USING TECHNOLOGY TO CONNECT GENERATIONS

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Profiles of the programs in the surveys described can be accessed from the same website as for this publication: http://extension.psu.edu/youth/intergenerational/program-areas/technology.

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About Generations United is the national member organization that works to improve the lives of children, youth, and older adults through intergenerational collaboration, public policies and programs for the enduring benefit of all. Founded by the National Council on Aging, Child Welfare League of America, AARP and the Children's Defense Fund, Generations United has served as a resource to policymakers and the public about the economic, social, and personal imperatives of intergenerational cooperation since 1986. Generations United acts as a catalyst for stimulating collaboration between aging, children, and youth organizations providing a forum to explore areas of common ground while celebrating the richness of each generation.

Using Technology to Connect Generations
GUIDEBOOK

By: Matthew Kaplan, Mariano Sánchez, Cecil Shelton, and Leah Bradley
[A Generations United/Penn State University publication]

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Preface

There can be rewarding relationships between the sevens and the seventy-fives. They are both closer to the world of mythology and magic than all the busier people between those ages.
J.B. Priestly

Any sufficiently advanced technology is indistinguishable from magic.
Arthur C. Clarke

It didn't take the creative people engaged in intergenerational work long to envision and build the bridge between the magic of their craft and the magic of technology. For years I've heard about or visited programs the engage young people in teaching older adults how to navigate the internet, establish websites, friend their grandkids on Facebook or text a friend. Yet no one had really examined the role of technology and its potential to connect or disconnect the generations.

Is technology an integrating or dividing force? This was a hot topic at Generations United's 2011 International Conference that led Penn State University and Generations United to collaborate on this guidebook. We wanted to confront the challenging question raised at that time: "How can we use new media as a tool to enable connections across age groups, increase collaboration across geographic distances, and improve communication to diminish stereotyping?"

A terrific international team took on this challenge and surveyed programs around the world. Their findings and recommendations as well as guidance for creating quality technology-based intergenerational programs can be found in this publication.

Using the guidebook as encouragement, the goal of the authors and their organizations is to stimulate additional efforts to establish and study innovation and effective uses of technology in the intergenerational programming arena.

The "unveiling" of this guidebook will take place concurrently with the 2013 Generations United Conference in Washington, DC, which includes a panel session, workshop presentations, and interactive activities focused on ways in which new technologies are being used to connect the generations.

Whether you are part of the conference experience or picking this up at a later date, I hope you embrace the magic and opportunity that technology offers to connect our bookend generations.

Donna Butts
Executive Director
Generations United

Overview

Technology is ambivalent: Depending on the circumstances, it can cut both ways, as a *social connector* or *isolator*. The main focus of this guidebook is on ways in which technology is being used to "connect" people from different generations. Our focus, however, goes beyond sheer connection. We look at how new and emerging technologies are being utilized to promote understanding, build relationships, and facilitate cooperation between generations in a range of community settings and family contexts.

Our primary data source is a recent survey of intergenerational programs that have a heavy technology component. To identify a diverse group of programs, our project team pursued a three-part outreach strategy. We scanned the research literature across several disciplines, reviewed the "gray literature" (including web-based materials highlighting relevant programs and practices), and reached out to intergenerational specialists and practitioners affiliated with prominent national and international networks in this field. Surveys were sent to professionals affiliated with programs that met our study criteria.

We received 72 surveys, 46 of which were deemed non-redundant, complete and within the scope of the study. These programs are quite diverse in terms of geography (they span 11 countries), type of technology used, and the ways in which that technology is being used to support and enrich the lives of people of all ages.

With the goal of creating a content-rich resource for those who are interested in learning more about intergenerational technology-based programs, we draw heavily on respondents' quotes and use them to paint a composite picture of program innovation, success and challenge.

For those readers who seek additional detail on the programs that were surveyed, we created a companion document that consists of one-page profiles of each of the 46 programs highlighted in the surveys. These profiles provide information on: program name, primary/base organization, organizational partners, program description, primary program objectives, type(s) of technology used, use and perceived importance of technology to promote intergenerational exchanges, and contact information (including program websites whenever available).[1]

This publication is intended to be more than a survey report. In order to present a broader range of ideas and to connect as many threads as possible, analysis of responses to the survey has been interwoven with ideas from the literature from relevant fields, practical recommendations for action, and reflections on upcoming challenges and opportunities towards a more powerful combination of intergenerational approaches and technology.

It is our hope that this preliminary effort to scan and contextualize the terrain of intergenerational programs that heavily utilize new technologies will be useful in generating additional interest, research and program innovation in this area.

[1] A document with one page profiles for each of the 46 programs in our survey study is available online at: http://extension.psu.edu/youth/intergenerational/program-areas/technology.

Introduction

In the intergenerational studies field, there is growing attention being paid to possibilities for expanding the role of technology in intergenerational programs and practices.

In Europe, we see several multi-country, European Union-funded initiatives such as the Grundtvig multilateral project called *Mix@ges - Intergenerational Bonding via Creative New Media*. With funding from the EU Lifelong Learning Program (2011-2013), this five-country project is exploring how the artistic use of digital media can bring together people of different age groups (Fricke, Marley, Morton, & Thome, 2013). Another EU Lifelong Learning Program initiative (2008-2011) supported the launch of 21 projects with a primary focus on supporting intergenerational learning and active aging through the development and use of digital skills (European Commission, 2012).

We also see some intergenerational initiatives in the U.S. whereby the creative use of technology has implications for funding. For example, for the third year of Youth Jumpstart Grants (2013) in which Generations United and the MetLife Foundation provide funds to youth-led projects, the grant priority was to fund technology-intensive projects.

On the technology development front, we see a spate of new software systems and devices developed and tailored for strengthening relationships between older adults and younger family members (Chen, Wen, & Xie, 2012; and Davis, Vetere, Francis, Gibbs, & Howard, 2008). An article by Gershenfeld and Levine (Aug. 6, 2012) focuses on answering the question, "How can we effectively transform media consumption into quality family time?" They draw attention to video games and their potential for helping to reunite generations in playful learning.

> "There is an emerging body of research highlighting the great potential of intergenerational game play. For example, in 2009, the Joan Ganz Cooney Center… and the University of Southern California studied video game play between adults and elementary school children. They found that kids were more engaged in learning with digital games than traditional board games and that adults learned technology skills from their kids."[2]

We also see how social media sites such as Facebook and Twitter are helping families maintain contact across geographical distance. In a 2012 survey of how 2000 Americans in the 13-25 and 39-75 age groups use online communication (both e-mail and social media), it was found that 83% considered online communication to be a good way to stay in touch with family members. Thirty percent of the grandparents and 29% of the teens and young adults felt that connecting online has helped them to better understand each other.

"Older adults have testified that technology builds bridges to the outside world leading to greater respect from their families."
[Program: Intergenerational Computing . Organization: Pace University.]

In considering the contributions that technology can

[2] In further support of their discussion about the potential of video games for promoting intergenerational play and literacy learning, Gershenfeld & Levine (Aug. 6, 2012) reference additional reports (e.g., Chiong, 2009). Another resource with useful insights on designing games for parents and children to play together is a blog written by Mindy Brooks (Feb. 3, 2011).

make to intergenerational relationships –
the main focus of this publication, it is useful to first step back and consider more broadly the role that technology plays in the social lives of young people as well as older adults.

One important area to consider is the potential of technology to expand people's social networks beyond the constraints on interactions outside of the immediate local environment. This is particularly important for older adults who experience social isolation in their living environments. For instance, Feist, Parker, and Hugo (2012) report on a small study of rural elders in southern Australia who were able to use new technologies to overcome the disadvantages of distance and mobility to enhance their social connections.

As noted in a recent report published by the Center for Technology and Aging, entitled, "The New Era of Connected Aging:"

> "We are at the dawning of "Connected Aging" in which the growing array of Internet-based technologies and mobile devices increasingly will support older adults to age in place. Emerging technologies will enable both older adults and their caregivers to address a comprehensive range of health, social, and functional needs. Technology-based solutions that connect older adults to friends, family, and community are becoming more viable; older adults and their caregivers are growing increasingly tech savvy; technology usability is improving; and price points are descending" (Ghosh, Ratan, Lindeman, & Steinmetz, 2013, p. 1).

On a similarly optimistic note, Joseph Coughlin, Director of the AgeLab at MIT, asserts the following:

> "The new future of old age is about staying in society, staying in the workplace and staying very connected. And technology is going to be a very big part of that, because the new reality is, increasingly, a virtual reality. It provides a way to make new connections, new friends and new senses of purpose." (Quote is from: Clifford, June 2, 2009, p. D5).

However, it is also becoming evident that many people with limited technology skills, support and access do not readily reap such social benefits associated with the advancements in technology. In the literature on how older adults use ICT (information and communications technology), there is recognition that older adults' adoption of new technologies is neither quick, simple, nor universally accepted by all older people (Feist, Parker, & Hugo, 2012; Selwyn, Gorard, Furlong, & Madden, 2003).

As Selwyn et al. (2003) note,

> "Exploring how older people adopt, learn and utilize new technologies is valuable for understanding how new technologies can be incorporated into maintaining social connectivity, independence, service delivery and access, and quality of life for older people. However, it must be remembered that this does not offer a panacea for all people or all issues associated with isolation, ageing-in-place and positive aging experiences. Nor is it simply a matter of accessibility to new technologies and a reliable Internet connection along with a course of instruction – although these certainly help" (p. 577).

On the children and youth side as well, much work has been done aimed at delineating the ways in which youth engage with new technologies. Here too, we see a mixed picture – i.e., great potential for technology to contribute to youth development and wellbeing, yet whether such benefits are realized depends on many factors, including the ability of young people to sidestep the threats that some new technologies might pose to them.

Indeed, much has been written about the dangers of new technology for today's youth. Some preliminary research suggests that certain uses of technology contribute to increased sexual activity (McMillen, 2012, summarizes a 2011 CDC survey about how Smartphone use is linked to higher rates of teen sex) and growing threats to youth safety and privacy.

However, the picture is not so simple. There is also evidence that young people are becoming more sophisticated in ways to protect themselves. According to a recent Pew Research Center survey of 802 American youth ages 12-17 and their parents that explored technology use, it was found that although teens are sharing more information about themselves on their social media profiles than when surveyed in 2006, they are also becoming more adept at managing the privacy of their online information. This includes taking a variety of technical and non-technical steps to keep their information from businesses and advertisers (Madden et al., 2013).

A group of youth researchers in Australia who studied issues related to youth online behavior and cybersecurity provide a reminder of the need to treat youth as active developers and users of technology rather than passive recipients or even victims of technology (Third, Richardson, Collin, Rahilly, & Bolzan, 2011). Their action research methodology involved asking youth to serve as technology educators and deliver a series of workshops on social networking and cybersafety for adult participants.

> "[The youth were positioned] as educators and partners with their parents and members of the community in finding solutions to keeping safe online. This unique methodology in which young people, researchers and adult members of the community are equal provides significant insight into bridging the 'digital divide' and reducing the 'disconnect' across generations" (Third, 2011, p. 4).

Drawing from the dialogue between the youth and adults, the researchers ascertained that the youth in their study were better equipped than most adults anticipated with regard to dealing with online risks. The youth in their study had learned how to deal with cybersafety issues through the informal learning processes of trial and error and through knowledge sharing with their peers.

Many technology-oriented intergenerational programs rely on an intergenerational dynamic that counts on tech savvy youth for helping older adults enter and navigate in the world of "digital inclusion." In turn, older adult participants are counted on for making other types of contributions to the intergenerational exchange and to other program objectives such as teaching youth about local history and working together on community improvement projects. This type of dynamic is reflected in the following description of the respective roles taken by participants of a novel community studies and participatory design program in a rural community in Scotland.

> "Young and old would work together; the elders have a vast local knowledge, the young have an intuitive understanding of contemporary technology and practitioners would bring insights from the design sector" (CLD Standards for Scotland report, n.d., p. 6).

It is important to keep in mind that even when the primary intergenerational engagement dynamic is one of "youth mentoring older adults in technology skills," as the older adult participants become more knowledgeable about technology and comfortable sharing experiences and learning from and with people across generations in a virtual world, new modes of communication become possible. In the words of Ghosh et al. (2013), the older adults become "empowered 'prosumers' of information in the digital world" (p. 12). Over time, the intergenerational communication dynamic becomes more multi-directional.

In constructing technology-assisted intergenerational programs, some assumptions about how young people and older adults will embrace the technological aspects of the program experience should be put aside. Participating youth might not have the technological prowess and older adults might not have the "digital incompetence" that some might presuppose.

The common assumption about youth being innately digitally literate has been called into question by a 2011 survey conducted by EU Kids Online. It was found that only 36 percent of 9 - 16-year-old said that it was very true that they know more about the internet than their parents. The EU Kids Online report also provides a nuanced view about the educational value of technology. The report highlights limitations in the way many young people are using computing. Much of the content is ready-made and this contributes to a "televisual" experience that promotes passivity. As Hall (2012) notes, "(This is) particularly problematic for the development of creativity and creative education" (p. 97).

So here we have it: There are very different portrayals of the value of technology in people's lives as well as the potential of technology to expand the intergenerational dimension of people's social worlds. Certainly new technologies have great potential for extending and expanding people's educational pursuits and in establishing additional layers of needed social connection and support in people's lives, however, there is nothing that is automatic or guaranteed with regard to whether such benefits will be realized.

In this publication, we try to focus in on what the rapid development of technology might mean for the emergent field of practice devoted to strengthening intergenerational relationships in diverse community and family contexts. In reviewing the literature and our survey data, we began asking several questions:

- How, if at all, does the intensive use of technology change how intergenerational programs operate and the outcomes that they can achieve?
- How might new areas of technological innovation and application provide intergenerational specialists with new tools and strategies for building intergenerational relationships and achieving goals related to healthy human development, stronger families, and more cohesive and caring communities?
- How might the technology component be configured to: prolong the intergenerational engagement? deepen the intimacy? add new domains of content to discuss? and stimulate new realms of collaborative civic engagement?

In highlighting survey results – in particular what we can learn from the 46 surveyed programs about promising practices for utilizing technology to promote intergenerational understanding and collaboration, we feel that this guidebook represents a solid beginning to answering these questions about the infusion of technology into intergenerational practice.

Methods

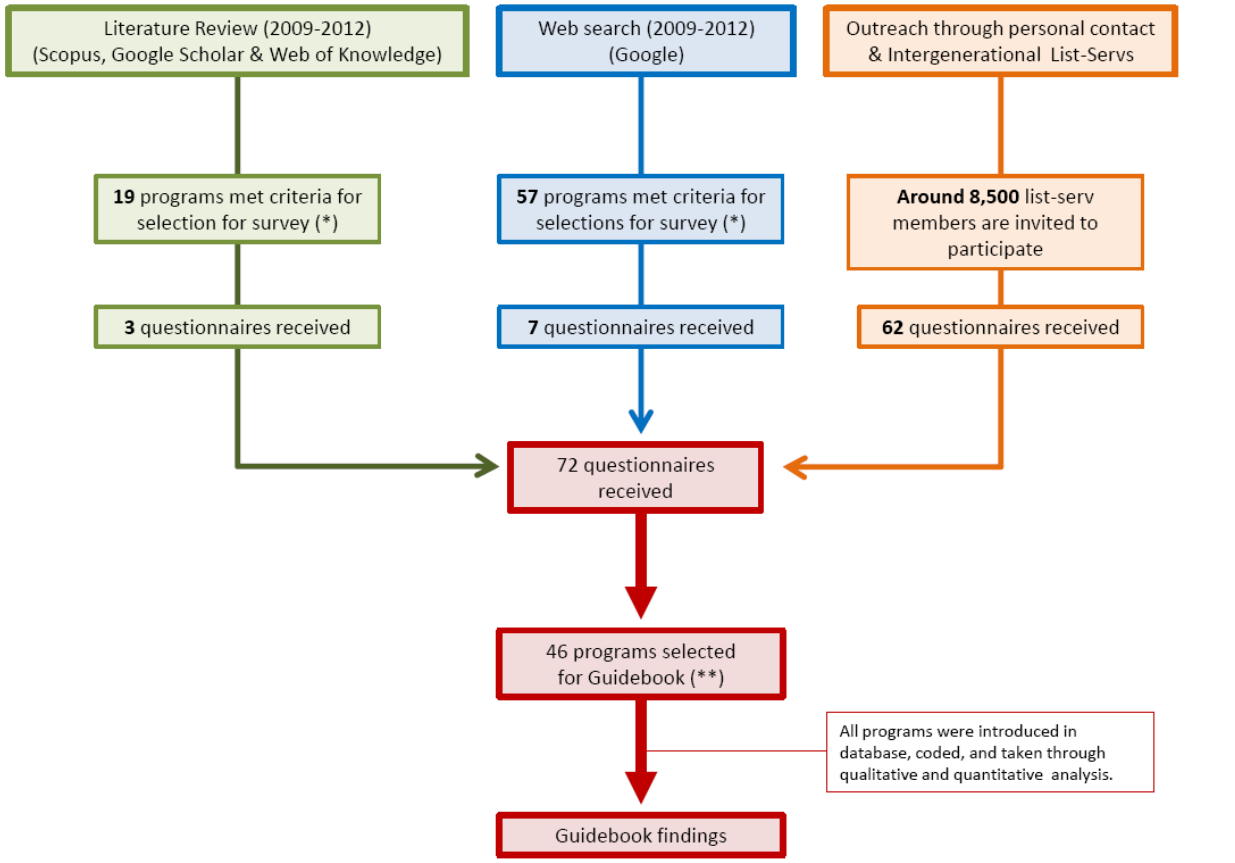
(1) Constructing and conducting the survey

The project team designed a specific survey to gather program information for this guidebook. The survey (which can be found in Appendix 1) was structured in two sections: Organization and primary contact information (including questions on primary program objectives, program description, time of program in existence, age distribution of program participants, and frequency of intergenerational interaction, among others) and technology specific questions (such as type of technology being used, how it is used, and the level of importance attributed to the technology in terms of its capacity to facilitate intergenerational relationships).

To identify intergenerational technology programs to be included in the survey, project team members employed a threefold strategy during the time period February 1 to May 15, 2013: outreach through intergenerational list-serves (managed by local, national, and international membership organizations) and personal contact with intergenerational practitioners, a structured web search (via Google Search), and literature review (via Google Scholar, SCOPUS, and Web of Knowledge) for the period January 1, 2009 to December 31, 2012. In both the web search and the literature review, the following combination of terms was used: “intergenerational program” AND “technology,” “intergenerational project” AND “technology,” “intergenerational activity” AND “technology,” and “intergenerational technology program”.

Figure 1, below, provides a visual for this program identification strategy, with key figures provided for each phase of this scan process.

Figure 1: Program identification strategy and response rate for the intergenerational technology programs survey.



(*) Criteria for selection were accessibility, topicality, and relevance.
(**) From previous phase, intergenerational programs to be redundant and/or not within the thematic scope of the Guidebook were not considered for final analysis.

Programs retrieved through the web search and literature review – as well as questionnaires returned from our outreach efforts targeting formal list-serves and personal networks – were assessed on three selection criteria inspired in previous work by Brophy & Bawden (2005): *Accessibility* (program is within reach), *Topicality* (program matches guidebook's subject matter), and *Relevance*. As per the latter, only those programs partially or fully meeting the following three relevance sub-criteria were deemed adequate for our sample: (i) facilitating intergenerational engagement is an explicit goal, (ii) the initiative involves more than a single contact or one-time only activity, and (iii) technology is used as a tool to facilitate connections across age groups.

Of the 72 questionnaires that were filled out and submitted, after checking them for redundancy, completeness, and selection criteria, 46 intergenerational programs were kept for analysis.

(2) Analysis

The project team employed a mixed-methods analytic strategy. First, two members of the research team jointly reviewed approximately 25% of the raw data with the overall purpose of developing response categories to encompass the full range of the survey data and frame it in the context of several themes prevalent in the intergenerational studies literature that addresses issues related to

intergenerational communication, relationship formation, and use of technology. Codes (113 in total) were established for a series of variables that fit into four major categories: *Program Objectives*, *Program Description*, *Technology Use*, and (perceived) *Technology Importance*. Some excerpts were assigned multiple codes, though such multiple coding determinations did not cross the four categories noted above. After several joint coding sessions, two members of the research team then worked independently to review and code the entire database (consisting of 431 excerpts which are classified in this guidebook as distinct responses), achieving an inter-rater reliability rate of .93. Differences were reconciled.

(3) Data presentation

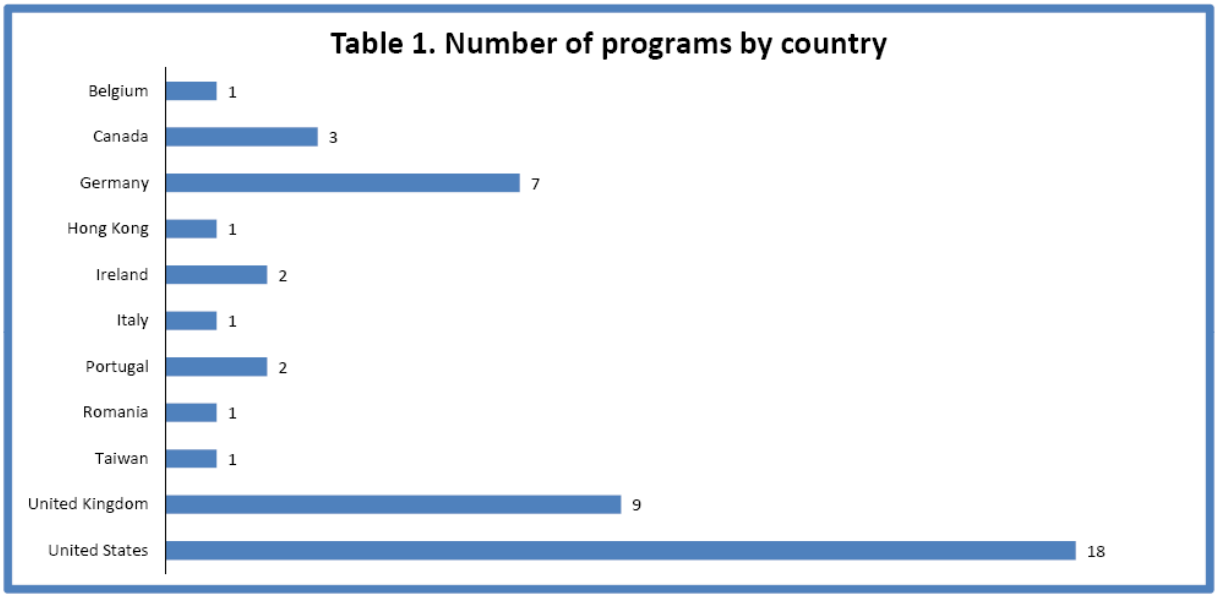
In choosing the excerpts to display in this guidebook, the project team looked for quotes that best illustrate prevalent themes and patterns found in the data and which provide detail about programs deemed to be *trailblazer* and prototype programs. Raw data from the surveys are provided in a companion document to this guidebook.[3]

Results

(1) Basic Characteristics of the Programs in the Survey (N=46)

This section reports on five basic characteristics of the 46 programs in the survey: location (country), time in existence, age distribution of program participants, frequency of interaction, and type(s) of technology used.

Table 1: Program location by country



[3] The introduction to the survey instrument included a disclaimer indicating that survey responses would be incorporated into this guidebook and an online database of technology-rich intergenerational programs.

Table 2: Time in existence: Amount of time programs have been in operation

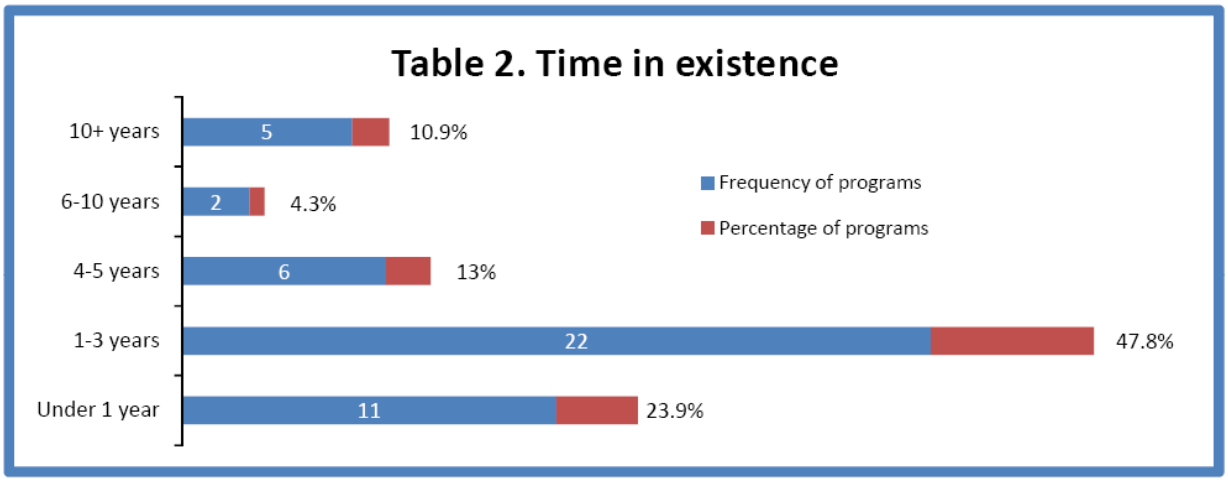


Table 3: Age distribution

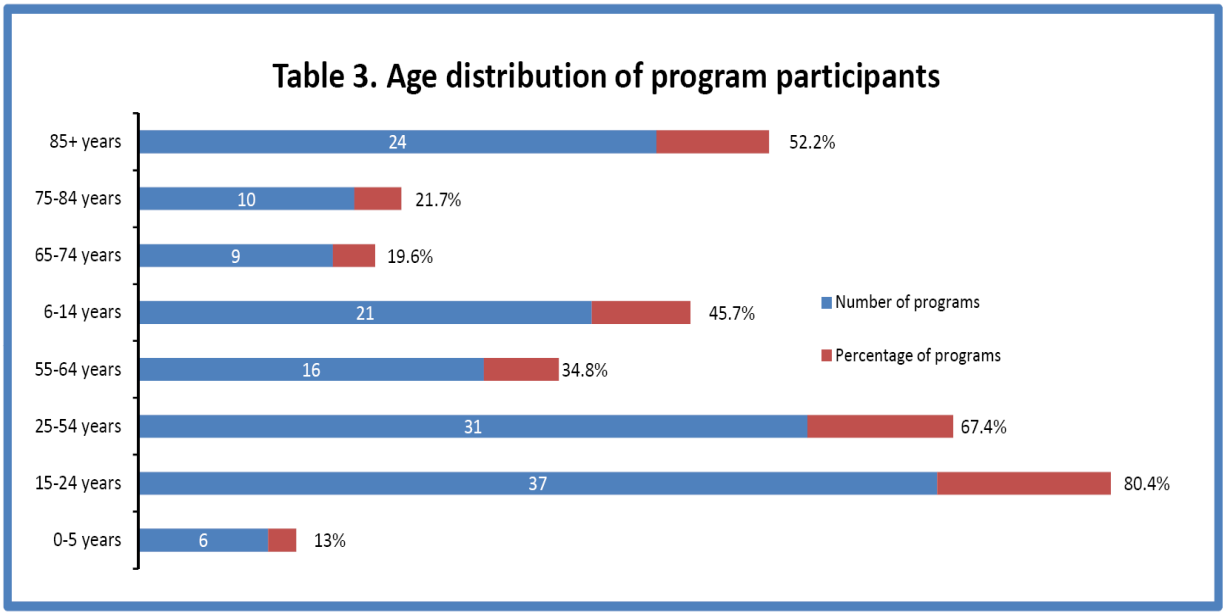


Table 4: Frequency of intergenerational interaction

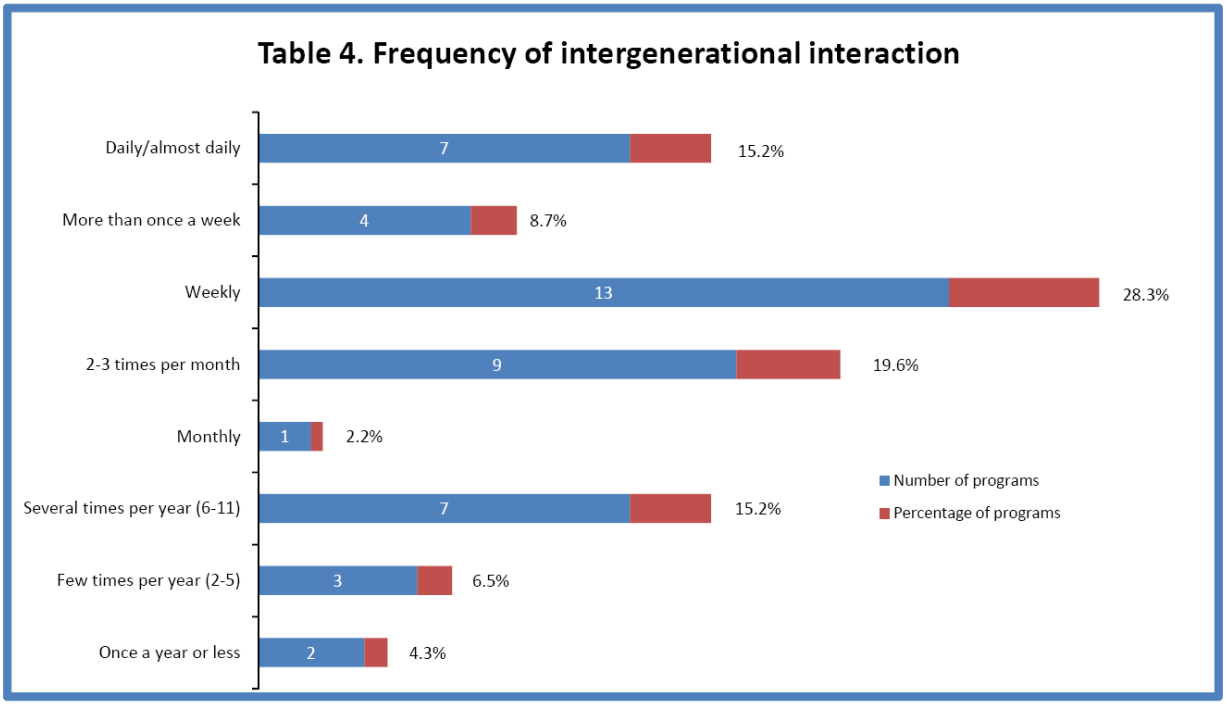


Table 5: Types of technology used

Types of Technology Used	# of programs	Percentage of programs
Computing (desktop) devices [Includes software for creating text, audio, video inputs) – E.g., Recording Studio, Modul 8 – *software* used for real-time video mixing; SMARTBoard – an interactive whiteboard; presentations/screen projection); iPad (used for drawing together)]	**43**	**93.5**
Mobile communication devices	**25**	**54.3**
Online platforms for sharing content [Includes: video-based content, webinars, study documents for participants, and Cloud-based systems (like Google-docs and Dropbox for sharing files). Includes real time voice/video interaction (e.g., Skype, Google-hangout, G-chat). Includes *SoundCloud* – a way for artists to create and share their music with others.]	**25**	**54.3**
Gaming platforms	**9**	**19.6**

(Cont'd)		
Digital cameras and other devices [Includes e-readers like Kindle, audio-recording *devices*, video-recording devices]	**8**	**17.4**
Social media [Includes creation of user-generated content. (YouTube, Wikis (WikipediaWikispaces), and social networks like Facebook, LinkedIn)]	**7**	**15.2**
Online publishing platforms [Includes blogs and Wordpress]	**6**	**13**
Other	**3**	**6.5**

[Project TRIP (Transforming Relationships through Intergenerational Programs), Virginia's CYFAR-funded Sustainable Community Project, includes a required technology component intended to provide children, youth, and program staff with opportunities to use current technology relevant to programming objectives. Project TRIP uses technology such as iPads, digital cameras, computers, and LCD projectors to support interaction and relationship development among children and older adult participants and to document these developing relationships. Photo credit: Lauren Catlett]

(2) Primary Program Objectives

There are many ways to categorize technology-based intergenerational programs/ practices. This can be done according to setting (e.g., workplace, home, schools, etc.), objectives (e.g., related to education, caregiving, healthy aging, recreation, disaster preparation and response, family cohesiveness, and volunteering and active citizenship), types of technology used (as done in Table 5, above), and/or how technology is accessed (e.g., mobile communication devices, social networking sites/services, and online platforms for sharing video-based content).

Insofar as a major goal of this study was to obtain a preliminary sense of the breadth of these programs in terms of what they are trying to achieve and how they are intended to function, the survey question on primary program objectives yielded useful results. This section presents information on three dimensions tied to program objectives:

- Area of intended impact
- Level of intended change (i.e. projected benefits for, or impact on, individual participants, families, local institutions and organizations, and communities)
- Influence on intergenerational relations

Results provide some validation of the project team's efforts to reach out across various disciplines and sectors to identify a diverse set of intergenerational technology programs to be included in this preliminary inquiry.

(a) Area of intended impact

Table 6, below, categorizes the programs in the survey according to major area(s) of intended impact. Clearly, the most common category of response is in the area of education; excerpts alluded to teaching and learning in non-formal as well as formal education settings.

Additional areas of intended impact, from most to least frequently noted, were related to: "technology" (includes technology development, deployment, and training), "aging well" (includes programs designed to enhance public health), "community improvement" (includes programs designed to promote community development, civic engagement, and environmental preservation), "cultural continuity" (includes campaigns aimed at recording and preserving local history – collective and personal histories – and cultural heritage), "family support" (includes efforts to foster strong, cohesive families), "work" (includes programs with a focus on career development, employment, and economic productivity) and "caregiving."

Table 6: Program objectives in terms of areas of intended impact

Area of Intended Impact Category	Number of responses	Number of programs	Percentage of programs
Education/Learning	39	31	67.4
Technology (as main focus)	16	15	32.6
Aging well	16	14	30.4
Community improvement	16	14	30.4
Cultural continuity	7	5	10.9
Family support	6	6	13
Work	4	3	6.5
Caregiving	2	2	4.3
Total	106		

Most of the intergenerational technology programs that we examined clearly have an education function and emphasis. However, this interest does not just consist of learning how to use technology. Reading Table 6 from a diffusion of innovations perspective (Rogers, 1983), the emphasis on learning can be seen as just an early stage, to be followed by a series of steps

involving experimentation with the technology in different formats and contexts and eventual decision-making with regard to which technological tools and resources to be adopted in the future. As we shall see below, within the framework of intergenerational practice, the technology learning-practice-application triangle encloses a pretty complex array of possibilities.

(b) Level of intended impact

If we look more closely at respondents' comments about program objectives, we can differentiate between programs in terms of the *level of intended impact* (or change), with responses ranging from benefits aimed at individual participants, families, local organizations and institutions, and entire communities.

Table 7, below, indicates that most of the excerpts (or distinct responses) collected for this variable alluded to intended impact on program participants (59 responses), followed by responses noting intended impact at the community and broader societal level (36 responses), impact on local institutions and organizations (32 responses), and impact on families (4 responses). To facilitate assessment against the total number of programs surveyed (N=46), we are providing as well percentages of programs in which each specific level of intended impact was acknowledged.

Table 7: Program objectives in terms of level of intended impact

Main response categories (related to level of impact)	# of responses/ percentage of programs	Example quotes
IMPACT ON INDIVIDUALS	[59/73.9%]	
Gaining technology-related knowledge/skills **[includes comments about specific technology-related skills as well as general comments about technological literacy and digital competence]**	27/43.5%	• "increased competence in technological advances that interest our elder participants" • "help older generations to develop ICT skills" • "promote digital competence among elders at risk of exclusion through intergenerational, peer-to-peer exchanges and relations with young people and among older people themselves" • "raise awareness of and reduce digital exclusion amongst older people" • "provide undergraduate students with the opportunity to assist older adults in learning new technologies" • "increase the knowledge and competency of mentors in using web based services in their work with these young people"
Gaining non-technology-related knowledge/ skills	14/23.9%	• "improve older adults' English as a second language skills" • "assist participants in producing short, first-person narratives" • "positively increase attitude and advocacy of college students towards older adults" • "maintaining fitness and a healthy lifestyle"

(Cont'd)		
Reducing sense of isolation/exclusion	7/15.2%	• "reduce the isolation and loneliness of older people." • "increase connectivity and social inclusion."
Mental acuity	5/10.9%	• "foster reminiscence for the older adults in activities" • "increase cognitive functioning in older adults" • "(encourage older adult participants to be) more mentally active"
Self esteem	4/8.7%	• "provide interesting volunteering opportunities to improve confidence of older and younger volunteers" • "give pupils great confidence through (their) interaction with older people, and better understanding of older people" • "individual self worth"
Work-related	4/6.5%	• "support young people in transitions from school to work"
Meeting other personal needs	3/6.4%	• "enable older people to use computers for online applications, searches, shopping, and Skype."
Fitness/ physical activity	2/6.5%	• "research intergenerational mental and physical exercise" • "improve older adult physical activity readiness to change, self-efficacy regarding physical activity"
IMPACT ON COMMUNITIES [includes impact at the broader cultural/ societal level]	[32/45.6%]	
Civic engagement	9/17.4%	• "promote active citizenship" • "increase levels of social capital in communities, with a specific focus on local associational life and participation in community programs" • "encourage the active participation of elders (and youngsters) in society through knowledge volunteer activities"
Preservation of history/ cultural heritage	8/13%	• "gather oral histories of older adults involved in social justice and human rights work" • "increase preservation of cultural materials and memory that is at risk of being lost and significantly boosting digital access to these assets and data"
Raise awareness	8/10.9%	• "Teaching Solidarity with Multimedia: Use art entangled with ICT to promote community awareness towards age prejudice and reinforce intergenerational cooperation" • "raise awareness of the issue of low Internet engagement by older people" • "introduce children to positive older role models in their communities"
Sense of community	2/4.3%	• "promote a shared sense of community"
Local events	2/2.2%	• "take part in social gatherings and events"
Other	6/13%	• "to promote and support the concept of youth mentoring in Germany" • "create a global connection for both mentor and student"

(Cont'd)		
IMPACT ON LOCAL INSTITUTIONS AND ORGANIZATIONS	[22/36.9%]	
Reaching the public	10/17.4%	• "enhance technology to advance communication for the organization with residents, family members and volunteers" • "share resultant archive with as many people as possible in various imaginative ways"
Program Innovation	8/17.4%	• "(create) an incubator for developing new intergenerational programs or training systems" • "explore and test innovative approaches towards intergenerational learning, evaluate them and transfer the knowledge to cultural institutions who wish to develop intergenerational programs" • "investigate the use of mobile technology with Family Learning"
Networking/ collaboration	7/15.2%	• "through partnerships with a range of organizations, institutions, and funders, we offer story making and story distribution services that prioritize the power of individual voices" • "engage and enthuse schools and colleges to work with us and to carry the baton when our involvement ceases"
Revenue	2/2.2%	• "provide revenue for national nonprofits and/or retirement assets for Baby Boomers exiting the workforce"
IMPACT ON FAMILIES	[4/8.7%]	• "encourage parents and grandparents to instill a love of learning; create lasting memories & have fun together" • "encourage and empower younger generations to pass on Internet skills to the older people in their own lives"

Most of the programs that we surveyed aim to have an impact on individual participants through enhancing their technology- and non-technology-related knowledge and skills. Such learning is not necessarily an endpoint; it can serve as a conduit for taking social and communal action. What individuals learn from these programs is often achieved within contexts and settings in which several generations gather to improve communities and community institutions and strengthen family relationships. Therefore, attention to individual impact (including learning) does not mean an individualistic approach since it is through multi-generational strategies cast within relationship-building inflection points (as noted in Table 8, below) and shared social and community contexts that efforts with an education component take form.

[Whitehall Public Library is one of a few libraries that is part of the Alleghany Library Association with regular technology programs. Photo Credit: Whitehall Public Library]

(c) Influencing intergenerational relations

The program objectives data also illustrate some of the novel ways in which the programs in the survey aim to use technology to influence intergenerational relations.

Table 8, below, provides examples of respondents' comments indicating intended program impact on the following dimensions of intergenerational contact:

- Communication [better/enhanced/expanded communication; includes recording and sharing life experiences/ stories across geographic distance]
- Understanding [better/worse understanding of one another; e.g., learning to challenge or see past stereotypes]
- Relationships [forming or improving relationships with one another; includes comments about increased respect]
- Service [serving one another as volunteers, role models, mentors, or technology tutors]
- Learning together
- Cooperation

Table 8: Program objectives aimed at influencing intergenerational relations

Main categories (intergenerational relations)	# of responses/ percentage of programs [56/82.6%]	Example quotes
Intergenerational communication	18/32.6%	• "increase communication and connectedness for students and elders" • "help younger and older people in their network to share information about their own abilities and competences" • "promote intergenerational dialogue by creating and presenting movies"
Understanding	15/32.6%	• "identify prejudices, discover differences / identify common ground" • "evoke critical analysis for debunking ageist myths" • "help younger generations to understand and tolerate older generations" • "valorize life stories of the elderly people" • "provide teens and seniors with the critical thinking and media production skills needed to respond to ageist/discriminatory messages in media"
Relationships formation / change	14/28.3%	• "strengthen relationships between generations involved in community service" • "encourage intergenerational bonding" • "foster social relationships in the way of network development - The development of a virtual place of exchange between the generations" • "improve relationships across the generations by providing interesting volunteering opportunities"
Serving one another	12/23.9%	• "encourage and empower younger generations to pass on Internet skills to the older people in their own lives" • "improve students' ability on digital teaching material and software"
Learning together	12/23.9%	• "co-productive approach to learning with older people as opposed to learning about them" • "encourage the generations to learn skills from each other" • "explore, learn and teach each other by using technology tools"
Cooperation	3/6.5%	• "create collaboratively and share purposeful projects developed by participants for the larger community (e.g. intergenerational photography exhibit, and intergenerational blog)" • "enhance intergenerational collaboration"

[Focusing on learning through technology while building relationships is exemplified through the Big Foot projects. Photo Credit:Courtesy of the partners and participants of the Big Foot project. Special thanks to Barbara Di Pietro, Gouré, Italy; Vanina Stoyanova, CDNWB, Bulgaria; and Christina Strapatsa, KENAKAP, Greece.]

(3) Valuing and using technology to build meaningful intergenerational relationships

Survey respondents were asked the question: "In your program, how important is using technology to facilitate intergenerational relationships among the participants?" As can be seen from Table 9, below, that illustrates their responses on a "1-7" scale, with "1" = "Unimportant" and "7" = "Very Important," most respondents provided a very high rating of the importance of technology for facilitating intergenerational relationships.

Table 9: Level of importance attributed to technology for facilitating intergenerational relationships

On a scale of 1-7 scale, 1=Unimportant, and 7= Very Important	Number of programs	Percentage of programs
7	23	50
6	7	15.2
5	9	19.6
4	4	8.7
3	3	6.5
2	-	-
1	-	-

When asked to explain their ratings, 17 respondents (32.6% of all programs surveyed) provided single or multiple responses noting how technology serves as either a *primary pathway for promoting intergenerational contact* or they commented on the *relationship-building properties* of technology. Here are some examples of these responses:

- "The didactical intergenerational approach is based on the active role of young students, who act as ICT teachers or tutors of elders. Within the project, the intergenerational exchange occurs while elders and youth practice together the use of technologies."

- "The technology becomes the tool for building their bond with each other. When the children help the adults connect via social media with new friends there is an immediate and tangible outcome."
- "The use of technology provides the opportunity for our various age groups to bond together in a common interest."
- "The technology is important in particular for communication. The older generation wants to communicate, to be in touch, to have the possibility to talk to the younger generation. And for this, even if the argument was not the one foreseen at the beginning of the project, we realize that this is really important."
- "Creative working with media brings people together."
- "Technology enhances the participants' enjoyment and engagement towards the activity and towards one another."
- "The technology (computers) serve(s) as the connection between our older adult students and our college students. The college students teach the older adults how to use computers more effectively."

To explore the relationship between the choice of technology, how the technology is used, and program contributions to the emergence of intergenerational relationships, we delved into the quotes from respondents who emphasized "building meaningful relationships" when asked about *how their programs are using technology*.

"Technology is at the core of the project. However, it is used as a vehicle and more as a "pretext" to enhance intergenerational linking and to stimulate intergenerational learning and dialogue."

[Program: mix@ages. Organization: Institut für Bildung und Kulture e.V]

Table 10: Some ways in which technology is used to promote meaningful intergenerational relationships

The technology (tools, resources and services)	Example quotes (describing how the technology is used to promote meaningful intergenerational relationships)
Gaming platforms (designed) to teach collaboration and systems thinking; broad band connectivity used to allow people to exercise together but separated in space using MS Kinnect technology.	• "(These applications of technology serve to) improve multiage relationships and health"
"Smart board"[4]	• "We are using a smart board to maintain the interest of the children and older adults during activities. It keeps the participants involved in the activity as well as stimulates more conversation about a picture presented on the smart board." • "It also increases teamwork between older adults and children by encouraging them to work together to figure out the activity on the smart board. The positive responses from the smart board have created a positive environment all around."
"technology such as iPads, digital cameras, computers, and LCD projectors"	• "(used to) support interaction and relationship development among child and elder participants and to document these developing relationships."
Provide use of video and remix equipment as educational tools (to teach youth/seniors to become more aware of age-related bias in the media)	• "(used to) foster mentor-mentee relationships between seniors and teens."
Computing devices, mobile communication devices	• "Stimulate conversation, establish rapport, transfer of knowledge and wisdom."
e-mail, texting, Skype	• "(used to) see and hear their family and friends overseas and communicating with them in daily bases." • "Students and residents interact over the teaching and learning of Skype and the personal computing devices."
Individualized computer tutoring. Includes exchanging e-mails, learning about graphic software, expanding the use of Facebook pages, video chatting; smartphones, and iPads. Each program is documented by a teen using a digital camera.	• "Older adults have testified that technology builds bridges to the outside world leading to greater respect from their families." • "Since the program began last year, more residents (85-93 years old) are using smartphones, iPads, and Skyping with family and friends." • "Many residents and volunteers are looking forward to building stronger relationships in future programming."
Digital media projects around themes of digital photography, producing a newsletter/ booklet/dvd developing social media/internet/website	• "Provide opportunities for conversation, discussion, building of friendships and creating better understanding between generations."

[4] The *Smart Board* is an interactive whiteboard that uses touch detection for user input (for example scrolling and right mouse-click) in the same way as normal PC input devices.

(Cont'd)	
Free technology (training) programs that extend to smartphones, iPads, digital cameras, Skype, WiFi, web searching, and online platforms for sharing video-based content	• "Residents (in senior care facility) and youth build ongoing relationships and (technology) skills." • "This series facilitates communication, learning and interaction between generations."
A web-based platform with a knowledge sharing component where mentors and young people in transitions can tell their stories and share/ receive advice on job related questions	• "(used to) stimulate the exchange of experiences between young peoples and their mentors."
E-mail correspondence platform designed to support English as a Second Language instruction across geographical distance	• "(used to) provide care and support" (in addition to stimulating written language improvement).

This broad diversity of technology being used in our sample of programs tells us that the promotion of meaningful intergenerational relationships is not so much with specific types of technology as it is with the way in which technology is actually used. Maintaining the interest, keeping participants involved, stimulating conversation and exchange, documenting interactions, and providing care are examples of how technology can connect to relationship building.

(4) The intergenerational dynamic in tech-heavy programs

This section builds upon the data presented in Tables 8 and 10 which highlight how technology is being used to promote intergenerational communication, understanding, relationship formation, joint service, and collaborative learning. In this section, we explore possible generational differences with regard to assumptions about participants' technological competence and technological leadership in the programs that were surveyed.

As noted in Tables 11 and 12, below, participating youth tended to be seen as having more status (at least when it comes to dealing with matters related to technology), and they were more readily positioned in the role of technology tutor or teacher than their adult counterparts. When the intergenerational teaching-learning dynamic was framed to allow youth to function as technology experts and teachers, they enjoyed this status either on their own or as equal partners with participating adults.

In contrast, many of the responses that implicitly or explicitly assign status to older adults with regard to their technological prowess received a relatively lower ranking. There appears to be a distinct thread of response that undervalues or under appreciates older people's assets. This orientation for using information technology to enhance the quality of life for older adults can be

characterized as "deficit-driven design" in contrast to "positive design" (Carroll, Convertino, Farroq, & Rosson, 2011).[5]

Table 11: Notions about generational differences with regard to knowledge, skills and assets related to technological capacity

Response Categories (generational differences/ similarities in status with regard to tech ability)	# of responses / percentage of programs	Example quotes
Youth first (assumed to have an advantage) [Emphasis on youth assets and/or older adults deficits when it comes to technology competence]	19/32.6%	• "The child is encouraged to be a motivator to the older adults to keep using the technology for learning better English language skills." • "The knowledge volunteers" (TKV) project aims to promote: the acquisition of digital competences among elders at risk of exclusion" • "In the case of the older generations, it is distance to technical issues, fears of disclosing personal data or misuse of the data that play a role." • "Our learning program was designed with the challenges and barriers experienced by older learners in mind such as older people's fear of technology or feeling they are too older to learn." • "The technology is our students' strong suit and an area where our elders feel incompetent."
Older adults first (assumed to have an advantage)	2/4.3%	• "The *school2work* platform has been developed for mentors in Germany that support young people on their way from school to work."
Equal status (entering program on an "equal footing") [Assumed equal level of competence]	17/34.8%	• "There are online training units as well as handbooks for "grandchildren" and "grandparents." • "mix@ges invites young people (14 – 20) and older people (50+) to create innovative media products, under the guidance and with support of professional artists and media trainers, including iPod movies, audio guides for a museum, video blogs on exhibitions, apps, tagtool performances and digital photographs." • "In this new innovative class, students will partner with local elders to help teach and practice digital skills in Emerson's computer lab" • "KOJALA is a network of and for older and younger people, who are prepared to share their knowledge and abilities with others."

[5] According to Carroll et al. (2011), in *deficit-driven design*, "the design intervention orients to and addresses problems, in this case the negatives of growing old alone and isolated, and seeks to mitigate these deficits." (p. 7). In *positive design*, "the design intervention orients to and addresses human or organizational strengths and seeks to leverage but also further strengthen them or facilitate their expression in new activities" (p. 7).

Table 12, below, illustrates distinctions in the surveyed programs with regard to the "direction" of technology-related teaching and learning, i.e., who is the teacher and who is the learner. Although there were significantly more "youth as teacher" responses than "older adults as teachers" responses (18 responses - 30.4% of programs and 7 responses - 10.9% of programs, respectively), the most common type of response emphasized complementary contributions to teaching and project leadership. This latter category can be broken into two sub-categories: emphasis on joint learning/joint teaching (25 responses, 41.3% of programs) and emphasis on common goals and sense of intergenerational partnership (26 responses, 41.3% of programs).

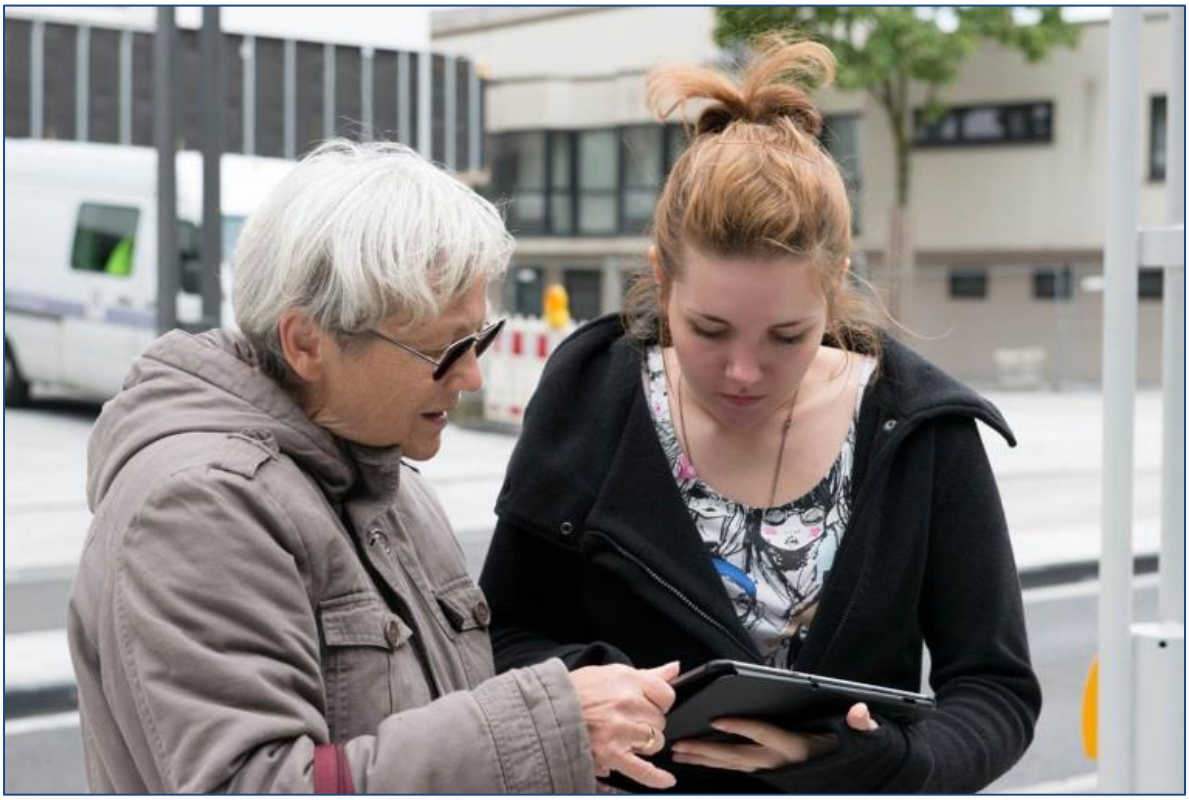
Table 12: Who teaches whom?

Response Categories	# of responses/ percentage of programs	Example quotes
Youth as teachers	18/30.4%	• "The pupils devised and delivered weekly sessions on various technologies and their uses." • "The program was launched at Shotley Primary School in Suffolk, with one talented pupil as the tutor and, initially 18 older people recruited at the local lunch club." • "After dinner the high schoolers teach participants how they can stay connected to friends using social media. • "We launched this website to help Ireland's younger generations' to teach their parents and older loved ones how to get the most from the Internet."
Older adults as teachers	7/10.9%	• "The Center creates opportunities for residents to continue their passion for teaching young children, as well as being with surrogate grandchildren." • "The Scholar Store Project is an online learning center for human service professionals and educators. It features the practice wisdom of seasoned professionals packaged in easily downloadable 5-10 page documents."
Complementary contributions to teaching and project leadership	45/63%	
[Complementary contributions:] ***Emphasis on joint learning/ joint teaching***	25/41.3%	• "The learning process can be both the telling itself, because it means reflecting on and working through personal experiences, and listening to/ reading tales of others." • "Knowledge Sharing (*Erfahrungsaustausch*): A knowledge sharing session where mentors and young people in transitions can tell their stories." • "RSVP recruits community members aged 55+ to correspond with students typically two-three times each month. Currently, participating classroom teachers set up a classroom blog and volunteers are matched with students to correspond through the school year." • "By sharing these activities together both adults and children acquire an understanding of shared values and gain increased respect for each other."

(Cont'd)		
[Complementary contributions:] ***Emphasis on common goals (and sense of IG partnership)***	26/41.3%	• "Unlike many other projects (in) "Generations," it was neither sought that the older people teach the younger ones, nor the other way round. Rather, the different groups were supposed to devote equal both a common task and a common theme. It was therefore judicious not only to stake on a good dialogue, but a dialogue of equals (in eye level), and that right from the very beginning." • "The presentation focus (is on) the shared learning about age, which is designed around older adults rights, making possible to develop a joint digital story, that also allows artistic skills to erupt by creating street paintings in the community addressing the meaning of the story." • "Historypin is a way for millions of people to come together, from across different generations, cultures and places, to share glimpses of the past and build up the story of human history." • "They worked together using computer, and other devices and applications. The final result was a book with the story of each family." • "Bringing together a small group of social work students, older actors and film makers, we utilized methods from drama and arts to explore sexuality and intimacy in later life. This resulted in a digital resource of 17 short clips as stimulus material in learning and teaching in health and social care." • "Through storytelling, both generations created the story of their lives using ICT to materialize and operationalize this. The younger generation taught the older how to use ICT while older generation explained and described the way they lived when they were young. They worked together using computer, and other devices and applications."

(5) Tuning into the technology component

As noted throughout this guidebook, the surveyed programs employ a wide range of strategies to facilitate intergenerational communication, cooperation, and relationship formation. Just how central is the technology component to these generation-linking strategies? Table 13, below, helps to address this question. It distinguishes between respondents' comments about the role of technology as being *central vs. secondary* to the intergenerational engagement function of the surveyed programs.



[Suburb–City– Home? Intergenerational Media Art Blogging is a program in Cologne where students and seniors jointly explored their neighbourhood and using tablets, created texts and photographs and published them in a blog. Photo credit: SK Stiftung Kultur Cologne, Janet Sinica]

A disproportionate number of responses (46 -73.9% of programs- versus 20 - 36.9% of programs, respectively) emphasized how the technology component is of central rather secondary importance to the essence of the program models.[6] This suggests that it is important to consider ways in which intergenerational programs that heavily emphasize or rely on technology might be qualitatively different from programs without a technology component.

"Without the technology, contacts would not be made, narratives would not be collected, and information would not be shared."

[Program: Vesta Studio. Organization:

[6] Insofar as some respondents described programs with multiple activities and components, they provided multiple responses to this question, hence the total percentage of responses (alluding to programs and activities for which technology is either central or secondary to program goals) adds up to over 100%.

Table 13: Respondents' comments about the central vs. secondary importance of the technology component in intergenerational technology programs

Response categories	# of responses/ percentage of programs	Example quotes
CENTRALITY OF TECHNOLOGY TO PROGRAM/ ACTIVITY	[46/73.9%]	
References made to the tech-heavy nature of project models/ activities	22/43.5%	• "The program is entirely dependent upon using technology to remix, share and explore media messages." • "The exergaming equipment is the core of the program. Without it, LIFE would not be the physical activity program it is meant to be." • "Technology is the main support and means of implementing and developing the activities in the MyStory project."[7] • "Technology is the first reason for the intergenerational encounter." • "The Computer Buddies program would not exist without computers and the technology to correspond via the internet." • "The use of technology is very important as it provides a common platform for youth to demonstrate technological knowledge by using the material provided by the older adults with the shared purpose of telling someone's story."
Emphasis on tech skills development	12/21.7%	• "The technology is also very important for the older generation in terms of being updated, i.e., the older generation wants to learn how to use computer." • "The focus was improving the technology skills of older people and the subject was chosen by the pupils - this gave them ownership of the project and the older people were keen to learn." • "Increasing the use of online based and often interactive services and tools available in the field of vocational orientation is the key idea of "school2work." Therefore, using technology is elementary for our purpose."
Emphasis on removing technological barriers	5/8.7%	• "The technology we provide has opened a door that can often times be a barrier; we have made it a pathway." • "This helps older people, including those over the age of 80 (in some cases 90), in overcoming a perceived barrier between them and a computer."

[7] In the "MyStory" project, young people are trained to collect older adults' stories and help process the collected materials and discussions. The older adults also receive ICT training to help them develop basic computer and internet skills. With EU funding, the program was initiated in Romania, but extended to include story collection in five European countries each representing their own unique people and unique history.

(Cont'd)		
TECHNOLOGY IS SECONDARY	[20/36.9%]	
Blended technology (the importance of blending tech and non-tech methods)	11/21.7%	• "Getting-to-know activities, ice-breakers, tandem and group activities, "analogue" creative activities (performing and painting) and informal chat in breaks were equally important." • "It is also a tool focused on community integration and social dialogue, enabling and valorizing the skills and knowledge of the older generation, combining traditional knowledge with modern communication tools and expertise in order to enable innovative, creative and productive joint solutions for local sustainable development." • "It is very important to use technology, as we have found many positive consequences have come from it. But in the slight chance that the technology cannot be used that day, we are able to have a successful activity without technology. When possibly, we prefer to involve technology in our activities." • "Virtual contact possibilities have to be combined with face-to-face meetings and learning activities." • "The learning platform KOJALA fosters not only Internet-supported learning processes independent of time and place, but also many face-to-face intergenerational projects." • "The devices are the vehicle for the interactions but the interactions extend beyond the devices since the interactions often occur in resident homes and other discussions are stimulated." • "Audio archives are an inspired way to promote access to sharing of memories but face-to-face engagement is what I believe breaks down intergenerational barriers."
Primary emphasis on program objectives/ goals (not the technology)	10/19.6%	• "Implicit in Digital Storytelling is people make stories with a computing device, but we emphasize good storytelling over technology in every situation." • "(Technology is used) as a vehicle and more as a "pretext" to enhance intergenerational linking and to stimulate intergenerational learning and dialogue. Getting-to-know activities, ice-breakers, tandem and group activities, "analogue" creative activities (performing and painting) and informal chat in breaks were equally important."
(There are times when) Technology is not needed	3/6.5%	• "My students and I also give educational lectures without using computers, but our main focus is teaching seniors how to play cognitively stimulating games." • "Some of the youth and seniors do not even use the computers, they talk about a variety of matters and conversation topics that are interesting to them at the time. Others utilize the computers non-stop throughout the program. On average we leave the activities up to them, the important part is that the youth and seniors are interacting and learning from one another."

One of the most useful findings for intergenerational practitioners trying to figure out how to weave new technology tools into their programs is the illustrative body of responses within the "blended technology" category. These responses allude to strategies that incorporate technology-intensive as well as "technology free" components into program activities.

Seven of the 11 responses that allude to this "blended technology" theme are presented above, in Table 13. This theme also came up in several respondents' comments about how technology is used. For example, one respondent wrote:

> *Without the smart board, we found that some of the kids were done with an activity before the older adults were finished.*

In this case, access to the *smart board* technology provides a way to complement and improve an existing activity in need of some modification. It is not a question of face-to-face contact *versus* technology-mediated contact, but a question of *how they reinforce one another*.

Respondents noted several other factors related to technology that are important to consider:

- **"Appropriateness"** of the technology (10 responses, 21.7% of programs). Examples include: developing "age friendly" technology tools and using high-tech equipment to develop appealing "ice breaker" activities.

- **"Comfort level"** (6 responses, 13% of programs). Emphasis is placed on using technology that is non-threatening and easy to understand and use. Examples of quotes:

    - "The challenge remains getting participants and staff comfortable with the technology …"
    - "It is a pleasant and unthreatening way for older people to learn the basics, in a pleasant and unthreatening environment."
    - "Older adults who are more comfortable using technology are able to play a more active role with assistance from their youth volunteer, while others who are not as knowledgeable can place their trust in the youth volunteer to drive the technological agenda."

- **"Access"** to the technology (3 responses, 6.5% of programs). Examples of quotes:
    - "We are very aware that many of the most valuable local and intergenerational activities within Historypin happen offline - often inevitably offline because of skills and access."
    - "The Seniors Are Cool! DVD relies on a computer/DVD machine for program participants to view it."

Finally, considering the rapidly shifting terrain of technological innovation and application, we add ***flexibility*** and ***creativity*** to this list. As we learned when trying to establish a categorization system to capture the full range of technological tools, resources and services used in the programs we surveyed, this is not a stagnant field. We learned how technological advancements related to mobile communication devices and online platforms for sharing content are enabling people to use the same software developed for computing (desktop) devices in ways that create new modes and

possibilities for synchronous and asynchronous intergenerational communication across geographical distance.

Advancing the Field

(1) Technology as pathway

There are many ways to frame and use technology so it functions as a pathway to intergenerational engagement. New technology provides powerful new tools to help people connect, communicate, understand, build relationships, and take collective action across generations.

> *"The technology we provide has opened a door that can often times be a barrier; we have made it a pathway."* [Program: IPAD-ICAN. Organization: Lutheran Home at Kane]

However, at the center of the intervention equation is not the technology itself, but the quest for tapping into the relationship-enhancing potential of the technology. This is quite consistent with the broader literature on intergenerational programs and practices, where the emphasis on relationship formation is still the "coin of the realm."

> "The technology becomes the tool for building their bond with each other. When the children help the adults connect via social media with new friends there is an immediate and tangible outcome." [Program: Evening Edition. Organization: My Second Home (Family Services of Westchester), which shares space with the Mt. Kisco Childcare Center]

Whether it is through e-mail, social media, video games, or other technological tools, additional opportunities may be created to stimulate, extend, and deepen intergenerational conversations. Our respondents have confirmed this possibility.

(2) Conceptual frameworks and practical approaches for utilizing technology in several program areas

We reviewed the data from our surveys of intergenerational technology programs with an eye toward identifying some distinct conceptual frameworks for weaving technological innovation and new applications into intergenerational programs. In the sections below, we share some themes with regard to program approaches used to: provide support for families, study and improve community life, and contribute to people's physical and mental health.

(a) Support for families

On the family front, new technology is being used to help family members stay in contact and maintain lines of social support across geographic distance. This is consistent with other research which notes that families seeking to extend operations and relationships over great distances is one of the major incentives for using new computer-based communication technologies (Harley, Veter, Firzpatrick, & Kurniawan, 2012).

The family unit also provides the means, the context, and opportunities for family members to gain technological competence. The following quotes allude to some basic considerations when devising program strategies to teach family members how to use new technology.

> "We have identified that when family members try to teach a parent Internet skills, they do it in a very reactive fashion, usually when their parents are stuck. When this happens, they tend not to teach but to 'fix' the immediate problem without helping their parents understand what went wrong. As a result, frustration grows and tensions rise - which doesn't make for happy families. GetYourFolksOnline.ie provides structure to help address this, with easy-to-use lesson plans and tips for getting the most from the teaching experience." [Program: Get Your Folks Online. Organization: Google Ireland.]

> "The aim of the project was to enhance our family learning program through the use of mobile technology. We chose iPads for this task as they are a well-known piece of technology, fairly easy to use for learners with no experience of technology and new technologies can attract harder to reach learners." [Program: Family Learning Goes Mobile. Organization: Neath Port Talbot Adult Community Learning (South Wales, U.K.)]

(b) Community study, community organizing, and cultural/ historical preservation

In several of the surveyed programs, intergenerational teams use mobile technology to find answers to explore community quality of life issues of common interest. This often entails concentrated learning and selective projects focused on issues related to local history, natural resources, recreational outlets, educational opportunities, and opportunities for civic engagement and social action.

Consistent with the emphasis on participatory program development that is found in the literature on intergenerational approaches to community study/development (e.g., Henkin, Brown, & Liederman, 2012, and Lawrence-Jacobson & Kaplan, 2011), many of these programs have adopted an *empowerment* perspective. Digital storytelling programs, for example, are designed to help participants articulate how the local community affects their individual and collective experience. Participants choose the personal and collective stories they will record and the photographic images and artwork they will use to illustrate their experience. This emphasis on participation and empowerment is reflected in the following excerpts:

> "The methodological approach [which involves providing older adult participants with access to an "easy-to-handle weblog learning environment with the potential of including audio and video files"] is a narrative one and combines the approaches of oral history, biographical research and storytelling. Senior citizens tell about their individual experiences within the European history in the 20th and beginning 21st century. The learning process can be both the telling itself, because it means reflecting on and working through personal experiences, and listening to/reading tales of others." [Program: LLP Grundtvig. Organization: Innovation in Learning Institute, University of Erlangen-Nuremberg (Germany)]

> "People of all ages and backgrounds have a story to tell. That is the fundamental principle behind our use of intergenerational digital storytelling to build community. We merge the age-

> old art of storytelling, with new multimedia technologies, bringing people together in a collaborative environment where they can exchange dreams, memories, thoughts and family histories, while learning how to use the tools of success in the rapidly evolving digital age. In this way we can appeal to the interests of a 92-year old grandmother, as well as the tech savvy preteen who would otherwise spend most of his or her time buried in a video game or instant messaging their sibling in the next room." [This statement is posted on the Digital Clubhouse Network's website (http://www.digiclub.org/progproj/index.html).]

The following excerpt conveys the value of merging traditional knowledge with modern communication tools for generating new solutions to community development challenges:

> "Mountain regions in Europe are centers of traditional cultural and natural diversity. At the same time, far away from the urban centers and marginalized, they are facing many challenges, including the lack of economic opportunities, and as a result - migration of the younger population towards urban centers. This process exacerbates the challenges of the rural mountainous areas - because the aging population is not properly integrated in the development process - and leads to the loss of traditional knowledge by breaking the connection between the older and younger generations. The idea of the Big Foot project is to bridge this gap by establishing intergenerational learning and dialogue and by enabling and valuating the skills and knowledge of the older generation of locals, combining traditional knowledge with modern communication tools and expertise in order to enable innovative, creative and productive joint solutions for local sustainable development." [Program: Big Foot. Organization: Menon Network EEIG (Brussels)]

(c) Promoting health and wellness

i. Social connectedness: A crucial component to aging well throughout the life-course

In looking at the multiple roles that technology plays in the programs that we surveyed, we gain a fuller picture of the psychological and social significance of participants' program experiences. Technology is being used in ways that build and nurture new relationships that contribute to new opportunities for learning and community engagement. One important theme noted by several respondents is how reducing *digital exclusion* can contribute to a reduction in *social exclusion*.

Age Action Ireland's "Getting Started" program runs computer and mobile phone classes across Ireland for people over 55. At a surface level, the program is simply about teaching older adults basic IT skills. However, in looking more closely at benefits associated with the program, there is also a social integration significance to the technology training.

> "Confidence in using the internet tackles the social exclusion that many older people may feel, helping them to stay active, healthy and less isolated. An aim of *Getting Started* is to create a more inclusive community and older learners meet volunteer tutors from their local area and subsequently both learner and volunteer become more engaged within their local area." [Program: Getting Started. Organization: Age Action Ireland]

Other respondents also alluded to the relationship between technology training and social inclusion. We see how enhanced technological skills, knowledge and use contribute to increased interest and capacity to engage in new or improved relationships in family and community contexts.

- "Resident A is unable to be part of a bridal shower for a family member in another state. With the Skype up and running, she was able to actually participate in the joyful event."
- "Most have the desire to learn how to compose email, keep in contact with family/friends, scan the internet, etc."
- "Older adults have testified that technology builds bridges to the outside world leading to greater respect from their families."
- "(participants learn) how useful and economical the use of emailing, texting and how magical for them through Skype to see and hear their family and friends overseas and communicating with them in daily basis.
- "[The program aims to] improve by little steps the digital literacy of elderly people to foster their full citizenship in the digital society."
- "Since the program began last year, more residents (85-93 years old) are using smartphones, iPads, and Skyping with family and friends. Many residents and volunteers are looking forward to building stronger relationships in future programming."

As evident in the following quote, *empowerment*, which emerged as a key theme in the previous section on community study and intervention, is another useful concept for exploring how gaining digital skills can have positive effects on participants' social lives.

> "Empowerment of residents closes the digital divide, tackles social exclusion, and improves access to services with intergenerational element; technology provides opportunities for conversation, discussion, building of friendships and creating better understanding between generations." [Program: Digital Age Project. Organizations: Linking Generations Northern Ireland (in partnership with Workers Educational Association)]

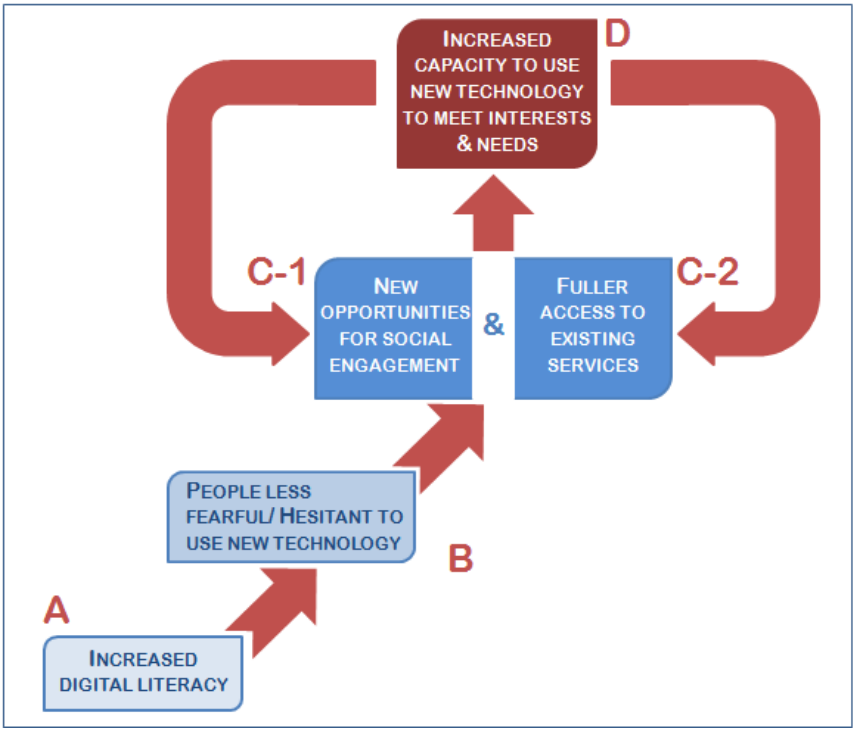
Figure 2, below provides our conceptual framework for breaking the "'digital exclusion' – 'social exclusion'" link. The framework is as follows:

(A) yields (B) yields (C1 and C2) which yields (D) and this leads to a feedback loop between (D) and (C).

- A = Increased digital literacy – through technology training and support systems (formal and informal educational processes) and accessible and user-friendly virtual environments. [People want and need friendly, simple, non-competitive, free (or affordable) ways to learn about and access technology.]
- B = More motivated and less fearful or hesitant to use new technology. [Older adults, more frequently than youth, consider computers and technology with apprehension, thinking of them as complicated and difficult.]
- C-1 = New opportunities for social (including intergenerational) engagement. Dialogue goes beyond talk about technology; participants also learn about each other's lives and gain new insights into ways to expand their social circles and civic engagement pursuits.
- C-2 = People have fuller access to new services (including human services and job training and career development opportunities).

- D = People have increased capacity to further develop and practice their technological skills and use technological resources in ways that reflect evolving interests, changing needs (e.g., associated with their pursuits with regard to individual health and wellbeing, strong families, and cohesive, caring communities), and expanded social networks.

Figure 2: A conceptual framework for breaking the "'digital exclusion' – 'social exclusion'" link.



There is a caveat, however. While we agree that it is problematic that low technology skills and confidence on the part of many older adults can contribute to social exclusion (real and imagined), it is important to avoid creating or feeding a negative stereotype that equates technological competence with relevance and importance.

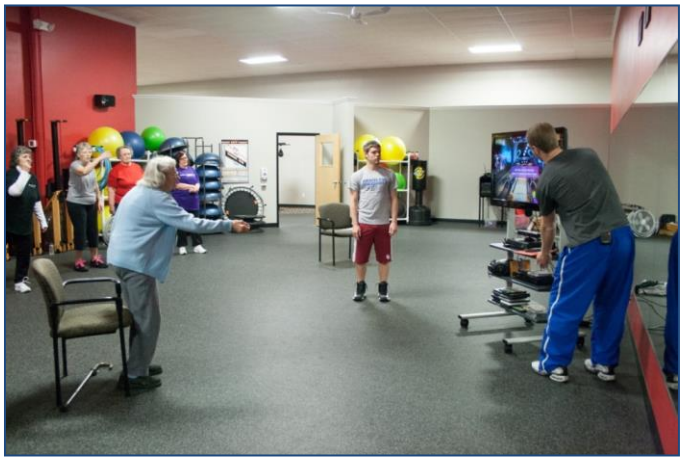
ii. Technology as tool for stimulating physical activity

Several of the programs in our survey used Kinect and other game platforms to encourage participants to be physically active, socially engaged, and mentally stimulated. Here are a few examples:

> "Broad band connectivity will be used to allow people to exercise together but separated in space using MS Kinnect technology." [Program: Konnectics. Organization: The Intergenerational School (U.S.)]

[The Konnectics program in action at The Brain Emporium in Cleveland, Ohio. Photo Credit: TJ McCallum]

> "The Brain Emporium is the Cleveland area's first computerized brain fitness center and is specifically designed to engage and mentally stimulate older adults." [Program: The Brain Emporium. Organization: Case Western Reserve University (U.S.)]
>
> "The LIFE Program design" [which uses exergaming technology and young adult trainings to promote physical activity for older adults] is based on the Whole Person Wellness Model and the Transtheoretical Model. These theoretical models have been used in the planning of the LIFE program to ensure that it is a well-rounded, yet targeted wellness program. The Whole Person Wellness Model includes six dimensions of wellness: physical, emotional, spiritual, intellectual, occupational, and social." [Program: LIFE (Living well through) Intergenerational Exercise and Fitness). Organization: Iowa State University.]



[One of the LIFE program's exergaming sessions in action. [Life stands for "Living well throughout Intergenerational Exercise and Fitness]. Iowa State University; © 2013 Iowa State University Extension and Outreach]

iii. Using technology to amplify the learning and service dimensions of intergenerational service-learning programs

Consistent with the literature on intergenerational service learning programs that have a heavy technology component (e.g., Moore, 2009), survey respondents provided several accounts of how technology can be used to enhance student exposure to issues related to aging and their ability to provide a service for older adults. Here is one such account:

> "The program was expanded to include mobile app development and research. Students developed mobile apps to assist the elderly and disabled to make utilizing technology easier. Android and iOS platforms were targeted for the apps. Subsequently, students started creating and testing apps for dementia and Alzheimer's patients in collaboration with community geriatric organizations. Other students constructed assistive technology devices to aid the elderly in more effectively interfacing with the computer." [Program: Intergenerational Computing. Organization: Pace University (U.S.)]

(3) The need for new modes of collaboration and strategic partnerships

One of the conclusions from the Generations United 2011 conference was that there is a need to "reconfigure our boundaries of operation and reach across sectors and traditional disciplines to form new partnerships." Some of the programs in our survey established creative and successful partnerships with technology-oriented organizations. In fact, in some cases, it was the technology-oriented partner that was the major initiator and driving force of the program. For example, Google Ireland plays a major role in its partnership with Age Action (a charity which promotes positive ageing and better policies and services for older people) to run "Get Your Folks Online," an initiative which aims to "encourage and empower younger generations to pass on Internet skills to the older people in their own lives."

The quest to establish new and effective ways to use technology to facilitate intergenerational engagement will likely be spurred on by new configurations of multi-disciplinary teams and cross-sectoral partnerships. For starters, we recommend that intergenerational specialists reach out to those in the emergent field of "community informatics"[8] with overlapping interests (Carroll, Convertino, Farroq, & Rosson, 2011; Harley & Fitzpatrick, 2009; Harley, Veter, Firzpatrick, & Kurniawan, 2012).

Working collaboratively might be the best way to address questions such as the following:

- What are some ways to create *virtual environments* that stimulate desired modes of intergenerational dialogue, relationship building, and joint problem solving?

[8] Community informatics (CI), also known as community networking, electronic community networking, community-based technologies or community technology refers to an emerging field of investigation and practice concerned with principles and norms related to information and communication technology (ICT) with a focus on the personal, social, cultural or economic development of, within and by communities. This field takes an interdisciplinary approach for exploring ways in which ICTs are utilized for different forms of community action. [This definition is derived from the Wikipedia website]

- What are some "active distracters?" In other words, what should we try to skip or avoid when trying to plan and implement technology-oriented intergenerational programs/ practices?
- What are some effective strategies for addressing concerns related to cybersafety, invasions of privacy, etc.?
- By embodying human experience/knowledge/histories into technological devices and services, how can this help strengthen intergenerational relationships in the 21st century?

(4) The need to think about *the environment* as consisting of *virtual* as well as *physical space*

(a) The power and promise of *virtual environments*

As we learned from the intergenerational technology programs in our survey, the *virtual environment* can function as a "place" to meet, share experience, and plan and take action.

> "The Internet-based competence platform was developed together with the stakeholders as a space for exchange of experiences between the generations. This makes the following over the Internet possible: - Making knowledge and abilities available to a community - Fostering social relationships in the way of network development - The development of a virtual place of exchange between the generations." [Program: Ulm network Kojala competence platform. Organization: Centre for General Scientific Continuing Education at Ulm University (ZAWiW) and partners.[9]]

> "A thematically structured 'market place' makes it possible to browse through the various offers. The Internet platform hosts working groups that can be created for joined virtual work amongst the participants: The working groups can introduce themselves, place their offers, administer their documents and present their work documentation without great previous technical know-how in the form of small homepages." [Program: Ulm network Kojala.]

Some virtual environments function as "resource hubs:" The originators of the EU-funded, multinational *Grandparents and Grandchildren* program established the "Internet Gym," a multilingual website with supporting materials for young tutors (website includes teaching exercises and other pedagogical resources designed for them), older adults, and professionals who either conduct or are considering conducting such programs (website includes project evaluation results) (Schneider, Tosolini, Iacob, & Collinassi, 2012).

This emphasis on *market places* and *learning hubs* is consistent with how virtual meeting places are described for some of the other initiatives we came across in our literature review. For example, Third et al. (2011) describe the "living lab" space, a virtual setting created to support workshops that youth conduct on social networking and cybersafety for adult participants, as a

[9] The Ulm network Kojala is a "network of and for older and younger people, who are prepared to share their knowledge and abilities with others. Many institutions in Ulm participate in the network. The engagement of the younger and the older Ulm citizens is the steering power behind this intergenerational network. The members on the platform have personal visiting cards, they can offer own abilities and competences and place requests."

"non-hierarchical space of intergenerational dialogue and learning that generated mutual respect between the young people and adult participants" (p. 8).[10]

These examples hint at how further development of virtual environments, for more fluid, multi-faceted, and participatory intergenerational exchanges, might herald a paradigm shift for extending the possibilities of intergenerational interaction beyond what people conceived of as possible or likely even in the recent past.

Meeting in virtual environments is a way to transcend time and space barriers. These online platforms often cost less (in terms of time, energy, and finance) and are less dependent on the planning and facilitation by outside agents as we see now with most traditional program-oriented models. However, access to the virtual environment can be a major impediment if people don't have the proper training and support.

Although we might not be quite there yet – in terms of training systems, computer and online access issues, and user-friendly software – it is probably worth spending more time considering the question: What will intergenerational relations look like when geographic distance is no longer a barrier?

(b) Designing environments that are conducive for multi-generational gatherings and intergenerational exchange

For the physical as well as the virtual environment, it is important to address issues related to *access*. If a person has no computer at home, it helps if there are community settings such as computer labs, community centers, libraries and other facilities that offer affordable web access. In our survey, we encountered several programs based in environments that are designed to immerse and engage users in technology-enhanced activity. Here is one example:

> "The organization upgraded the entire building with WI Fi, resident computers and iPads. The I PAD I CAN program was initiated by a contribution from a family member to enhance the technology within the organization for residents, family members, visitors, volunteers and activities." [Lutheran Home at Kane (PA)]

It is also important to consider what is *developmentally appropriate* for the physical and virtual settings in which intergenerational meetings are expected to take place. These settings need to accommodate the physical and psychological needs of people across the age and ability spectrum. The technology configuration and participants' access to the technology should be framed in ways that are developmentally appropriate for all participants. For example, in ICT learning projects aimed at teaching older adults new technological skills, it may be necessary to incorporate adaptive technology. For example, as noted by Harrison and Mulvehill (2008), when young volunteers from Age Concern Enfield's Trans-IT computer project visited older adults' homes to provide them with ICT training, it helped for them to have ready access to a range of adaptive technology resources such as large screen laptops, large roller ball mice and keyboard stickers.

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[10] These authors refer to Eriksson, Niitamo, & Kulki (2005, p. 4) for the formal definition of a living lab: "A user-centric research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts."

Finally, when designing physical environments for intergenerational exchange, there is evidence to suggest that it is worthwhile to provide "conversational space" as well as technology access space. To make the case that the physical environment should accommodate activities that are both, technology-based and non-technology based, Third et al. (2011) share lessons learned from an action research project in which youth conducted workshops on social networking for adults. Their research team found that when participants were in front of a computer screen, that screen tended to grab their attention and have a communication-impeding effect. Hence, they recommend providing intergenerational teams with computer-free space for at least some of the program time.

This is consistent with how several of our survey respondents described the virtual environment (see responses in the "blended technology" category in Table 13), i.e., as a great resource for facilitating intergenerational contact, but one that can be even better when supplemented with opportunities to meet and engage in joint activities and projects beyond what can take place in online contexts.

(5) Considerations in teaching and learning new technology skills

(a) Working to integrate formal and informal learning systems

People gain technology skills in many ways, including participation in formal, structured technology training programs in educational settings and through informal learning processes typically found in natural settings, where that are no structured programs of learning or carefully prescribed modes of interaction.

Here is one example of the importance of "self directed, informal and fundamentally experiential" learning processes (Third et al., 2011, p. 7). In their study of how youth learn and teach older adults about social networking services, Third and colleagues found that participating youth gained their extensive knowledge on issues such as cybersafety through their reliance on the informal learning processes of trial and error and knowledge sharing with their peers.

Efforts to help people gain technological competence should acknowledge the role of both learning systems. This might entail structured curricula (e.g., tutorials and learning modules) as well as space for people to engage the content in more nature (less guided) ways such as knowledge sharing with their peers, family members and others in their social networks.

We contend that any effort to "teach" digital literacy should acknowledge that just as people seek to be active users and not passive recipients of technology, they need to be active learners. What this means for technology "education," even in formal/highly structured technology education programs, is that there is value in providing unstructured, collaborative learning spaces that afford opportunities for informal knowledge sharing, discussion, discovery, practice, and application.

(b) Who is teaching whom?

Earlier in this guidebook we emphasized how youth participants in intergenerational programs that have a heavy technology component often tend to be disproportionally respected for their digital

competency and be positioned in the role of technology tutors, either on their own or as equal partners with participating adults.

Several respondents alluded to a complex interrelationship between the respective roles taken by the youth and the older participants. Both generations make meaningful (and often reciprocal) contributions as they develop a relationship through a primary focus on technology. The most common pattern is, indeed, when the youth take the lead as teachers of technology, with the older adults contributing in other ways, e.g., by teaching gerontology students about some other topic related to the experience of aging. There are interlocking goals, and some reciprocity in learning.

The dynamic of who does the teaching is not necessarily a generational issue insofar as we see so many configurations with regard to participants' technological competencies and the roles they play. Reinforcing our conclusions in this regard, we found accounts in the literature that emphasize the technology teaching capacity of young people in work settings (Bailey, 2009), the often significant influence that grandparents have on youth learning about science and technology (Jane & Robbins, 2007), and the power of intergenerational teams to innovate and apply new technologies (Large, Nesset, Beheshti, & Bowler, 2006).

The themes of co-learning, collaboration, and the primacy of the intergenerational relationship that were present in the current survey results also resonate in the broader intergenerational field. For example, one of the best practice guidelines provided in a recent document by ECIL (European Certificate in Intergenerational Learning) emphasizes the importance of encouraging "reciprocal learning" (i.e., opportunities in which the generations learn from and with one another) (ECIL, 2013).

Further Discussion

(1) **Limitations of our study**

Our intergenerational technology programs survey represents a preliminary effort to explore how new technological developments are being applied in a range of settings and contexts with a robust intergenerational engagement component. The data gathered captures some innovative strategies for utilizing technology to connect generations in areas focused on enhancing health and wellbeing, strengthening families, and organizing and improving communities.

However, perhaps as an artifact of how the survey was constructed and distributed (e.g., it is a very short and general survey, and the emphasis is on identifying formal intergenerational programs), we had limited access to experts at the forefront of technological innovation, in areas such as robotics and the construction of new types of technological devices for recording, organizing, and sharing information. Whereas it can be argued that many such devices are beginning to have applications in the intergenerational field, at this point, for those at the forefront of technological innovation, responding to a survey on technological applications in intergenerational programming might not have been their priority.

In our professional travels, we have encountered individuals who are developing new devices and associated apps for use in family contexts, e.g., Candice Ng's "Digital Heirlooms" and

"Remember Me Inheritance Kits",[11] in caregiving settings (e.g., "smart houses"), and in educational settings (e.g., new distance/online learning platforms). However, such work is beyond the purview of this preliminary study and hence not examined in any detail for this particular publication.

(2) Technology as friend or foe?

Technology is a powerful medium for intergenerational exchange, no argument here. Our stance, which has remained consistent from before we began this project to its completion, is that technology is *value neutral*. Technology is no panacea. The main question is how we decide to apply technology while staying true to underlying goals and corresponding values for promoting intergenerational solidarity.

This is not so simple. As discussed in the introduction section, there are many accounts, coupled with an abundance of social commentary, about how advances in technology can have a negative as well as a positive influence on the lives of young people and older adults. In family contexts for instance, young people's expertise using electronic media and peer-oriented participation in social networks can introduce a divisive influence on family relations (Figuer, Malo, & Bertran, 2010).

In some cases, technology seems to function as both, a barrier and an opportunity. The following is an excerpt from a summary of the EMIL series of roundtable events which took place in 2012 to celebrate the European Year for Active Ageing and Solidarity between Generations:

> "There was also some discussion about technology being a barrier in some cases to forming friendship between generations but the group also highlighted the opportunities for intergenerational learning through computer classes. Interestingly some of the younger participants also highlighted some of the negative aspects of social networking whereby they recognized that some young people use technology at the expense of talking to older people and this is not good for intergenerational solidarity" (EMIL, 2013, p. 25).

Such concerns notwithstanding, we are encouraged by the results from our survey. These intergenerational technology programs provide some useful clues as to strategies for tapping into the positive potential of technology for creating and supporting intergenerational relationships and contributing to participants' health and well being, support for families, and stronger communities.

We learned about how technological tools and services are helping: older adults to have positive aging experiences and maintain social connectivity, youth to gain skills that contribute to their employability, community residents to preserve local history and take part in local planning endeavors, and family members to keep stay in contact and maintain lines of social support across geographic distance.

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[11] As part of a poster presentation at the Generations United 2011 conference, Ng and Kaplan (2011) described and demonstrated two prototype devices designed to preserve family history and help younger family members engage with and remember their older relatives: (1) The "Digital Heirloom:" Family members work with an older adult relative to create recordings that highlight cherished family memories with that individual. These recordings are then embedded in a device that plays back voice audio clips when triggered by a motion sensor. (2) The "Remember Me - Inheritance Kit" which contains personal items that belong to a cherished family member: By embedding a memory chip that contains personal recordings, stories, histories and messages into these items, they provide a living, personalized record of that person's existence.

In looking forward, it will be interesting to see how new technology, which we expect to be introduced at an accelerating rate given the techno-social age that we live in, will influence intergenerational relationships in the future. This is particularly relevant in areas in which technology is undergoing rapid development – such as robotics, portable and wearable devices that link people to the Internet (e.g., "Google Glass" and i-Watch), nanotechnology, and 'smarter' and more integrated services and systems able to combine many different functions of technology.

The challenge, which many of the programs that were surveyed met head-on, is in figuring out ways in which "high tech" can lead to "high touch." Another way to put it is to draw a distinction between *cold* versus *warm* technologies (and strategies for using any given technology), where the latter is more conducive to promoting the types of closer relationships that people yearn for, especially during uncertain times of rapid change.

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Appendix 1: Intergenerational technology programs survey

Intergenerational Technology Programs - Survey

Generations United and Penn State University are conducting a survey of intergenerational programs that use technology to promote intergenerational relationships.

Instructions:

* Please complete this survey in full by February 15, 2013.

* If your organization implements multiple intergenerational programs that use technology as a primary component, please fill out a separate survey for each program that has distinct objectives and methods.

* Please send form by desired method:

Email: cjs1170@psu.edu
Fax: 1-(814) 863-7277
Mail: Cecil Shelton
012 Ferguson Building
Penn State University
University Park, PA 16802

Please save a copy of the survey form for your records. Once your form has been received you will be informed by email or telephone that it was received and there are no issues with the readability or completeness of the form. Please allow 2-3 business days to receive your confirmation.

Please contact Cecil Shelton (cjs1170@psu.edu) or Matt Kaplan (msk15@psu.edu) with any questions.

Disclaimer: By completing this survey, you agree to allow Generations United and Penn State University to use this information in a guidebook and an online database of technology-focused intergenerational programs.

Organization and Primary Contact Information (* Denotes required response)

Name of Organization: *

Name of Intergenerational Technology Program: *

Address: *

Name of Primary Contact: *

Primary Contact Phone Number: *

Program Website (If Applicable):

Program's Primary Objectives (Maximum of Three) *

1:
2:
3:

Brief Description of Program (200 Word Maximum): *

Partnering Organizations in the Intergenerational Technology Program (If Applicable)

Length of time Intergenerational Technology program has been in existence (Place an "X") *

_____ Under 1 year
_____ 1-3 years
_____ 4-5 years
_____ 6-10 years
_____ 10 + years

Approximate age distribution of program participants (Check all that apply) (Place an "X") *

_____ 0-5
_____ 6-14
_____ 15-24
_____ 25-54
_____ 55-64
_____ 65-74
_____ 75-84
_____85 +

Frequency of intergenerational interaction generated or stimulated by the program (does not have to be face to face) (Check only 1) (Place an "X") *

_____ Daily / almost daily
_____ More than once a week
_____ Weekly
_____ Two to three times per month
_____ Monthly
_____ Several times per year (6-11)
_____ Few times per year (2-5)
_____ Once a year or less

Technology Specific Questions

Check all types that apply of technology you are using in the intergenerational program for the purpose of connecting program participants from different generations. (Place an "X") *

____ Computing devices
____ Gamming platforms
____ Mobile communication devices
____ Online platforms for sharing video-based content
____ Robotics
____ Other:
____ Other:
____ Other:

In which ways are you using that technology? (e.g. to stimulate conversation, provide needed care or support, learn about or work to improve the community, etc.) (150 words maximum) *

In your program, how important it is using technology to facilitate intergenerational relationships among the participants?

Please respond by using the following scale of "1" to "7", with "1" being "Unimportant" and "7" being "Very Important". (Place an "X") *

____ 1 (Unimportant)
____ 2
____ 3
____ 4
____ 5
____ 6
____ 7 (Very Important)

Please explain your ranking selection:

Would you be willing to be interviewed should we have more questions about your program? *

____ Yes
____ No

END OF SURVEY

Thank you for your valued participation!

Appendix 2. List of surveyed programs used for guidebook

Program	Organization	Country
All Together Now	Center for Digital Storytelling	United States
Between "LOL" and Yesteryear - an Intergenerational Digital Storytelling Opportunity	University of Beira Interior, LabCom, Online Communication Lab	Portugal
Big Foot	MENON Network EEIG	Belgium
Computer Buddies	RSVP of Dane County	United States
Digital Age Project (in partnership with lead organization of W.E.A).	Linking Generations Northern Ireland	United Kingdom
Email Mentor Communication	Chaminade University, Inter Exchange, Inc.	United States
Evening Edition	My Second Home	United States
Family Learning Goes Mobile	Neath Port Talbot Adult Community Learning	United Kingdom
G&G - Grandparents and Grandchildren	Centre for General Scientific Continuing Education (ZAWiW), Ulm University	Germany
Generations in dialogue	JFF – Institute of Media Education	Germany
Generations Together	Worcestershire Archive & Archaeology Service	United Kingdom
Get Your Folks Online	Google Ireland	Ireland
Getting Started	Age Action Ireland	Ireland
Historypin	We Are What We Do	United Kingdom
InterGen Tech	Emerson School	United States
Intergenerational Computing	Pace University	United States
Intergenerational ICY Skills	ISCAP	Portugal
Intergenerational IT Project	Age UK Oxfordshire	United Kingdom
Intergenerational Media Literacy Program	The Lamp	United States
Intergenerational Programming	Kendal at Oberlin	United States
Intergenerational-ESL Technology Program	BNU/HKBU United International College	Hong Kong
IPAD - ICAN	Lutheran Home at Kane	United States
Konnectics	The Intergenerational School	United States
Learn with Grandma	Learn with Grandma	United Kingdom
Living (well through) Intergenerational	Iowa State University	United States

Exercise and Fitness (LIFE)		
LLP Grundtvig	Innovation and Learning Institute, University of Erlangen-Nurembe	Germany
Mix@ges – Intergenerational Bonding via Creative New Media	Institut für Bildung und Kultur e.V	Germany
MyStory Project	EuroEd Foundation	Romania
Neighbors Growing Together	Adult Day Services, Virginia Tech	United States
Project TRIP	Virginia Tech	United States
Rude Older People	Middlesex University	United Kingdom
school2work	German Youth Institute (Deutsches Jugendinstitut)	Germany
Seniors Are Cool!	Seniors and Healthy Aging Secretari	Canada
Service Learning on intergenerational program and digital teaching	Shi-Chien University	Taiwan
Silver Surfers	Age UK Suffolk	United Kingdom
Silver Surfers Intergenerational Program	LINKages Society of Alberta	Canada
Skyping project	Penn State University Center for Healthy Aging	United States
Technology for All	Volunteer Centre East Ayrshire	United Kingdom
Technology Helpers	Ring House	United States
The Brain Emporium	Case Western Reserve University	United States
TKV: The Knowledge Volunteers	Fondazione Mondo Digitale	Italy
Transfer of Wisdom Across Generations	The Scholar Store	United States
Ulm network KOJALA – Competence platform for young and old in learning exchange	Centre for General Scientific Continuing Education (ZAWiW), Ulm University	Germany
VESTA Narrative Gerontology	VESTA Studio	United States
Video der Generationen /Video of Generations	German Center for Youth and Children Films	Germany
Weaving Memoirs on the Web	Toronto Public Library – Albert Campbell District Branch	Canada

The word cloud was developed from survey responses.