

EDUCATIONAL INNOVATIONS IN SENIOR LEARNING: THE ROLE OF THE UNIVERSITY OF THE THIRD AGE IN ADDRESSING DIGITAL LITERACY GAPS

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Introduction. In the rapidly digitalizing world, the digital literacy gap presents a formidable challenge, especially for older populations. This gap refers to the disparity in the ability and opportunity to access and effectively use digital technologies between different groups, often influenced by factors such as age, socioeconomic status, and educational background. For older adults, bridging this gap is crucial not only for accessing essential services but also for participating actively in the digital society [16].

Digital exclusion, a critical aspect of the digital divide, refers to the barriers that prevent individuals from fully participating in the digital world. This form of exclusion impacts social inclusion and access to public services, making it a significant issue for the elderly who are at risk of being left behind in an increasingly digital world [22].

Ukraine, witnessing a demographic shift towards a growing number of older citizens, exemplifies these challenges. The country's widespread adoption of digital services, including in the social services sector, underscores the pressing need for digital competence among its aging population [9, 20, 21]. Digital competence involves not just the basic ability to use technological tools, but a deeper, culturally ingrained capacity to engage with digital technology as a means for self-education, community participation, and access to essential services. It turns individuals into adept users of digital platforms, influencing their social identities and the professional practices of those who support them, such as social workers [10, 14].

Recognizing the essential role of digital competence, researchers [6] and international bodies like the European Union (2019) [1] and the World Health Organization (2020) [24] have highlighted the need for equitable access to digital technologies. This is crucial for enabling effective management of daily life in today's information-rich society [5].

Amidst the backdrop of global challenges such as the COVID-19 pandemic and the ongoing Russo-Ukrainian war, the urgency for digital inclusion has intensified. These crises have accelerated the digitization of public services, further emphasizing the necessity for targeted educational initiatives that empower older adults to navigate and thrive in the evolving digital landscape.

The focus of this paper centers on such an initiative: an experimental program at the University of the Third Age in Poltava, Ukraine. This program is a proactive response to the identified needs for digital literacy among older learners. By intertwining lifelong learning with social service provisions, it aims to mitigate digital exclusion and bridge the digital divide for elderly citizens. This study not only assesses the impact of these efforts but also aims to spotlight educational strategies and innovations that enhance digital competence, fostering broader social inclusion and participation among older adults in digital society. Through this examination, we hope to illuminate paths forward for future research and development in gerontological education, ensuring that older generations are not bystanders but active participants in our digital world.

Theoretical Framework: Integrating Gerontological and Digital Education for Older Learners in Third Age Universities

The research is framed within two overarching concepts: (1) gerontological education within specialized institutions of the informal education called Universities of the Third Age and (2) digital competence.

Examining Ukrainian [13, 15] and international [2, [11] experiences reveals diverse forms of gerontological education, encompassing formal education (courses, lectures, seminars at universities), informal education (clubs, groups, workshops), and self-directed learning. Universities of the Third Age (U3As), dedicated to lifelong learning, play a pivotal role in addressing the educational needs of post-retirement individuals.

From the standpoint of certain researchers [7, 8, 13], key functions of the University of the Third Age should be attributed to improving the qualitative characteristics of the lives of the older people through intellectualization and increasing the variability of their education, especially in terms of digital technologies. Notably, these institutions are adapting to the digital era, integrating online platforms and tools to enhance accessibility and engagement for older learners. The theoretical foundation for instructing older individuals within Third Age Universities draws heavily from adult education principles, notably M. Knowles' seminal work [12]. Recognizing older adults as autonomous decision-makers who leverage accumulated life experiences, the framework acknowledges their unique reservoir of practical, professional, and social knowledge. Unlike traditional child learners, adults, especially in later years, are motivated by resolving life challenges and achieving specific goals. Adult learning is characterized by the immediate application of acquired knowledge and is influenced by temporal, spatial, domestic, professional, and social factors.

Aligned with the concept of flexible learning [4], the framework empowers learners to tailor educational processes to individual needs, interests, and circumstances. Resonating with theories of self-regulated learning [23, 25], it emphasizes learners' abilities to plan, control, and regulate their learning activities. Internationally, the high regard for self-regulated learning in acquiring digital competencies among older adults supports the efficacy of this framework [18]. Integrating andragogical principles, in particular geragogical [3] principles ensures that educational programs in Third Age Universities are designed flexibly, fostering effective learning experiences tailored to individual needs and interests.

Current digital transformations call for the thoughtful development of relevant competencies for both social workers and their clients [19]. In the realm of digital competence, based on the DigComp 2.0 Framework concepts [5], four distinct components of such competence for older learners at the University of the Third Age were singled out: knowledge, skills and abilities, motivation, and responsibility. The latter incorporates aspects such as digital security. The digital competence of these participants is delineated into four parts: information and media literacy, communicative competence, technical competence, and consumer competence. The analytical work led to the identification of key criteria for assessing the formation of digital competence in older adults, reflecting their ability and skill levels in using digital technologies. These criteria include the level of access to technology, mastery of basic skills, digital literacy, use of digital services, and the integration of digital technologies into everyday life. Additionally [17] perspective, which connects digital literacy with socialization to old age, was considered in the analysis.

This dual theoretical framework lays the foundation for the subsequent designing and exploration of the impact of an experimental program at the University of the Third Age on the digital competence of older learners, and discussions on its educational innovations.

Research Background. The experimental work on enhancing digital competence among older individuals took place at the University of the Third Age within the territorial center for social services (provision of social services) under the Department of Social Protection of the Population of the Podilsky District Council in Poltava. Established in 2011, this university has been at the forefront of addressing the evolving needs of its elderly participants. The program's inception in 2016 marked the beginning of a transformative journey, adapting to ongoing societal digitization. Subsequent modifications in 2017 and 2018, along with adjustments in 2020 due to the COVID-19 pandemic and 2022 with the experimental introduction of the Moodle platform amidst the Russo-Ukrainian war, underscore the program's responsiveness to dynamic external factors.

In 2022, the experimental program was implemented on the Moodle digital platform and consisted of 11 modules:

- 1) Introduction to digital tools and the working environment;
- 2) Moodle digital platform in the learning process;
- 3) Windows operating system. Files and folders;
- 4) Basics of working in Microsoft Office;
- 5) Working on the Internet. Google applications;
- 6) Personal digital space. Basics of digital security and personalized Internet work;
- 7) Information search on the Internet;
- 8) Online communication;
- 9) Internet services;
- 10) E-commerce;
- 11) E-governance.

When implementing the experimental programme for developing digital competencies, the following principles of organizing learning and tutoring for older listeners on the Moodle platform were applied: competence development; practice-oriented approach; flexible curriculum planning; self-organization and

self-learning; interactivity: interaction with tutors; advanced virtual infrastructure; variety of forms and methods of learning; diversity of original teaching materials; active use of problem-solving methods; construction and creativity.

The program is characterized by variability and openness, aiming to ensure the individual educational trajectory of elderly individuals, aligning with the basic principles of lifelong learning and geragogy in particular [3] and the philosophy of organizing education at the University of the Third Age [13]. Its implementation in a social institution allowed the integration of gerontological education services with social support, engaging participants in other activities of the territorial center and implementing an approach oriented toward developing the strengths of social work clients.

Research Methodology. The study involved 360 participants from the University of the Third Age, all clients of the territorial center enrolled in the digital competence development programme. Respondents' ages ranged from 60 to 82 years. The largest segment (321 clients, or 89.2% of participants) was in the 60 to 70 age group. In terms of gender, respondents comprised 34.7% males and 65.3% females, aligning approximately with the gender and age distribution of Ukraine's elderly population. Those with disabilities made up 23.6% of all respondents. Education-wise, the breakdown is as follows: secondary education – 25.3%, vocational-technical (manual skills occupations) – 14.3%, specialized secondary (technical colleges) – 31.2%, higher education – 26.2%, academic degree – 2.5%. The study, conducted in 2022-2023 involved surveys administered at the beginning and end of the academic year. The *paper questionnaires* were distributed and collected by social workers involved in delivering sessions at the University of the Third Age, reflecting the formative impact of the programme.

The self-completion questionnaire for the participants of the "University of the Third Age" program aimed at a comprehensive assessment of the level of digital competence level among older people. It covered different levels of digital literacy and addressed changes in digital preferences and digital resocialization of older people. The questionnaire included questions on various aspects of digital competence, such as access to technology, use of digital services, mastery of basic skills and perception of risks online, which helped to determine the level of digital literacy of the participants. The questionnaire also focused on questions about motivation to learn, identifying the factors that motivated older people to participate and the role of motivation in their success in acquiring digital skills. Additional questions assessed overall satisfaction with the digital competence development programme and whether the programme met the needs and expectations of the participants. In addition to structured surveys, the methodology encompassed *open observations* during the educational sessions on digital competence, allowing for a nuanced understanding of participants' reactions, challenges, and the effectiveness of the tailored approach focused on leveraging their strengths.

All participants were informed of the anonymity of the study and were assured that their responses would not influence the provision of social services or their continued participation in the University of the Third Age. The study's hypothesis posits that the implementation of the experimental programme at the University of the Third Age will significantly enhance digital competence among older individuals, thereby reducing the digital divide and mitigating digital exclusion. This improvement is expected to have a positive impact on various aspects of the participants' lives. Descriptive statistical methods and mathematical analysis were used for quantitative data processing, using the MS Excel for Windows software package. The data was summarised and anonymized while maintaining the confidentiality of the research participants.

The research results were presented in the form of aggregated data, whereby the anonymity of the individual survey participants was preserved. Observations were systematically proceeded to identify recurring patterns, challenges, and notable instances of successful skill acquisition. The qualitative insights from these observations provided enhance the understanding of the dynamics in the gerontological learning environment of the University of the Third Age, situated within a local social service context.

Research Results. The experimental initiative validated the efficacy of the program in fostering digital competence among older individuals in the context of gerontological education.

A noteworthy observation is the significant improvement in computer usage among participants. At the commencement of the academic year, only 66.2% of individuals were using computers, a figure that surged to 83.1% upon program completion.

Across various age brackets of elderly participants in the University of the Third Age, a substantial rise in the adoption of digital communication tools is evident. This surge is most pronounced in the 60-64 years, 65-70 years, and 71-75 years age groups, witnessing growth rates of +32.4%, +26.5%, and +6.4%, respectively. Even in the 76-82 age group, there is a modest increase of 0.9% (see Figure 1).

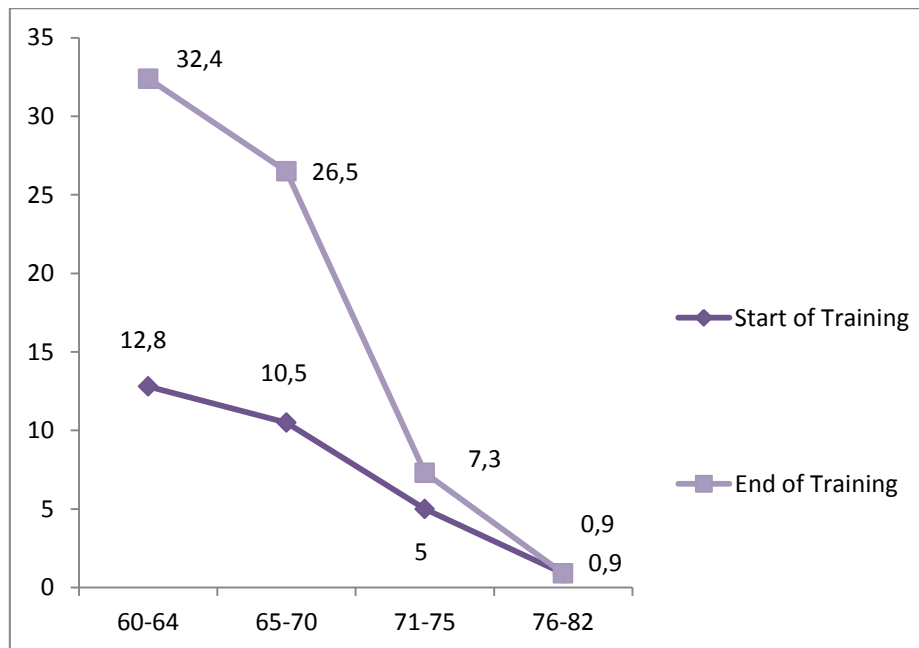


Figure 1. Communication in social networks among the gender-age groups of older participants in the University of the Third Age (in %; n=360).

At the programme's outset, a majority of respondents primarily used computers for personal hedonistic needs. However, post-training, a significant majority shifted their focus towards expanding their worldview and enhancing their cultural knowledge. This indicates a keen interest in learning and acquiring new knowledge in the digital realm. Digital communication has become a meaningful aspect for older individuals, enabling them to sustain social connections and feel supported by relatives and friends. Notably, there is a positive trend in the use of digital tools for communication, particularly through the popularity of social networks.

The data presented in Table 1 from your study strongly evidences a significant shift in the motivations and goals of older adults following digital technology training, indicating not only an increase in digital literacy but also a transformation in how they view and utilize technology in their daily lives. Here's a detailed interpretation of how these changes reflect shifts in motivations:

1. *Increased Functional Use of Technology:*

- Text and Photo Printing: The substantial increase from 5.0% to 34.2% in the usage of technology for printing text and photos indicates a newfound comfort with handling practical tasks digitally. This suggests a shift from viewing technology as a novelty to recognizing its utility in accomplishing everyday activities.

2. *Enhanced Engagement with Civic and Administrative Tasks:*

- Using Electronic Cabinets of Public Institutions: The jump from 5.9% to 64.8% demonstrates a significant rise in participants' willingness and ability to engage with government services online. This marks a transition from dependency on traditional, possibly in-person, methods to an autonomous handling of civic duties via digital means.

3. *Social Integration and Communication:*

- Social Media Communication: The increase from 29.2% to 66.2% in social media use underscores a broader social engagement, where participants are motivated to maintain and expand their social networks online.

- *Communication with Relatives and Friends via Platforms like Skype, Zoom, Google Meet:* Rising from 25.6% to 57.5%, this shows a motivation to maintain close personal connections and adapt to modern forms of communication, reflecting a shift toward embracing digital tools for personal relationships.

4. *Financial Independence and Security:*

- Internet Banking and Paying Utility Bills: Dramatic increases in these areas (from 13.7% to 79.0% for internet banking, and 7.8% to 36.5% for paying bills) illustrate a significant growth in confidence and trust in managing financial transactions online, indicating a shift towards financial autonomy and security.

5. *Cultural and Intellectual Engagement:*

- Broadening Horizons, Increasing Cultural Level: The most significant rise, from 20.5% to 72.1%, highlights a powerful shift in using digital tools for personal growth and cultural enrichment. This represents a deeper, more intrinsic motivation for lifelong learning and intellectual exploration.

6. *Convenience and Accessibility in Everyday Tasks:*

– Making Purchases Through Online Stores and Scheduling Medical Appointments: These activities saw notable increases (23.7% and 13.2%, respectively), indicating a shift towards utilizing digital platforms for more convenient access to goods and services, which enhances quality of life and independence.

The overall shift in motivations as evidenced by the data in Table 1 reflects a transformation in the senior participants’ perceptions of technology – from a tool of limited personal relevance to a crucial element of active, autonomous, and enriched living. This aligns with broader educational goals of fostering digital inclusivity and competence, ensuring that seniors are not only consumers of digital content but also active participants in the digital community. These findings provide a compelling argument for the continuation and expansion of digital training programs for the elderly, emphasizing the role of such education in empowering older adults to meet their personal, social, and civic needs more effectively.

In order to discern effective strategies for enhancing the formation of digital competencies among elderly learners in the University of the Third Age, particularly in the context of the challenges posed by the COVID-19 pandemic and the Russo-Ukrainian war, we incorporated questions gauging satisfaction with distance learning in the digital competency programme. In response to the question, «What do you like about distance learning?», elderly learners ranked their preferences, revealing insights into their evolving perspectives (Table 1).

Table 1.

Attractiveness of Distance Learning for Older Learners (significance coefficient, k)

Criteria	Start of Training	End of Training
Learning conditions comfortable for me at home	1	4
Ability to independently choose a convenient time for learning	3	2
Ability to independently choose the pace of learning	4	1
Ability to independently choose the amount of time needed to complete tasks	2	3

The data in Table 1 illustrates a discernible shift in the preferences and perceptions of Third Age University learners concerning distance learning throughout the academic year. Initially, learners highly prioritized the comfort of learning at home, while the ability to independently choose the pace and time of learning held less significance.

However, by the end of the academic year, there was a noteworthy change in priorities. Participants increasingly valued the flexibility afforded by distance learning, emphasizing the importance of choosing their own time, pace, and the duration dedicated to completing tasks. This shift indicates a positive impact of distance learning on the adaptability of older learners to this educational format within the context of the Third Age University’s gerontological education programme. The investigation into the distance learning system, akin to any process, brings forth its set of challenges. To discern the primary issues influencing the quality of digital competence development among older learners at the University of the Third Age during distance learning, we scrutinized respondents’ replies to the query, «What specifically dissatisfies you about distance learning?»

Foremost among the concerns for University of the Third Age learners is the absence of «live» interaction with instructors and peers, registering at 55.3%. This absence not only diminishes motivation for learning, acknowledged by 32.8% of respondents, but also emerges as the most substantial challenge. Other relatively minor issues in distance learning through digital technologies for elderly learners include the limited bandwidth of the electronic network (8.9%) and the ambiguity in evaluating completed assignments (3.1%). Consequently, addressing these identified challenges requires tools and methodologies. As a compensatory measure for the absence of «live» communication, we propose an increase in the frequency of online tutorials using Zoom conferences and Google Meet meetings.

Based on open direct observations during the acquisition of digital knowledge, employing an approach tailored to the strengths of elderly clients proved effective through the following strategies:

1. Framing challenges positively: shifting the focus of difficulty content towards a positive perspective; fostering a positive identification with their new societal role; minimizing and managing stress; treating the problem as manageable; facilitating the process of acquiring new competencies.

2. Cultivating a positive future outlook: instilling optimistic expectations; building confidence in personal resources to overcome challenges; directing attention to the life potential within individual resources; encouraging social activity and initiative; transforming attitudes towards circumstances that an elderly person may not be able to change.

In detailing the unique aspects of implementing digital competence development within a territorial center, it's worth noting that participants in the University of the Third Age had the opportunity to access various social services and engage in mutual support groups facilitated by the territorial center.

Discussions. The study's findings shed light on significant aspects of integrating digital technology training among older learners within the University of the Third Age programme.

One key revelation concerns the transformative impact of digital education on the motivations of older participants. Initially motivated by personal gratification, the majority shifted towards an aspiration for broadening their perspectives and cultural horizons through digital learning. This shift underscores the potential of digital education to foster a continuous and purpose-driven pursuit of knowledge among older individuals. Similar findings are also observed in some other studies [13, 18].

The participants' resilience and adaptability to digital spaces, despite external challenges such as the COVID-19 pandemic and geopolitical tensions, emphasize the capacity of older individuals to overcome barriers to digital inclusion. This adaptive readiness underscores the importance of tailored approaches in designing effective digital literacy initiatives for older learners.

The study's findings support the hypothesis that the implementation of the experimental programme at the University of the Third Age significantly enhances digital competence among older individuals. The results indicate a positive shift in the participants' behaviors and attitudes towards digital technology, showcasing increased usage of digital tools for diverse activities. Improvements observed in computer usage, communication through digital platforms, and engagement with various online services suggest a notable reduction in the digital gap and mitigation of digital exclusion among the elderly participants. Therefore, the study provides empirical evidence that the experimental programme has effectively contributed to enhancing digital skills, aligning with the study's initial hypothesis.

The study also underscores the growing role of digital platforms, especially social media, in facilitating social connectivity for older adults. The observed positive dynamics in the use of digital tools for communication highlight their significance in alleviating social isolation among this demographic.

The analysis of the experimental work on fostering digital competencies among the participants of the University of the Third Age at the Territorial Center of Social Services provided grounds for identifying key components in this initiative. Employing a comprehensive approach, the following components were delineated, accompanied by recommendations for their refinement:

1. *The creation of a user-friendly digital gerontological learning environment for the University is crucial.* This platform should feature simplicity in use, be adapted to the specific needs of elderly users, possess a comprehensible interface, and ensure access to necessary educational resources.

2. *Motivating elderly learners to acquire essential digital knowledge and skills is pivotal.* Programmes for digital competence development should be structured and oriented towards the practical application of acquired knowledge and skills. The application of a modular approach can cater to both beginners with no digital literacy and those who have a certain level but need improvement. Fostering interest in learning, aiding in overcoming digital anxiety, and promoting independence in acquiring knowledge are vital aspects.

3. *Motivation of elderly learners and social workers to collaborate in the digital environment is essential.* Collaboration between generations and knowledge exchange can serve as motivating factors for active participation in digital learning. Providing opportunities for interaction with younger generations is crucial for elderly individuals to feel the significance of their knowledge and experience. Other researchers [14] also point this out,

4. *Instilling a commitment among social workers, involved into gerontological education, to develop their professional digital competencies is paramount.* Social workers play a crucial role in shaping the digital skills of elderly individuals. They should possess the necessary knowledge and skills for effective teaching on digital platforms. Their readiness to utilize digital technologies in the educational process is a crucial aspect of the success of this initiative.

Furthermore, for future research endeavors, exploring international practices concerning the social integration of elderly individuals through digital technologies is prudent. Additionally, there is a need to develop programs that cultivate digital competencies among older people who have been displaced from occupied and front-line territories of Ukraine, necessitating relocation to safe areas.

The synthesis of best practices in the professional training of social workers – gerontagogues in Ukraine and abroad merits attention. Lastly, studying the ongoing process of digitization in the field of social services can provide valuable insights into the evolving landscape of seniors' care.

These directions offer promising avenues for advancing knowledge and contributing to the ongoing discourse on digital inclusion and education for the older people.

Here are some thoughts on educational innovations to include in the discussion chapter of your book, focusing on the pedagogical and technological advancements observed in the Third Age University Programme:

Overall, the study's findings also illuminate the vital role of educational innovations in integrating digital technology training among older learners within the University of the Third Age program. One significant innovation is the development of a tailored, gerontologically sensitive digital curriculum that caters specifically to the learning styles and needs of older adults. This curriculum is crafted to ease the digital entry for seniors, incorporating interactive and engaging content that enhances understanding and retention. Moreover, the program's educational structure is innovative in its modular approach, allowing participants to engage at various levels of competency. This flexibility ensures that each learner finds content that matches their skills and progresses at their own pace, which is crucial for maintaining motivation and engagement among older learners. The modular system also allows for the incorporation of emerging digital tools and platforms, ensuring the curriculum remains relevant in a rapidly evolving digital landscape.

Another notable innovation is the emphasis on intergenerational learning, which not only enhances the learning experience but also fosters social inclusion and reduces age-related stereotypes. By integrating younger volunteers or educators in the learning process, older participants benefit from direct exposure to the digital natives' fluency, gaining insights and skills that may be less accessible through traditional senior-focused educational settings.

The program also innovatively incorporates real-time feedback mechanisms through digital platforms, which are essential for continuous improvement and adaptation of the curriculum. These feedback systems help in identifying the specific challenges faced by participants, allowing for timely adjustments and personalized support. Lastly, the discussion should touch upon the critical role of continuous professional development for educators and social workers involved in the program. The investment in training these professionals to be adept in the latest digital educational strategies is paramount. Their ability to adapt to new technologies and pedagogical approaches directly influences the efficacy of the program and the overall experience of the learners. These educational innovations underscore the University of the Third Age's commitment to creating a robust, inclusive, and adaptive digital learning environment that not only meets the needs of today's senior learners but also prepares them to be active participants in the digital world. Future research should continue to explore these innovations, expanding them and adapting them in new contexts to meet the challenges and opportunities of educating older adults in the digital age. Furthermore, the use of virtual reality (VR) and augmented reality (AR) technologies has to be explored as part of the advanced modules. These technologies offer immersive experiences that can significantly enhance learning and engagement for seniors, particularly in understanding complex digital environments and tools.

Conclusions. This study sheds light on the transformative power of digital education for seniors participating in the University of the Third Age program. Importantly, the study accentuates the theme of empowerment for older individuals, showcasing their ability to adapt, learn, and actively engage in the digital realm. The development and testing of a comprehensive program aimed at cultivating fundamental digital competencies, encompassing skills in computer and mobile device usage, internet and email proficiency, social network and messenger utilization, online banking, electronic payments, and digital health, have yielded valuable insights. This study pinpoints key components crucial for the effectiveness of digital competency initiatives. It emphasizes the significance of user-friendly learning environments, motivation strategies, fostering intergenerational collaboration, and ensuring the digital readiness of social workers. The study highlights the growing role of digital platforms, particularly social media, in nurturing social connectivity among older adults. Looking ahead, the study recommends further exploration of international practices in digital integration for seniors, the development of tailored programs for displaced populations, and ongoing research into the digitization of social services. These insights contribute to the broader discourse on digital inclusion and education for the elderly, paving the way for future advancements in gerontological education and technology integration.

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