Lighthouse
FOR OLDER ADULTS

CITRIS AND THE BANATAO INSTITUTE

EVALUATION REPORT

UC DAVIS HEALTH

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executive summary

OVERVIEW

The Lighthouse Project aimed to provide internet accessibility and digital literacy training with the overarching goal of improving health, engagement, and well-being for older adults in senior living communities. Selected communities from Front Porch Center for Innovation and Wellbeing (FPCIW) and Eskaton, two primary providers of affordable senior housing in Southern and Northern California, participated in the Lighthouse Project.

METHODS AND APPROACH

The Lighthouse Project was evaluated through a pragmatic application of the RE-AIM framework, using qualitative and quantitative data. Data sources which informed the evaluation findings in this project include project surveys at three time points, training participation logs, tech support logs, Lighthouse planning meeting notes, as well as key informant interviews with project and site staff in each community.

FINDINGS

Evaluation findings provide insights into the sustainability and replication of the Lighthouse Project. Quantitative results indicate participants increased their confidence and comfort using technology after the intervention. In addition, physical and emotional well-being among participants showed a statistically significant increase over time as compared to baseline.

Qualitative feedback from participants and site staff indicate high endorsement of the project overall. Participation in the project fostered greater interaction within the community and connection with the "outside world." Site staff from all communities supported continuation of the program, noting the positive impact it has had on residents. Their recommendations to change or strengthen the program also provided key insights for the feasibility, sustainability and replication of the project.

PROJECT SITES AND TIMELINE

The Lighthouse Project included six main sites throughout Northern (Eskaton) and Southern California (FPCIW). Upon completion of a 3-month pilot phase, the intervention (which included internet installation, technology deployment, and digital literacy training) was initiated in July 2021 and continued through November 2022. The main communities included Jefferson Manor, Pilgrim Tower, Hazel Shirley, Lincoln Manor, Vista Tower, and La Pintoresca. Two additional communities, Good Shepherd Homes and Good Shepherd Manor, also received devices and digital training through a separate grant and are included in some of the analyses.

PROJECT REACH

The Lighthouse Project had wide-ranging reach to residents and sites. Residents received free or low-cost internet accessibility, user–friendly devices, and device-specific training and support.

672 # of **housing units** now able to access new/ faster internet connections

779 # of **devices** distributed to participants*

988 # of hours of **technology training** delivered to seniors

*All communities, including GSM and GSH are included in this count

PROJECT REACH (CONTINUED)

PARTICIPANT CHARACTERISTICS

Overall, Lighthouse participants were primarily female (66%), not married or living with a partner (73%), and 75 years of age or older (69%). Many participants reported challenges such as cognitive decline (25%), hearing (31%), vision (26%), and/or mobility limitations (24%). Most described their heritage group as Asian (71%). At all but one site, they spoke between 3-8 different languages, with a majority speaking Korean (55%), English (28%) or Chinese (16%).

LANGUAGES BY COMMUNITY SITE

	English	ASL	Chinese	Farsi	Japan.	Korean	Spanish	Viet.	Other
Hazel Shirley	✓		✓	✓	✓	✓	✓		✓
Jefferson Manor	✓		✓				✓	✓	✓
La Pintoresca	✓		✓				✓		✓
Lincoln Manor	✓						✓		
Pilgrim Tower	✓	✓				✓			✓
Vista Tower	✓					✓	✓		

LITERACY & LANGUAGE PROFICIENCY

Most participants (73%) described completing their highest level of education outside of the US and over half (64%) spoke English "not well" or "not at all." In addition, 57% had less than a high school degree. Limited English proficiency and educational attainment affected device learning and use.

PRIOR TECH EXPERIENCE

Lighthouse participants had limited previous experience with technology. Prior to the Lighthouse Project:

Almost **1 in 3 were new to using devices** such as a computer, laptop, tablet or smartphone.

ADOPTION

SITE CHARACTERISTICS

Lighthouse sites varied in their ability to adopt and implement the intervention. Factors that impacted adoption included: building characteristics which affected Wi-Fi installation, staff capacity to invest in Lighthouse implementation, alignment of the intervention with the diversity of languages among residents, and residents' health limitations.

PARTICIPATION

Approximately 30% of residents across all sites declined to participate in the program because they already had a device; were fearful about learning a new device and/or attending training classes; were dissuaded by family members and/or health professionals; had health challenges impeding participation; or did not think the device was relevant.

Successful efforts to foster participation helped inform subsequent outreach approaches as more sites were added. Strategies included recruiting door-to-door, providing opportunities for residents to ask questions and reach out to family, as well as hosting social gatherings and orientations. Some residents who were initially hesitant to participate in the project joined after witnessing others use their devices.

IMPLEMENTATION

TAILORING INTERVENTIONS

All sites were consistent in implementing the same basic components of the intervention. However, training duration and types of tech support offered were tailored for each community. In addition, training topics were adapted over time to align with participants' needs. For example, at some sites, topics were dropped when apps proved too complex for participants. While increasing the acceptability and fit of the intervention, tailoring also added to the complexity of evaluating and comparing the interventions across sites.

ROLE OF STAFF

Site staff at Eskaton and FPCIW communities played a pivotal role in the success of the project – assisting in recruitment, orientation, deployment, translation, and training support. They also provided feedback at each step to assist in ongoing evaluation. Their knowledge and established trust with residents allowed for increased communication and engagement in the project.

The time and effort required of staff to assist with the project, on top of their regular duties, was described as both impactful and challenging to sustain, particularly in the language-diverse communities with a lower number of site staff to support efforts.

ROLE OF RESIDENT AMBASSADORS

A total of 39 residents with a knowledge of or interest in technology were recruited and trained to serve as Resident Ambassadors (RAs). RAs at each site helped provide tech support to project participants, as well as bridge language gaps between staff and residents.

> " It's tough. You almost need a dedicated group or employee that is doing just [tech support] and can do everything for this [project]. Some days I [get] no questions, but other days we have 5-6 residents with questions. And then you also have the language barrier....Our job is what it is. When you throw this on top, it really is a lot.
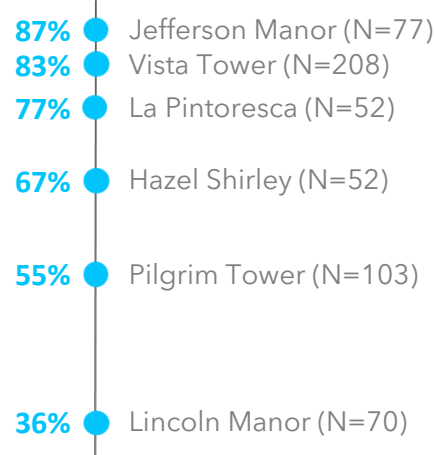>
> - Site staff

EFFECTIVENESS

TRAINING PARTICIPATION
Participation in the training sessions varied by site.

% OF PARTICIPANTS WHO ATTENDED 1+ CLASSES

87% Jefferson Manor (N=77)
83% Vista Tower (N=208)
77% La Pintoresca (N=52)

67% Hazel Shirley (N=52)

55% Pilgrim Tower (N=103)

36% Lincoln Manor (N=70)

At some sites, different cultural groups preferred learning in a more social environment, while others preferred to practice on their own. Other factors, such as restrictions on gatherings related to COVID-19, also influenced class attendance and implementation.

EFFECTIVENESS (CONTINUED)

PHYSICAL AND EMOTIONAL HEALTH

An important goal of the Lighthouse Project was to improve the well-being and health of residents. Evidence-based measures used to assess social isolation and risk for depression across time points showed mixed results. The inability to ascertain if certain survey items were understood by participants of all languages and literacy levels limited the ability to interpret findings. However, two single measures focused on self-rated physical and emotional health were reliable across communities. Both items showed a significant (p=.005) increase (good/very good/excellent) as compared to entry/baseline.

12%
of participants reported a positive **increase** in emotional and physical health from entry to 30-days

Improvement in emotional health was sustained after the intervention, with 10% showing continued improvement in emotional health and 13% showing increased improvement in physical health, as compared to entry.

> " Thank you for giving me a Samsung tablet and even training me when I couldn't do anything. Thanks to that, I enjoy entertainment, music, and movie soap operas. I am living happily. Thank you.
>
> – VT participant

DEVICE ACCEPTABILITY & USE

Across the Lighthouse communities, a variety of devices were distributed. Device selection was based on affordability (to ensure scalability), large display screens, quality speakers, voice-first capabilities, compatibility with Google platforms (to maximize language accessibility), and battery life. Overall, the tech devices selected for each community were well received.

In learning to use their devices, over half of participants (54%) reported that their device was "somewhat difficult" or "very difficult" to use. However, almost all participants (92%) reported that they would recommend their device to friends or family. High endorsement of the device may be connected to high participant satisfaction with the Lighthouse Project overall.

Participants continued to use their devices after the conclusion of the core training. Primary uses included entertainment to watch news, sports, television shows, movies and YouTube.

87%
continued to use their devices **at least once a week** throughout the intervention

Participants stated that the in-person classes and device handbooks were the most helpful resources in learning to use their devices. Satisfaction with tech help declined after program completion, likely due to reduced access to such support after the intervention training.

EFFECTIVENESS (CONTINUED)

ATTITUDES TOWARD TECHNOLOGY

A majority of respondents found it **somewhat difficult to use** the tablet.

| 12% | 34% | 44% | 10% |
| Very Easy | Somewhat Easy | Somewhat Difficult | Very Difficult |
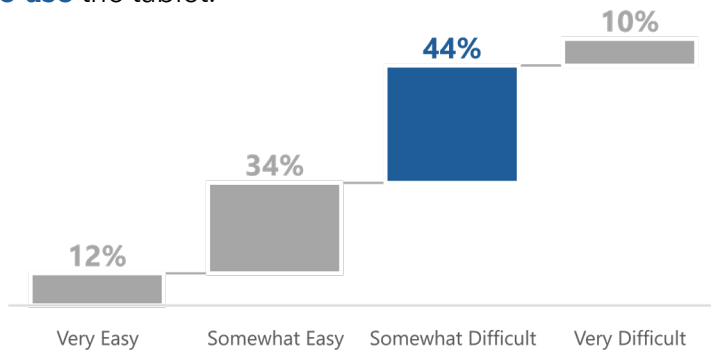
Although most participants expressed challenges learning to use their new devices, survey responses and staff feedback indicate that the Lighthouse Project increased participants' comfort with technology.

Specifically, participants' attitudes towards technology using two validated subscales showed sustained improvement from entry. Reduction in tech anxiety was significant from entry to 30-days, and an increase in tech comfort was statistically significant from entry to 90-days.

In addition, participants strongly agreed that technology is useful for connecting with family and friends, and for learning new information and skills.

90% agreed that technology helps them **connect with family and friends**

94% agreed that technology helps them **learn new information and skills**

> This Yoga tablet is wonderful. I have learned many new ways to communicate. I love the size. Happy to have it.
> - JM participant

RELATIONAL OUTCOMES

The Lighthouse Project led to many other positive and relational outcomes such as:

- Increased social engagement and excitement as participants learned to use the devices together. Taking part in classes and office hours fostered new relationships among residents.

- Strengthened relationships between site staff and residents as participants became more comfortable in reaching out for assistance. The increased familiarity prompted participants to feel more comfortable in asking for assistance in other areas.

- Devices facilitated communication between residents and staff through apps such as Google Translate and 'pushed' announcements via the Echo Show devices.

- Resident Ambassadors experienced multiple benefits, including a sense of purpose in helping others and expanded social connections.

MAINTENANCE

After project completion, the evaluation team met with site staff to learn about continued efforts to promote digital literacy in their communities. Staff at every site agreed that sustained support was vital, though communities varied in the type and amount of ongoing support they provided.

At some communities:

- Site staff or outside volunteers continue to offer additional training classes for residents.
- RAs continued to provide ad hoc tech support to neighbors.
- Staff organized social events to increase participant comfort in reaching out to RAs.
- Data provided by internet service providers continue to indicate high levels of device use.

> " It's rewarding and also challenging just to see how the program started and what has transpired. My advice to others would be to get residents "pumped up." Do something to make them feel special. Host events. Focus on outreach. Get feedback monthly on what residents' interests are. Be patient. Understand where they are coming from. Encourage them. Take one step at a time. Have an open door for them to come back, take a break as needed —take a breather and make improvements as needed. Focus on clear communication. Improve based on their feedback. And have fun!
>
> - Site staff

LESSONS LEARNED

Review of the qualitative and quantitative data led to the identification of key lessons and recommendations related to implementation, sustainability and evaluation.

1 **Tailoring is essential**. Deployment of the Lighthouse Project required flexibility and tailoring of the intervention approaches carried out at each community.

2 **Linguistic alignment is key**. Participation, acceptability and continuous use of tech devices was highly influenced by the ability to provide devices, tech support and resources in the participants' preferred language.

3 **Longer intervention and training is necessary**. Both participants and site staff highlighted the need for a longer training duration and continuous support to assist and encourage residents to use their devices.

4 **Site staff are essential to project success**. Buy-in and active participation of the site staff in the planning and implementation of the project played a significant role in its overall success.

5 **Support from outside the community is key to sustainability.** The project added to the regular workload of site staff. For sustainability, outside assistance (e.g., resources and staffing) is needed.

6 **Evaluation is complex**. Evaluation must include careful selection of tailored survey instruments, alignment and tracking of outcomes, and internal support for data collection.

introduction

Supported by a grant through UC Berkeley CITRIS, the Lighthouse Project was launched to help bridge digital inequality and increase digital social engagement among vulnerable older adults residing in congregate living settings.

Through the development and implementation of a scalable project, the Lighthouse Project provided internet accessibility and digital literacy training with the overarching goal of improving health, engagement, and well-being for older adults.

Selected communities from Front Porch Center for Innovation and Wellbeing (FPCIW)) and Eskaton, two of the largest providers of affordable housing in Southern and Northern California respectively, participated in the Lighthouse Project. Low-income senior residents were provided with access to broadband internet and invited to participate in the project intervention to increase digital literacy.

Evaluation of the project was carried out by the UC Davis School of Medicine Office of Research Evaluation Unit.* The evaluation team monitored ongoing activities and conducted all data management and analysis to inform quality improvement as well as assessment of project outcomes and impact. This report focuses on the evaluation findings from 2020-2022.
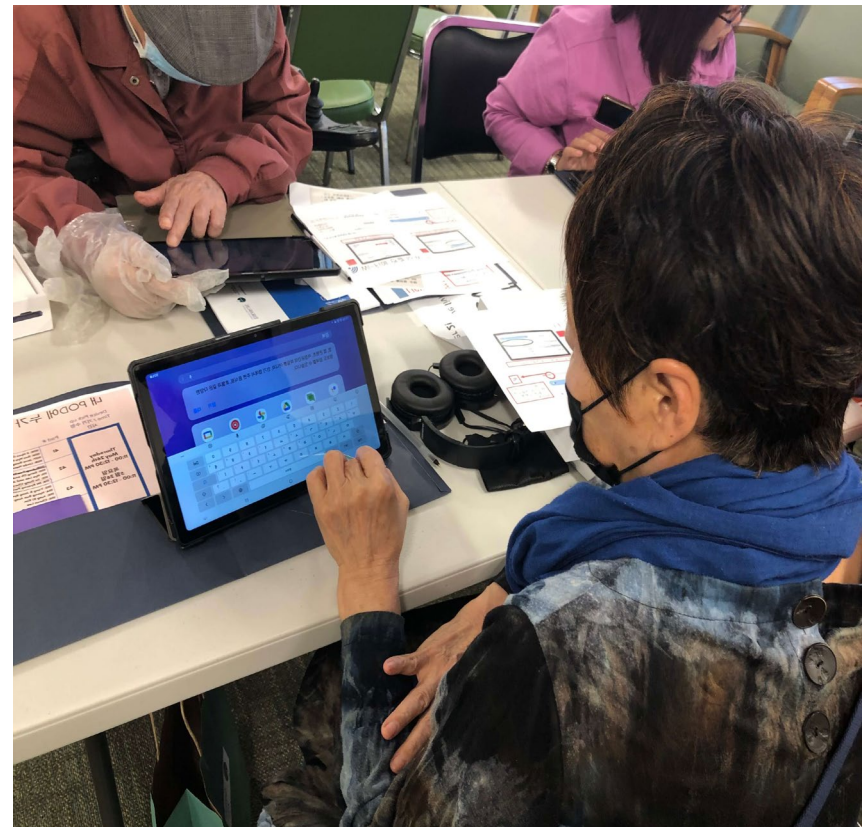
* The School of Medicine Office of Research Evaluation Unit includes Rebeca Giacinto, PhD, Pauline Martinez, MA, Stuart Henderson, PhD, Robin Kipke, MS, Melissa Sullivan, and Stacey Neves, MA.

lighthouse project overview
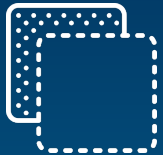
BACKGROUND

Digital inclusion is correlated with improved mental and physical health outcomes for older adults. Technology connects older adults with the outside world, increases social support, fosters participation in activities of interest, and increases self-confidence and a sense of self-control. It can connect older adults with culturally appropriate care providers, digital health solutions, educational opportunities, and information and resources, such as government benefits, employment, or opportunities for civic engagement.

PROBLEM

Vulnerable communities (low income, diverse, older adults dealing with concomitant health conditions and at high risk for isolation, loneliness and depression) disproportionately lack access to internet service, technology-enabled devices and training in digital literacy.

GOAL

The goal of the Lighthouse Project was to connect underserved older adult populations with technology to bridge digital inequality and increase digital social engagement with family, friends, community and necessary healthcare resources.

INTERVENTION

The project intervention approach aimed to improve health, engagement, information, and well-being for older adults residing in congregate living settings through the development and implementation of a scalable program that provided internet accessibility and digital literacy training.

sites overview

The Lighthouse Project included six main sites throughout Northern (**Eskaton Manor**) and Southern California (**FPCIW**). Two additional FPCIW sites, Good Shepherd Homes and Good Shepherd Manor, also received devices and digital literacy training through a separate grant project. These sites are included in the aggregate data analysis for the reach of the project, but not the full analysis comparing outcomes specific to effectiveness in this summary.
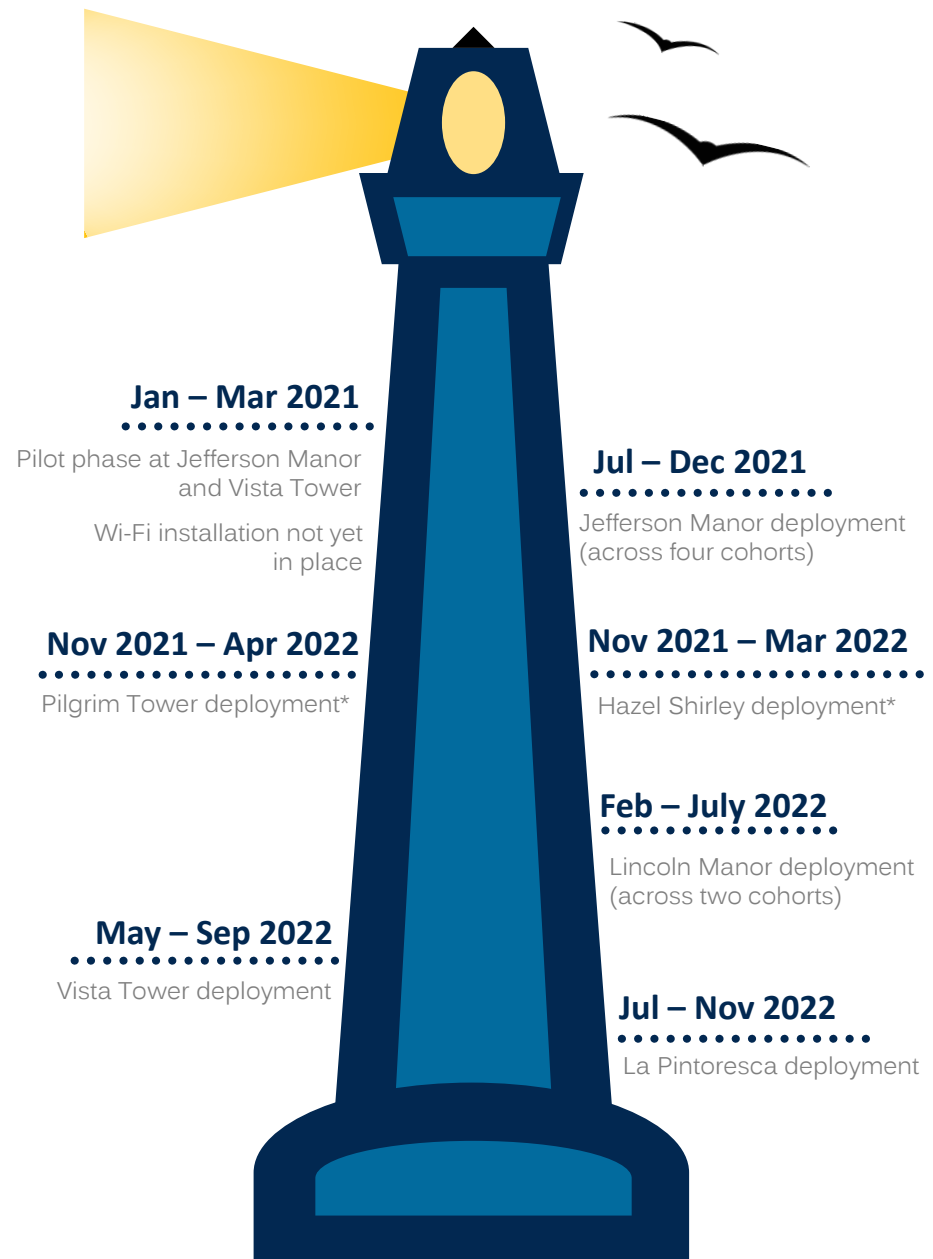
Sacramento
Jefferson Manor
132 residents
104 units

Placerville
Lincoln Manor
100 residents

Pasadena
La Pintoresca
95 residents
64 units

Los Angeles
Pilgrim Tower
152 residents
112 units

Korea Town
Vista Tower
284 residents
230 units

El Cerrito
Hazel Shirley Manor
73 residents
64 units

Los Angeles
Good Shepherd Manor
143 units

Inglewood
Good Shepherd Homes
71 units

project timeline

The Lighthouse Project was launched in July 2020 in response to the COVID-19 crisis which exacerbated well-documented risks[1-4] for health and wellbeing among older adults living in congregate living settings.

Prior to starting the project, a **pilot phase** was carried out across two community sites from FPCIW and Eskaton. This allowed for testing and refinement of a virtual digital literacy training and support model, as well as for assessing the acceptability of the research and data collection methodology prior to implementation.

Upon completion of a 3-month pilot phase, the **Lighthouse Project intervention** (which included internet installation, technology deployment, and digital literacy training) was initiated in July 2021. The first community to begin the program was Jefferson Manor. Subsequent participation of other communities included Pilgrim Tower, Hazel Shirley, Lincoln Manor, Vista Tower, and La Pintoresca over the course of a year (2021-2022).

The timeline displayed on the right includes time periods in which **data collection** of entry (baseline) survey data, deployment of technology devices to all participating residents, delivery of a core curriculum of **digital literacy classes** (ranging from 2-5 classes), and collection of mid-point and end-point surveys occurred. While surveys were intended to be collected at 30- and 90-days, in reality, survey collection varied, leading to a longer intervention timeline in some communities.

Jan – Mar 2021

Pilot phase at Jefferson Manor and Vista Tower

Wi-Fi installation not yet in place

Jul – Dec 2021

Jefferson Manor deployment (across four cohorts)

Nov 2021 – Apr 2022

Pilgrim Tower deployment*

Nov 2021 – Mar 2022

Hazel Shirley deployment*

Feb – July 2022

Lincoln Manor deployment (across two cohorts)

May – Sep 2022

Vista Tower deployment

Jul – Nov 2022

La Pintoresca deployment

* Implementation paused at certain sites due to COVID protocols

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intervention components

Across the Lighthouse communities, the intervention included six components. High speed Wi-Fi was installed throughout each community; Resident Ambassadors (RAs) were recruited and trained to support neighbors; devices were offered to all residents; simplified user handbooks were provided in participants' languages; a series of in-person training classes were offered onsite at each community; and weekly tech support office hours were hosted by RAs and/or staff (similar to a 'Genius Bar').

Wi-Fi available in all units

Resident Ambassadors trained

Tablet or voice-first devices offered to all residents
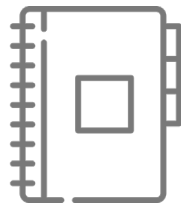
Simplified user handbooks provided in participants' languages

Series of 2-5 training classes offered in each community

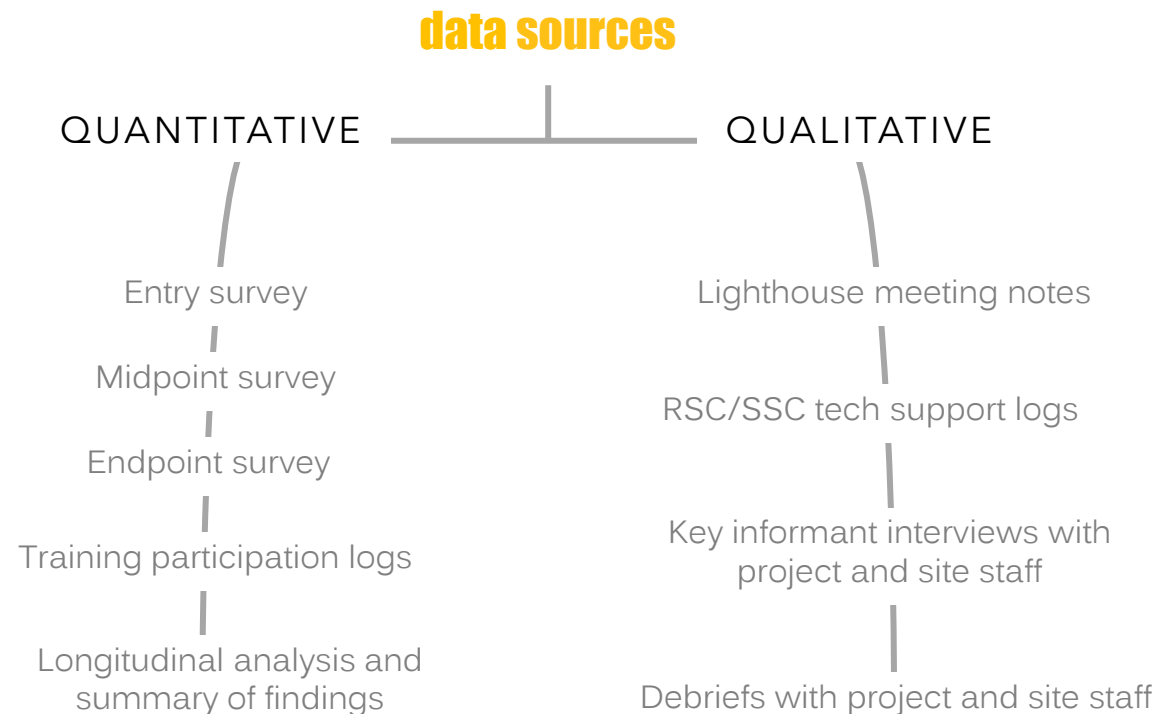Weekly tech support office hours

evaluation overview

The Lighthouse Project was evaluated through a pragmatic application of the RE-AIM framework[5-6]. This framework has been widely used to assess interventions in health by examining reach, effectiveness, adoption, implementation and maintenance. Although the evaluation examined each of these elements, particular attention was focused on reach, implementation and effectiveness of the Lighthouse Project. The figure below highlights evaluation questions for each element of RE-AIM. The framework has been reordered to more closely match the unfolding of the intervention.

RE-AIM FRAMEWORK

Reach
How many devices were distributed? How many trainings were delivered? Who participated in the intervention? How does this compare to the target population? What was the diversity of participants?

Adoption
What were the characteristics of the participating sites? What were unique barriers and facilitators to planning and adopting the Lighthouse Project?

Implementation
How was the project implemented across sites? What was consistent or inconsistent across sites? What were the roles of site staff and Resident Ambassadors?

Effectiveness
Model: How effective was the implementation model? Were the trainings well attended? Was the Resident Ambassador model successful in reducing staff burden?

Individual: Did participants' health and well-being improve? Have they grown more comfortable using technology?

Organizational/Social: What impact (burden/benefit) did the project have on participating communities? What impact did it have on the relationships between participants and site staff?

Maintenance
What ongoing supports are necessary to maintain the project? What recommendations are there for sustaining long term participant engagement and learning?

evaluation sources

The Lighthouse evaluation draws on qualitative and quantitative data. Data sources include project surveys (entry, midpoint, and endpoint surveys), training participation logs, tech support logs, as well as key informant interviews with project and site staff at the start of the intervention phase in each community. The evaluation team also met with each community at the end of the intervention to share longitudinal community findings and interview site staff (RSCs [Resident Service Coordinators] or SSCs [Social Service Coordinators]). These meetings and interviews provided opportunities to learn more about the Lighthouse experience from different perspectives, validate and interpret findings, and identify lessons learned on implementation, sustainability and generalizability.

data sources

QUANTITATIVE — **QUALITATIVE**

QUANTITATIVE	QUALITATIVE
Entry survey	Lighthouse meeting notes
Midpoint survey	RSC/SSC tech support logs
Endpoint survey	Key informant interviews with project and site staff
Training participation logs	Debriefs with project and site staff
Longitudinal analysis and summary of findings	

reach

- ((•)) HOW MANY DEVICES WERE DISTRIBUTED?
- ((•)) HOW MANY TRAININGS WERE DELIVERED?
- ((•)) WHO PARTICIPATED IN THE INTERVENTION?
- ((•)) HOW DOES THIS COMPARE TO THE TARGET POPULATION?
- ((•)) WHAT WAS THE DIVERSITY OF PARTICIPANTS?

reach PROJECT OUTPUTS

The Lighthouse Project had immediate effects on residents and sites. Residents received free or low-cost internet accessibility, user–friendly devices, and device-specific training and support. In total, 672 housing units received new or faster internet connections; 779 participants were given devices and 988 hours of technology training was delivered.

Training was provided by Lighthouse Project and site staff. In addition, resident volunteers with basic experience or interest in the technology curriculum (called Resident Ambassadors) provided support to fellow participants. The training program included train-the-trainer preparation, learning sessions and post-training support.

672 # of housing units now able to access new/faster internet connections

779 # of devices distributed to participants*

39 # of resident ambassadors engaged to provide tech assistance to residents

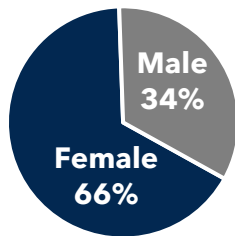**988** # of hours of technology training delivered to seniors

*All communities, including GSM and GSH are included in this count

reach PARTICIPANT DEMOGRAPHICS

Overall, Lighthouse participants were primarily female (66%), not married or living with a partner (73%), 75 years of age or older (69%), and described their heritage group as Asian (71%). There were variations between sites, for example Lincoln Manor participants were primarily White or Caucasian (79%) and none reported being married or living with a partner.
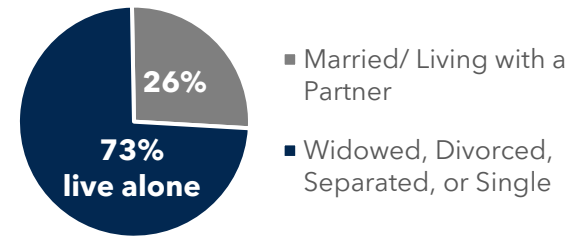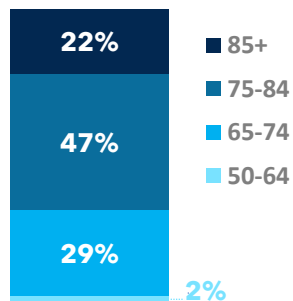
GENDER

More participants **were female**.

- Male 34%
- Female 66%

MARITAL STATUS

Most participants **lived alone**.

- 26% ■ Married/ Living with a Partner
- 73% live alone ■ Widowed, Divorced, Separated, or Single

AGE

Nearly **2 in 3** participants **were 75+**.

- 22% ■ 85+
- 47% ■ 75-84
- 29% ■ 65-74
- 2% ■ 50-64

RACE/ETHNICITY

7 in 10 participants **were Asian**.

- 71% ■ Asian
- 10% ■ White/Caucasian
- 9% ■ Black/African American
- 6% ■ Hispanic/Latinx
- 1% ■ Multiracial/ Biracial
- 1% ■ American Indian/Alaskan Native
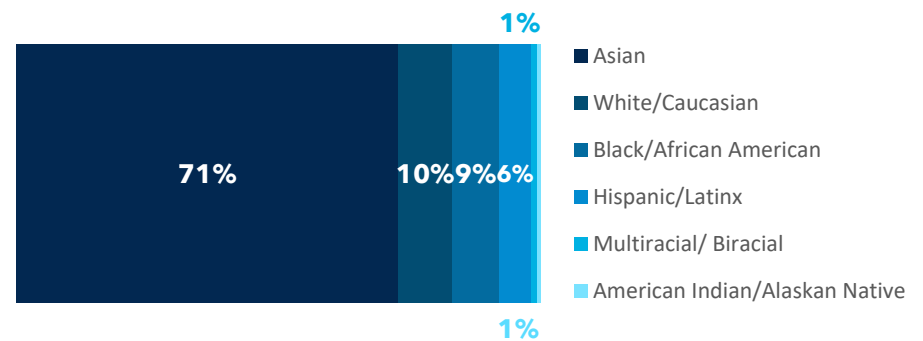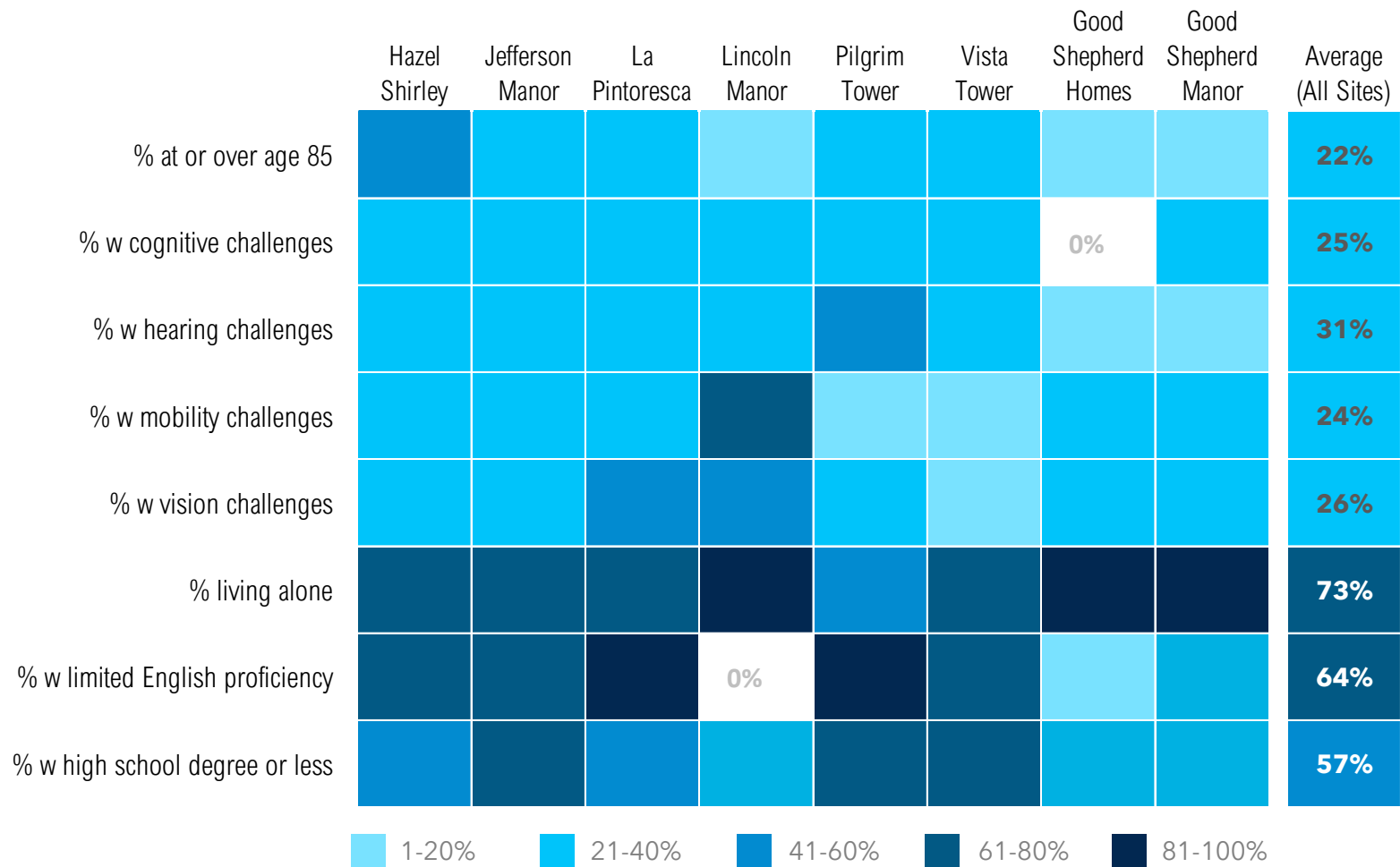
reach PARTICIPANT CHARACTERISTICS

Lighthouse participants reported many demographic and health factors that impact technology adoption. These included older age, cognitive and physical challenges, limited English proficiency, and low educational attainment. The figure below shows the variability among participants who were affected by characteristics influencing technology adoption.

FACTORS INFLUENCING TECHNOLOGY ADOPTION

	Hazel Shirley	Jefferson Manor	La Pintoresca	Lincoln Manor	Pilgrim Tower	Vista Tower	Good Shepherd Homes	Good Shepherd Manor	Average (All Sites)
% at or over age 85									**22%**
% w cognitive challenges							0%		**25%**
% w hearing challenges									**31%**
% w mobility challenges									**24%**
% w vision challenges									**26%**
% living alone									**73%**
% w limited English proficiency				0%					**64%**
% w high school degree or less									**57%**

Legend: 1-20% | 21-40% | 41-60% | 61-80% | 81-100%

reach LANGUAGES SPOKEN

Over half of participants (55%) indicated their preferred language was Korean; 28% preferred English and 16% preferred to speak Chinese. A smaller percentage of participants spoke Spanish, Vietnamese, ASL, or another language. Ensuring linguistic congruency in the delivery of the program was challenging given the diversity of languages spoken at each site. In all but one location, participants spoke between three to eight different languages, requiring staff or Resident Ambassadors who spoke these languages to assist in the translation of the curriculum, surveys, and other materials.

OVERALL

Three out of four participants' preferred language was an **Asian** language.

N=537

| Korean 55% | English 28% | | Chinese 16% |
| | Spanish 4% | Vietnamese 4% | ASL 2% | Other 2% |
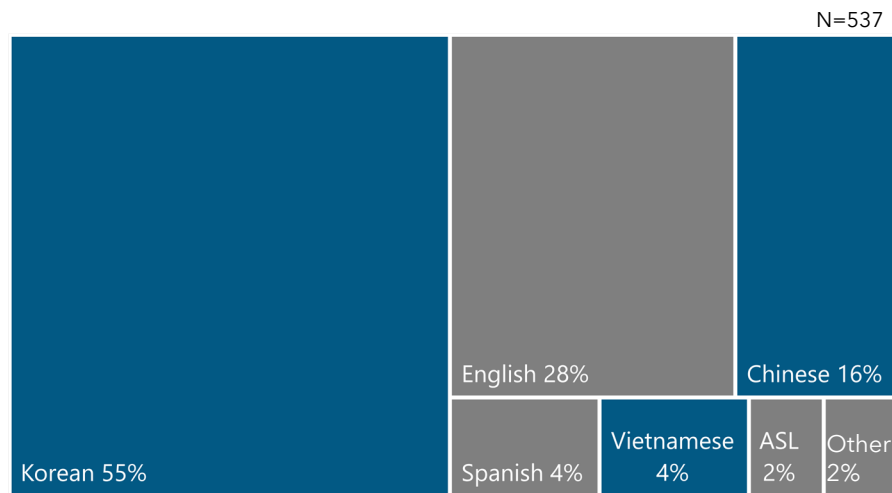
Chinese included Mandarin, Cantonese, and Taishanese.
ASL stands for American Sign Language.
Other includes Japanese, Farsi, Tagalog, Hmong, and Taiwanese Hakka.

BY SITE

At all but one site, translation was needed in **multiple languages**.

	English	ASL	Chinese	Farsi	Japan.	Korean	Spanish	Viet.	Other
Hazel Shirley	✓		✓	✓	✓	✓	✓		✓
Jefferson Manor	✓		✓				✓	✓	✓
La Pintoresca	✓		✓				✓		✓
Lincoln Manor	✓						✓		
Pilgrim Tower	✓	✓				✓			✓
Vista Tower	✓					✓	✓		

Chart includes languages spoken by participants at each site.
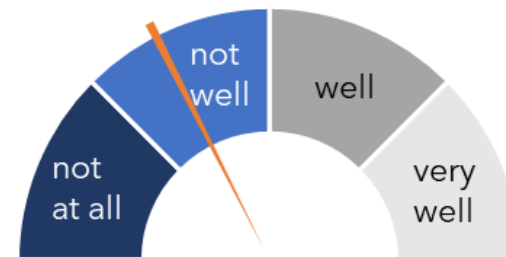
reach LANGUAGE PROFICIENCY AND EDUCATION

Nearly two-thirds of Lighthouse participants reported having limited English proficiency (64%) and more than a third reported having less than a high school degree (37%). While the training curricula and user handbooks were translated into participants' languages, some residents felt incapable of learning new technology because of low reading comprehension.

Staff described the challenges of teaching classes and providing tech support where language barriers were compounded by residents' lack of understanding of tech jargon. Although staff used tools such as Google Translate to communicate, some terms did not make sense when directly translated.

In addition, although participant devices were configured in their preferred languages, this further challenged staff who needed to navigate device interfaces in other languages when providing tech support.

> ❝❝ Translating in a language they [participants] can understand, on top of translating tech language and icons that they are not familiar with, that they have never heard of or conceptualized…it's hard…you have to sit with them and tell them to push each button each time.
>
> - Site staff

ENGLISH PROFICIENCY

The ability to speak and understand English was low. Across all sites, **64% of respondents** said they didn't speak it well or at all.

EDUCATIONAL ATTAINMENT

More than one in three participants **did not finish high school**.

|	
No school	6%
Some high school	31%
High school degree	20%
Some college	22%
College degree	16%
Graduate degree	6%

reach EMOTIONAL HEALTH + WELL-BEING

At baseline about 1 in 3 participants were at risk for depression, social isolation and loneliness. The variation of these measures across communities (shown in dot plot figures below) as well as the average amongst all communities (in yellow) indicate that some communities appeared to be outliers, where translation or misinterpretation of survey items may have been a factor (as described later in this report on pg. 34). Risk for depression, social isolation, and loneliness were assessed across timepoints among Lighthouse participants. Risk for depression was assessed using the PHQ-2 scale[7-8]; risk of isolation was assessed using the Lubben Social Network Scale[9-10]; and loneliness was assessed using the UCLA 3-item scale[11-12].
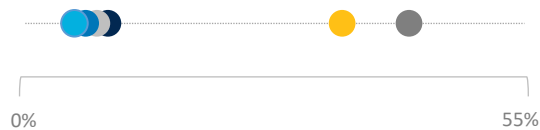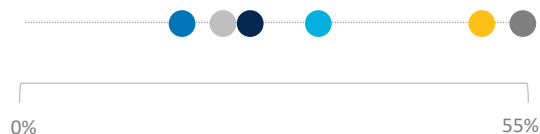

30% of Lighthouse participants were at risk of depression, as measured by the PHQ-2
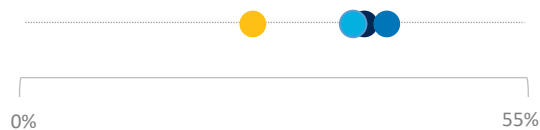
35% of Lighthouse participants were socially isolated, as measured by the Lubben Social Network Scale*

35% of Lighthouse participants were lonely, as measured by the UCLA 3-item loneliness scale

● HS   ● JM   ● LP   ● LM   ● PT   ● VT

*The Lubben measure was administered only at HS, LP, LM and PT

reach FAMILIARITY WITH TECHNOLOGY

Overall, many Lighthouse participants had limited previous experience with technology. Prior to the project, 22% of participants had never used a smartphone, tablet or computer, and 8% had just begun using such a device in the past year. Among those who were using technology, most had only used a smartphone. Relying on a smartphone for internet access limits one's ability to conduct tasks traditionally reserved for larger screens, for example, filling out forms or applications for medical visits or government benefits. In addition, age-related changes in vision and dexterity impact smartphone usability. Prior to Lighthouse, only one-third of participants reported regularly using a tablet, and one-third reported regularly using a computer (defined as a desktop or laptop).
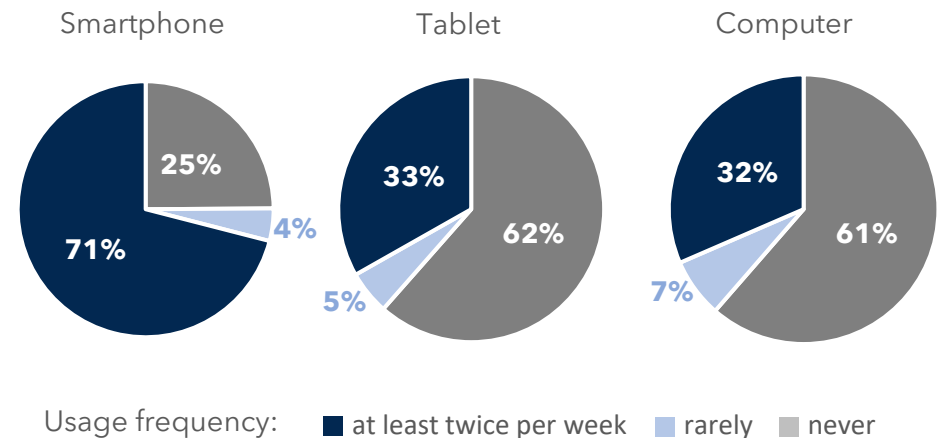
USE OF TECHNOLOGY OVERALL

Almost 1 in 3 were new to using devices such as a computer, laptop, tablet or smartphone.

>2 years — 59%
1-2 years — 11%
<1 year — 8%
Never — 22%

30% new to technology
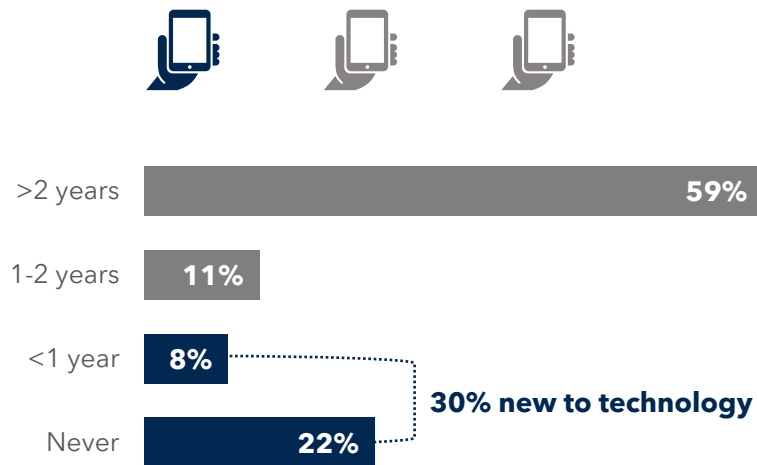
DEVICES USED BEFORE LIGHTHOUSE

At entry, **most Lighthouse participants reported using a smartphone**. Only about one-third of participants reported using a tablet and/or computer on a regular basis.

Smartphone
71% / 4% / 25%

Tablet
33% / 5% / 62%

Computer
32% / 7% / 61%

Usage frequency: ■ at least twice per week ■ rarely ■ never

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adoption

- 🛜 WHAT WERE THE CHARACTERISTICS OF THE PARTICIPATING SITES?

- 🛜 WHAT WERE THE UNIQUE BARRIERS AND FACILITATORS TO PLANNING AND ADOPTING THE LIGHTHOUSE PROJECT?

adoption SITE CHARACTERISTICS

Lighthouse sites varied in their ability to adopt and implement the intervention. Several factors impacted adoption of the Lighthouse Project across the six affordable senior housing communities, including: building characteristics that hindered Wi-Fi installation, staff capacity to support the Lighthouse implementation, diversity of languages spoken by participants and staff, and residents' health status. The following pages examine unique characteristics of Eskaton and FPCIW sites.

FPCIW SITES

Pilgrim Tower
Koreatown, Los Angeles
152 residents
112 units
Deployment: Nov 2021

Pilgrim Tower was unique in that about 1 in 10 residents who participated in the project were deaf or hard of hearing. The remaining residents were primarily monolingual Korean speakers.

Pilgrim Tower employed two Resident Service Coordinators who were both involved with Lighthouse deployment – one was Korean-speaking and the other was able to communicate using American Sign Language.

Pilgrim Tower was the second largest Lighthouse community with 152 residents.

Vista Tower
Koreatown, Los Angeles
284 residents
230 units
Deployment: May 2022

Vista Tower was the largest Lighthouse community at 284 residents, 96% of whom were Korean-speaking.

Of all the Lighthouse communities, Vista Tower experienced the most challenges with Wi-Fi installation due to its cement construction.

Vista Tower was unique in that it was an Integrated Wellness in Supportive Housing site, which allowed for the employment of an on-site wellness nurse and funds to support wellness activities.

Vista Tower participated in two initial Lighthouse pilots, engaging 10 residents. Staff reported that this experience encouraged many other residents to participate in the full Lighthouse deployment.

La Pintoresca
Pasadena
95 residents
64 units
Deployment: July 2022

La Pintoresca was somewhat similar to Hazel Shirley in that the onsite Resident Service Coordinator did not speak the same language as the majority of the residents (Chinese).

La Pintoresca was the final Lighthouse community, which allowed the Lighthouse team to incorporate many lessons learned from previous sites.

adoption SITE CHARACTERISTICS

ESKATON SITES

Jefferson Manor
South Sacramento
132 residents
104 units
Deployment: July 2021

Jefferson Manor was one of the most linguistically diverse communities in the Lighthouse Project. Participants spoke Cantonese (29%), English (29%), Vietnamese (22%), Mandarin (9%), Spanish (9%), Arabic (1%), Hmong (1%), Hindi/Punjabi (1%).

The Social Service Coordinator did not speak many of the primary languages at the community (Chinese, Vietnamese, or Spanish) which made it challenging to initially engage residents.

However, adoption at JM was facilitated by the fact that this community was selected for the Lighthouse pilot phase of the project. Lessons learned during this initial phase helped inform project engagement.

Hazel Shirley Manor
El Cerrito
73 residents
64 units
Deployment: Nov 2021

Similar to Jefferson Manor, Hazel Shirley participants spoke many languages, including English, Mandarin, Cantonese, Korean, Spanish, Farsi, and Japanese.

However, unlike Jefferson Manor, the Social Service Coordinator at Hazel Shirley spoke the same language as the majority of residents (Chinese), which facilitated initial project outreach and recruitment.

Residents at Hazel Shirley were slightly older than the other Lighthouse communities, and the SSC reported that many residents experienced challenges with cognition and mobility.

Lincoln Manor
Placerville
102 residents
100 units
Deployment: Feb 2022

Lincoln Manor was unique in that it was located in a rural setting. Also, 100% of its residents spoke English well or very well compared to other Lighthouse sites where residents had limited English proficiency.

The site experienced a number of other unique challenges that slowed resident engagement, such as: political division, high concern over COVID vaccination status of fellow residents, and social cliques. There was no centralized "front desk" to share community announcements. Also, the Education Director and SSC were new to the community and had less established relationships with residents.

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adoption FACTORS INFLUENCING PARTICIPATION

Despite the unique characteristics of each site setting, **the ratio of residents who declined to participate was consistent across all sites at approximately 30%** (ranging from 26% at Jefferson Manor to 34% at Lincoln Manor). Reasons for non-participation included already having a device; fear or perceived burden of learning a new device and/or attending training classes; dissuasion from family members and/or health professionals; challenges related to vision, hearing, mobility or cognitive decline; or not finding the device relevant. Also, at each site some participants returned their devices a few weeks after receiving them.

Successful efforts to foster participation helped inform subsequent outreach approaches as more sites were added. Tactics included going door-to-door to invite participants, particularly those who were more isolated or less likely to see recruitment flyers; providing opportunities for residents to ask questions and reach out to family members to discuss the project; and hosting social gatherings and orientation sessions.

REFLECTIONS ON PARTICIPATION

" For some, seeing other residents use their device, and learning more about its application and relevance motivated them to ask to join later, though they initially were hesitant or declined to participate.   – Site staff

" For the person that returned the tablet today, he came to all the classes but...he had issues with memory and cognition and gave it back. The others that didn't participate said that it was too complicated and [they] couldn't handle learning it. Another said, 'It's not an iPad, so I don't want it.' Overall, it's either too confusing, they already have tech, or [it's] not good enough.   – Site staff

30% of residents declined to participate in the Lighthouse Project

implementation

- HOW WAS THE PROJECT IMPLEMENTED ACROSS SITES?
- WHAT WAS CONSISTENT OR INCONSISTENT ACROSS SITES?
- WHAT WERE THE ROLES OF SITE STAFF AND RESIDENT AMBASSADORS?

implementation VARIATIONS IN ENGAGEMENT MODELS

All sites at FPCIW and Eskaton implemented the same basic components of the project, however the types of tech support offered as well as training duration were tailored for each community. While increasing the acceptability and overall success of the project, this also added to the complexity of evaluating and comparing the interventions delivered at each site.

FPCIW SITES

	Pilgrim Tower	**Vista Tower**	**La Pintoresca**
Devices	Lenovo Yoga Android Tablet	Samsung Tab A7	Samsung Tab A7
Training Classes	2 core training classes Staff led 2 classes per day, 4 days per week for 2 weeks Classes were led by FPCIW Innovation staff, two onsite RSCs, and a student intern	5 core training classes 3 classes offered per day, 4 days per week for 5 weeks 2-4 staff led each class of 3-14 students	4 core training classes 2 per day, 2 days per week for 4 weeks 2-15 participants per class
Resident Ambassador (RA) Model	3 RAs were recruited 4 months post deployment Languages spoken: Korean, American Sign Language Given devices and user manual before full deployment RA training covered project goals, teaching skills, tablet basics	6 RAs were selected by site staff to provide support during training classes Languages spoken: Korean Given devices and user manual before full deployment RA training covered project goals, teaching skills, tablet basics	20 residents volunteered to become RAs, but only 10 attended the RA training and just 5 helped during the core training classes Languages spoken: Chinese, Spanish Given devices and user manual before full deployment RA training covered project goals, teaching skills, tablet basics
Tech Support Office Hours	Offered 2 hours per day, 2 days per week Initially, FPCIW Innovation staff and a student intern led the office hours, with the onsite RSCs taking over during the second month. Participants preferred drop-in tech support office hours over the core training classes. Many showed up with friends and participants helped each other to learn to use the devices. Unfortunately, two months after deployment, office hours were discontinued due to COVID	Offered 1 hour per day, 2 days per week Led by FPCIW Innovation staff, RSCs and a student intern for the first 5 weeks of implementation RAs provided support on an ad hoc basis – available for neighbors to contact them as needed (similar to Lincoln Manor)	Offered 1-2 hours per week Led by FPCIW Innovation staff for the first two weeks after training. Then the RSC and RAs tried to continue office hours, but participation was very low, so these were discontinued. Later, two RAs offered tech support to participants on an as-needed basis in Spanish and Cantonese. RAs shared their phone numbers and room numbers so neighbors could contact them.
Support from Offsite Staff	2 FPCIW Innovation staff, student intern	1 full time FPCIW Innovation staff, student intern	FPCIW Innovation staff, student intern

implementation VARIATIONS IN ENGAGEMENT MODELS

ESKATON SITES

	Jefferson Manor	Hazel Shirley Manor	Lincoln Manor
Devices	Lenovo Yoga Android Tablet	Samsung Tab A7	Amazon Alexa Show Powered by Speak2
Training Classes	3 core training classes Staff led 4 classes per day (1 pod per class), one day per week, for 12 total weeks Participants were divided into 4 cohorts, each deployed 3-4 weeks apart Each cohort was further divided into pods of 5 participants to enable small class sizes	2 core training classes Staff led 2 classes per day, 2 days per week, for two total weeks Approximately 10 participants attended each class	3 core training classes; later expanded to 5 classes Virtual classes were offered during COVID Omicron spike, but were discontinued due to low participation The user handbook and training curriculum needed to be completely revised for the Alexa Show device used at this site
Resident Ambassador (RA) Model	4 RAs recruited to translate during classes and lead tech support office hours Recruited during training classes Languages spoken: Vietnamese, Spanish, Chinese (Mandarin and Cantonese) RAs asked to volunteer 4 hours per week, lead office hours 1 day per week Stipend provided for first two months	10 RAs recruited to translate in classes and lead tech support office hours Recruited by Eskaton Innovation staff via a booth in the common area prior to deployment Languages spoken: English, Spanish, Mandarin, Cantonese, Farsi Given devices and user manual before full deployment RA training covered project goals, teaching skills, tablet basics	6 RAs recruited to provide feedback on training guide and curriculum and tech support to their neighbors, and to recruit project participants Recruited prior to deployment Languages spoken: English only, since all participants were English speaking RA training covered project goals, teaching skills, tablet basics
Tech Support Office Hours	Regular weekly drop-in office hours were offered in 5 languages but low attendance in Vietnamese, Spanish, and English prompted discontinuation after the first month. Support in Chinese continued for several months post-training	No office hours were offered due to staffing changes and the COVID Omicron spike	Tech support was provided as needed (e.g., participants could knock on the RAs' door or contact the RA to arrange a time to meet)
Support from Offsite Staff	One full-time Eskaton Innovation staff member managed the Lighthouse intervention and led all training classes	One full-time Eskaton Innovation staff member supported RA recruitment, RA training, and led the core training classes	Speak2 staff created the curriculum and user handbook and led the first training class Eskaton Innovation Staff provided the RA training, assisted the SSC in going door-to-door to recruit participants, and led and/or assisted with all of the core training classes

implementation TRAINING TOPICS

Training topics were adapted over time and tailored to participants. All sites reviewed device basics and cybersecurity, but other topics were site dependent. For example, at Pilgrim Tower, the curriculum was geared towards participants who were deaf or hard of hearing. At other sites, some topics were dropped when apps proved too complex for seniors to use. Despite cybersecurity being taught at all sites, staff indicated the need for greater emphasis on this topic. (Note: Sessions often covered more than one topic.)

number of core training sessions offered at site ●

JEFFERSON MANOR ●●●	PILGRAM TOWER ●●	HAZEL SHIRLEY ●●	LINCOLN MANOR ●●●●●	VISTA TOWER ●●●●●	LA PINTORESCA ●●●●
Device Basics	Device Basics	Device Basics	Device Basics	Device Basics	Device Basics
Cybersecurity	Cybersecurity	Cybersecurity	Cybersecurity	Cybersecurity	Cybersecurity
Voice User Interface		Voice User Interface	Voice User Interface		
Google Translate	Google Translate	Google Translate		Google Translate	Google Translate
YouTube	YouTube	YouTube	YouTube	YouTube	YouTube
Zoom/Video Calls	Zoom/Video Calls	Zoom/Video Calls			Zoom/Video Calls
Camera/Photos (only cohort 4)		Camera/Photos			
Google Play Store (only cohort 4)	Downloading Apps			Downloading Apps	
	Chrome, Instant Messaging, Sorenson (video American Sign Language interpretation)		Contacts, alarms + reminders, music, news, weather, podcasts, games	Chrome, Gmail, OnDemand Korea, KoreaTimes, Radio Korea, Tubi	Chrome

implementation THE ROLE OF STAFF

Site staff – Resident Service Coordinators (RSCs) or Social Service Coordinators (SSCs) – at both Eskaton and FPCIW communities played a pivotal role in the success of the project by assisting in recruitment, orientation, deployment, translation, and training support. They also provided feedback at each step to assist in ongoing evaluation. Their knowledge and established trust with community residents allowed for increased communication and engagement in the project.

The **time and effort required of staff to assist** on the project, on top of their regular duties, was described as both impactful and challenging to sustain, particularly in language-diverse communities or when they were the only RSC/SSC on site. They were frequently sought out by residents to answer questions and troubleshoot tech issues. Some participants needed extensive support with basic skills such as restarting and charging their devices, while others asked for help in learning new apps or online platforms.

Despite the great time commitment, all of the staff involved with Lighthouse described it as a positive experience. One RSC described that observing residents' enthusiasm in learning to use their devices and interacting with each other was a highlight of the project.

> " Even though it is so much time, I know that it will help them enjoy life even more, so I'm willing to do it. – Site staff

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implementation PERSPECTIVES FROM SITE STAFF

Being a tech or training resource for participants and supporting the project overall added to staff workloads. However, those involved felt their contribution was worth the benefit it provided to participants.

"It's tough. You almost need a dedicated group or employee that is doing just that [providing tech support] and can do everything for this [project]. Some days I [get] no questions, but other days we have 5-6 residents with questions. And then you also have the language barrier... Our job is what it is. When you throw this on top, it really is a lot."

— Site staff

"We need to encourage the residents and help when possible because if we don't, they will likely not use the device and not ask for help again. Participants...need to have an open door for questions to encourage them coming back and not giving up." — Site staff

"As an RSC, I believe it's a success even if I can help one or two residents. But even to help two people learn to use the devices is a lot of work." — Site staff
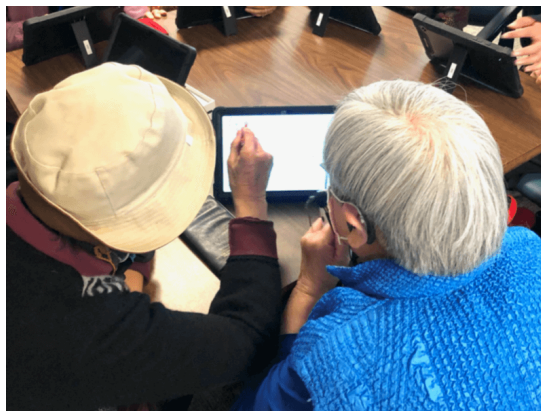
"They [participants] are very passionate about the project, wanting to learn, wanting to know what else they can do with their tablets." — Site staff

"There is always a backlog of residents needing help." — Site staff

implementation THE ROLE OF RESIDENT AMBASSADORS

Residents with a knowledge of or interest in technology were recruited and trained to serve as Resident Ambassadors at each site to support RSCs and SSCs. A total of 39 were trained and/or engaged to provide tech support to project participants.

Their role was to assist learners during and outside of the training sessions. In many communities, the RAs helped bridge language gaps between staff and residents. They also provided input on the training curriculum and assisted with participant recruitment. At some sites, they provided regular office hours whereas at others, they helped out on an ad hoc basis whenever people needed assistance with their devices.

At most Lighthouse communities, RAs received their devices prior to other participants and attended an RA training that covered project goals, teaching skills, and device basics. The RA training covered the entire core training curriculum so RAs would know what to expect when the classes were offered to the full community. This increased RAs' confidence to provide tech support to participants both in and outside of class.

Even when RAs did not have extensive knowledge or tech skills, staff shared that they motivated fellow neighbors during the training classes, saying, "Even though we're old, we can do this. It is fun. The technology will help us stay on top of things mentally and connect with others."

effectiveness

📶 *MODEL*
- HOW EFFECTIVE WAS THE IMPLEMENTATION MODEL?
- WERE THE TRAININGS WELL ATTENDED?
- WAS THE RESIDENT AMBASSADOR MODEL SUCCESSFUL IN REDUCING STAFF BURDEN?

📶 *INDIVIDUAL*
- DID PARTICIPANTS' HEALTH AND WELL-BEING IMPROVE?
- HAVE THEY GROWN MORE COMFORTABLE USING TECHNOLOGY?

📶 *ORGANIZATIONAL*
- WHAT IMPACT (BURDEN/BENEFIT) DID THE PROJECT HAVE ON PARTICIPATING COMMUNITIES?
- WHAT IMPACT DID IT HAVE ON THE RELATIONSHIPS BETWEEN PARTICIPANTS AND SITE STAFF?

effectiveness TRAINING PARTICIPATION

The number of training classes offered in each community varied, with some offering a total of 2 classes and others up to 5 classes. Participation in the trainings also varied depending on the site. Training attendance was highest at Jefferson Manor and Vista Tower, where more than 80% of participants attended **at least one class**. The percentage of participants who **attended all classes,** however, was below 50% for all communities, with a low of 3% and a high of 44% (see chart below).

Sites adopted a variety of strategies and approaches to increase training participation. For example, ensuring scheduled classes did not conflict with other popular activities, providing multiple reminders (phone calls, notices) prior to scheduled trainings, encouraging participants with in-person reminders to encourage training attendance, and engaging RAs to encourage and remind neighbors to participate.

Despite receiving a Lighthouse device, participants declined to attend training classes due to:

- Cultural or personal preference to learn on their own versus a group
- Already receiving outside help to learn to use the device (e.g., from a caregiver or family member)
- Confident in own tech skills; do not see benefits of classes
- Lack interest in the training topic(s)
- COVID concerns
- Prefer to drop-in spontaneously at office hours with friends, rather than attend formal classes
- Scheduling conflicts (e.g., medical appointment, senior center activities, free senior shuttle to groceries)

TRAINING PARTICIPATION BY SITE

Site	# core classes offered		% completed 1+ class	% all classes completed
Pilgrim Tower (N=103)	2	●●	55%	14%
Hazel Shirley (N=52)	2	●●	67%	44%
Jefferson Manor (N=77)	3	●●●	87%	36%
La Pintoresca (N=52)	4	●●●●	77%	37%
Lincoln Manor (N=70)	5	●●●●●	36%	3%
Vista Tower (N=208)	5	●●●●●	83%	21%

- At PT, 2 core classes were offered, yet only **14%** of participants **went to both** classes.

- At LM, 5 core classes were offered; just **3% attended all 5** classes.
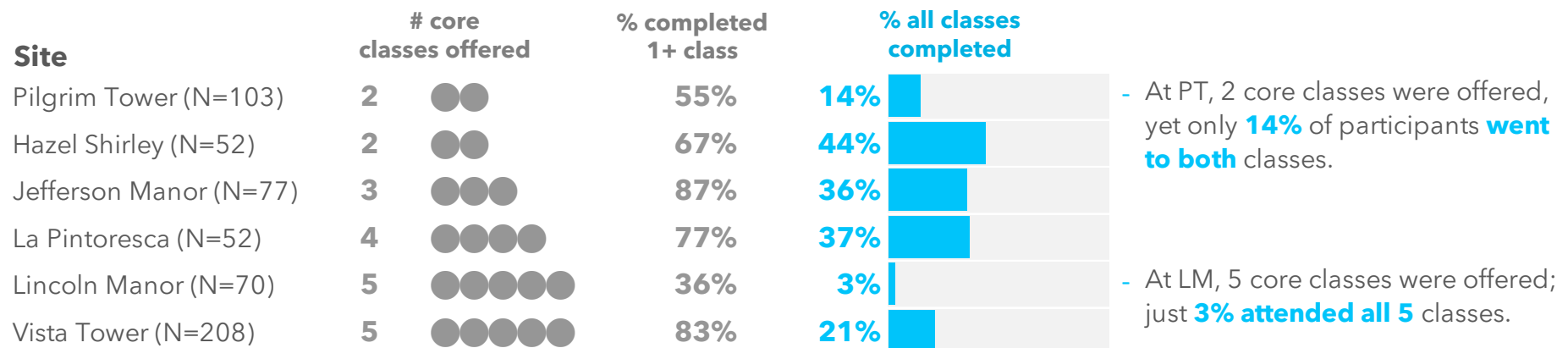
effectiveness RESIDENT AMBASSADOR MODEL

The nature of the RA model varied across communities in terms of RA recruitment, training, expectations as well as their ongoing participation. RAs were most effective when they volunteered rather than were chosen by staff; had previous technology experience; and were well-known and liked in the community.

At many of the sites, the number of RAs declined after the training. In some cases, RA attrition was attributed to a lack of structure. To sustain engagement, site staff need to provide ongoing support and encouragement to RAs. Other RAs did not have the tech skills to be seen as a go-to resource for support. In these cases, participants preferred to go to staff rather than peers for tech support. RAs may benefit from receiving ongoing or additional training to bolster their digital literacy skills.

Strategies should also be implemented to ensure that residents know who the onsite RAs are and that they feel comfortable reaching out for help. At several Lighthouse communities, a post-training social event was organized to remind participants that the RAs are a friendly and trustworthy source of tech support. Staff introduced RAs and participants, RAs wore brightly colored Lighthouse t-shirts, and flyers were distributed with RAs' contact information.

> " Resident Ambassadors were eager to become device experts, attending as many in-person classes as they could. They are seen as go-to resources for fellow residents.
>
> – Site staff

> " Sometimes residents don't want to go to unknown persons. They prefer going to the RSC. They will use the RA if they know each other previously, but they are hesitant to visit new ambassadors. Culturally, they don't like to ask for help.
>
> – Site staff

effectiveness EMOTIONAL HEALTH + WELL-BEING

An important goal of the Lighthouse Project was to improve the health and well-being of residents. Evidence-based self-reported measures, including the PHQ-2 item scale[7-8] used to assess risk for depression, the 6-item Lubben Social Network Scale[9-10], and the UCLA 3-item loneliness scale[11-12], showed mixed results. The attrition in survey responses across time points as well as the inability to ascertain if certain items were understood by all participants led to limitations in the generalizability and validity of these findings. Shown below is the overall percent of participants "at risk" at 30-days. The figures also show the variation across timepoints for each community (colored dots).

27%

Of Lighthouse participants were **at risk of depression**, as measured using the PHQ-2 at 30 days.

42%

Of Lighthouse participants were **socially isolated**, as measured using the Lubben Social Network Scale at 30-days.

27%

Of Lighthouse participants were **lonely**, as measured using the UCLA 3-item loneliness scale at 30 days.

Legend: ● HS ● JM ● LP ● LM ● PT ● VT
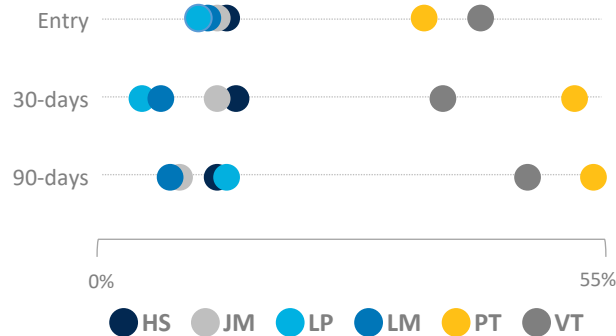
Limitations:

The PHQ-2 scale inquires about the frequency of depressed mood and anhedonia over the past two weeks using two items. Site staff indicated that these items were **not well understood** by participants with low literacy and English language proficiency. In particular, this measure may not have performed well among participants at Vista Tower and Pilgrim Tower.
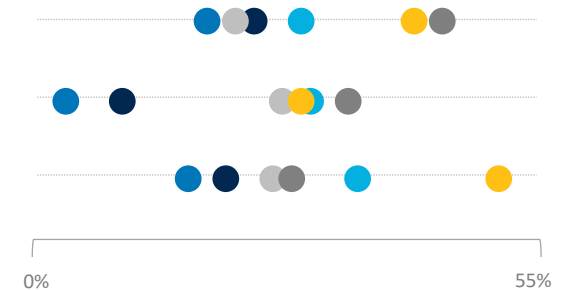
Limitations:

The Lubben Social Network scale is a measure of social engagement including family and friends. This measure was **not consistently administered** in surveys, which made comparisons within and across communities challenging. The scale was not included at VT at entry, and only administered at JM at 90 days. Also, not all participants responded to all 6 items in the scale needed to assess risk for isolation, limiting the sample size that could be included.

Limitations:

The UCLA-3 item scale measures 3 dimensions of "loneliness" for relational and social connectedness as well as self-perceived social isolation. Staff reported mixed results in terms of acceptability among participants. Questions such as "How often do you feel left out?" may have been **challenging to accurately translate**. In addition, **negatively worded questions** for this scale and those in the PHQ-2 may have been confusing.

effectiveness HEALTH

Adapted from the Patient-Reported Outcomes Measurement Information System (PROMIS) [13-14], two global health items measuring emotional and physical health were tailored and piloted for their use among participants in the Lighthouse Project. These items have been widely used in large national surveys in the U.S. and may be useful for comparisons among the general population.

EMOTIONAL HEALTH

Though some evidence-based measures assessing psychosocial health had multiple limitations restricting the ability to interpret findings, two single items focused on self-rated physical and emotional health (shown below) were easier for participants to understand and therefore considered more accurate.

Findings among the Lighthouse participants who responded (ranging from poor to excellent) to the question, "In general, how would you rate your emotional health?" indicate that their **emotional health significantly improved over time.**

Participants indicated that their **emotional health improved** over time.

|	fair/poor	excellent/very good/good
Entry	45%	55%
30-day	34%	66%
90-day	35%	65%
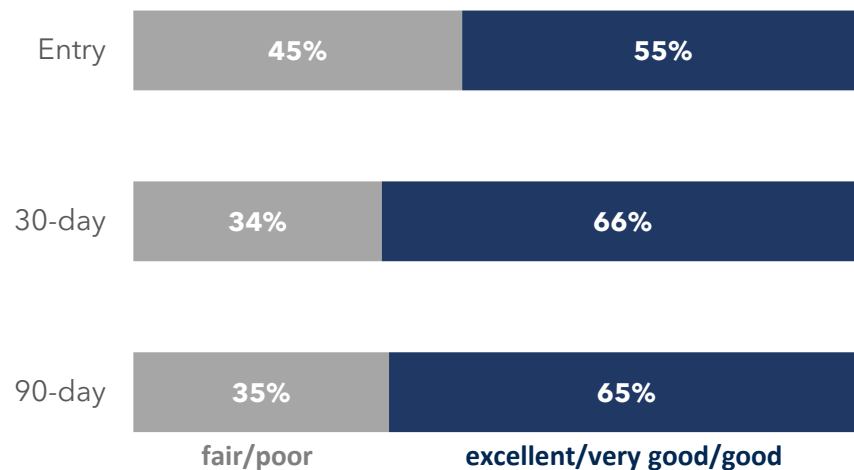
PHYSICAL HEALTH

The PROMIS global health single item measuring physical health asked participants, "In general, how would you rate your physical health?"

Findings among the Lighthouse participants who responded to this question indicate that **physical health significantly improved over time.** Similar to findings for emotional health, results for physical health were also **sustained over time** at 90-days.

Participants indicated that their **physical health improved** as well.

	fair/poor	excellent/very good/good
Entry	57%	43%
30-day	44%	56%
90-day	47%	53%
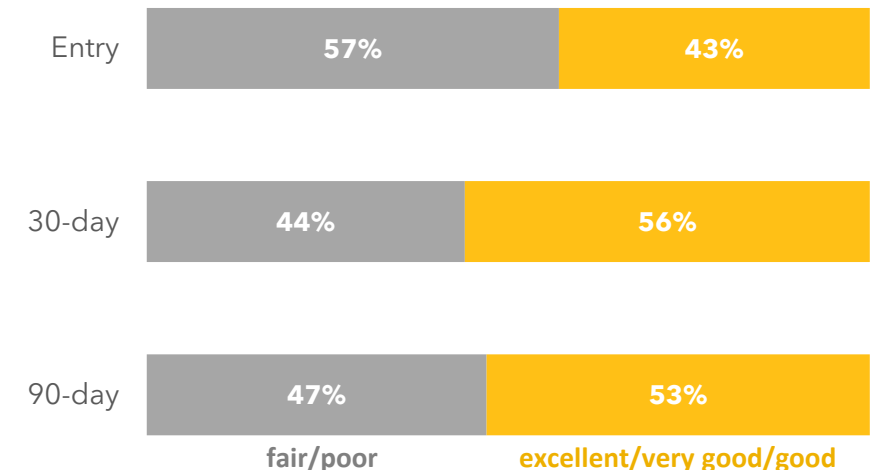
effectiveness DEVICES

Across the six Lighthouse communities, a variety of devices were distributed. Device selection was based on affordability (to ensure scalability), large display screens, quality speakers, voice-first capabilities, compatibility with Google platforms (to maximize language accessibility), and battery life.

Overall, the tablets were well received. Participants who previously had smartphones were able to transfer their skills over and generally, they liked the large screen size. However, individuals without previous technology experience needed a device with a simplified interface. Others needed adaptations such as larger icons.

LENOVO YOGA ANDROID TABLET	SAMSUNG TAB A7	AMAZON ALEXA SHOW POWERED BY SPEAK2

The Lighthouse Project initially planned to obtain Lenovo Yoga Tablets for all of the sites, but after getting tablets for Jefferson Manor and Pilgrim Tower, Lenovo discontinued this model. This taught the Lighthouse team a valuable lesson — to ensure the curriculum and implementation remained device-agnostic. The device also had problems with poor Wi-Fi connectivity.

Samsung TabA7 devices were deployed at Hazel Shirley, Vista Tower and La Pintoresca. While the Lenovo Yoga and Samsung TabA7 tablets offered greater language capabilities than the Alexa Show devices, voice first features did not work for Cantonese dialects and the keyboard was difficult to use with Chinese characters. Even when the tablets were configured in another language, some things still came up in English.

The Alexa Show device with Speak2 interface, used at Lincoln Manor, was simpler and tailored to new tech users. This made it more intuitive to learn, but it had limited functionality. Users were unable to access YouTube, social media, or browse the internet. It also required significant staff time to help participants use the devices for video calling.

One unique benefit of this device was the ability for staff to 'push' announcements to residents.

effectiveness DEVICE SATISFACTION

Over half of participants (54%) reported that their device was "somewhat difficult" or "very difficult" to use. However, almost all participants (92%) reported that they would recommend their device to friends or family. High endorsement of the device may be connected to high satisfaction of participants' experiences with the Lighthouse Project overall. In addition, community staff reported that participants may believe that others (friends and family) would find the device easier to use. Comments from participants, along with feedback from community staff at each site, indicate a need for further support for participants to troubleshoot challenges using their devices, in addition to the training classes provided.

A majority of respondents found it **somewhat difficult to use** the tablet.

10%

44%

34%

12%

Very Easy   Somewhat Easy   Somewhat Difficult   Very Difficult
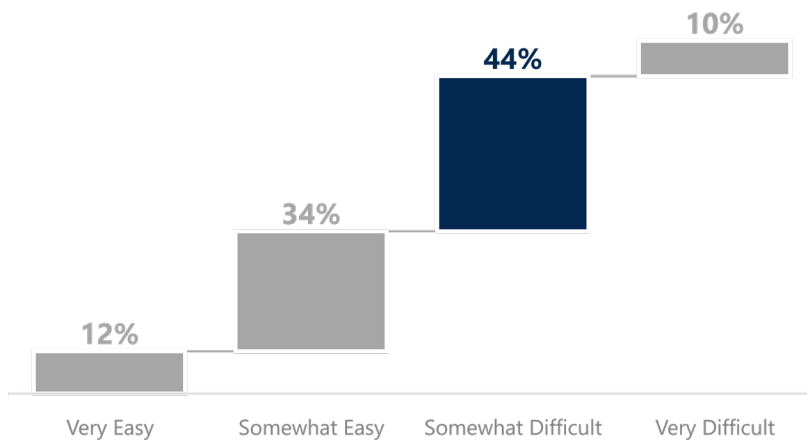
Even so,

92%

would recommend the device to friends or family

❝ This technology is too hard …I am not [able to] understand…but am trying and get help from my church/family.

– JM participant

❝ I am grateful for the efforts of the teaching staff…so I want to do well. I am sorry I cannot handle the machine.
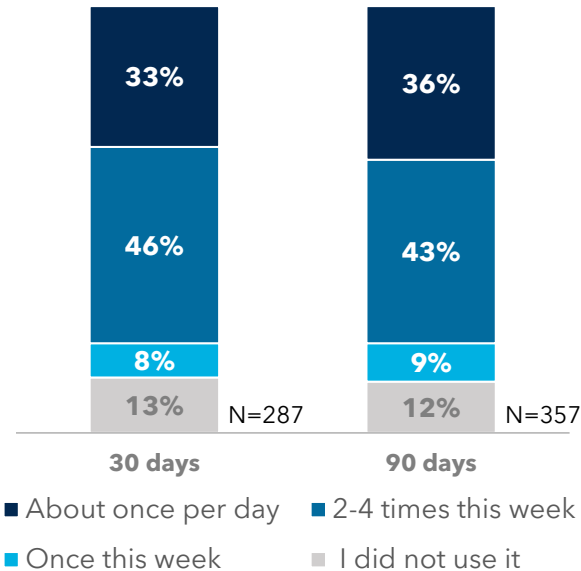
– VT participant

❝ [I feel] completely ignorant of this technology, I don't know how to start, and I don't know who to ask for advice.

– LP participant

effectiveness DEVICE USE

Participants engaged with their devices even after core trainings ended. In fact, almost 90% of participants continued to use their devices at least once a week — even 30 and 90 days out. Participants primarily used their devices for entertainment to watch news, sports, television shows, movies and YouTube. GoogleTranslate was also frequently used, facilitating communication among neighbors and between residents and staff. Residents also utilized cultural- and language-specific apps. Interestingly, **23% of participants reported accessing health information at 90 days,** despite this not being emphasized in the training curriculum. Finally, about 1 in 10 participants used Zoom to attend church services, exercise sessions, or classes offered by outside community-based organizations.
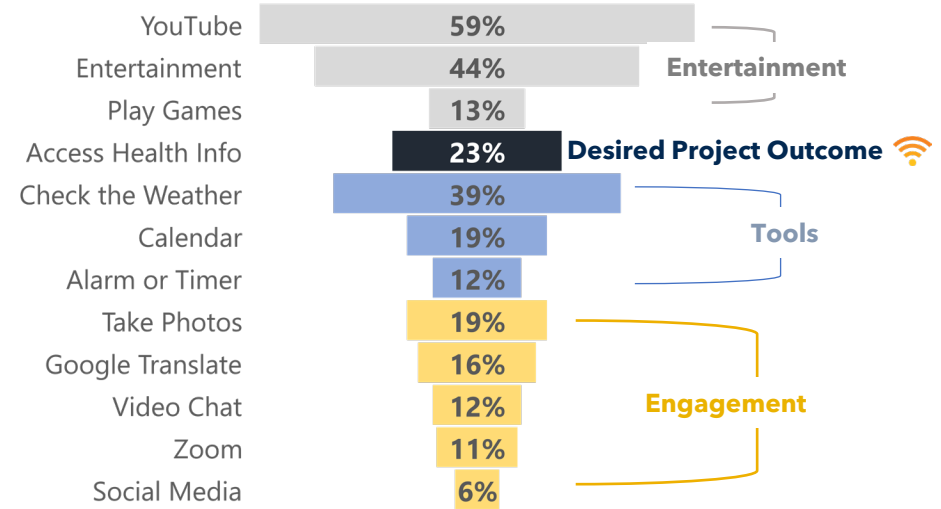
LIGHTHOUSE DEVICE USE FREQUENCY

Device usage remained fairly consistent over time, with the majority of respondents using them at least **several times per week**.

	30 days	90 days
About once per day	33%	36%
2-4 times this week	46%	43%
Once this week	8%	9%
I did not use it	13%	12%
	N=287	N=357

- ■ About once per day
- ■ 2-4 times this week
- ■ Once this week
- ■ I did not use it

LIGHTHOUSE DEVICE USE ACTIVITIES

While participants primarily used their Lighthouse devices for **entertainment**, **nearly one in four people accessed health information online**. They also used apps to **access tools** and **engage with the outside world.**
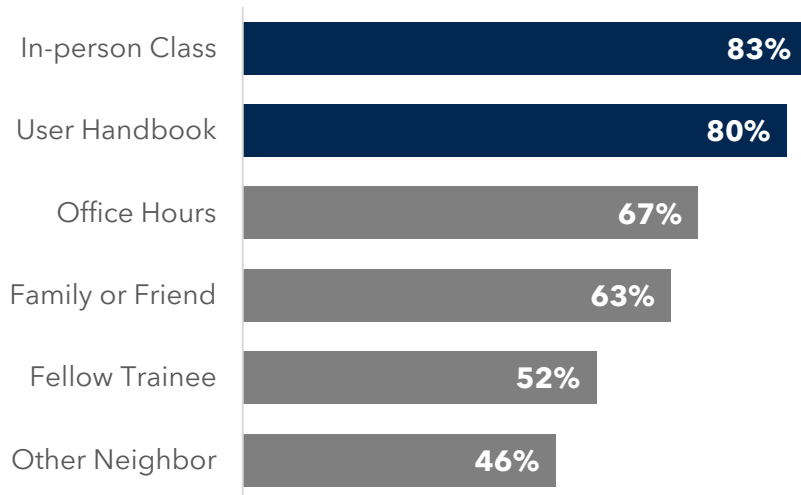
Activity	%
YouTube	59%
Entertainment	44%
Play Games	13%
Access Health Info	23%
Check the Weather	39%
Calendar	19%
Alarm or Timer	12%
Take Photos	19%
Google Translate	16%
Video Chat	12%
Zoom	11%
Social Media	6%

Entertainment — YouTube, Entertainment, Play Games

Desired Project Outcome — Access Health Info

Tools — Check the Weather, Calendar, Alarm or Timer

Engagement — Take Photos, Google Translate, Video Chat, Zoom, Social Media
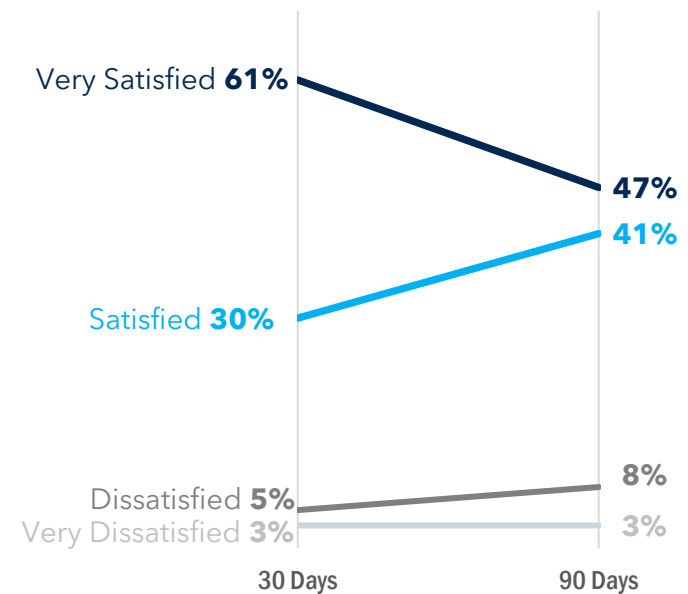
Data reported at 90 days (N=379)

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effectiveness TECH SUPPORT

The post-intervention surveys asked participants about the effectiveness of the different tech support provided. The in-person classes followed by the device handbook were the most helpful resources for participants in learning to use their devices. This was followed by attending tech support office hours and getting help from a family member or friend. Satisfaction overall with the tech help received declined upon program completion, likely due to reduced access to tech support provided during the training.

Participants found **structured learning methods** helped them learn to use their devices more than ad hoc interactions.

In-person Class	83%
User Handbook	80%
Office Hours	67%
Family or Friend	63%
Fellow Trainee	52%
Other Neighbor	46%

Extreme satisfaction with tech help **lessened** somewhat after training sessions had ended.

Very Satisfied **61%** → **47%**

Satisfied **30%** → **41%**

Dissatisfied **5%** → **8%**

Very Dissatisfied **3%** → **3%**

30 Days   90 Days

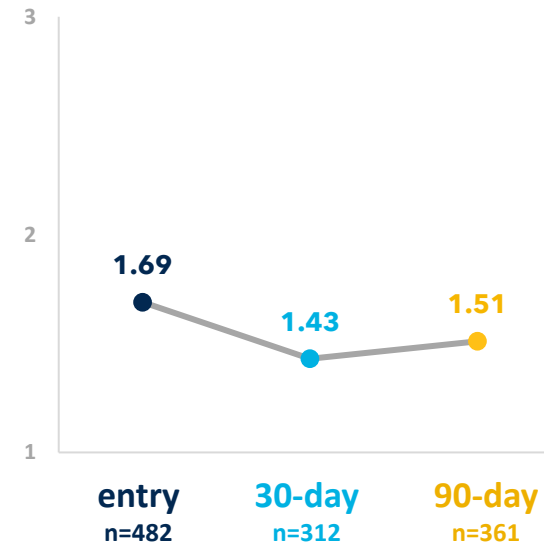# effectiveness ATTITUDES TOWARD TECHNOLOGY

The Lighthouse Project increased participants' comfort with technology overall, including computers, tablets, and smartphones. Researchers have long measured attitudes towards technology as a predictor of use[15-16]. In the Lighthouse Project, attitudes towards technology were measured using two validated subscales for a total of six survey items. Response categories for all statements ranged on a scale of 1 to 4.

Tech comfort increased, though the change was only significant from entry to 90-days.

Tech anxiety significantly decreased from entry to 30 days. It remained lower at 90-days, though the change from entry was not significant.
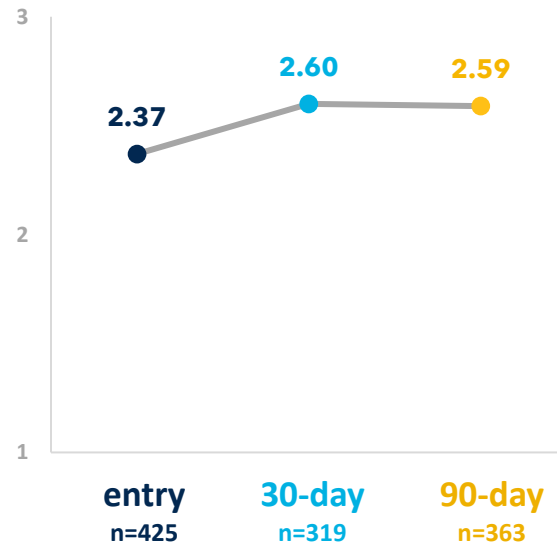
The Attitudes Towards Computers Questionnaire (ATCQ) Comfort Subscale[17] includes four items: "I feel comfortable with technology" (reverse scored), "Technology makes me nervous," "I don't feel confident about my ability to use technology," and "Technology is confusing." In the Lighthouse Project, this scale showed strong internal consistency and reliability, with a Chronbach's Alpha score of 0.818.

The Senior Technology Acceptance Model (STAM) Technology Anxiety Subscale[18] includes two items: "I feel apprehensive about using technology," and "I hesitate to use technology for fear of making mistakes I cannot correct." This scale also showed strong internal consistency and reliability, with a Chronbach's Alpha score of 0.845.

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effectiveness ATTITUDES TOWARD TECHNOLOGY

In addition to participants reporting significant improvement in comfort with technology overall **across all timepoints,** participants strongly agreed that **technology is useful for connecting with family and friends**, and technology is useful **to learn new information and skills**. Research shows that perceived usefulness of technology is a key predictor of acceptance and use[15].

90% agree

10%
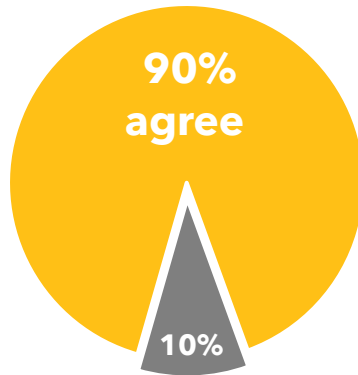
Ninety percent of respondents agreed that technology helps them **be connected with family and friends**.

"This project enables the elderly to increase their communication with the outside world." – HS participant

"I think it is wonderful! It makes me very happy to be a part of this modern tech…" – LM participant

"I am so thankful that I have this tablet. It helps me a lot. Teaches me to learn more." – JM participant

94% agree

6%
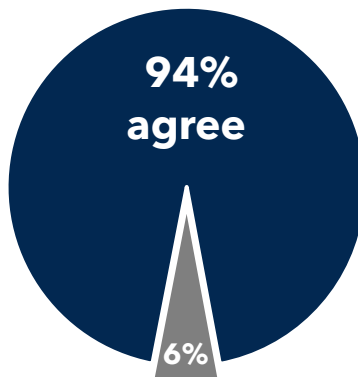
Almost all respondents agreed that technology helps them **learn new information and skills**.

"Thank you for giving me a Samsung tablet and even training me when I couldn't do anything. Thanks to that, I enjoy entertainment, music, and movie soap operas. I am living happily. Thank you." – VT participant

"It has opened doors for me to a whole new world. Thank you"
– LM participant

"This project helped me a lot in learning new information and skills…"
– VT participant

effectiveness RELATIONAL OUTCOMES

The Lighthouse Project led to many other positive relational outcomes, such as:

- **Increased social engagement** and excitement amongst participants in learning to use the devices together. Participating in the classes and office hours fostered new relationships among residents.

- **Enhanced access and connectivity** for all residents, including those who did not participate. The Wi-Fi infrastructure served as a valuable resource to the larger community, providing benefits to non-participants, visitors, family members, and caregivers who interact with the residents, and potentially contributed to the community overall well-being.

- **Strengthened relationships between site staff and residents** as they became more comfortable reaching out for assistance. The increased familiarity allowed for participants to feel more comfortable asking staff for assistance in other areas.

- **Increased ways of communicating.** Devices facilitated communication between staff and residents through apps such as Google Translate and 'pushed' announcements via the Echo Show devices.

- **Deepened sense of purpose for Resident Ambassadors.** RAs reported that helping and expanding connections with others provided them with new feelings of purpose.

effectiveness RELATIONAL OUTCOMES

Qualitative debriefs with site staff and Resident Ambassadors provided insight into how the Lighthouse Project increased social engagement in the communities, increased ways of communicating, enriched participants' lives, and expanded their interest in learning. Resident Ambassadors described additional benefits gained through their role as project volunteers.

INCREASED SOCIAL ENGAGEMENT

"Previously, neighbors had little to talk about with one another. When they passed each other in the hallways, they would say hello, but there were few organized activities that brought them together." – Resident Ambassador

"One neighbor asked for help to find a song on YouTube… [She] then sang the song out loud along with the video. Everyone loved the performance, and it was a real highlight." – Resident Ambassador

"Participants could be found gathering in groups in shared community spaces, exploring their devices." – Site staff

INCREASED WAYS OF COMMUNICATING

"When my phone line was down for nearly an entire week, residents could still get ahold of me via the devices." – Site staff

"The Echo Show devices are great for pushing out announcements — for example, when the water in the community was shut off. Prior to Lighthouse, we had to provide hard copy notifications that were often not seen by residents until the next day." – Site staff

"Kakaotalk helped residents stay even more connected with one another and with others." – Site staff

ENRICHED PARTICIPANTS' LIVES

"Technology is a new language…but they are very motivated, and they are proud of themselves." – Site staff

"One of our participants is using his device to practice his English." – Site staff

"They also are learning, for example, how to cook something, how to get exercise. Friends get together — they watch, they discuss." – Site staff

"One resident with low vision is now interested in learning more about other technology devices, since they experienced how helpful and easy the Echo Show device was." – Site staff

RESIDENT AMBASSADOR BENEFITS

"Before the project, I didn't know many people at the community. Being a Resident Ambassador allowed me to get to know my neighbors and socialize, which I really enjoyed." – Resident Ambassador

"Sometimes they have questions. If I can explain to them, so they can use the tablets, they feel very good and I feel very good, too." – Resident Ambassador

"This [project] enriches our lives… I liked figuring things out together." – Resident Ambassador

maintenance

- WHAT ONGOING SUPPORTS ARE NECESSARY TO MAINTAIN THE PROJECT?

- WHAT RECOMMENDATIONS ARE THERE FOR SUSTAINING LONG TERM PARTICIPANT ENGAGEMENT AND LEARNING?

maintenance

After project completion, the evaluation team met with site staff to learn about ongoing efforts to promote digital literacy in their communities. Staff at every site agreed that sustained support and in-person engagement was vital to foster residents' continued learning and use of devices.

Some RAs continued offering tech support. However, instead of offering scheduled tech support office hours, they transitioned to ad hoc support. Neighbors were encouraged to knock on RAs' doors or reach out using an instant messaging app (such as KakaoTalk).

At some communities, staff continued to lead training classes onsite. However, participation dwindled, and staff described investing significant time developing the curriculum and handouts and promoting the classes.

At one community, an outside volunteer continued to offer regular digital literacy classes onsite; the courses were well attended. Bringing outside resources (staff, volunteers, curricula) minimizes the burden on RSCs and SSCs, who have many competing priorities.

> " The challenge is that they forget. We teach them one thing, but they forget and when they come to see us again, they ask for us to repeat.   - Site staff

> " Some residents are not using their device at all due to low digital literacy skills. Residents will need more classes and support before they will be able to use the tablet on their own.
> – Resident Ambassador

maintenance POST-INTERVENTION SUPPORT

Support provided after the Lighthouse Project intervention was continued at both the FPCIW and Eskaton communities. Sites incorporated ways to continue to use their devices and sought support from outside the community to help lead and support continued efforts. Some of these activities, as described by leadership and site staff, are documented in the following tables. FPCIW is also exploring funding sources to provide stipends to Resident Ambassadors for their continued engagement and support of fellow neighbors.

FPCIW SITES

	Pilgrim Tower	Vista Tower	La Pintoresca
Post-Training Support within Evaluation Time Period	Two months post deployment, a student intern offered eight digital wellness training classes via Zoom, though participation was low. Later, over the holidays, FPCIW deployed a 'tic tac toe' game, encouraging residents to use their tablets in various ways.	A social event was organized to focus on learning to use a popular Korean app, KakaoTalk, on Lighthouse devices. A flyer with the RAs' contact information was distributed to the 45 attendees, and they were encouraged to communicate either in person or via KakaoTalk.	The RSC offered two additional classes though attendance was low. The topics included email and researching public transit schedules using Google Maps. Two RAs offered tech support to neighbors.
Post-Intervention Support	Eight months post-deployment, staff reported offering classes two days per week. Topics ranged from apps to learn English (Duolingo), to games, to looking up health information. Attendance ranged with up to 10 participants, including a mix of Korean and ASL residents. The staff provided relevant handouts and collected surveys to gather feedback on the devices, what apps participants are using, and training topics of interest for the future.	Seven months post-deployment, site staff reported they led ongoing classes twice per month. Topics varied depending on participants' interests, and sometimes were informal drop-in sessions to simply practice using Lighthouse devices together. One year post-deployment, tech support activities include a 3-week workshop led by a graduate student, as well as weekly hosted tech support by a Resident Ambassador, called "Tech Tuesdays." The VT wellness nurse, along with staff, continue to integrate the use of devices in daily activities such as telehealth visits and resident messaging platforms. Naver PaPaGo has been a popular app for Korean translation (replacing GoogleTranslate).	Classes initially offered by the RSC were without Mandarin translation and not well attended, so they were paused. Two RAs continued to offer tech support to neighbors on an ad hoc basis. As of Feb 2023, weekly workshops resumed, led by FPCIW staff and two student interns. Workshop topics included advanced tablet basics (airplane mode, settings), cybersecurity, connecting to new Wi-Fi networks, and a YouTube refresher. All topics were chosen based on inquiries the RSC received from residents.

maintenance POST-INTERVENTION SUPPORT

ESKATON SITES

	Jefferson Manor	Lincoln Manor	Hazel Shirley
Post-Training Support within Evaluation Time Period	Tech support office hours were offered weekly in multiple languages.	The core training series was repeated twice during the evaluation time period. While the second round was geared to 10 new participants in cohort 2, this allowed interested participants to repeat courses. Participants reached out to RAs for tech support on an ad hoc basis.	None
Post-Intervention Support	The Chinese-speaking RA continued offering office hours for about a month post-intervention, but participation dwindled.	Four months post-deployment, staff reported that RAs continued to provide tech support to neighbors. In addition, a report from Amazon revealed that 70%-80% of participants are using their devices daily. A primary driver of continued engagement is nearly daily announcements pushed out to the devices, for example, social opportunities in the community room.	Post-intervention follow-up trainings, led by a volunteer during the second half of 2022, continued to be well attended by approximately 30 participants. In particular, site staff noted that Mandarin and Taishanese language groups continued to have a high level of engagement post-intervention.

maintenance STAFF/RESIDENT AMBASSADOR RECOMMENDATIONS

During debrief interviews with site staff and RAs, a variety of suggestions were made to improve training effectiveness and promote continued participant learning and engagement.

> " I suggest offering at least one class a month, or even a resident-led tablet exploration group. Residents could get together in small groups to try out new apps, troubleshoot problems and teach one another.
> – Resident Ambassador

- Survey residents to learn about their interests and inform class tailoring. For example, some residents expressed interest in language apps to learn English, and medical or health-related apps and information. One important topic to weave through all lessons is cybersecurity.

- Be more explicit about pairing class curricula with the user handbooks so that participants will be more familiar with using the handbook on their own after class.

- Focus on one app at a time and go slowly. For example, Google Translate has many functions; it is best to teach one thing at a time. Lessons can also cover how apps can be applied across devices (e.g., from tablets to phones).

- Consider differentiating classes for beginner, intermediate, or advanced technology levels. Some participants may be interested in an advanced user handbook.

- Continue to offer classes in all resident languages. Ensure promotional materials, user handbooks, and surveys are linguistically and culturally adapted.

- Connect popular community activities with online applications. For example, participants at onsite group exercise classes could be taught to access exercises via an app or on YouTube.

- Offer another Resident Ambassador training to continue to engage and empower existing RAs and train new RAs.

- Plan a set time and location for residents to get together in small groups to try out new apps, troubleshoot problems, and teach one another.

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lessons learned IMPLEMENTATION

Review of the qualitative and quantitative data led to the identification of lessons related to implementation, sustainability, and evaluation. These lessons may also serve to inform areas needed for successful replication and scalability of the project among other affordable senior housing communities.

Linguistic tailoring is key

Acceptability and continuous use of the devices was highly influenced by the ability to provide tech support in participants' language, as well as the capability of the device to be programed in these languages. In many communities, the ability of site staff (RSCs or SSCs) as well as Resident Ambassadors (RAs) to communicate in the language of participants was key to engaging and supporting them with navigating their device. Residents who did not have access to support in their primary language were more likely to struggle to learn to use their device and give up. In addition, some communities reported challenges with the limited language options of the device, which added to the complexity of its use.

One size does not fit all

In addition to tailoring the intervention for linguistic variation, implementation required modifications based on the unique cultural, cognitive, and accessibility needs of each community. Many Lighthouse participants reported challenges such as cognitive decline, hearing, vison and/or mobility limitations, which led to challenges learning new tech skills or using the devices. Success required communities to be adaptable and flexible. For example, at Pilgrim Tower, to increase successful implementation, the curriculum was geared toward participants who were deaf or hard of hearing.

Longer interventions and training are needed

Across all Lighthouse communities, both participants and site staff highlighted the need for a longer training duration as well as continuous support to assist and encourage residents to use their devices. Redundancy and repetition of the training topics, as well as more informal training opportunities may benefit participants. Additionally, meeting each participant at their place of comfort in their learning journey, was frequently mentioned as crucial. Staff emphasized the importance of making the classes fun and relevant to participants' lives.

Participant engagement needs to be ongoing

Initial framing of the project and recruitment efforts at communities should be inclusive, inviting and accessible. Successful approaches for fostering participation included initial "recruitment parties" led by staff, going door to door to address residents' questions, concerns and offer support, as well as connecting and integrating device use to daily life application. Fears around breaking the device in addition to a distrust of technology persuaded some participants not to participate. For some who initially declined to participate, seeing others learn and use their devices prompted them to participate in the project at a later time. In addition, group learning or assignment to "pods" with selected fellow participants in some communities also provided social support and fostered continued engagement.

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lessons learned SUSTAINABILITY

Outside support is needed

Buy-in from site staff played a significant role in the success for the project. The Resident Service Coordinators and/or Social Service Coordinators (RSCs and/or SSCs) were essential in encouraging residents to participate in the project, and to complete surveys at different timepoints to assess outcomes. They also were crucial in providing tech support and answering questions. Though staff were highly supportive of Lighthouse efforts and outcomes, many staff felt that the additional workload involved with assisting with the project – along with their existing day to day work responsibilities – was unsustainable. Having a dedicated team or point person from "outside" of the community to help with tech support may alleviate the burden for staff in some communities, particularly for those with fewer staff available. In addition, outside facilitators may draw more residents to participate and foster sustained motivation to engage with technology.

Continued adaptation is important

Deployment of the Lighthouse Project across communities required flexibility and tailoring of the intervention. Sustainability will require continued adaptations as participants' learning and accessibility needs change over time. It is important to collect participant feedback throughout the intervention to tailor training topics and support to participants' needs. Changes to the communities' resources will also fluctuate, so strategies to monitor and reflect on the training and support will be needed.

Ongoing support is key to sustainability

Ongoing support is key to sustainability. Along with a longer duration of interventions to impact outcomes of interest, post intervention support is also needed for sustained tech use. Site staff suggested the need for seeking outside resources to lead classes, continuing classes like those in the intervention but with less frequency, or forming partnerships with other entities (i.e., local universities) who can provide volunteers to assist. In addition to providing tech support to troubleshoot issues or access new tools, incorporating new and relevant topics, such as more coverage on cybersecurity or other topics of interest to participants, is also important.

lessons learned EVALUATING OUTCOMES

Selecting survey instruments is complex

In an effort to increase acceptability and generalizability of research findings, evidence-based instruments were selected, tested and refined during the pilot phase of the project. Despite these efforts, some evidence-based instruments employed may not be the right fit for older, low acculturated, linguistically diverse residents such as those in the Lighthouse Project. For example, translation of language or concepts ascertaining risk for depression (PHQ-2) may not have been understood by all participants, limiting the ability to interpret results within and across sites. In addition, many residents were reported to have low literacy and may have struggled with reading and understanding some survey questions. Staff described that residents may have felt embarrassed to admit challenges with reading comprehension and were likely hesitant to reach out for help when needed.

Aligning and tracking outcomes requires planning

Aligning surveys and other tracking assessments with short-term outcomes that are feasible to change during the intervention is important. For example, assessing change in the use of online platforms to access medical providers and health resources across timepoints will likely show minimal change if these topics are not covered at length in the intervention. Similarly, assessments should capture outcomes leading up to intended behavior change, such as attitudes about receiving care online as well as confidence and skills to navigate this process. Site staff also recommended survey questions be tied to intervention components. For example, instead of asking how often residents connected with friends or family at different timepoints, a more direct question such as, "Did this device allow you to connect with family more frequently?", may be more accurate to assess the impact of the project.

Support for research implementation is necessary

Reliance on site staff to disseminate and collect surveys at the three timepoints posed challenges for the evaluation. Staff with limited time and training in research methods, though instrumental to informing this process, may not be the best suited to lead evaluation efforts. Challenges with survey administration, answering and translating survey questions, as well as adhering to timelines of data collection, all require significant time and training. Timeliness of data collection was a challenge for many communities. Data measurement points were intended to capture changes from baseline (entry) to post intervention (at 30 days, anticipated to show the greatest change) and follow up (at 90 days) to measure sustained effects. Delays and challenges in the timeline of survey dissemination and collection at communities limited the ability to assess change at the different timepoints and compare these findings across communities.

lessons learned KEY TAKEAWAYS

Though carrying out an intervention like the Lighthouse Project can require significant effort and resources, the positive impact on resident well-being and the potential broader benefits for participating communities make it a valuable investment.

Evaluation findings provide insights into the sustainability and replication of the Lighthouse Project and offer lessons for similar projects.

The quantitative results indicate that the intervention was effective in increasing participants' confidence and comfort using technology, as well as improving their physical and emotional well-being over time.

The qualitative feedback from both participants and site staff is also encouraging, with high endorsement of the project overall. The project has fostered greater interaction within the community and connection with the outside world, which is an important aspect of promoting social support and reducing social isolation among residents.

The staff's recommendations for changes and improvements to the program are also valuable for ensuring the sustainability and replicability of the project. By taking into account ongoing feedback from staff and participants, similar projects in the future can be further refined and adapted to meet the needs of residents and help ensure their relevance and long-term success.

❝❝ It's rewarding and also challenging just to see how the program started and what has transpired. My advice to others would be to get residents "pumped up." Do something to make them feel special. Host events. Focus on outreach. Get feedback monthly on what residents' interests are. Be patient. Understand where they are coming from. Encourage them. Take one step at a time. Have an open door for them to come back, take a break as needed —take a breather and make improvements as needed. Focus on clear communication. Improve based on their feedback. And have fun!

- Site staff

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