

Resilient Digital Seniors: Strengthening Elderly Digital Literacy Through Interpersonal Communication Approach Strategies

^{1**}Yohanes Adven Sarbani, ²Rita Gani, ³Niken Pupy Satyawati, ⁴King Anugrah Wiguna, ⁵Citra Rosalyn Anwar, ⁶Giri Lumakto

¹Faculty of Business, Widya Mandala Surabaya Catholic University

²Faculty of Communication, Bandung Islamic University

³Faculty of Communication and Business, Karanganyar Muhammadiyah University

⁴Faculty of Social and Political Sciences, Jenderal Soedirman University

⁵Fakultas Ilmu Pendidikan, Universitas Negeri Makassar

⁶Tular Nalar Program, Masyarakat Antifitnah Indonesia

E-mail: adven@ukwms.ac.id

Diserahkan: 24 February 2026

Direvisi: 11 March 2026

Diterima: 3 July 2026

Abstrak

Kelompok lanjut usia merupakan kelompok rentan tertinggal dalam pemanfaatan teknologi informasi. Penelitian ini bertujuan untuk membangun pemahaman yang lebih komprehensif mengenai bagaimana komunikasi antarpribadi dapat memperkuat literasi digital melalui edukasi digital di kalangan lansia. Studi ini menggunakan metode analisis tematik Braun & Clarke pada hasil wawancara dengan fasilitator dan peserta Akademi Digital Lansia/ADL. Program itu melibatkan lansia di 38 provinsi dan menjangkau 10.208 lansia di seluruh Indonesia. Informan penelitian dipilih dari wilayah Aceh, Kalimantan Barat, Jawa Barat, Nusa Tenggara Timur, Sulawesi Selatan, dan Maluku Utara. Penelitian ini mengidentifikasi lima tema utama dari pembelajaran literasi digital lansia: kedekatan emosional, fasilitator sebagai mediator, diskusi kelompok kecil, dukungan sosial, dan transfer nilai digital yang berkelanjutan. Penelitian ini menawarkan kebaruan dengan menempatkan komunikasi antarpribadi bukan sekadar sebagai sarana edukasi, melainkan juga sebagai mekanisme penyaringan informasi dan sarana penguat komunitas digital lansia. Hasil penelitian menunjukkan bahwa literasi digital berjalan melalui pengembangan hubungan yang empatik, partisipatif, dan berbasis komunitas.

Kata kunci: Pendidikan digital, literasi digital, lansia, komunikasi antarpribadi

Abstract

*The elderly are a group vulnerable to being left behind in the adoption of information technology. This study aims to develop a more comprehensive understanding of how interpersonal communication can strengthen digital literacy through digital education among the elderly. It employs Braun & Clarke's thematic analysis method to examine data from interviews with facilitators and participants of the *Akademi Digital Lansia* (ADL)—or Elderly Digital Academy. The program engaged older adults across 38 provinces, reaching 10,208 individuals nationwide. Research informants were selected from Aceh, West Kalimantan, West Java, East Nusa Tenggara, South Sulawesi, and North Maluku. The study identifies five key themes in digital literacy learning among the elderly: emotional closeness, the facilitator as a mediator, small-group discussions, social support, and the sustained transfer of digital values. This research offers a novel perspective by positioning interpersonal communication not merely as a tool for education, but also as a mechanism for information filtering and a means to strengthen the digital community of the elderly. The findings demonstrate that digital literacy is fostered through the development of relationships that are empathetic, participatory, and community-based.*

Keywords: Digital education, digital literacy, elderly, interpersonal communication

INTRODUCTION

Massive digital transformation has altered the landscape of social, economic, and health participation in Indonesia. However, older adults (*lansia*) have emerged as one of the most vulnerable segments at risk of being left behind. Data from the Central Statistics Agency (Badan Pusat Statistik/BPS) (Badan Pusat Statistik, 2024) reveals that only 15.2% of older adults access the internet, significantly lower than younger age groups (73%). This disparity is exacerbated by low educational attainment among older adults 65.7% have only completed primary education and economic inequality, with 58.9% in the lowest income quintile (The World Bank, 2024). Geographic factors further compound this gap: rural older adults are three times less likely to use the internet than their urban counterparts (International Telecommunication Union/ITU, 2021).

The digital access challenges faced by older adults extend beyond technical barriers to psychosocial dimensions. A survey by the Indonesian Internet Service Providers Association (Asosiasi Penyelenggara Jasa Internet Indonesia (APJII), 2024) found that 28.7% of older adults were exposed to hoaxes, reflecting weak digital safety literacy, which scored only 3.12 in Indonesia's digital literacy index. Inadequate personal data protection and rampant fraudulent investment advertisements further heighten their vulnerability (Frau-Meigs et al., 2017).

The COVID-19 pandemic underscored the urgency of improving digital literacy among older adults. Studies by Seifert et al. (2021) show that 40.5% of older adults lost income during the pandemic, while 52% experienced reduced social interaction. Digital access could have mitigated these impacts through telemedicine and social assistance platforms. However, only 8% of Indonesian older adults utilized e-government services (The World Bank, 2024), compared to 45% in Malaysia.

Globally, Indonesian older adults lag behind their Asia-Pacific counterparts (e.g., Singapore, Japan) in internet adoption (International Telecommunication Union, 2024). For instance, only 8.83% of Indonesian older adults are digitally active, versus 54.3% in Hong Kong. Low technology adoption correlates with social isolation: 53.4% reported heightened anxiety during the pandemic (Xie et al., 2020), and 60% experienced loneliness due to limited digital interaction (Nimrod, 2010).

Efforts to enhance older adults' digital literacy have employed various approaches, including constructivist methods (Sarbani et al., 2024). However, conventional strategies like classroom-based training or self-learning modules often prove ineffective as they overlook

psychosocial barriers such as technology-related anxiety or lack of social support (Czaja et al., (2019), Xie et al., (2020)). A more humanistic, communicative approach, grounded in interpersonal communication is needed to build confidence and motivation. Czaja et al. (2019) emphasizes the necessity of andragogical approaches that value lived experience, while Fang et al. (2024) highlight the role of affective trust in technology adoption.

Interpersonal communication, encompassing face-to-face interaction, empathy, and emotional engagement, holds significant potential for improving digital literacy education. This approach fosters a supportive, reinforcing learning environment where older adults learn not only from facilitators but also peers through social learning processes (Joseph A. DeVito, 2016). Moreover, it facilitates meaningful relationships, proven to reduce learning anxiety and enhance digital resilience among older adults (Seifert, Cotton, & Xie, 2020).

Beyond its pedagogical benefits, interpersonal communication also plays a crucial role in bridging the psychological and social barriers that often hinder older adults from adopting digital technologies. Personalized interactions allow facilitators to adapt explanations to the cognitive pace, emotional comfort, and prior experiences of older learners. Through dialogic engagement, encouragement, and trust-building, interpersonal communication creates a safe learning environment where older adults feel valued and confident in exploring new technologies. Such relational dynamics are particularly important for older learners who may experience technophobia, self-doubt, or social isolation. Therefore, integrating interpersonal communication into digital literacy programs can serve not only as a teaching method but also as a mechanism for empowering older adults to develop sustained digital engagement and resilience.

This study addresses the need for a more empathetic and effective approach to digital learning for older adults. By integrating interpersonal communication theory, adult learning principles, and digital resilience models, this research aims to develop a comprehensive understanding of how interpersonal communication can strengthen digital literacy among older adults. The findings are expected to provide both theoretical contributions and practical recommendations for educators, policymakers, and communities working in older adult education and digital transformation.

RESEARCH METHODOLOGY

This study employed a qualitative approach utilizing in-depth interviews with key informants from six implementation regions of the Digital Academy for Older Adults

(Akademi Digital Lansia/ADL) program under Tular Nalar. Tular Nalar is a digital literacy program targeting special groups including older adults, implemented across 38 provinces. The program is delivered by Mafindo volunteers in 44 regions and 60 local partners. By the end of 2024, ADL had trained 10,208 older adults nationwide.

Interviews were conducted with participating older adults and facilitators directly involved in ADL activities across six regions: Banda Aceh (Aceh), Pontianak (West Kalimantan), Bandung (West Java), Kupang (East Nusa Tenggara), Kendari (Southeast Sulawesi), and Ternate (North Maluku). Participants were selected through purposive sampling, considering active involvement, direct experience, and representative socio-cultural backgrounds of local dynamics.

Semi-structured, in-depth interviews were conducted using a topic guide covering: (1) training experiences, (2) digital behavior changes, (3) interpersonal interactions during learning, and (4) reflections on program sustainability. Interviews were audio-recorded, transcribed verbatim, and analyzed Braun & Clarke (2006) thematic analysis method, which involves six phases: (1) Data familiarization, (2) Initial code generation, (3) Theme identification, (4) Theme review, (5) Theme definition and naming, (6) Report production. The accompanying flowchart (Braun & Clarke, 2006) illustrates this thematic analysis process.

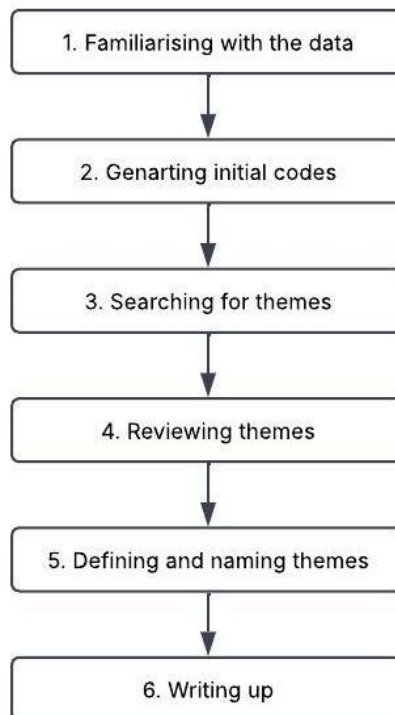


Figure 1. Flowchart Thematic Analysis Method (Braun & Clarke, 2006)

Data validity was ensured through respondent triangulation (facilitators and participants), findings confirmation, and multi-researcher analytical consistency. This approach enabled an in-depth exploration of how ADL's interpersonal communication strategy contextually and meaningfully strengthened older adults' digital literacy competencies.

RESULTS AND DISCUSSION

This study aimed to develop a comprehensive understanding of how interpersonal communication enhances digital literacy among older adults. Field interviews were conducted during site visits from March 10-16, 2025. The table below presents participant demographics from six regions.

Table 1. Respondent Data

Region	Role	Initial	Age	Gender	Occupation/Community
Banda Aceh, Aceh	Participant	H	51	Female (F)	Housewife
	Facilitator	DA	21	F	Mafindo Aceh
Pontianak, West Kalimantan	Participant	H	52	F	Shelter staff
	Facilitator	RWU	32	Male (M)	RTIK Activist
Bandung, West Java	Participant	R	63	M	Self-funded retiree
	Facilitator	RWS	25	F	Mafindo Bandung
Kupang, East Nusa Tenggara	Participant	KKL	68	M	Pro-elderly Community
	Facilitator	MVD	23	F	Mafindo Kupang
Kendari, Southeast Sulawesi	Participant	RK	67	F	Housewife
	Facilitator	DA	27	M	Mafindo Kendari
Ternate, North Maluku	Participant	FN	64	F	Housewife
	Facilitator	BSM	28	M	Mafindo Ternate

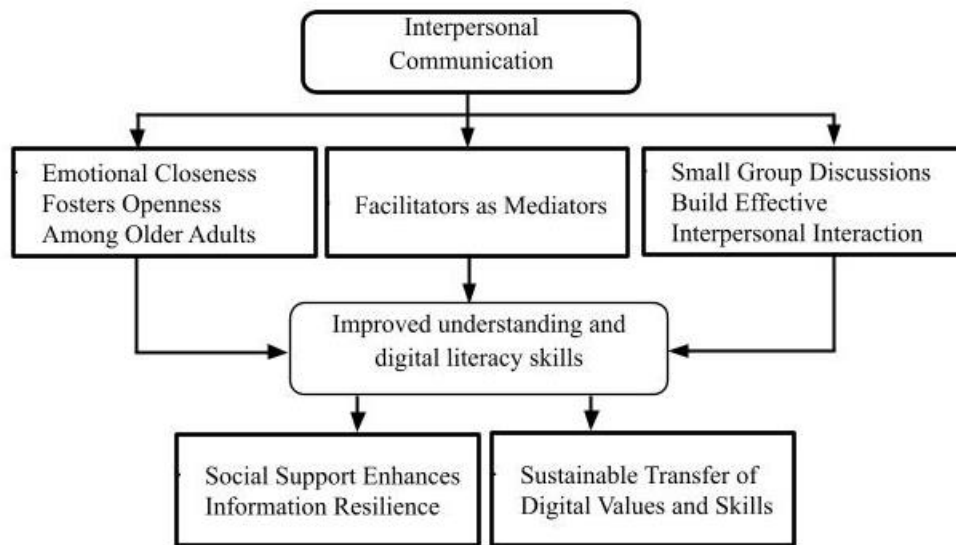
The respondents in this study consisted of twelve informants drawn from six regions in Indonesia, namely Banda Aceh (Aceh), Pontianak (West Kalimantan), Bandung (West Java), Kupang (East Nusa Tenggara), Kendari (Southeast Sulawesi), and Ternate (North Maluku). Each region involved two informants, comprising one older adult participant and one facilitator involved in the digital literacy program. The older adult participants were aged between 51 and 68 years, representing individuals in the early elderly to elderly age categories. Their backgrounds varied, including housewives, shelter staff, self-funded retirees, and members of pro-elderly community groups. This diversity reflects the socio-economic and occupational backgrounds of older adults who participate in community-based digital literacy programs.

Meanwhile, the facilitators ranged in age from 21 to 32 years and consisted of individuals affiliated with Mafindo regional chapters and digital literacy activist communities such as RTIK. These facilitators played a key role in guiding and assisting older adults in understanding digital technologies during the training sessions. In terms of gender distribution, the study involved both male and female informants. Among the older adult participants, the majority were female, while facilitators included both male and female trainers. This composition reflects the collaborative learning dynamics between younger facilitators and older participants in digital literacy initiatives. Overall, the combination of cross-regional representation, intergenerational interaction, and diverse socio-professional backgrounds provides a comprehensive perspective on how interpersonal communication practices operate within digital literacy programs for older adults in Indonesia.

Based on the interview data, the researchers conducted initial coding and identified emerging themes. Subsequently, theme refinement was performed, including theme labeling and definition. Finally, a comprehensive report was compiled from both facilitators and participants of the Digital Academy for Older Adults (Akademi Digital Lansia/ADL). Five principal themes were successfully identified, providing a holistic understanding of how interpersonal communication strengthens older adults' digital transformation.

These themes are as follows: (1) Emotional Closeness Fosters Openness Among Older Adults, (2) Facilitators as Mediators, (3) Small-Group Discussions Facilitate Effective Personal Interaction, (4) Social Support Enhances Information Resilience, (5) Sustainable Transfer of Digital Values and Skills. The first, second, and third themes contributed to measurable improvements in participants' digital literacy knowledge, enabling them to develop into more competent individuals. Similarly, the fourth and fifth themes reinforced behavioral and social empowerment. The following visualization (Figure 1) illustrates these five key themes and demonstrates how interpersonal communication effectively enhances older adults' digital literacy competencies.

Figure 2. Flowchart of Key Interpersonal Communication Themes



Theme 1: Emotional Closeness Fosters Openness Among Older Adults

A warm and supportive emotional connection between facilitators and older adult participants emerged as the fundamental key to the success of the ADL training process. Older adults demonstrated greater openness, activeness, and participation when they felt valued, heard, and treated with empathy. This emotional closeness created a comfortable communication atmosphere, enabling facilitators to effectively deliver relatively complex digital literacy materials.

Facilitator DA revealed that older adults "want to be heard," and when given space to share their stories, they naturally began to mutually correct and filter information without needing direct reprimand. These findings support empathetic communication theory, which emphasizes the importance of emotional engagement in building effective communication (Czaja et al., 2019); (Joseph A. DeVito, 2016)).

Emotional closeness formed the foundational basis for dialogic and reflective interactions. In the context of older adult training, this proves particularly crucial given that many participants experience physical limitations, cognitive constraints, or even low self-confidence regarding technology. By establishing psychological safety, interpersonal communication creates bridges to effectively reach this population.

Theme 2: Facilitators as Mediators

Unlike conventional approaches that position facilitators as primary knowledge sources, the ADL program emphasized facilitators' roles as mediators or learning partners. Facilitators

served as companions who facilitated discussions, encouraged active participation, and valued participants' lived experiences.

Participant H's statement that they did not merely deliver material unidirectionally but instead created spaces for discussion and storytelling demonstrates an andragogical approach that prioritizes participants' experiences in the learning process (Knowles, 1980). As adult learners, older adults require flexible, non-authoritative approaches rooted in real-world experiences.

This was further reinforced by MDV's findings that older adults were "More willing to listen and understand when engaged in small-group discussions." These results underscore the importance of horizontal relationships in interpersonal communication, aligning with Freire's dialogical approach that emphasizes education must be rooted in dialogue and equality (Freire et al., 2018).

Theme 3: Small Group Discussions Build Effective Interpersonal Interaction

The micro-teaching method employed in ADL training created more intimate and inclusive communication spaces. Dividing participants into small groups enabled each individual to participate actively, reduced psychological barriers, and enhanced discussion dynamics (Czaja et al., 2019).

Participants reported feeling comfortable sharing experiences, asking questions, and even laughing together, creating a pleasant and non-intimidating learning atmosphere. Participant KKL noted that "Small group interactions work well," allowing facilitators to better maintain participant engagement.

Previous research has demonstrated that small-group discussions enhance interpersonal communication quality and promote more meaningful learning (Garrison et al., 1999). For older adults with diverse educational backgrounds and varying technological competencies, small groups proved particularly effective as a pedagogical strategy.

Theme 4: Social Support Enhances Information Resilience

One of the positive outcomes of interpersonal communication in ADL is the formation of social networks among participants. Following the training, older adults not only acquired knowledge but also established informal communities that mutually support one another in verifying information and protecting themselves from hoaxes.

For instance, FN became an information reference for her neighborhood (RT) residents, frequently assisting other women in using the Kalimasada chatbot to verify news authenticity.

This demonstrates the critical role of social support in strengthening digital resilience, as articulated in social support theory (Bandura, 1977; Tsai et al., 2017).

Digital literacy evolves not merely as an individual cognitive ability but also as a sustainable social practice through interpersonal interactions. Within older adult communities, interpersonal relationships play a vital role in expanding and maintaining their understanding of the digital world.

Theme 5: Sustainable Transfer of Digital Values and Skills

Interpersonal communication extends beyond the training setting. ADL participants brought home the values and knowledge they gained, subsequently disseminating them to family members, neighbors, and their broader communities (Nimrod, 2010). This process illustrates how interpersonal communication-based training creates a snowball effect in enhancing digital literacy.

For example, H shared training materials via images in her neighborhood WhatsApp group. Meanwhile, RWU noted that although participation numbers in Tanjung Sali were modest, participants "Immediately shared (knowledge) with neighbors, leading to rapid information dissemination."

These findings reinforce existing literature on older adults as agents of societal change. While demonstrating that effective interpersonal communication drives bottom-up social transformation (Joseph A. DeVito, 2016).

This study confirms and expands theoretical understanding of interpersonal communication's importance in community-based education, particularly for older adults in digital contexts. Four novel contributions merit emphasis:

1. Contribution to Local Socio-Cultural Contexts

This study highlights a socio-cultural context that rarely receives attention, specifically how elderly individuals in Eastern Indonesian regions such as Pontianak and Kupang undergo digital transformation through interpersonal communication approaches. This demonstrates that digital literacy can be significantly developed even in societies with limited digital infrastructure, provided human interactions are designed empathetically and participatively (Batra et al., 2024; Neves et al., 2018)

2. Interpersonal Communication as Digital Gatekeeping

Interpersonal communication in ADL training functions not merely as an information delivery bridge, but also as a "Digital filtering mechanism" within elderly communities. Elderly participants who complete the training become credible information references within

their communities, demonstrating interpersonal communication's emerging role as a form of gatekeeping in the post-truth era (Fang et al., 2024)

3. Sustainability of Peer-to-Peer Learning among the Elderly

The finding that elderly individuals can actively transfer digital knowledge both to their peers and to younger generations demonstrates a form of learning sustainability that is both horizontal and intergenerational in nature. This enriches current digital literacy approaches that have been excessively focused on formal or platform-based methods (Martínez-Alcalá et al., 2018)

4. Affective Foundations of Digital Literacy

In contrast to the dominant cognitive approach in digital literacy, this study demonstrates that affective factors, such as empathy, social recognition, and emotional attachment, instead form a more robust foundation in shaping digital awareness among elderly individuals. This research supports recent findings indicating that affective trust serves as the primary determinant in technology adoption among older users (Schreurs et al., 2017; Yoon et al., 2020)

Based on the findings of this study, there are three key practical implications that can be applied to develop and enhance the effectiveness of digital literacy programs for the elderly:

- 1) Digital literacy programs for the elderly should adopt an interpersonal communication approach based on empathy and trust

The findings indicate that emotional closeness and empathetic communication are pivotal in encouraging openness and active participation among the elderly in training sessions. Older adults feel more valued and motivated when interacting in a warm, open, and non-judgmental environment. This aligns with the study by (Chen & Schulz, 2016; Fang et al., 2024; Yang et al., 2024) which demonstrates that affective trust is the primary determinant in technology adoption among the elderly. Therefore, an empathy-based approach not only strengthens the learning process but also fosters relationships that reinforce self-confidence and critical thinking skills among older adults regarding digital information.

- 2) Training should focus on building learning communities rather than merely transferring technical knowledge

Interpersonal communication in digital literacy training creates a collaborative and reflective learning space. The elderly learn not only from facilitators but also from fellow participants. This model supports horizontal social learning, where the exchange of experiences becomes a primary source of knowledge. This is reinforced by (Ma et al., 2020)

who argue that community support and local social contexts are crucial for sustaining digital literacy among older adults. Thus, training designs should encourage peer interaction and the strengthening of sustainable learning communities even after the training concludes.

3) Facilitators require specialized training in interpersonal communication skills and cross-generational inclusive approaches

The facilitator's role is central in creating an inclusive and empowering learning atmosphere. The research findings reveal that facilitators who act as companions rather than dominant instructors successfully build trust and foster equitable dialogue with elderly participants (Ma et al., 2020). Interpersonal communication skills and cross-generational sensitivity are essential in this context. This is consistent with the literature on intergenerational learning, which suggests that inclusive and communicative approaches can bridge digital and social divides across age groups (Martínez-Alcalá et al., 2018) With proper training, facilitators can serve as catalysts for transformative and sustainable learning experiences for the elderly.

CONCLUSION

This study successfully demonstrates that interpersonal communication plays a strategic role in strengthening digital literacy among the elderly. Through five key themes: (1) emotional closeness, (2) the facilitator's role as a mediator, (3) the effectiveness of small-group discussions, (4) social support, and (5) the transfer of digital values and skills—it is evident that the learning process for older adults is significantly influenced by the quality of interpersonal interactions. These findings confirm that digital literacy is not merely a technical or cognitive matter but also involves profound affective and social dimensions. Empathetic, open, and participatory interpersonal communication has proven effective in fostering self-confidence, critical awareness, and active engagement among the elderly in the digital world.

This research also contributes to theoretical discourse by expanding the understanding of interpersonal communication as a gatekeeping mechanism for digital information, while highlighting the importance of a locally contextualized approach in digital empowerment for older adults. From a practical standpoint, this study offers a novel framework for nonformal education targeting the elderly, which can be adopted by educational institutions, local communities, and policymakers.

Despite providing rich insights, this study has several limitations that should be addressed in future research. First, the data used were narrative and qualitative, derived from

the limited experiences of a select number of facilitators and participants in digital literacy training. To enhance generalizability, future studies should employ a mixed-methods approach, incorporating a broader range of locations and respondents. Second, this research did not conduct an in-depth exploration of other influencing factors, such as intergenerational dynamics, gender considerations, and geographic variations in the effectiveness of interpersonal communication for digital literacy. Subsequent studies could investigate these aspects to enrich the design of digital education interventions for older adults. Third, longitudinal studies are recommended to assess the long-term impact of interpersonal communication in digital literacy training, particularly in terms of behavioral changes and community policy development.

ACKNOWLEDGMENTS

The authors extend their gratitude to the facilitators and elderly participants of digital literacy training across the six study regions for their time and contributions to this research. This study was conducted as part of the Tular Nalar 3.0 program by Mafindo, supported by Google.org.

REFERENCES

- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2024). *Survei Penetrasi Internet Indonesia 2024*. <https://survei.apjii.or.id/survei>
- Badan Pusat Statistik. (2024). *Statistik Penduduk Lanjut Usia 2024: Vol. Volume 21, 2024*. Badan Pusat Statistik.
- Bandura, Albert. (1977). *Social learning theory*. Prentice Hall.
- Batra, R., Flatt, J. D., Pharr, J. R., Sharma, M., Khubchandani, J., Kanekar, A., Chirico, F., & Batra, K. (2024). Exploring Social Support Strategies and Socio-Cultural Factors Influencing Social Isolation and Loneliness: The Role of Digital Literacy. *Healthcare*, 12(21), 2149. <https://doi.org/10.3390/healthcare12212149>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Chen, Y.-R. R., & Schulz, P. J. (2016). The Effect of Information Communication Technology Interventions on Reducing Social Isolation in the Elderly: A Systematic Review. *Journal of Medical Internet Research*, 18(1), e18. <https://doi.org/10.2196/jmir.4596>
- Czaja, S. J., Boot, W. R., Charness, N., & Rogers, W. A. (2019). *Designing for older adults: Principles and creative human factors approaches* (3rd ed.). CRC Press.
- Fang, Z., Liu, Y., & Peng, B. (2024). Empowering older adults: bridging the digital divide in online health information seeking. *Humanities and Social Sciences Communications*, 11(1), 1748. <https://doi.org/10.1057/s41599-024-04312-7>
- Frau-Meigs, D., Veles, I., & Michel, J. F. (2017). *Public Policies in Media and Information Literacy in Europe*. Routledge. <http://www.ecrea.eu>
- Freire, Paulo., Ramos, M. Bergman., Macedo, D. P. ., & Shor, Ira. (2018). *Pedagogy of the oppressed*. Bloomsbury Academic.

- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*, 2(2–3), 87–105. [https://doi.org/10.1016/S1096-7516\(00\)00016-6](https://doi.org/10.1016/S1096-7516(00)00016-6)
- International Telecommunication Union. (2024). *Measuring Digital Development Fact and Figures 2024*. ITUPublications.
- Joseph A. DeVito. (2016). *The Interpersonal Communication Book* (14th ed.). Pearson Education Limited.
- Knowles, M. S. (1980). *The Modern Practice of Adult Education*. Cambridge.
- Ma, Q., Chan, A. H. S., & Teh, P.-L. (2020). Bridging the Digital Divide for Older Adults via Observational Training: Effects of Model Identity from a Generational Perspective. *Sustainability*, 12(11), 4555. <https://doi.org/10.3390/su12114555>
- Martínez-Alcalá, C. I., Rosales-Lagarde, A., Alonso-Lavernia, M. D. L. Á., Ramírez-Salvador, J. Á., Jiménez-Rodríguez, B., Cepeda-Rebollar, R. M., López-Noguerola, J. S., Bautista-Díaz, M. L., & Agis-Juárez, R. A. (2018). Digital inclusion in older adults: A comparison between face-to-face and blended digital literacy workshops. *Frontiers in ICT*, 5, 21. <https://doi.org/10.3389/fict.2018.00021>
- Neves, B. B., Waycott, J., & Malta, S. (2018). Old and afraid of new communication technologies? Reconceptualising and contesting the “age-based digital divide.” *Journal of Sociology*, 54(2), 236–248. <https://doi.org/10.1177/1440783318766119>
- Nimrod, G. (2010). Seniors’ online communities: A quantitative content analysis. *The Gerontologist*, 50(3), 382–392. <https://doi.org/10.1093/geront/gnp141>
- Sarbani, Y. A., Mulyati, H., & Astuti, S. I. (2024). Literasi Digital, Lansia, dan Konstruktivisme. *Scriptura*, 14(1), 72–81. <https://doi.org/10.9744/scriptura.14.1.72-81>
- Schreurs, K., Quan-Haase, A., & Martin, K. (2017). Problematising the digital literacy paradox in the context of older adults’ ICT use. *Canadian Journal of Communication*, 42(2), 1–28. <https://doi.org/10.22230/cjc.2017v42n2a3130>
- Seifert, A., Cotten, S. R., & Xie, B. (2021). A Double Burden of Exclusion? Digital and Social Exclusion of Older Adults in Times of COVID-19. *The Journals of Gerontology: Series B*, 76(3), e99–e103. <https://doi.org/10.1093/geronb/gbaa098>
- The World Bank. (2024). *DIGITAL PROGRESS AND TRENDS REPORT 2023*. <https://doi.org/10.1596/978-1-4648-2049-6>
- Tsai, H. S., Shillair, R., & Cotten, S. R. (2017). Social Support and “Playing Around.” *Journal of Applied Gerontology*, 36(1), 29–55. <https://doi.org/10.1177/0733464815609440>
- Xie, B., Charness, N., Fingerman, K., Kaye, J., Kim, M. T., & Khurshid, A. (2020). When Going Digital Becomes a Necessity: Ensuring Older Adults’ Needs for Information, Services, and Social Inclusion During COVID-19. *Journal of Aging & Social Policy*, 32(4–5), 460–470. <https://doi.org/10.1080/08959420.2020.1771237>
- Yang, Z., Qiang, L., & Wei, Z. (2024). *A study on the influence of digital literacy on the participation of rural middle-aged and elderly people in digital life: Moderating Effect based on Intergenerational Support*. <https://doi.org/10.21203/rs.3.rs-4621828/v1>
- Yoon, H., Jang, Y., Xie, B., & Lee, S. (2020). Integrative literature review on digital literacy development amid COVID-19 pandemic: Implications for older adults. *The Gerontologist*, 60(8), e569–e580. <https://doi.org/10.1093/geront/gnaa104>