



Technology:

Serving the "Silver Tsunami" On A Silver Platter



Karen L. Fortuna, PhD, LICSW

Adults aged 65 years and older interact with technology—from social media, to smartphones, to video games. Older adults use technology to maintain connection with family and friends, participate in hobbies, play games, learn, entertain themselves, and manage aspects of their lives to maintain community tenure such as finances and shopping^[1]. Increasingly more older adults are engaging with technology. For example, 55% of older adults use social media, with Facebook being their social media platform of choice. Further, 84% of older adults own smartphones and 90% report using their smartphone every day. While 84% of older adults own smartphones, a recent study found that older adults prefer tablets to smartphones^[1]. As technology has become an important aspect of the daily lives of older adults, this report presents the benefits of digital technologies for older adults, how to access technologies for low-income older adults, how to teach older adults how to use technologies, factors to offset challenges associated with normal aging, and sustaining engagement in technology.

¹ <https://www.pewresearch.org/internet/fact-sheet/mobile/>



The Benefits of Digital Technologies for Older Adults

Technologies have the potential to help older adults with daily function, facilitating social supports, and assist with a variety of tasks that promote community tenure. For example, sensors placed inside smart homes may help track physiologic and safety of older adults and improve response to emergencies, such as falls and offset premature nursing home placement. Sensors are just one of many emerging technologies for older adults. Below, includes a discussion of emerging technologies and their application to older adults.

Sensors



Sensors are devices that have the capacity to measure movement such as walking speeds and gait asymmetry from a physical environment. Sensors can be used in older adults' living environments such as nursing homes, independent living facilities, residential facilities to collect data on movement to detect declines in mental health (e.g., depression, cognition), physical health (e.g., falls), and social health (e.g., loneliness) to facilitate early intervention. Of course, older adults must consent to having these technologies in their living environments. Sensors can facilitate independent living in the aging population^[1] and promote community tenure through prevention and early interventions.

Wearables



Wearables (e.g., fitbits or smartwatches) are devices that can be worn on an older adults' body. Wearables track the activity of an older adult, including step count, heart rate, and among many other data collection points, oxygen level. Wearables are considered less disruptive than home sensors, and allow older adults more control over data collection---as they can simply remove the wearable from their body^[1]. Wearables allow for sharing of data with providers to monitor time in between clinical encounters with providers. Wearables can empower older adults to self-manage conditions through self-monitoring. For example, an Apple smartwatch can track and record vital signs 24/7. Older adults can self-monitor these vital signs and be on the look out for abnormalities that may require an intervention. Wearables may help reduce emergency room hospital visits and enhance older adults' self-management skills.

Robots



There are four types of robots that are specifically designed for older adults, including assistive robots, social robots, socially assistive robots, and telepresence robots. Robots can complete tasks and support older adults and people with physical disabilities^[1]. Robots help support community tenure through services delivery that offers companionship to address loneliness and social isolation, and provide support to complete activities of daily living. For example, PARO is a social robot that has shown promising evidence of improving physiological and psychological health in older adults.

Smartphone Applications



Apps that work on a tablet or a smartphone, such as PeerTECH, can facilitate peer support, which has been traditionally provided in-person within individual, or group environments. PeerTECH works with older adults with a diagnosis of a serious mental illness to co-manage mental health, physical health, and social health. This platform facilitates access to peer support while older adults are in the community---not a clinic setting. Promising evidence indicates PeerTECH impacts quality of life, hope, self-efficacy to manage chronic diseases, and empowerment. These apps may also allow for text messaging. Text messaging has been found to be feasible and acceptable among older adults and has been used by Certified Older Adult Peer Support Specialists for appointment reminders, goal setting, promoting and encouraging self-care and mental health and physical health self-efficacy, and peer support.



Accessing Technology for Low-Income Older Adults

If an older adult does not have access to technology or has difficulty affording technologies, the following are resources in the United States that offer free or low cost assistance:

Safelink Wireless®

Safelink Wireless® is a United States government benefit program that offers free cell phones or smartphones and a data plan. Only eligible individuals who qualify for Medicaid services are permitted to apply and enroll in Safelink Wireless®. More information can be found at: <https://www.safelinkwireless.com/>

State Assistive Technology Act Program of 1998:

The mission of the State Assistive Technology Act Program is to serve people with all types of disabilities, across all ages and environments and provide an array of services to meet assistive technology needs. State-level activities of the State Assistive Technology Act Program include demonstrations on how to use devices, loaning and re-utilizing devices, and state financing. State leadership activities under this program include providing information and assistance, training and technical assistance, and creating public awareness. More information can be found at: www.at3center.net/stateprogram



How to Teach Older Adults How to Use Technology

To effectively design opportunities for older adults to learn how to use technology, it is necessary to understand how adults learn, and especially how their needs differ from individuals of other age groups. There are many factors that affect the learning experience for older adults, including: (1) prior experiences (e.g., life, work, previous learning); and (2) factors associated with aging such as memory and vision. Below includes a description of the andragogical learning theory that values the prior experiences of older adults in the learning process, next human factors that impact ability to use technologies and how to offset challenges related to normal aging and technology use.

Andragogical learning theory. Most current theories of adult learning are based on the pioneering work of Malcolm Knowles and his development of the paradigm of andragogy, as defined as “the art and science of helping adults learn”^[1]. There are four andragogical principles that can facilitate learning how to use technology among older adults, including the following: (1) learner as self-directed; (2) learner as resource; (3) learning as developmental; and (4) learning as application to real world; these principles are not mutually exclusive.

<p>1 <i>Learner as Self-Directed</i> Adults are able to learn more effectively if they are self-directed^[2]. To do so, the instructor must serve as a facilitator that will guide adults to develop their own knowledge rather than direct them by strictly providing them facts^[1].</p>	<p><i>Learning as Developmental</i> Instructors must employ strategies designed to assist adults to achieve their individualized learning goals^[1].</p>	<p>3</p>
<p>2 <i>Learner as Resource</i> Adults’ life experiences should be viewed as a resource for their own learning^[2,3]. Adults have many experiences and have developed subsequent knowledge that they can use to connect theories and concepts to their knowledge and experiences^[4].</p>	<p><i>Learning as Application to Real World</i> Learning strategies should be less involved with theory, and more focused on emphasizing practical applications of knowledge relevant to the real world^[1,2].</p>	<p>4</p>

¹ Knowles, 1977

² Patterson & Pegg, 1999

³ Uehling, 1996

⁴ Merriam & Caffarella, 1999



Two interventions that employ principles of andragogy in teaching older adults how to use technology, including Older Adult Peer Tutors and the “I-We-You” method.



Older Peer Tutors

The peer-tutor model can be used amongst older adults to teach each other about digital technologies. A study that utilized the peer-tutor model to teach older adults about information and communications technologies reported results of significant and consistent increases in confidence in engaging in computer-related tasks, using technology tools such as email and the internet, and engaging in online chats^[3]. This peer-tutor model can be used as an effective tool in presenting new knowledge of digital technologies to older adults and empowering them to engage with the technologies. An example of this could include younger peer support specialists teaching older adult service users how to engage with smartphone applications and conversations about privacy and confidentiality in using technologies.

“I-We-You” Method

The “I-We-You” method is another effective way to teach older adults how to engage with technology. In this method, the instructor first demonstrates how to use the technology, then both the instructor and the older adults use the technology together. Lastly, the older adult demonstrates the new skills that they have learned on their own. During this learning method, you can tell the older adult “First I am going to show you how, then we will do it together, then I will ask you to try this on your own.”

Factors to Offset Challenges with Normal Aging and Promote Engagement in Technology.

Older adults experience of normal aging is associated with changes to eyesight, hearing, memory, and mobility. This experience of normal aging may impact how older adults engage with technology.



Eyesight



While vision loss is not considered a normal part of aging, changes in eyesight are. In addition to normal changes in eyesight as adults age, older adults are at higher risk for macular degeneration and glaucoma which are age-related eye conditions. Older adults may experience difficulties in focusing one's vision on objects that are close-up, experience difficulty in distinguishing similar colors such as blue vs. black, and experience difficulty distinguishing between objects and their backgrounds. These difficulties highlight the need for more light or well-lit surroundings to see well and allowing for time to adjust to different levels of light. Additionally, older adults may be more sensitive to glare, such as the glare from digital devices. This may lead to an increased need for breaks during meetings. Solutions to offset these challenges include (1) communicate using large fonts in emails, texts, and other virtual communications; (2) position yourself in a well-lit room for video meetings and do not sit too close to the screen. This will allow others to view your face clearly and promote connection through non-verbal cues; and (3) respect and support individual preferences for communication (e.g. video vs. phone calls).

Hearing Loss



Decreased hearing is also a normal part of the aging process. Age-related hearing loss occurs gradually, and typically presents itself in both ears. It is normal for older adults to have difficulty hearing high-pitched sounds or consonant-heavy words. Additionally, older adults may have difficulty keeping up with conversations when there is excess background noise both in-person or virtually. Solutions to offset these challenges include (1) incorporate the use of hearing impaired earphones or amplified headsets; (2) keep background noise to a minimum during phone calls and video meetings; (3) include closed-captioning in large text on videoconferences, and (4) incorporate assistive resources for individuals who use sign language such as apps that translate text to sign language and vice a versus, and/or American Sign Language services.

Memory



As people age, changes in memory occur naturally. Some adults experience these changes sooner than others or notice a decline in memory faster than their younger counterparts. These changes may be found as disturbing to the older adult or those around them, but it is important to highlight and normalize that changes in memory are a natural part of the aging process. As we age, subtle changes in memory occur naturally as part of the aging process. For older adults, there are multiple factors that can lead to memory problems, or exacerbate normal age-related memory challenges. One reason for this is medication side effects. Additionally, changes in memory could be related to a new health problem that the older adult is experiencing. Solutions to offset these challenges include (1) when teaching older adults how to use technology, the instructor should talk slowly, repeat themselves; (2) write down the steps towards using the technology to support recall; (3) encourage hands-on practice and focus on learning one skill or platform at a time; and (4) summarize each meeting and follow-up via email at the conclusion of each meeting. Include the caregiver in this if service users have provided their informed consent to do so.

Mobility



Older adults may experience changes in mobility that are also a normal part of aging. These changes may be due to reduced bone size and density, putting them at a higher risk for fractures, muscle loss, and the curving and flattening of spinal columns. All of which affect strength, endurance, and flexibility. Solutions to offset these challenges include (1) take breaks during learning sessions; (2) again, respect and support individual preferences for communication (e.g. video vs. phone calls).

Cognition



Older adults may experience a slowing of cognition that is also a normal part of aging. Older adults may also take medications for existing mental or physical health problems that also slows their cognition. Solutions to offset these challenges include (1) keep teaching of technology relevant and simple through using single-structure sentences and discussing one topic at a time. For example, if teaching an older adult how to use Facebook, focus on signing up for Facebook in one session, and in a another session, focus on another task (i.e., adding friends); (2) present information at a 4th or 6th grade level to promote comprehension; (3) allow for processing time by pausing between questions; and (4) speak slowly when reviewing information or questions.



Engagement with Technology May Require Human Touchpoints

To date, scientific understanding of patient engagement in technologies indicates one of the most promising ways to promote engagement in telehealth and other mobile technologies is through human touchpoints. Reciprocal accountability^[1] and supportive accountability^[2] are two models that suggest the integration of human touchpoints in digital health technologies is necessary to promote initial and sustained engagement. Consistent with these models, a recent systematic review examined features of apps and their impact on engagement and found that live (not automated or artificial) peer support had the highest engagement (17%) compared to other features (i.e., trackers = 6.3%; mindfulness/ mediation= 4.1%; breathing exercises = 1.6%; and psychoeducation = 3%). Human touchpoints can come in the form of text messaging between sessions, using technology within an in-person session, or possibly informal peer support groups within technologies.

About the Author:

Dr. Karen Fortuna is an Assistant Professor of Psychiatry at Dartmouth College. Dr. Fortuna has a PhD in Social Welfare and is a Licensed Independent Clinical Social Worker. Dr. Fortuna works in partnership with vulnerable populations, including older adults with a diagnosis of a serious mental illness, in the United States, Canada, Europe, Australia, Africa, and New Zealand in co-producing and empirically testing digital peer support technologies and trainings. Dr. Fortuna publishes extensively (80+ articles) and average 1–2 invited presentations per month (and over 100 presentations in total) at both national and international scientific meetings. Dr. Fortuna served as an international expert on the International Standards Advisory Committee to develop the first-ever accreditation standards for behavioral health care for older adults with CARF International. She currently serves as Co-Chair of the Patient Engagement Advisory Panel on smartphone app development and Patient Centered Outcomes Research Institution Advisory Panel on Patient Engagement. She is on the editorial board of several scientific journals (i.e., British Journal of Social Work, Journal of Participatory Medicine, and the American Journal of Geriatric Psychiatry).

Disclaimer

This publication was prepared for the Central East Mental Health Technology Transfer Center under a cooperative agreement from the Substance Abuse and Mental Health Services Administration (SAMHSA). All material appearing in this publication except that taken directly from copyrighted sources, is in the public domain and may be reproduced or copied without permission from SAMHSA or the authors. Citation of the source is appreciated. Do not reproduce or distribute this presentation for a fee without specific, written authorization from the Central East Mental Health Technology Transfer Center. This publication is posted on the Central East Mental Health Technology Transfer Center website.

At the time this document was produced Dr. Miriam E. Delphin-Rittmon served as the Assistant Secretary for Mental Health and Substance Use in the U.S. Department of Health and Human Services and the Substance Abuse and Mental Health Services Administration. The views, opinions, and content contained in this document are those of the author and do not necessarily reflect the views, opinions, or policies of SAMHSA. Nothing in this document constitutes a direct or indirect endorsement by SAMHSA.



¹ Fortuna et al.

² Mohr et al.



References

1. Mois, G., & Fortuna, K. L. (2020). Visioning the Future of Gerontological Digital Social Work. *Journal of Gerontological Social Work*, 63(5), 412–427. <https://doi.org/10.1080/01634372.2020.1772436>
2. Fortuna, K. L., Naslund, J. A., Aschbrenner, K. A., Lohman, M. C., Storm, M., Batsis, J. A., & Bartels, S. J. (2019). Text message exchanges between older adults with serious mental illness and older certified peer specialists in a smartphone-supported self-management intervention. *Psychiatric Rehabilitation Journal*, 42(1), 57–63. <https://doi.org/10.1037/prj0000305>
3. Woodward, A. T., Freddolino, P. P., Wishart, D. J., Bakk, L., Kobayashi, R., Tupper, C., Panci, J., & Blaschke-Thompson, C. M. (2012). Outcomes from a peer tutor model for teaching technology to older adults. *Ageing and Society*, 33(8), 1315–1338. <https://doi.org/10.1017/s0144686x12000530>
4. Knowles, M. S. (1978). *Andragogy: Adult Learning Theory in Perspective*. *Community College Review*, 5(3), 9–20. <https://doi.org/10.1177/009155217800500302>
5. Brookfield, S. (1986). *Understanding and Facilitating Adult Learning*. Paperback. Open University Press Jun-01-1986.
6. Rogers, P. L. (2002). Designing instruction for technology-enhanced learning. *Choice Reviews Online*, 40(03), 40–1679. <https://doi.org/10.5860/choice.40-1679>
7. Bauer, J. M., & Sousa-Poza, A. (2015). Impacts of Informal Caregiving on Caregiver Employment, Health, and Family. *Journal of Population Ageing*, 8(3), 113–145. <https://doi.org/10.1007/s12062-015-9116-0>
8. Brown, K. W., Coogler, C. L., & Wegelin, J. (2015). A pilot randomized controlled trial of mindfulness-based stress reduction for caregivers of family members with dementia. *Aging & Mental Health*, 20(11), 1157–1166. <https://doi.org/10.1080/13607863.2015.1065790>
9. Alzheimer's Association. (2014). *Tips for Being a Healthy Caregiver Brochure*. https://www.alz.org/national/documents/aa_brochure_stressrelief.pdf
10. Gitlin, L. N., Marx, K., Stanley, I. H., & Hodgson, N. (2015). Translating Evidence-Based Dementia Caregiving Interventions into Practice: State-of-the-Science and Next Steps. *The Gerontologist*, 55(2), 210–226. <https://doi.org/10.1093/geront/gnu123>
11. Smith, R., & Greenwood, N. (2013). The Impact of Volunteer Mentoring Schemes on Carers of People With Dementia and Volunteer Mentors. *American Journal of Alzheimer's Disease & Other Dementias*, 29(1), 8–17. <https://doi.org/10.1177/1533317513505135>
12. Ansell, P. & Breckman, R. (1998). *Elder mistreatment guidelines for health care professionals: Detection, assessment, and intervention*. New York: Mount Sinai/Victim Services Agency.
13. Next Avenue. (2019, June 15). 6 Myths About Elder Abuse. <https://www.nextavenue.org/myths-elder-abuse/>
14. Ernst, J. M., & Cacioppo, J. T. (1999). Lonely hearts: Psychological perspectives on loneliness. *Applied and Preventive Psychology*, 8(1), 1–22. [https://doi.org/10.1016/s0962-1849\(99\)80008-0](https://doi.org/10.1016/s0962-1849(99)80008-0)
15. Badcock, J. C., Shah, S., Mackinnon, A., Stain, H. J., Galletly, C., Jablensky, A., & Morgan, V. A. (2015). Loneliness in psychotic disorders and its association with cognitive function and symptom profile. *Schizophrenia Research*, 169(1–3), 268–273. <https://doi.org/10.1016/j.schres.2015.10.027>
16. Stain, H. J., Galletly, C. A., Clark, S., Wilson, J., Killen, E. A., Anthes, L., Campbell, L. E., Hanlon, M.-C., & Harvey, C. (2012). Understanding the social costs of psychosis: The experience of adults affected by psychosis identified within the second Australian national survey of psychosis. *Australian & New Zealand Journal of Psychiatry*, 46(9), 879–889. <https://doi.org/10.1177/0004867412449060>
17. Ong, A. D., Rothstein, J. D., & Uchino, B. N. (2012). Loneliness accentuates age differences in cardiovascular responses to social evaluative threat. *Psychology and Aging*, 27(1), 190–198. <https://doi.org/10.1037/a0025570>
18. Adam, E. K., Hawkey, L. C., Kudielka, B. M., & Cacioppo, J. T. (2006). Day-to-day dynamics of experience-cortisol associations in a population-based sample of older adults. *Proceedings of the National Academy of Sciences*, 103(45), 17058–17063. <https://doi.org/10.1073/pnas.0605053103>
19. Fox, C. M., Harper, A. P., Hyner, G. C., & Lyle, R. M. (1994). Loneliness, emotional repression, marital quality, and major life events in women who develop breast cancer. *Journal of Community Health*, 19(6), 467–482. <https://doi.org/10.1007/bf02260327>
20. Cacioppo, J. T., Hawkey, L. C., & Berntson, G. G. (2003). The Anatomy of Loneliness. *Current Directions in Psychological Science*, 12(3), 71–74. <https://doi.org/10.1111/1467-8721.01232>
21. Tomaka, J., Thompson, S., & Palacios, R. (2006). The Relation of Social Isolation, Loneliness, and Social Support to Disease Outcomes Among the Elderly. *Journal of Aging and Health*, 18(3), 359–384. <https://doi.org/10.1177/0898264305280993>
22. Cacioppo, J. T., Hawkey, L. C., Crawford, L. E., Ernst, J. M., Bureson, M. H., Kowalewski, R. B., Malarkey, W. B., Van Cauter, E., & Berntson, G. G. (2002). Loneliness and Health: Potential Mechanisms. *Psychosomatic Medicine*, 64(3), 407–417. <https://doi.org/10.1097/00006842-200205000-00005>
23. Wilson, R. S., Krueger, K. R., Arnold, S. E., Schneider, J. A., Kelly, J. F., Barnes, L. L., Tang, Y., & Bennett, D. A. (2007). Loneliness and Risk of Alzheimer Disease. *Archives of General Psychiatry*, 64(2), 234. <https://doi.org/10.1001/archpsyc.64.2.234>
24. Heinrich, L. M., & Gullone, E. (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*, 26(6), 695–718. <https://doi.org/10.1016/j.cpr.2006.04.002>
25. House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and Processes of Social Support. *Annual Review of Sociology*, 14(1), 293–318. <https://doi.org/10.1146/annurev.so.14.080188.001453>
26. Sündermann, O., Onwumere, J., Kane, F., Morgan, C., & Kuipers, E. (2013). Social networks and support in first-episode psychosis: exploring the role of loneliness and anxiety. *Social Psychiatry and Psychiatric Epidemiology*, 49(3), 359–366. <https://doi.org/10.1007/s00127-013-0754-3>
27. Eglit, G. M. L., Palmer, B. W., Martin, A. S., Tu, X., & Jeste, D. V. (2018). Loneliness in schizophrenia: Construct clarification, measurement, and clinical relevance. *PLoS ONE*, 13(3), Article e0194021. <https://doi.org/10.1371/journal.pone.0194021>
28. Hoffmann T, Jansen J, Glasziou P (2018) The importance and challenges of shared decision making in older people with multimorbidity. *PLoS Med* 15(3): e1002530. <https://doi.org/10.1371/journal.pmed.1002530>
29. Warner, L. M., Ziegelmann, J. P., Schütz, B., Wurm, S., & Schwarzer, R. (2011). Synergistic Effect of Social Support and Self-Efficacy on Physical Exercise in Older Adults. *Journal of Aging and Physical Activity*, 19(3), 249–261. <https://doi.org/10.1123/japa.19.3.249>