



Conceptual Frameworks and Practical Applications to Connect Generations in the Technoscape

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Abstract

There are many ways to frame and use technology so it functions as a pathway to intergenerational engagement. The ever-evolving technoscape is filled with powerful technological tools and resources that help people connect, communicate, build relationships, and take collective action across generations. This technology can be life-altering, especially for isolated seniors and families navigating long distance relationships. 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. To explore this potential, an international survey was conducted with 46 intergenerational programs that reflect innovation and intensive uses of technology. Results demonstrate that important strides are being made in utilizing new technology for effectively connecting generations and positively affecting aging adults' lives.

Keywords: technology, intergenerational programs, intergenerational relationships, intergenerational communication

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Introduction

What are the dimensions of today's technoscape that pervade the aging process and have an impact on intergenerational relationships? This is the overall framing question at stake in this paper. Since the term intergenerational focuses on interactions happening between different generations, and human aging and longevity develops through an array of intra- and inter-generational age-linked trajectories and transitions embedded in institutional contexts (i.e., throughout a life course), the capacity of technologies in the technoscape to mediate and potentially transform intergenerational relationships becomes a relevant issue to consider. This is particularly true in a time when the global relevance of both phenomena (population aging and technology pervasiveness) has become so evident (Hampton 2015; Plouffe and Voelcker 2015).

Interest around digital technology and intergenerational relationships has been gaining momentum in the era of technoscape. For instance, we have learned that cell phone usage by sub-Saharan African young people is a shifter of the generational power balance, particularly within the family context, as youngsters are becoming repositioned as family information hubs (Porter et al. 2015). There is growing international evidence of older adults' use of Information and Communication Technologies (ICT) to maintain or strengthen communication among family members, especially grandchildren (Chesley and Johnson 2014; Yuan et al. 2015). Attention has been paid to social media use as well as web-based communicative practices for family-based kin-keeping and intergenerational relationship building (Dare 2008; Napoli 2014; Siibak, Andrak and Tamme 2013). A subset of this attention addresses the dual potential of new technologies to exacerbate (Mesch 2006) as well as reduce intergenerational tensions in families (Gerschenfeld and Levine 2012; Horst 2010).

It is also relevant to consider breakthroughs in the development of digital products such as augmented reality integrated games to construct "barrier-free" digital environments for older adults, thus promoting their social interaction with children (Lin, Fe and Chang 2013). Improvements in software and hardware platforms for game playing and game-based communication have implications for enriching family communication (Chen, Wen and Xie 2012). In fact, specialists in access in the information society have concluded that "the intergenerational context is important for designers and researchers to accommodate as an explicit focus for design efforts" (Harley et al. 2012:2).

We use the term Intergenerational Technology Programs (ITP) to refer to programs with a strong technological component that aim to establish relationships between any two generations (Kaplan and Sánchez 2014; Sánchez, Kaplan and Bradley 2015). It is our belief that ITP “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 wellbeing, support for families, and stronger communities” (Kaplan, Sánchez, Shelton, and Bradley 2013:46). In this paper, our focus is not just finding ways in which a particular technology may be helpful for intergenerational interactions in the framework of specific programs. Instead, and following Licoppe’s (2004) stance, we contend that to understand intergenerational relationships within ITP we need to take into account the ways in which the management of these relationships rely on the whole available technoscape, hence the importance of blended processes such as the combination of face-to-face and asynchronous technology-centered intergenerational learning.

Technology is ambivalent: Depending on the circumstances, it can cut both ways, as a social connector and isolator, a friend or foe (Jarvenpaa, Lang and Tuunainen 2005). The main focus of this article is the ways technology is being used to “connect” people from different generations. Our focus, however, goes beyond sheer contact. We look at how new and emerging technologies are being utilized to promote understanding, build relationships, and facilitate cooperation throughout the life course between generations that are aging together in a range of community settings and family contexts pervaded by the technoscape.

Theoretical Framework

Central to our theoretical perspective is the concept of life course, “which relates to aging as a general process of intergenerational interactions in changing historical circumstances” (Lowenstein 2010:57). The life course principle of linked lives underlines the interconnectedness of lives as we move through the life course (Bengtson, Elder and Putney 2005), and technology as utilized in ITP may have an impact on such interconnectedness between lives and social structures. Compellingly enough, it has been argued that a life course approach can be useful in terms of deepening our understanding of social implications of technological innovations (Chesley and Johnson 2014). We concur.

Issues regarding the balance of power between generations interacting in the technoscape (Gora 2009), the consequences of role changing as so-called digital natives meet digital migrants (Prensky 2001), and the web of complex and fluid patterns of technology use and competencies across and within non-homogeneous generational groups (Bertel 2013) are but some examples of relevant questions to consider once a life course lens is implemented at the crossroad of intergenerational programs and the technoscape. Since a life course perspective is dynamic by definition, our exploratory approach to international ITP confronts the static view according to which young people are always the most skilled and innovative users of digital technologies as well as the ones who are able to take more advantage of ICT.

ITP can be perceived by individuals and generational groups as opportunities to maintain intergenerational ties with significant others (relatives, neighbors, organizational members, and so on) with whom they feel interdependent. The technoscape in general and the particular involvement in ITP may influence the way key life transitions, crisis, risks, and changes at different life stages are approached. Overall, “the life-course perspective is a tale of

path dependency, gravity, and shocks” (McDaniel and Bernard 2011:1-2). To what extent might our own life course tales be altered as a function of how we immerse ourselves in the technoscape and engage in ITP initiatives?

Empowerment is a central feature in intergenerational programs (Gamliel and Gabay 2014). ITP are not an exception to this regard. Given the intra-generational variation in terms of technology literacy and its changing nature throughout the life course, as well as the importance of being technology wise in the technoscape, ITP may provide a viable context of empowerment for traditionally disempowered groups (i.e., children and elderly people). Therefore, special attention will be paid to the empowering effect of ITP on participants.

In this paper, life course analysis and empowerment will be considered with a strong relational orientation in mind. To this regard, we follow Donati (1999) in considering the underlying essence of generations as being inseparable from social relationships, actual and implied. Consequently, in our exploration of ITP we will emphasize the being with and being together in the technoscape (Sánchez, Sáez and Pinazo 2010).

Procedure

In line with our review of the literature and our emergent theoretical framework, we have reflected on three broad questions related to the infusion of technology into intergenerational practice:

- 1) How might the technoscape provide intergenerational specialists with new tools and strategies for building intergenerational relationships and achieving ITP goals?
- 2) How might intergenerational programs with a heavy technology component contribute to health and well-being, family cohesion, and livable communities throughout the life course?
- 3) How might the technology component be configured to provide the best conditions for participants’ empowerment?

In the literature, examples of ITP do not abound (Gamliel and Gabay 2014; Han 2013; Lanasa Gatnau 2012; Wu 2005). Furthermore, to the best of our knowledge, at the moment of launching our research effort there was no available exploratory study on international ITP. Therefore, the primary data source for this article is a recent survey of ITP (i.e., intergenerational programs that have a heavy technology component) (Sánchez, Kaplan and Bradley 2015). To identify a diverse group of programs, the project team, which consisted of the article authors and a graduate student assistant, pursued a three-part outreach strategy. The team 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. A series of questions was sent to professionals affiliated with programs that met the study criteria.

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

and challenge. As for how quotes presented below have been selected, after second cycle coding and prolific analytic memo writing, researchers in the team independently selected the most vivid and representational quotes in the sample in line with focusing strategies in qualitative analysis (Saldaña 2009). Through several debriefing sessions, selection decisions as to representative quotes to be included in the final narrative were made.

In order to present a broader range of ideas and to connect as many threads as possible, in the narrative below, analysis of responses to the survey is interwoven with text that highlights 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.

Methods

Constructing and Conducting the Survey

The survey designed by the project team counted on one questionnaire 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 first half of 2013: outreach through intergenerational list-servs (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 combinations of terms were used: “intergenerational program” AND “technology,” “intergenerational project” AND “technology,” “intergenerational activity” AND “technology,” and “intergenerational technology program.”

72 surveys filled-out by program coordinators were received, 46 of which were deemed non-redundant, complete and within the scope of the study and those programs constitute the study sample.

The 46 programs in the sample are quite diverse in terms of geography (they span 11 countries), type of technology used, and the ways in which technology is being used to intentionally support and enrich the lives of people of all ages. Information about the names of these programs as well as the organizations and countries in which they are based is posted online.¹

Most programs (74 percent of the sample) were designed to have a positive impact on the lives of the participants, whether through helping older individuals in developing ICT skills or through raising awareness of and reducing digital exclusion amongst older people (Sánchez, Kaplan and Bradley 2015:99). While a majority of these programs were primarily focused on enhancing individual participants’ technology-related knowledge and skills, 24 percent of the

programs in the sample also targeted non-technology related capabilities such as how to maintain a healthy lifestyle and improve second language skills (Sánchez, Kaplan and Bradley 2015:99).

Some other program objective themes that were only touched upon briefly in the Sánchez, Kaplan and Bradley (2015) article, such as reducing the sense of isolation or exclusion among older people, impact on family life and community connectedness, are explored in this article in more depth. The primary focus here is on objectives and outcomes associated with the ways in which digital technologies are allowing older adults to establish deeper intergenerational connections in their families and communities in the framework of the technoscape.

Analysis

The project team employed a mixed-methods analytic strategy. We implemented thematic inductive and deductive analysis of responses to open questions (Braun and Clark 2006) through coding (Saldaña 2009). Two members of the research team generated an initial draft codebook by independently reviewing approximately 25 percent of the raw data. Afterwards, research team members compared proposed themes and produced an initial master list of codes fitting into four major categories: 1) Program Objectives, 2) Program Description, 3) Technology Use, and 4) (perceived) Technology Importance. Examples of themes are “relational level,” “generational differences with regard to technology,” “inclusion,” and “technology as (dis)connector.”

Some excerpts were assigned multiple codes, though such multiple coding determinations rarely crossed the four categories noted above. After several joint coding sessions a final codebook with 113 codes was reached. During the coding process two members of the research team worked independently to review and code the entire database (consisting of 431 excerpts which are classified in this article as distinct responses). Differences in coding were reconciled through discussion (Graneheim and Lundman 2004). Inter-rater reliability rate achieved was .93 (Cohen Kappa), a highly reliable value (Miles and Huberman 1994).

Coding of qualitative data and sample demographics were used to feed descriptive quantitative analysis: “information from codes could be used in the quantitative follow-up or for specific, significant statements or quotes from participants” (Creswell and Plano Clark 2007:145). Dedoose mixed methods web-based application was used to this regard.

In choosing the excerpts to display in this article, the project team looked for quotes that best illustrated prevalent themes and patterns found in the data which provided detail about programs functioning with a concentration on intergenerational communication and relationship formation. Following Porter et al. (2015), in the remainder of the paper we draw attention to ITP’s specific features insofar as they are considered vital for discussion.

Results and Discussion

Valuing and Using Technology to Build Meaningful Intergenerational Relationships

The program objectives data illustrates some of the distinctive ways in which the surveyed programs aim to use technology to influence intergenerational relations. Table 1, below,

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

- ⦿ Communication [better/enhanced/expanded communication; record and share life experiences/ stories across geographic distances]
- ⦿ Understanding [better/worse understanding of one another. For example, 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 1: 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%	<ul style="list-style-type: none"> • "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"
Understanding	15/32.6%	<ul style="list-style-type: none"> • "identify prejudices, discover differences/ identify common ground" • "evoke critical analysis for debunking ageist myths"
Relationships formation / change	14/28.3%	<ul style="list-style-type: none"> • "encourage intergenerational bonding" • "foster social relationships in the way of network development - The development of a virtual place of exchange between the generations"
Serving one another	12/23.9%	<ul style="list-style-type: none"> • "improve students' ability on digital teaching material and software"

Learning together	12/23.9%	<ul style="list-style-type: none"> • “co-productive approach to learning with older people as opposed to learning about them”
Cooperation	3/6.5%	<ul style="list-style-type: none"> • “create collaboratively and share purposeful projects developed by participants for the larger community (e.g. intergenerational photography exhibit, and intergenerational blog)”

According to the language presented in Table 1, a majority of ITP practitioners believed that diverse relationships could be encouraged through joint intergenerational activities mediated by digital technology. To what extent is technology crucial to the latter in the context of ITP? 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 2, below, most respondents provided a very high rating of the importance of technology for facilitating intergenerational relationships.

Table 2: 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 percent of all programs surveyed) noted 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 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.”

We were able to explore the relationship between the choice of technology, how the technology is used, and participants’ intergenerational relationships. We delved into the responses from participants who emphasized “building meaningful relationships” when asked about how their programs are using technology. Some of these responses are provided in Table 3, below.

This broad diversity of technology being used in our sample of programs indicates that the promotion of meaningful intergenerational relationships is not so much a matter of the specific types of technology being used as it is with the way in which technology is actually applied. Therefore, the observation by Licoppe (2004) above applies in the sense that the whole available technoscape may provide tools and strategies (e.g., new mentor-mentee relationships) for intergenerational interaction. 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.

In the sections below, and connecting to the theoretical framework previously presented, we share some themes with regard to program approaches being used to strengthen intergenerational relationships in families, study and work to improve communities, and promote social and digital inclusion throughout the life course.

Table 3: 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	"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."
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	"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.	"Since the program began last year, more residents (85-93 years old) are using smartphones, iPads, and Skyping with family and friends."
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."
Free technology (training) programs that extend to smartphones, iPads, digital cameras, Skype, WiFi, web searching, and online platforms for sharing video-based content	"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).

Strengthening Intergenerational Relationships in Families

Throughout the survey, across questions, and in line with some of the literature noted above, respondents alluded to positive ways in which technology and technological competence can have an impact on family relationships. Here are a few examples of such comments:

[Program participants use e-mail and texts to] “see and hear their family and friends overseas and communicating with them in daily bases.”

[The program helps families] “create lasting memories and have fun together.”

“Older adults have testified that technology builds bridges to the outside world leading to greater respect from their families.”

Interestingly, “the outside world” is where the technoscape becomes fully meaningful. ITP in families can help pave the way for older adults to keep connected with a changing outside world. There is as well an empowerment component in the process of being technologically skilled: the status of older adults within the family improves because of their capacity to use technology.

To place responses into a broader context, we have looked to the literature to provide some complementary perspectives on how older adults and professionals view the role of technology in influencing intergenerational relationships in families.

The following quote is from a 65-year-old grandfather living in England who is dissatisfied with the communication (or lack thereof) with his grandchildren living in the U.S.:

It’s interesting, very, very, very rarely do we contact them, and that’s not because we don’t want to it’s because, our son will say “do you want to talk to granddad?” and they’ll say “no,” because they’re doing something else, but I think it’s as much to do with ... they don’t know us, they don’t know us. (Tarrant 2015:294-295)

This grandfather is not alone. Many grandparents, particularly those living long distance from their grandchildren, are looking for ways to have more frequent and more satisfying communication with their grandchildren. Even with ICT advances that provide family members with additional options for communicating across great distances, it is not always clear how to get the conversation started, nor place priority on the connection. ITP can be instrumental to this regard since respondents in our sample referred to “stimulate conversation” as one strength associated with use of technology in intergenerational programs.

Harley et al. (2012) emphasize the important role that many grandchildren play with regard to motivating their grandparents to learn about and use new technology:

When considering older people’s engagement with new information and communication technologies, it is inevitable that intergenerational contact will play some part in framing these interactions. This is particularly true for familial interactions between grandchildren and grandparents. Grandchildren are often a significant source of expertise for their

grandparents when it comes to learning about computer-based technologies. Intergenerational contact also provides an important motivator for older people to engage with new technologies in the first place. (Harley et al. 2012:1)

Fortunately, in many instances, new and updated technology is being utilized, and applications are being developed, to help family members to stay in contact and maintain lines of social support across geographic distance. This is consistent with other research reported in the literature which notes that families seeking to extend communication and relationships over great distances is one of the major incentives for using new computer-based communication technologies (e.g., AARP 2012). As noted by Harley et al.,

Despite the dramatic changes to everyday family life in developed societies, intergenerational bonds remain very important within families continuing to operate over great distances and provide an incentive for using new computer-based communication technologies. (2012:2)

Community Study, Community Organizing, and Cultural/ Historical Preservation

In several of the surveyed programs, intergenerational teams use mobile technology to explore community quality of life issues of common interest or to solve a community challenge. 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/improvement (e.g., Henkin, Brown and Liederman 2012; Lawrence-Jacobson and 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 experiences. Participants choose the personal and collective stories they will record and the photographic images and artwork they will use to illustrate their experience. Below, we draw from several of the programs in our study to provide narrative detail as to how such programs engage participants:

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. [Excerpt from survey. 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 ageing 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 valuing 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. [Excerpt from survey. Program: Big Foot. Organization: Menon Network EEIG (Belgium)]

Historypin, another one of the programs in our survey of intergenerational technology programs, has received a fair amount of attention in the intergenerational studies literature with regard to its effective use of technology for stimulating intergenerational conversations about local history as well as participation in community activities. Historypin.com, which functions as an online, global archive to which people can add photos, audio, video, stories, and memories by pinning them to a particular place and time on a communal map, serves as “a catalyst for numerous online and offline collaborations between older and younger people” (Armstrong 2012:294).

Knight (2012) writes about the Historypin program in Reading, England as follows:

The [Historypin] project worked in Reading to build a living, collective history of the city and its people over the last 150 years through the use of an online google-map tool. Based at Reading Museum, the main project partner, an intergenerational volunteer group reached out to members of the community to encourage them to participate in intergenerational activities and events including weekly Historypin drop-ins, one to one history sharing sessions, Historypin guided walks, and heritage events. (2012:312)

[...] nearly four out of ten (38 per cent) of survey respondents stated that since taking part in Historypin activities, they had become more involved in activities in their community.

One younger participant commented: 'I learnt a lot about history and older residents lives. I learnt a lot from a particular resident about Huntley and Palmers where she had been a worker. I now feel I know so much more about Reading – it makes me proud to be a Reading resident' (2012:312)"

We have all learnt things we would never have known about Reading's history and even our own families, as we would have never had the reason to ask. It has given us the chance to spend our afterschool time doing something fun as well as educational, rather than going home just to sit on the sofa. (2012:309).

It is also important to consider the multi-directional intergenerational communication dynamic in such projects. Some projects begin with an emphasis on how tech savvy youth can help older adult participants enter and navigate in the world of "digital inclusion." However, in turn and over time, the older participants tend to be 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.

Such a 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.: 6).

Infusing a historical perspective in ITP emphasizes the temporal component linked to every human being and generation. Therefore, the crossing of young and old around history and technology amalgamates for the life course linked lives principle to become self-evident. In this sense, digital technology can facilitate new ways for life course tales to keep being lived and told.

"The My Story project aims to record interesting stories from older people's lives. The sorts of things that may be lost if not recorded in some way. And who better to record the stories than younger people, eager to learn first-hand about their own social history." [Excerpt from survey. Program: My Story. Organization: EuroEd Foundation (Romania)]

Social and Digital Inclusion for Aging Well throughout the Life Course

In looking at the multiple roles that technology plays in the programs that we surveyed, we gained a more complete picture of many of the ways in which technology contributes to the overall health and well-being of program participants as they age. 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, one of the programs in our survey, runs computer and mobile phone classes across Ireland for people over age 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 a much deeper significance to the technology training. As noted in the following excerpt, the program has implications for reducing the social

exclusion experienced by older adults and promoting youth as well as older adult community involvement:

“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.” [Excerpt from survey. Program: Getting Started. Organization: Age Action Ireland]

Other respondents also alluded to the relationship between digital inclusion and social inclusion. We see how increased technological skills, knowledge and use contribute to augmented interest, emphasis, 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.”

“[The program aims to] improve by little steps the digital literacy of elderly people to foster their full citizenship in the digital society.”

As evident in the following quote, empowerment, which emerged as a key theme in the previous section on community study and intervention, is also a useful concept for helping to explain how gaining digital skills can have positive psycho-social effects:

“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.” [Excerpt from survey. Program: Digital Age Project. Organizations: Linking Generations Northern Ireland (in partnership with Workers Educational Association)]

Breaking the Digital Exclusion – Social Exclusion Link

Recognition of the link between digital exclusion and social exclusion in older adults’ lives is one point of confluence in the gerontological and computer science literatures.

On an 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.” (from Clifford June 2 2009: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. Research focused on how older adults use information and communications technology concludes that older adults' adoption of new technologies is neither quick, simple, nor universally accepted (Feist, Parker and Hugo 2012; Selwyn et al. 2003).

Harley and Fitzpatrick (2009) suggest that the digital exclusion experienced by many older adults is more a matter of social exclusion than age: "Being older does not preclude the opportunity to learn about new technology but social isolation does" (p. 19). ITP surveyed can assist older adults in their transition into the technoscape given some of the objectives that these programs adopt, for example, "to raise awareness of and reduce digital exclusion amongst older people," "social inclusion (and eInclusion) of seniors," and "break down social isolation for older people."

Based on survey results as well as our review of the broader literature, we developed the following emergent conceptual framework for understanding and working to break the "'digital exclusion'–'social exclusion'" link:

A. The framework begins with an effort to increase digital literacy. This is done through technology training and support systems (formal and informal educational processes) and creating an accessible and user friendly virtual environment. It is assumed that people want and need friendly, simple, non-competitive, free (or affordable) ways to learn about and access technology:

"Technology is used to create very simple experiences ... for new and nervous users as well as those in low tech environments." [survey excerpt, Program: Historypin. Organization: We Are What We Do (United Kingdom)].

B. Enhanced digital literacy is likely to yield increased motivation and less fear and hesitancy to use new technology. Older adults more frequently than youth consider computers and technology with apprehension, making assumptions that they are complicated and difficult.

C. As our data show, increased motivation is likely to yield new opportunities for social engagement (including intergenerational engagement). The intergenerational exchange should not only focus on the technology (and topics related to digital exclusion). It is also important that opportunities are present for dialogue through which participants learn about each other's lives and gain new insights into ways to expand their social circles and civic engagement pursuits:

"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," [survey excerpt, Program: Silver Surfers Intergenerational Program. Organization: LINKages Society of Alberta (Canada)].

Broader access to new services (including human services and job training and career development opportunities).

D. Such opportunities and increased access are likely to yield greater capacity to further develop and practice their technological skills and use technological

resources in ways that reflect evolving interests, changing needs, and expanded social networks:

“Age soon became irrelevant. The older people gained a whole new set of skills and the younger people gained so much confidence from the project.” [survey excerpt, Program. Technology for All Organization: Volunteer Centre East Ayrshire (United Kingdom)].

A positive C-D loop develops. This increase in technological competence and practice contributes to increased opportunities for social engagement and vice versa. This “loop” has implications for reducing social as well as digital exclusion.

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.

Final Remarks

Technology: An Integrating or Dividing Force?

Technology is most definitely a powerful medium for intergenerational exchange. However, 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 satisfactory and meaningful intergenerational interactions and relationships.

On a positive note, we know that whether it is through e-mail, social media, video games, or other technological tools, additional opportunities can be created to stimulate, extend, and deepen intergenerational conversations. Our survey respondents confirmed this possibility in diverse family and community contexts.

However, there is no simple formula. As touched on briefly in the Introduction, there are accounts of how advances in technology can have a negative as well as a positive influence on the ways people communicate and form relationships across generations. 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 and Bertran 2010; Mesch 2006).

Considering the many ways in which technology touches our lives, including the nature of our relationships with others, we recommend that our survey data be approached with a more nuanced understanding of how substantial use of technology can function as an intergenerational connector or isolator, a communication barrier or barrier remover. Considering the preliminary nature of our study, we recommend viewing conclusions drawn from the study as speculative, requiring further research utilizing multiple methods.

Limitations of 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 describes some innovative strategies for utilizing technology to connect generations in areas focused on enhancing health and wellbeing, strengthening relationships in 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. Accordingly, such work is beyond the purview of this preliminary study and hence not examined in any detail for this particular publication.

Another limitation of this study is that it does not allow for cross-cultural comparison of intergenerational technology programs. Although the data set included programs from 11 countries, it is too small a sample to draw meaningful comparisons and conclusions. Considering the global dimensions of technological innovation and concerns about social and demographic changes that influence intergenerational relations (Kaplan and Sánchez 2014), one line of future inquiry that we feel would be particularly useful is to explore potential cross-cultural variations in terms of how technology is conceived, perceived, and utilized for the purpose of strengthening intergenerational relationships.

There are also limitations associated with the self-reporting nature of the dataset. This method does not assess the degree to which those filling out the surveys on behalf of their programs and organizations are describing actual practices. One way to address this limitation, as well as to provide more nuanced data with regard to ITP operations and program challenges as well as successes, is to infuse an ethnographic component to complement survey data. However, this could not be done in the current study due to time and resource constraints.

Recommendations

Taking what our survey participants have shared with us into account, we would recommend considering the following questions when engaging in the complex task of designing ITP aimed at enhancing intergenerational relationships.

- How might the technology component be configured to prolong the intergenerational engagement along with deepening interpersonal intimacy?

- Does the technology component add new domains of content to discuss, reflect upon, and act upon, together? [If not, and adding no interpersonal enhancement or enrichment value, consider not going high tech.]
- What are some ways to create virtual environments that stimulate desired modes of intergenerational dialogue, relationship building, and joint problem solving?
- 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 technoscape?
- Are the new modes of human interaction between generations made possible by technology in any way inferior to person-to-person contact without the aid of technology? In other words, does technology-mediated interaction alter human relationships in somehow undesirable (less satisfying?) ways?

Keeping such a long list of questions and considerations in mind is indeed a tall order for those looking for ways in which technological innovation could be used to stimulate and support human interaction.

The following quote from one of the survey respondents acknowledges the multi-dimensional nature of technology, yet articulates a simple idea for moving forward: “The technology we provide has opened a door that can often times be a barrier; we have made it a pathway.” [Excerpt from survey. Program: IPAD-ICAN. Organization: Lutheran Home at Kane (United States)].

As it has been frequently said, the solution to opening this pathway is figuring out how “high tech” can lead to “high touch.” However, in the specific framework of this special issue of the journal, this other way to put that challenge becomes more appropriate: What is it that “technoscapes” have to say regarding the promotion of aging well in our increasing “multi-generational scapes”? Our research indicates that promoting intergenerational bonding through technology-based programs is an interesting option.

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 arena.

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Notes

1. Profiles of surveyed programs are posted online at:

<http://extension.psu.edu/youth/intergenerational/program-areas/technology/using-technology-to-connect-generations-profiles>. For additional details about the surveyed programs, such as time in existence, age distribution of program participants, frequency of interaction, and type(s) of technology used, see Sánchez, Kaplan and Bradley (2015).

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