# Who Helps the Helpers?: Complications and Considerations for ICT Instructors Teaching Older Adults

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## Abstract

Older adults often require educational support when adopting and learning new technologies, with ICT instructors serving as essential intermediaries. Despite their significant role in reducing digital disparities, the specific needs and challenges these instructors face remain underexplored. Through qualitative interviews with five smartphone instructors in Seoul, South Korea, we uncover nuanced challenges across different aspects of ICT education for older adults. Our findings highlight difficulties in content selection and class administration, including managing individual demands, creating instructional material, and addressing privacy concerns during demonstrations. The instructors were also affected by the internal and external risks of older adults using technology. Based on these findings, we propose systematic support strategies such as resource hubs, privacy-preserving demonstration methods, adaptable learning modules, and deployable practice sessions. This study provides critical insights into these instructional challenges and proposes design considerations for developing assistive tools to support ICT education for older adults.

## CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; Empirical studies in accessibility; • **Applied computing** → *Learning management systems*; **Computer-assisted instruction**.

## Keywords

Older Adults, Mobile Devices: Phones/Tablets, Empirical study that tells us about people, Interview, Qualitative Methods, Education

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## 1 Introduction

The widespread adoption of smartphones, alongside societal digitalization, has significantly increased the importance of mobile internet services for participation in modern society. However, this rapid advancement has also introduced new inequalities as marginalized groups struggle to access and effectively use information and communication technology (ICT)—a disparity also commonly referred to as the digital divide. Older adults represent one of the most affected demographics, frequently characterized by low technology adoption rates and limited digital literacy [23]. Amid the accelerated online migration driven by COVID-19, this user group has increasingly adopted new technologies [8, 16], but still often face greater difficulties and lag behind younger generations in technology use [2, 20].

Among developed nations, South Korea presents a particularly compelling case of the digital divide, where rapid technology penetration coincides with one of the fastest-aging populations[19]. Older adults in South Korea are rapidly catching up with their younger counterparts as smartphones are becoming a necessity for various services. A national survey in 2023 showed that 91% of older adults aged 60+ owned a smartphone, still lower than but similar to 96.1% of the general public [27]. Despite this improvement, the same nationwide survey has also found that while an increasing number of older adults now own a smartphone, they still lag behind in usage rates of specific features such as email, SNS, and online commerce [27]. This implies the multi-layered aspect of digital divide: although the disparity of hardware and access may be improving, a more subtle divide persists in adoption and usage levels [31]. Simply owning a smartphone does not automatically translate into digital inclusion.

This persistent gap has called for proactive interventions and support to help older adults fully utilize their devices and maintain

digital inclusion. As mere access to technology proved insufficient, various stakeholders now recognize digital literacy education is necessary to address this gap. Many organizations, including community centers and local governments, now provide ICT training programs and courses [14].

While these educational initiatives represent a significant step forward, their effectiveness heavily depends on the instructors who bridge between older adults and digital technology. However, these instructors face a unique set of challenges that have not been adequately addressed in current research or practice. Older adults navigate unique physical, cognitive, and emotional challenges in engaging with technology. While the instructors attempt to help older adults overcome such barriers, they are often not specifically trained in gerontology or related fields of study and, therefore, lack systematic pedagogical tools [37]. Moreover, older adults are not a homogeneous group; their technology usage and learning needs vary significantly based on prior experience, socioeconomic background, and physical or cognitive abilities. However, it is unrealistic to expect ICT instructors to provide personalized education tailored to each older adult's unique circumstances.

To address this gap and explore opportunities in ICT education support, we begin by investigating the current landscape of senior smartphone education in South Korea, focusing on the question: How do ICT instructors teach older adults to use smartphones, and what challenges do they encounter in helping them acquire these skills? To address this question, we conducted an interview study with five ICT instructors who currently teach smartphone use to older adults in local community centers in five different regions of Seoul, South Korea. Our qualitative approach aims to uncover the specific perceptions, strategies, and experiences of ICT instructors, offering insights into their teaching practices and the challenges they face. This paper contributes to the HCI field by examining instructors' perceptions of older adults' barriers to learning new technology, their instructional strategies for support, and the challenges they encountered in the process. Based on these insights, we propose actionable design recommendations for assistive tools to better support ICT instructors. By addressing this underexplored area, this study contributes to a broader understanding of how HCI can support intergenerational digital inclusion efforts.

## 2 Related Work

### 2.1 Digital Divide and Older Adults

The digital divide refers to inequalities in access to and use of Information and Communication Technologies (ICT) [5], encompassing three levels: the first-level digital divide (access), the second-level digital divide (skills and usage), and the third-level digital divide (tangible outcomes of Internet use) [31]. The third-level divide emerged as ICT became integral to daily activities, and the disparities in technology use started to influence broader areas of life. This digital divide has been further exacerbated by smartphone penetration and the migration to online platforms during COVID-19.

Although generational gaps in device ownership and internet access have narrowed, disparities persist. In 2021, 61% of older adults aged 65+ in the US reported owning a smartphone. Ownership rate differences compared to those aged 18–29 have significantly decreased from 53 to 35 percentage points [10]. However, the disparities still exist in the second and third levels of the digital divide, as they use fewer apps and features compared to younger cohorts [2, 20, 21].

Older adults face several different challenges when using ICT and smart devices. Traditional studies reported that age-related changes in vision, motor, and cognitive abilities negatively affect the acquirement of new technology [11, 22, 26]. Psychological factors, such as lack of confidence and low motivation for change, were also identified as hindering technology adoption [6, 29, 36]. Other factors include social status, socio-economic status, and education levels [15].

Recent studies [17, 18, 30] emphasized the need for alternative perspectives on technology non-use—that low adoption of older adults should not be framed as an accessibility problem that implies that older adults are fundamentally limited. Instead, it should be interpreted as a signal for attention to risks and concerns that are often overlooked, such as the value misalignment between older adults and technology. While these barriers are well-documented, it should also be noted that older adults are a heterogeneous group with great diversity in age, experience, digital literacy, and technology usage patterns [35]. This heterogeneity must be brought into consideration when interpreting and addressing the barriers to their technology use.

### 2.2 ICT Education for Older Adults

As the digital divide in older adults and their challenges gain attention, ICT education for them has become a priority for many community welfare initiatives. Beyond the informal help from family and friends [34], these programs aim to provide formal assistance in improving digital skills. This education is provided by diverse institutions, including local community centers, third-age universities, libraries, religious organizations, and government-financed projects [14, 33, 37]. Instructors range from professional educators and peer mentors to students participating in inter-generational programs [25]. Participants often reported that they not only improved digital skills but also experienced subjective benefits of technology usage, such as attitude changes toward technology and increased well-being [3, 9].

Despite the focus on older adults as learners, the perspectives of ICT instructors remain underexplored [33]. Much of the existing literature examines the obstacles the older adults face and the general strategies to help them overcome these difficulties [13, 24, 28], often neglecting the experiences and challenges of instructors. However, they hold valuable perspectives on difficulties and potentials in current ICT education. Geerts et al. [25] have characterized formal ICT support as 'cold' training that closes the gap left by the 'warm' support from family and friends. This study reported general teaching strategies to overcome common acquisition barriers, including facilitating practice, repeating content, explaining benefits, keeping the content simple, and creating an enjoyable experience.

In the study of Chiu et al. [7], the instructors often had to tailor for participants re-enrolling to the same class, manage unintended incidents, and answer different individual needs. Chiu et al. identified three common strategies to address these issues: (1) reserving certain content for later, (2) relying on unscripted teaching, and (3) encouraging peer assistance among learners. Instructors in the

study of Tomczyk et al. [37] shared that they face distinct difficulties due to the lack of content and methodological support. The instructors expressed their need for recent data and software, scientific publications on digital inclusion, and well-established teaching methods grounded on andragogy and geragogy. Along with such resources, the participants called for a society-wide promotion of lifelong education. Several different studies [12, 32] identified additional challenges faced by instructors, including their own stereotypes and difficulties with intergenerational communication.

These works highlight the importance of understanding ICT educators' perspectives. They reveal that not only do they provide insights into barriers faced by older adults, but they also have distinct problems and unmet needs that exist on a separate plane. Still, there has been limited exploration of these challenges and how technology can assist in overcoming them, particularly from an HCI perspective. This research aims to bridge this gap by examining instructors' needs and exploring design considerations for tools that can better support them in their roles.

## 3 Methods

Our study builds upon interviews with smartphone instructors currently teaching older adults. Five instructors currently teaching older adults were recruited at five community centers across the Seoul metropolitan area. The first author volunteered as a teaching assistant before the interview, ensuring a prior understanding of the instructors' class structure and environments. The semi-structured interviews, which lasted approximately one hour, were conducted in person by the first author. The questions were on three primary topics: (1) content covered in their class, (2) difficulties instructors faced in teaching older adults, and (3) specific efforts made to address such difficulties. Common questions posed to all instructors included: 'What are the technologies you consider important?', 'What content do your students request for?', 'What difficulties do you face in teaching older adults?', and 'What teaching resources or strategies do you use?'. Individualized follow-up questions were more specific: 'What aspect of typing is the most troublesome for older adults?', 'How would your students react differently to your advice and their children's?', and 'How do you administer classes on difficult topics such as account creation?'. This study was approved by the Institutional Research Board of the university of the first author.

The specific demographics and experiences of the five instructor participants are presented in Table 1. The interviewees had 2 to 10+ years of experience in smartphone education, with a median of 5. P3 worked as an ICT instructor for 26 years in an education-providing company. She did not provide the exact length of smartphone education other than it was longer than 10 years. All others experienced career changes and had relatively shorter teaching experiences. It is worth noting that P1, P4, and P5 are older adults themselves who started ICT education after retirement and thus have a compounded perspective as both older adults and instructors.

We adopted reflexive thematic analysis (RTA)[4] for its open and iterative procedure. The first author who conducted the interview transcribed the data from audio recordings. After proofreading, the first and a senior author independently reviewed all the data to familiarize themselves with it. They then met to discuss themes

that stood out and iteratively refined them. Subsequently, the first author systematically coded the data through multiple iterations of review and refinement. The analysis yielded 68 different semantic and latent codes, again used to form three refined themes, which we present in the following section.

## 4 Findings

### 4.1 Balancing Desires and Realities in ICT Class Content for Older Adults

Many instructors tailored their courses by surveying the contents that their students were interested in or designing them based on the popularity of features from previous classes. Older adults often request to learn a specific task, for example, online shopping. However, these tasks are complex activities and require mastering many basic skills like touchscreen interactions and ID/password creation.

Older adults unfamiliar with smartphones often have to learn the basic conventions of workflows and UI elements to navigate the screens. P3 found that beginners had difficulties with touchscreen interaction, such as double-tap or long-press. P2 observed that her students were unaware they had to hit submit after typing. P4 similarly emphasized his strategy of explaining standard icons and menu structures first. Instructors frequently used metaphors to help them understand technical terms through well-known objects. "If someone says their storage space is limited, I explain it's like living in a smaller apartment—you have to keep organizing and throwing things out to make room. (P3)" However, most technical terms used in smartphones are directly borrowed from English with multiple lexical variations (e.g., 'app' and 'home screen'), making it overly confusing for non-English-speaking populations. P1 was pessimistic about this issue. "If they don't know English, they just can't use it. Teaching them English from scratch to make it work? That's nearly impossible. (P1)" Older adults with at least some English education at school fared better in processing new terms.

Creating a new account was a significant initial barrier to adoption for many services. The overall process of authentication, username availability check, composing a password that satisfies the password rule, and confirming it by entering it twice is altogether unfamiliar. "Even checking for duplicate IDs or doing identity verification, which feels routine to us, is really challenging for older adults since they're not used to it. (P2)" P3 also agreed that it is the most challenging part of using a new app. Online services require creating an English ID and password with different password requirements. The instructors observed that remembering passwords was a burden to many older adults, calling for a password management method without security risks. P4 recommended Google Password Manager but acknowledged it might be too difficult. P1 demonstrated his password management to the class; he would write his passwords in his mobile notepad with specific replacement rules. Since many older adults in Korea were unfamiliar with alphabet-based writing and keyboard systems, account creation came with an additional hurdle. "So, when I even start explaining that they need to create an ID in English or include special characters in their password, half of them, I'd say, just lose it and go, 'I don't want to use this anymore.' (P1)"

**Table 1: Demographics of instructor participants along with their experience in smartphone usage education.**

| ID | Age | Gender | Education | Major(if any) | Years of exp. | Avg. class size |
|----|-----|--------|-----------|---------------|---------------|-----------------|
| **P1** | *69* | M | Third level | public administration | 10 | 20 |
| **P2** | 52 | F | Third level | silviculture, fashion | 4 | 15 |
| **P3** | 48 | F | Third level | multimedia | 10+ | 12 |
| **P4** | *72* | M | Third level | public administration, state affairs | 2 | 7 |
| **P5** | *68* | F | Third level | Korean education, psychology | 5 | 10 |

In addition to apps commonly requested by older adults and essential lower-level tasks, instructors were also passionate about including features they believed were beneficial to older adults. P1 mentioned a Social Networking Service that can also be used as a personal cloud service. P1, P4, and P5 noted the recent rise of generative AI and the positive reactions of their students when they selected those topics for their classes. "They were delighted with it. Instead of just staying home all the time when the society was changing so much, coming out and learning something new gave them a sense of accomplishment and pride. One even said, 'I don't need to take any more classes now. With just this, I can enjoy my life at home as much as I want.' (P5)"

P2 noted that older adults preferred to learn *useful* features, but without firsthand experience, it is difficult for them to determine what is truly useful. Also, the existing demands varied so widely that she chose to cover general features only. P5 adjusted the content for each group according to the overall composition of the class participants. P4, with the smallest class size, actively splits the class depending on individual progress, allowing students who have difficulties with new topics to review past content instead.

## 4.2 Teaching Strategies for Older Adults Learning ICT

Class materials included digital presentations, handouts, and booklets. Most instructors created their own materials except for P3, who used premade booklets provided by her company. The resources often contained screenshots of each task stage with graphic indicators and explanations. P1 shared that creating detailed instructions was usually difficult and time-consuming, but step-by-step instructions were necessary for helping older adults follow them. These materials should be constantly modified as devices and apps are updated. P2 and P5 explicitly noted the consistent need to learn new features. P1 also actively sought education on the latest technology, including generative AI.

The prepared resources varied in form, but all our instructors reported using screen share (or "mirroring") as a significant means of demonstration. The students needed step-by-step instructions on the same screen as they could see on their devices. Instructors would break down the workflow and walk through the process together. P4 said it was particularly effective to alternate between presentations and screen share as it makes lesson structure more predictable. However, this involved inevitable privacy issues for the instructor, more so since the lessons often involved sensitive topics such as mobile banking. Some instructors, as with P3, felt uncomfortable that she had to reveal her bank account information to demonstrate the procedure. P4 withdrew from teaching banking

at all and told his students to find help at offline bank branches instead.

These one-time walkthroughs usually proved insufficient to learn a feature, making review sessions spanning multiple classes necessary. P2 shared that only a portion of her students practice at home, and others come to class and tell her they forgot what they learned last time. "So I always think about it, you know? Like, how much I should teach and how much I need to repeat things—that kind of stuff. I think about it a lot. (P2)" P3 encouraged enrolling in similar classes again, as different instructors can offer both a review of familiar topics and the opportunity to learn new content. Yet, the learning speed differs for each individual as they vary in skills and understanding. The factors frequently identified included age (P1, P4, P5), experience with technology (P1, P2, P4), education, particularly English (P1, P5). P4, who had a relatively small class, could split the group to have review sessions for students having difficulties while providing others with additional materials to work on. P3 reviewed it for everyone since "most seniors forget it soon enough anyway."

The instructors had many variances to tend for in class other than different skill levels. P2 felt limited in answering requests for specific tasks. P5 observed the presence of many unnecessary apps installed, but it was not practical to help each student remove them. The screens—the screenshots in slides or mirrored phone screens—were not identical to everyone due to differences in device models, OS versions, or app availability. This inconsistency made it difficult to copy the instructor at every step and required additional attention for each variant. This was more of a problem in mobile banking, as different banks had apps with very different UI layouts and workflows. "That's why, especially for beginners, one-on-one or one-on-two lessons work best. If they already know a little, then we can manage group sessions like this, but yeah. (P2)" P2 also pointed out that some instructors prefer to install third-party apps instead of focusing on default features because these features vary depending on device models and versions. Volunteers or peer mentors helped handle individual needs, especially with complex tasks such as account creation. However, the availability of assistance differs for each institute, course, and class. Instructors may also help during breaks or after class, but there are practical limitations, especially for larger classes.

## 4.3 Balancing Risks and Rewards in Learning

Often, older adults' children play a pivotal role in shaping their motivation to learn specific ICT skills, either by encouraging or discouraging them. Some students avoided learning certain skills or abandoned what they already learned because they would rather

rely on their family members to complete tasks for them instead of learning to do them independently. "From my experience with students, only about 10% actually do it (online shopping) themselves. Most still rely on their kids, and I think that's a problem. (P5)" On the other hand, some older adults were motivated to learn because they wanted to reduce their reliance on their children and avoid asking for help every time. In addition, P2, P3, and P5 all mentioned that seeing their peers use technology is a common source of motivation. P5 speculated that having many social connections to share what they learned led to higher satisfaction with the course.

Instructors tried to encourage technology engagement by increasing perceived usefulness. P4 thought introducing new possibilities could help trigger new desires, such as showing concert recordings available online. "It's about tapping into that—sparking their desire. Once you do that, there are people who'll find a way to learn no matter what. (P4)" P1 encouraged his students to at least try once after learning. "And once they use it, it gets easier, so they end up buying more. Cheap options keep popping up, and they buy because they need them. (P1)" However, there were limits to what instructors could do. "At 70, everyone has their own lifestyle, and that's not something I can really comment on. (P5)"

Older adults' reluctance to use certain features was partially attributed to their fear of mistakes. This was especially the case in high-stakes situations, namely tasks involving money. They were largely afraid of typos and tapping the wrong buttons. This was linked to security concerns, as they could not be confident of their reliability judgments. "We (younger people) know about these things, so they assume the risk is lower for us. But they don't, so they think any mistake they make will definitely cause a problem. (P3)"

P1 and P3 reported that older adults refrained from making accounts because they considered passing their information to service providers unsafe. They also tend to be more cautious and distrustful about smartphone transactions. P3 and P5 observed that their students were reluctant to enter credit card information because they were concerned about security breaches. The instructors are aware of this concern and put efforts into teaching security measures such as having a separate bank account for online activity, deleting credit card information after payment, and scheduling special sessions dedicated to phishing attacks. P3 commented that her students were still hesitant despite her encouragement but suggested that family support and approval can also help overcome the reluctance. "Even if we say it's fine, it doesn't work. But if their children say, 'Mom, use this—it's convenient,' they seem to trust that. (P3)"

However, external contexts can be an additional barrier if they are unsupportive. Family members concerned about financial damage often discourage mobile shopping and banking, especially if the older adults are not financially independent. P2 shared that the institutes prohibited instructors from teaching those topics in the past. Although the situation was recently improving, she could not actively encourage her students to learn these activities because of the possibility of financial harm. P5 chose to avoid the risk altogether and excluded financial activities from her curricula "because if older adults make a mistake, all the blame ends up directed at the instructor who taught them."

## 5 Discussion

ICT instructors faced multiple challenges across various aspects of education but lacked systematic support throughout the process. The experiences shared by our participants were centered on the two major stages of ICT education: teaching preparation and instructional management. We aim to identify significant difficulties in each stage and provide guidelines for potential solutions.

**Teaching preparation** involves active decisions on class topics and their order, based on the instructor's understanding of the student group and the desires and requests from the student side. Then, the instructor prepares for individual lessons by creating and updating the resources.

While specific strategies and approaches may vary, the instructors who participated in our study largely covered similar contents. However, most developed their own curricula and resources, except for P3, who was an employee of an ICT education company. This highlights a potential benefit of a **resource hub** where the instructors can download open-source class materials such as presentations, handouts, and activities. Communities that share ideas on structured strategies and detailed teaching approaches could also reduce efforts and improve the overall quality of ICT education. This aligns with previous research advocating for an open-access platform for ICT instructors[37].

However, the instructors pointed out that new features and updates require constant modification of course content. This is why class material management should not be limited to organization and sharing but should mainly focus on **convenient means of creation and modification**. Integrating screenshots, for instance, was a common and time-consuming pattern as most older adults required step-by-step tutorials. Tools to manage, insert, and annotate screenshots would be helpful.

Including screenshots creates an inevitable risk to privacy, which was a source of distress and reluctance when teaching particular topics. Tools for **masking personal information** may be useful, as in editing screenshots to replace sensitive information. An alternative approach would be to record the procedures and apply masks or edits to the video so that the edited video can replace live demonstrations. This would also be advantageous to the students since they can replay the video in case they do not understand or need reviews.

**Instructional management** poses distinct challenges as the instructors should actively respond to individual needs and situations that are often unforeseen in the preparation stage. They continuously assessed understanding and motivation levels, adjusting their teaching strategies on the fly to address emerging challenges in the field.

Since these adjustments could involve modifications in curriculum, **modularization** of the materials would be greatly appreciated. The sessions should be open to impromptu structure control to adapt to unforeseen incidents in class. Other potential improvements include scheduling and creating tools for review sessions. Considering that the need for additional explanations or repetitions varies for individual students, these sessions would be useful if they could be deployed as standalone videos or slides for independent learning. Individualized training was shown to be effective in encouraging older adults' technology use [1].

Yet, addressing specific barriers to older adults' technology use is relatively challenging. Our participants often compromised with many factors of psychological and external contexts since their influences were limited for either issue. Low motivation was often attributed to low perceived usefulness, and instructors often tried to demonstrate the advantages of technology adoption in our interviews and previous studies [25] alike. Assistive systems for ICT classes would preferably **support such efforts to enhance motivation**, for instance suggesting beneficial situations, providing low burden tasks to try for beginners, and encouraging the sharing of accounts between the students.

Fear of mistakes and losses was especially prominent in areas of higher stakes, where mistakes could cause actual harm. The instructors observed that doubt in one's abilities could intensify security concerns as well, but classes on security threats and precautions did not necessarily create a sense of safety. While the heightened awareness may help prevent harm, it may also discourage older adults from using technology itself. We suggest a **safe practice ground** to incorporate into instructors' lessons. It may be helpful to provide practice opportunities for (1) familiarizing with the workflow to reduce the psychological burden and fear of mistakes and (2) recognizing actual security threat cases and trying standard security measures to improve judgment. Mock apps with exercises may serve as a helpful resource.

However, the barriers in technology use may extend beyond the individual students themselves. External contexts in technology education involve multiple stakeholders: institutes, family members, instructors, and older adult learners. Each group has legitimate concerns about technology adoption that extend beyond what can be solved by a technical approach. This raises a critical question: How can we responsibly introduce technology while respecting the nuanced social and personal considerations of each stakeholder? These insights call for a constant effort to improve social awareness and safety beyond the focus on simple education.

The primary limitation of our study is that it is limited to five instructors teaching in Seoul. Several of our participants have hinted that their experience varied depending on which area of the city they were teaching in, due to differences in socioeconomic status or the extent of family support. It can be inferred that older adults and their instructors in areas outside the city face very different obstacles. Further research on regional differences in ICT education experiences may bring more generalizable findings. Also, instructors with other teaching environments, such as those who mainly give one-on-one assistance, likely have distinct needs. Other potential research topics include the deployment and testing of various assistance approaches in the wild to validate if they are beneficial in the versatile reality of ICT education.

## 6 Conclusion

This study maps the common tasks, strategies, and challenges of ICT education for older adults by examining the experiences of instructors teaching smartphone use. By focusing on the intermediaries who support digital literacy, we reveal the complex process of teaching technology to marginalized populations. Instructors carefully select content for older adults with varying needs and deliver it with demonstration and repetition while attempting to

address individual requests. Throughout the process, the instructors experience common obstacles in their students, including lack of motivation, fear of mistakes, and discouraging external contexts. Based on these findings, we suggest potential design approaches for systematic support for ICT instructors teaching older adults. We hope these points provide insights and context to guide future designs for ICT instructors and contribute to societal efforts to address the digital divide.

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