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## **Opportunities and Challenges of Digital Delivery of *Sharing Dance Seniors* for Social Inclusion**

### **Abstract**

Older people, especially those living with dementia, experience significant barriers to meaningful participation in their communities. Focusing on the expansion of an arts-based program to address social inclusion for older people via information communication technology (ICT), this paper identifies the challenges and opportunities of the digital delivery of the Baycrest NBS Sharing Dance Seniors program, a weekly dance class professionally instructed via online-streamed video and facilitated in-person in community and institutional care settings. Findings are drawn from older people and career experiences in community-based, multi-method pilot studies in the Peterborough Region, Ontario, and the Westman Region, Manitoba (2017-19) Canada. Through observations, diaries, focus groups, and interviews featuring the experiences of program instructors, participants, carers, administrators, facilitators, and volunteers, the challenges and opportunities presented by the digital delivery of the Sharing Dance program are analyzed as they relate to understanding social connectivity and relational and multi-dimensional influences on social inclusion. Findings point to the key role of facilitators and in-person support, with implications for the development of social resources and facilitator training in community and institutional settings.

**Keywords:** Older people, information communication technology (ICT), social inclusion, arts-based approaches

### **Introduction**

Information and communication technology (ICT) can play a significant role in the digital delivery of accessible programs, enabling older people to participate and socially connect in a range of activities and settings. Understanding adoption, use, and impact of ICT for so-

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cial connectedness may provide potential solutions to social isolation and to prevent exclusion in the development, implementation and assessment of emerging technologies for older people (Neves & Vetere, 2019). ICT can foster active ageing that includes older people not only in managing their daily lives and physical well-being, but as contributors to contemporary society in social, economic, and cultural activities (Ferriera et al., 2014). ICT has the potential to address important social inclusion issues such as the growing risk of social isolation for older people (Chen & Schultz, 2016) including older people with dementia (Pinto-Bruno et al., 2017), and those residing in rural areas who are currently the lowest users of technology (Warburton et al., 2013). Understanding ICT-delivered social connectivity has implications for older adults' social exclusion more broadly in dimensions such as social connections and resources; services; place & community; and individual capacity (Walsh et al., 2019). Many questions remain regarding ICT's effectiveness in mediating meaningful human connectivity and how it can be measured. One of the ways we can assess ICT is with a focus on social connectedness according to the preferences of older people at individual, community, and societal levels (Waycott et al., 2019).

This article identifies the opportunities and challenges of using ICT-based initiatives for social connectedness at individual, community, and societal levels by drawing on findings of a qualitative study exploring the digital delivery of the Baycrest NBS Sharing Dance Seniors program (Skinner et al., 2019) – an arts-based program for older people and people living with dementia in rural communities. In the sections that follow, we review the literature on ICT approaches addressing social connectedness for older people and how that relates to a broader conceptualization of social inclusion. We then outline our study design and draw out the opportunities and challenges of the digital delivery of the Sharing Dance Seniors program with regards to social connectedness. We discuss how ICT both enhances and creates barriers to social connectedness in the digital delivery of the Sharing Dance Seniors program, as experienced by older participants in rural areas, including participants living with dementia, carers, volunteers, staff, and facilitators. We discuss how these findings have implications for social inclusion more broadly as they pertain to Walsh and colleagues' (2019) dimensions of social exclusion such as social relations and social resources. The central argument is that ICT can provide important opportunities for social connectedness for older people with in-person facilitation and support of connectedness at a local level.

### Digital delivery of social connectivity toward social inclusion

While some health practitioners have taken interest in the development of ICT-based initiatives to promote active ageing and social health (Pinto Bruno et al., 2017), much of the research on this – from medical to arts-based approaches – has taken an interventionist approach to address isolation and loneliness (Khosravi et al., 2016; Chen & Schultz, 2016; Stojanovic et al., 2017; Poscia et al., 2018). In a different approach, Waycott and colleagues (2019), have drawn on social gerontology to propose a framework that informs ICT-based approaches with older adult experiences instead of designing compensating technology. They emphasize social connectedness, rather than focusing on isolation and loneliness. Social connectedness is a common thread in these multiple approaches to information communications technology (ICT). Technological innovations and interventions driven by ICT have demonstrated that it is possible to reduce social isolation and loneliness by creating connections to people such as health care professionals (Blusi et al., 2013; & Van Der Heide et al., 2010);

family and friends (Ferreira et al., 2014); communities of interest and the outside world (Chen et al., 2014; Waycott et al., 2019). ICT-based approaches have also emphasized social connectedness through the delivery of activities (Chen & Schultz, 2016; Blusi et al., 2013) using arts-based approaches to address individual limitations (Poscia et al., 2018); or by emphasizing positive social behaviour (Pinto Bruno et al., 2017) as opposed to reducing social loneliness and isolation. Warning of potential pitfalls of relying too much on technology, Van Der Heide and colleagues (2010) emphasize the importance of human connectivity with the recommendation that care organizations' activities should be "facilitated but not dominated by the technical means. The driving force should be the creation of an opportunity to improve the effectiveness and quality of the care provided to clients." (Van Der Heide et al., 2010, p. 290).

From the perspective of older people, future services and applications of ICT should support the development of social relations through communication, as they see the main benefits of technology as connecting to family and friends (Ferreira et al., 2014), lamenting how activities such as watching TV used to be a group activity (Papa et al., 2011). Looking at human connectivity beyond family and friends and through activities, Baez and colleagues (2019) pointed out the significant role of mediators or facilitators in connecting older people through ICT in their findings that the use of peer assistants was effective for older people in adapting to technology. Out of two studies that have showed that ICT solutions promoted more social behaviours than non-tech solutions (Pinto Bruno et al., 2017), one illustrated the benefits of technology to foster social participation for persons living with dementia, and that technology was useful for facilitators to make activities person-centred (Nijof et al., 2013).

In rural areas, ICT-based carer support can be valuable for older family carers as it contributes to quality of life improvement and helps older people in rural areas to learn to adopt new technology and to regain social connectedness and quality of life (Blusi et al., 2013). However, some of the challenges of ICT in rural areas include barriers such as the double digital divide wherein rural areas lack ICT-infrastructure and familiarity with ICT (O'Connell et al., 2019), along with attitudes towards ICT, low digital literacy and a lack of training and support (Warburton et al., 2013). In general, challenges for organizations for the effective uptake of ICT include internal training infrastructure; communication that includes feedback from users; and co-creation opportunities (Van Der Heide et al., 2010).

In these studies addressing social and health needs of older people through ICT, the focus has been on how older people and their carers use ICT directly such as through computer applications, iTV, and exergames for social connectivity. Few focus on group activities delivered to shared screens in recreation programs, limiting our understanding of potentially mediating effects of digital delivery of recreation programs through ICT, such as barriers to social inclusion. There is little work looking specifically at the effects that the digital delivery of programs for older people can have on processes and outcomes for social connectivity. More work is needed to understand the impact and outcomes of digital delivery, and in relation to social inclusion.

While social connectedness is a prevalent theme in the literature focused on the development of ICTs for addressing social isolation, it is one aspect of a broader conceptualization of social inclusion in the gerontological literature. For example, Walsh and colleagues (2019) conceptualize older-adult social exclusion as a multi-scale, multi-dimensional, and relational construct wherein mediating forces influence the potential for social exclusion in interconnected domains as experienced by older people in rural areas (Walsh et al., 2019). Mediating

forces include individual capacities; place and community; macroeconomic forces; and life-course trajectories. This paper looks at ICT as a mediating force with the potential to enhance or create barriers to social inclusion in the domain of social relations, using the digital delivery of the Sharing Dance Seniors program as an example of a mediator of social connectivity. The digital delivery of social opportunities such as Sharing Dance Seniors has the potential to enhance or create barriers to interpersonal social connectivity due to challenges such as digital literacy and infrastructure. This paper identifies the challenges and opportunities of the digital delivery (i.e. pre-recorded, streamed video) of the Sharing Dance Seniors program providing insights into the mediated connectivity of older people and the influence of ICT on social inclusion for older people.

## Methods

To examine the challenges and opportunities of digital delivery, we draw on a qualitative sequential pilot study, *Improving social inclusion for older Canadians with dementia and carers through Sharing Dance*, of the innovative Baycrest NBS Sharing Dance Seniors program. Our multi-method qualitative approach was ideal for collecting in-depth information from multiple perspectives, including older participants and their carers; facilitators, staff, and volunteers of host organizations; as well as the on-screen instructors of the digitally-delivered program. Data were collected between 2017 and 2019 in non-metropolitan areas of two Canadian provinces: Peterborough, Ontario and Brandon, Manitoba. Three pilot studies took place in sequential phases in each of two regional areas in the Peterborough, Ontario Region, (referred to as P1, P2, and P3 in Peterborough,) and in the Westman Region based in Brandon, Manitoba, (referred to as B1, B2, and B3). Each regional pilot started with one site in each province and then expanded to subsequent community and institutional settings in three phases for a total of 11 sites across the two regions. Full details of the research methods including the theoretical framework and data analysis are published in the study protocol (see Skinner et al., 2018).

### About Baycrest NBS Sharing Dance Seniors multi-modal delivery

During the study, the Sharing Dance Seniors program was delivered in-person or digitally (via live-stream video, pre-recorded videos for download, or pre-recorded video stream). Originally designed for in-person instruction, the Sharing Dance Seniors program, developed by Canada's National Ballet School (NBS) and Baycrest Health Sciences, became produced as a video to be delivered via live-stream to multiple remote settings from a studio at NBS in Toronto, Ontario. In Peterborough, two pilot studies P1 and P2, sessions were live-streamed, while in P3, due to technical challenges experienced during P2, sessions were pre-recorded and made accessible to participating organizations through the Sharing Dance online portal, with the option to download in advance or stream. In Brandon, Manitoba, B1 was delivered via live-stream video, while B2 and B3 were delivered via pre-recorded video stream (See Table 1). Peterborough Pilot participants also had the opportunity to experience the in-person delivery of the program, when instructors from NBS travelled to a central site to deliver the final class in-person to all sites in the region. The pilot was designed to include a piece

of choreography that participants practiced weekly, culminating in a shared “performance” on the final day.

Table 1. Multi-modal delivery and levels

Pilot	Live Stream	In-person demo or Finale	Pre-Recorded Option/back-up	Pre-recorded Video Stream
P1				
P2				
P3				
B1				
B2				
B3				

### Class levels and protocols

The Sharing Dance Seniors program offered two different formats of the program. Level One was instructed from a seated-only position to include participants with significant physical and cognitive challenges. Level Two provided both seated and standing dance options. In all phases of the Peterborough pilot studies (P1, P2, P3), participants experienced the one-hour, Level Two (standing and seated) session. In the Brandon pilot studies participants in all phases experienced 45-minute Level One sessions. Each program level was designed to make dance accessible to older people with varying levels of physical and/or cognitive abilities (including dementia). Protocols included considerations for physical and artistic goals in each dance such as physical awareness and mobility; coordination; strength; confidence; eye focus; storytelling through movement and gesture; joy; and engagement with music.

### Facilitation

In-person facilitators in each remote setting were integral to the digital delivery of the program and accessed orientation and training via online course modules via the Sharing Dance platform. The role of the facilitator was to welcome and organize participants; to participate in and model the program for participants to complement the on-screen instructor; to monitor and encourage participants for maximum benefit and safety; and to collect and provide feedback to NBS upon completion of the session via an online form.

### Research Participants

Research participants were originally recruited in partnership with Community Care Peterborough and the Alzheimer Society of Canada Westman Region office in Brandon. The Sharing Dance Seniors pilot program and research project was also advertised in both regions using local radio and newspaper channels along with word of mouth and referrals by the partner agency support groups. As the pilot studies expanded, returning participants recommended the program to others who joined sessions in the community settings. In institutional settings, recreation directors promoted the program internally to wider audiences and purposively selected participants based on whom they thought would be ideal participants, includ-

ing persons living with dementia and their carers. Information sessions were held at each site and open to residents' families and local community members. There were 23 participants in P1, 54 in P2, 40 in P3 (including eight people living with dementia), 16 in B1 (including seven people living with dementia), 36 in B2 (including 15 people living with dementia), and 140 in B3 (including 68 people living with dementia), for a total of 289 participants in the three phases in both regions (See Table 2). Research participants included older adult participants; persons living with dementia; administrators and staff in both community and institutional settings; facilitators; volunteers; and carers.

### Data Collection

With ethics approval from Trent University in Peterborough, Ontario, and Brandon University in Brandon, Manitoba, data was collected through observations, interviews, focus groups, diaries, and researcher reflections (see Table 2.) Observations focused on participants' experiences of social inclusion at weekly sessions in each pilot at every site, recorded in writing in a semi-structured guide that developed over the two-year period. Researchers were encouraged to participate during the sessions, to enhance participation in the program and to help participants feel less 'observed'. All participants were given the option of keeping a diary of their experiences of the program to complete after each dance session through a semi-structured questionnaire in a provided journal or tablet to record their experiences. Semi-structured interviews were conducted with interested participants, carers, facilitators, administrators, staff, and volunteers upon completion of the eight-week sessions. Focus groups were held with participants, their carers, facilitators, administrators, staff, and volunteers at the end of the eight-week sessions for each site in each pilot (see Skinner et al., 2018 for a detailed description).

### Data Analysis

The qualitative data analysis began with an initial round of inductive thematic analysis (Braun & Clarke, 2006), identifying emerging thematic codes through detailed analysis using Nvivo software. As data collection progressed, the research team reflected on the evolving thematic code book to resolve coding differences between investigators, and examined new and emerging codes with each pilot. To be attentive to different dimensions of social inclusion within the data, Walsh and colleagues' (2019) conceptualization of social exclusion was incorporated into the coding to look for themes of potential exclusion or inclusion related to financial resources; social connections and resources; services; transport and mobility; safety; macro-economic; place & community; individual capacity; life-course trajectories. These themes, along with other themes generated from analysis of the pilots, were organized by the three research objectives of the project: to explore older persons' experiences; to assess program delivery effectiveness; and to identify the challenges of scaling up the program. (See Skinner et al., 2018.)

Table 2. Pilot Study Participants (Updated from Skinner et al., 2018).

RESEARCH DESIGN		PETERBOROUGH PILOT STUDY (2017-18)					BRANDON PILOT STUDY (2018-19)				
Program Level		Sharing Dance Seniors – Level 2 (older adults)					Sharing Dance Seniors – Level 1 (including persons with dementia PWD)				
Research Phase		Pilot dress rehearsal P1 (1 site)	Community settings P2 (5 sites)	Institutional expansion P3 (8 sites)	Household care settings P4	Pilot dress rehearsal B1 (1 site)	Community settings B2 (3 sites)	Institutional expansion B3 (6 sites)	Household care settings (B4)		
Method	Observations										
	– Participants	23	54	40	TBD	11	20	122	TBD		
	– Carers					5	16	11			
	– Volunteers						9	7			
	Diaries										
	– Participants	23	10	6	TBD	20	23	1	TBD		
	– Carers					15	10	5			
	Focus groups										
	– Participants	23	26	16	TBD	2	3	6	TBD		
	– Carers					5	22	39			
– Facilitators						8	12				
– Volunteers						1	10				
Interviews											
– Participants	23	16	20	TBD	8	25	36	TBD			
– Carers	23	13	17		3	12	19				
– Facilitators						3	4				
– Volunteers						2	8				
Reflections											
– Investigators	6	6	6	TBD	6	6	6	TBD			
– Knowledge users	3	3	3		3	3	3				
Knowledge exchange, translation and dissemination	Planning work-shop	Planning work-shop	Pilot meeting	Pilot meeting	Pilot meeting	Planning work-shop	Pilot meeting	Pilot meeting	Pilot meeting		
	P1 Planning Report	P1 Planning Report	P3 Pilot Report	P4 Pilot Report	B1 Planning Report	B2 Pilot Report	B3 Pilot Report	B4 Pilot Report			
		Peterborough Pilot Synthesis Report and Public Seminar	Peterborough Pilot Synthesis Report and Public Seminar	Peterborough Pilot Synthesis Report and Public Seminar							
		International Knowledge User and Collaborator Symposium (hosted with Canada's National Ballet School)									

## Findings

While digital delivery provided the opportunity for older people in remote areas to participate in the Sharing Dance Seniors program, it mediated the experience by both creating barriers to participation and enhancing social connectivity, according to the experiences of the on-screen instructors (OSI), the participants, and the facilitators. Digital delivery challenged the OSIs' ability to see participants or to enhance participation and interactivity. As one OSI from B3 described, "I felt like I was blind when I was leading the class because I couldn't see who was participating or how they were doing. Was I going too fast? Were they enjoying it?" (OSI, personal communication, September, 2019) These concerns for older participant safety and enjoyment motivated OSIs to use encouragement in their on-screen instruction. For example, OSIs would use regular reminders to participants to only do what their bodies would allow them to do.

She was very clear and she said do what you can do and what is comfortable – if you have to take little steps, take little steps, and she kept doing [that], which is good because I need reminders (Participant, Focus Group, B2, Minnedosa).

This data shows how older participants appreciated reminders about how to follow the program and were responsive to the OSI's prompts. The one-way perspective of the digital delivery of the program created a potential barrier to safe and enjoyable participation that was alleviated by the OSI's prompts.

From the perspective of participants, the OSI provided opportunities to feel connected with the instructor, and they described how, "She talked to you like she was there." (Minnedosa carer B2, Focus Group) One example of this was when participants had conversations with the OSI during the program.

The OSI asks, "What are some of the things we see under the sea?" A participant, Bill says "Starfish." OSI says "That's right, starfish." Another participant, Oliver, looks at Bill and smiles," as if the OSI was responding to them. (Field notes, Minnedosa, Pilot B2)

In the above example, not only was the participant talking to the OSI, but by looking at their fellow participant, was bringing them in on the conversation in a three-way interaction that acknowledged their connectedness. Participants would also demonstrate their individual connections to the OSI as they spoke to the screen or responded to her commentary during the dances.

The OSI says she caught a northern Pike during the narrative fishing sequence. A participant, Bert shakes his head smiling and says to the screen, "Oh no you didn't." (to share his knowledge that that isn't the type of fish you would catch with her technique) The facilitator smiles at this ... (Field Note, Minnedosa, Pilot B3).

The above examples demonstrate consistently with other studies, the potential of ICT to deliver programs that enhance social connectivity through activities, (Chen & Schultz, 2016; Blusi et al., 2013) using an arts-based approach (Poscia et al., 2018). The Sharing Dance Seniors program enhanced social inclusion, by providing a program that otherwise wouldn't have been available in-person to older people in rural areas. The Sharing Dance Seniors program, via ICT was effective according to older adults' preferences for social connectivity on two levels: both interpersonally and, by feeling connected to instructors at a distance, in connecting to the outside world (Waycott et al., 2019).



One of the challenges for participants was in making the transition from screen focus to in-person interaction. Some participants tended toward a singular focus on the screen, in order to keep up with choreography in time to the music. This sometimes created a barrier to connecting to others in-person during some of the interactive moments when they were meant to look at each other or exchange movements.

Danielle, Parker and Reagan all share their energy (as instructed) with each other in a triangle, reaching out and looking at each other's arms, then getting eye-contact and looking at each other with relaxed smiles. Then as a trio they extend an invitation to Gloria, who sits in the middle of them. They look over to her and open their arms. Gloria reaches out her arms, but she is looking at the screen, following the moves of the OSI, not responding to or looking at others. She is focused on the movement of her arms in accordance with the OSI's. (Week 6 Minnedosa, B2)

This example demonstrates how the digital delivery of the *Sharing Dance Seniors* program enhanced social connectedness through instructions to look at and interact with each other. However, the challenge of this was that some individuals would remain focussed on the screen. As one facilitator noted of a few of her clients, "Some of them would just watch – it's this dynamic of – you watch TV, you don't do actions," (Focus Group Transcript, B3, Hamiota). Also noted were varying individual capabilities to keep pace; to see the screen; to hear through speakers; and to switch focus from interacting with co-participants to following the OSI, consistent with findings from human-computer interaction scholars who recommend that for technology for older people "Designers must be aware of normative age-related changes and how such aspects can affect technological interaction (e.g. reduced vision and hearing, slower pace, decreased attention division skills, etc.)" (IJsselsteijn et al. p. 1171, as cited in Zhou et al., 2017).

Victoria: And sometimes you can't keep up, you're doing one thing and they are doing another thing already. (Interview Transcript, B3, PCH participant, Minnedosa)

And a lot can't see, I know grandma couldn't see. So she wouldn't watch the screen, she would watch me. U: But visually, that's where she struggles, so if she could see you right beside her, that was the bonus right. Grandmother responds: So I did see, absolutely. (Focus Group Transcript, Hamiota, Pilot B3)

F: And it's a hearing aid thing too, I just know that sometimes in a group where there's laughter, there's extra background noise, with a hearing aid, I just know that sometimes residents can't hear anything and it all sounds like background noise. So I understand why they may always feel like they are a step behind. But that's a hearing aid thing and I don't know how we get around that ever, really I don't.

Highlighting these challenges demonstrates how, at a micro-level, ICT has the potential to intensify experiences of exclusion if older peoples' individual capacities are not properly considered. This exemplifies the interconnected factors at play in mediating old-age exclusion in the domain of social relations, with implications for personal independence (Walsh et al., 2019) as some participants were dependent upon assistance from family members and volunteers to participate. This emphasizes that carers play a role in mediating experiences of ICT-delivered programs for some older people (Blusi et al., 2013).

Different types of support enabled participants to interact with the OSI and other participants, highlighting the importance of in-person facilitator, carer, and volunteer support in guiding participants through the program. One volunteer described how participants were receptive to encouragement:

When people were just watching the screen, if you gave them a nudge, or demonstrated a lot. Or encouraged them, like “You’re doing a really great job. That’s it, you’re doing it.” (Focus Group Transcript, Hamiota, Pilot B3)

In other examples of support, the facilitator enhanced engagement of the participants, while other supporters such as carers, staff and volunteers complemented their efforts.

The facilitator watches each participant to ensure that the choreography is understood, provides instruction and reminders to do what they can when necessary, encouragement and praise, and participates enthusiastically as a secondary demonstrator. (Field notes, Millbrook, Pilot P3)

The extra staff and companions and volunteers made it more interactive and engaged everybody. (Interview Transcript, B3, Facilitator)

This support enhanced the interpersonal social connectivity of older adult participants in the program. Volunteers, facilitators and carers modelled the movements and interactions; encouraged participants to engage; brought their attention to the screen; and reassured them to function according to their own ability and at their own pace for comfort and safety. This points to the importance of in-person facilitation of the digital delivery of the Sharing Dance Seniors program and raises questions about the differences between digital and in-person delivery. Some participants preferred to have programs like Sharing Dance Seniors delivered in-person.

The video was great, the music was great, but it was nice to have an actual person there. I guess I’m not as much into technology a lot yet – I’m 70 – I can do certain things but the technology is just like – I want the person (Community Participant, Interview Transcript, Brandon, Pilot B3).

This finding is consistent with other studies that show how attitudes towards technology and low digital literacy contribute to the challenges of digital-delivery in rural areas and indicate a need for training and support (Warburton et al., 2013). However, for some older participants of the Sharing Dance Seniors program, the mode of delivery was not a barrier to participate. A facilitator describes their perspective of how participants were responsive to either on-screen or in-person delivery methods:

I was curious to see, to tell you the truth, how they would respond via television, because I do exercise programs regularly – I was curious to see how technology would play a part – I thought it was great – I thought that some really latched on to the fact that it was via TV, but some still watched me – I think there was a good mix of that– lots were on me because that’s something they look for regularly, they’re looking at me regularly – but a great combination ... (Facilitator, Interview transcript, Pilot B3)

These different responses to the mode of delivery of the program suggest that older people are a heterogeneous demographic with a range of attitudes, preferences, and abilities that contribute to their participation in social activities delivered by technology. While some participants responded well to the digital delivery of the program, others preferred the presence of a person. Together with results above, this builds on the assertion by Van Der Heide and colleagues (2010) that technology should not be the dominant means, but that social connectivity should be emphasized by using digital delivery as an opportunity, facilitated by in-person support to account for diverse preferences of older people.

From the facilitators’ perspectives, there were challenges with becoming oriented to the program and understanding their role at different times throughout the program. While NBS provided facilitator training and communication online, this was taken up inconsistently, as

one facilitator explained that they “didn’t have access to their email or to the online module without their own computer at work,” (Melinda, Interview Notes, Pilot B3). This sometimes caused confusion in what was expected in leading the program due to missed memos. For example, in one dance sequence, referred to as the “patty cake” sequence, the OSI told facilitators and volunteers to move around the room and clap hands with participants, but the music did not seem to allow enough time to do this with everyone before the sequence advanced to other movements.

I found it was just like awkward timing when you went around, like everyone else was just tapping their knees, so when you go around to do this, by the time they’re supposed to ... it’s just off on lots of timing. (Facilitator, Interview Notes, Pilot B3)

Facilitator tries to get up to clap with people but there really isn’t enough time before the next move starts. (Field notes, Pilot B3, Hamiota, Week Four)

Upon providing this feedback to NBS via the online module, facilitators learned that they were meant to continue to move around the room and interact with participants throughout the entire song, and not to return to their seats to demonstrate the moves until the next song. Facilitators’ participation in communicating via the online module provided by NBS emphasizes how feedback is an effective mechanism in addressing the use of ICT for organizations (Van Der Heide et al., 2010). ICT delivery can exacerbate barriers to participation through miscommunication, and draws attention to social inclusion at an organizational level, where not all digital infrastructure or access to it is equal, particularly in rural areas (see Kosurko et al., in press).

With inconsistent ICT infrastructure in rural study sites, technical difficulties due to internet connectivity were consistently reported as the most common challenge associated with the digital delivery of the program, with varying levels of tolerance and frustration. One facilitator noted in a focus group that their group was accepting of the technical difficulties as she acknowledged that “There’s nothing we can do about that. Obviously. Every week – other than the last two – every week we had glitching moments, but you were all very patient with that, when it would stop and we would still be singing and we would just kind of wait...” (Facilitator, Focus Group Transcript, Pilot B3) Another facilitator noted that the technology was the worst aspect of the job, “Trying to keep the computer running, having glitches – technical difficulties are the worst things.” (Facilitator, Interview Transcript, Pilot B3) Another facilitator expressed disappointment due to technical difficulties because, “When the technology was hiccupping, I could see the frustration on people’s faces. I felt helpless and that made it disappointing.” (Facilitator, Interview Transcript, Pilot P2)

Interestingly, the technical difficulties also created opportunities for social connectivity through interaction and support, further emphasizing the strength of in-person support to complement the delivery of the program. In one instance of technical difficulty, the program came to a halt close to the end of the session, with one or two dances remaining. After a brief moment of waiting, the facilitator led the final choreography without the video stream, with support of staff and participants in remembering the sequence.

F1 goes to the computer and attempts to adjust the internet connection and still the program won’t restart. She sits down and says, “I’m going to finish it,” and with the support of F2 and R she thinks through to remember the sequence of the moves from previous weeks and then leads the class in the baseball sequence. She gets everyone singing “Take me out to the Ballgame” and runs the routine three times all together. All in the group follow along. ... then she leads the group through a singa-

long with swaying arms to “You are my sunshine,” which the group follows along with. When the song finishes, F announces refreshments and all applaud. (Field notes, B3, Week Three, Killarney)

There were many instances when program interruptions challenged facilitators to attempt to get the technology running again.

Once the program is running again, F says “I should be a computer technician,” sits back down and the program stops and starts again several times. Madeline says, “You’re beautiful F, we forgive you no matter what.” “Aw thanks Madeline, says F.” All sit quietly and wait. “We feel for you too, because we realize the pressure you’re under.” “Thanks Madeline.” (Field notes, Killarney, Pilot B3, Week 4)

These examples of situations caused by the use of ICT-delivery, while labelled ‘challenges’ in our initial analysis, enhanced social connectivity by providing opportunities for participants to support the facilitator rather than the other way around, demonstrating a reciprocal exchange and a meaningful contribution to social connectedness on the part of the participants. In both of these examples, the essential role of the facilitator in complementing the program instruction is highlighted, along with the opportunity for the group to connect with each other and to adapt to the challenges they faced as a group. Using the framework provided by Waycott and colleagues to inform the design of technology for older people (2019), we can see how the Sharing Dance Seniors program, through its digital mode of delivery provided opportunities for older people to connect personally; by making reciprocal contributions to situations; within their communities; and like others in contemporary society, in the navigation of technical difficulties. By focussing on the social connectivity of the group as provided by the technology, this innovation may be evaluated as effective on all three levels of social connectivity as preferred by older adults (Waycott et al., 2019). It further emphasizes the relational nature of older-adult social exclusion (Walsh et al., 2019) and how factors such as individual capacities and coping mechanisms, along with technology in the context of rural communities and places can enhance or create barriers to meaningful social inclusion.

## **Discussion and concluding comments**

We have highlighted opportunities and challenges of using technology to address social connectivity as part of a larger discussion about social inclusion for older people, including older people living with dementia in rural areas. Technology is frequently framed as a potential solution to social isolation in aging research (Khosravi et al., 2016; Chen & Schultz, 2016; Stojanovic et al., 2017; Poscia et al., 2018). Our analysis demonstrates that while ICT-delivery of programs like Sharing Dance Seniors provides opportunities to connect older people to programs and services, facilitator and carer support is required at a local level, particularly in rural areas where there is more work to be done to ensure that ICT-delivery is accessible and socially inclusive.

Our data demonstrate how digital-delivery can both enhance and create barriers to social connectivity for older people. Borrowing from Walsh and colleagues (2019) framework, our focus was on connectivity in social relations, one of the domains of potential rural old-age social exclusion. Our findings highlight the opportunities and challenges provided by the Sharing Dance Seniors program for older people to connect socially and to develop interper-

sonal social resources with consideration of relational, mediating factors such as individual capacities, and aspects of place (such as technology infrastructure) (Walsh et al., 2019). When participants were faced with barriers to social connectivity due to individual capacities and technical difficulties related to digital-delivery, carer and facilitator support contributed to alleviation of those barriers. This need for carer support has implications for independence of the older person (Walsh et al., 2019), and points to the importance of the role of the facilitators and carers, and the required training infrastructure and feedback channels for their success, consistent with recommendations by Van der Heide and colleagues (2012). Extending facilitator training to include ICT-based carer support can be valuable for older family carers to help older people in rural areas to learn to adopt new technology and to regain social connectedness and quality of life (Blusi et al., 2013).

According to Walsh and colleagues' framework (2019), multi-dimensional and relational influences can contribute to social exclusion, such as individual capacities. The Sharing Dance program has demonstrated how ICT delivery can challenge but also enhance individual capacities to participate in arts-based programs, particularly by providing opportunities for social connections regardless of individual capacity. This was evident in the Sharing Dance Seniors approach in OSI prompts to "do only what they could do," along with the use of in-person facilitator and carer support. This points to the role of supportive social resources such as family and volunteers and presents an opportunity for the development of those social resources. By providing facilitation roles and online training for digital delivery, the Sharing Dance Seniors program fosters the development of social resources and digital literacy at local levels, enhancing social inclusion.

Using Waycott and colleagues' (2019) framework in assessing the digital delivery of the Sharing Dance Seniors program for social inclusion for older people, this paper contributes an example of how older people help us understand their preferences for social connectivity. Specifically, in personal relationships and reciprocity, our findings demonstrated participants responding to each other and on-screen instructors in conversation through the program, but also in providing support back to the facilitator during moments of technological malfunction. This exemplifies how older people are important contributors to the development of technology in the products and programs designed for their benefit.

While this study included people living with dementia who were able to actively participate in social networks in their communities, supported by carers, volunteers, and staff in both community and institutional settings, our findings do not differentiate between older people and people living with dementia in this paper. This paper is also limited to sole focus on the Sharing Dance Seniors program. Assessment of the effectiveness of ICT-delivery may in this case be dependent on NBS's unique approach to digital delivery for the arts-based objectives of the Sharing Dance Seniors program. In this sense, the program and the technology used to deliver it may be inseparable as entities for assessment. A deeper look at how NBS approached the program with digital delivery in mind may be useful to understand the challenges and opportunities presented here. Further examination of the Baycrest NBS Sharing Dance Seniors mode of digital delivery, in comparison to other programs' approaches to digital delivery would help to identify success factors for enhancing social connectivity and social inclusion across digitally-mediated programs.

The Sharing Dance Seniors program supports social inclusion in the domain of social relations through digital delivery of social opportunities, providing older people, including people living with dementia and in rural and remote settings, access to dance instruction that

would otherwise not have been available, with trained facilitator support and feedback channels to support social connectivity at interpersonal, community, and societal levels. Our findings acknowledge the important role that older adults play in contributing to the development of technological innovations for social connectivity. Older adults' preferences for social connectivity point to the importance of in-person support and facilitation, with training to support that facilitation. The implications for social inclusion are in the opportunities that this program provides for local development of social resources, digital infrastructure, and digital literacy through facilitator and other potential training. The opportunities for social connectivity in the Sharing Dance Seniors program arise through its digital delivery as well as in the challenges that that delivery presents. Such challenges provided facilitators, carers, and participants the chance to support each other while they engaged in dance together.

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## References

- Baez, M., Nielek, R., Casati, F., & Wierzbicki, A. (2019). Technologies for promoting social participation in later life. In *Ageing and Digital Technology* (pp. 285-306). Springer, Singapore.
- Blusi, M., Asplund, K., & Jong, M. (2013). Older family carers in rural areas: experiences from using caregiver support services based on Information and Communication Technology (ICT). *European journal of ageing*, 10(3), 191-199.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Chen, Y., Hicks, A., & While, A. E. (2014). Loneliness and social support of older people living alone in a county of Shanghai, China. *Health & social care in the community*, 22(4), 429-438.
- Chen, Y. R. R., & Schulz, P. J. (2016). The effect of information communication technology interventions on reducing social isolation in the elderly: a systematic review. *Journal of medical Internet research*, 18(1), e18.
- Ferreira, S. M., Sayago, S., & Blat, J. (2014). Towards iTV services for older people: exploring their interactions with online video portals in different cultural backgrounds. *Technology and Disability*, 26(4), 199-209.
- Ferreira, S. M., Sayago, S., & Blat, J. (2016). Going beyond telecenters to foster the digital inclusion of older people in Brazil: lessons learned from a rapid ethnographical study. *Information Technology for Development*, 22(sup1), 26-46.
- Ijsselstein, W., Nap, H.H., de Kort, Y., Poels, K.: Digital game design for elderly users. In: *Proceedings of the 2007 Conference on Future Play*, pp. 17-22. ACM (2007).
- Khosravi, P., & Ghapanchi, A. H. (2016). Investigating the effectiveness of technologies applied to assist seniors: A systematic literature review. *International journal of medical informatics*, 85(1), 17-26.
- Khosravi, P., Rezvani, A., & Wiewiora, A. (2016). The impact of technology on older adults' social isolation. *Computers in Human Behavior*, 63, 594-603.

- Kosurko, A., Skinner, M., Herron, H., Bar, R., Grigorovich, A., Kontos, & P., Menec, V. (2020). Rural gerontechnology: arts-based insights into rural ageing and the use of technology. In Skinner, M., Winterton, R., & Walsh, K. (eds.) (in press), *Rural Gerontology: Towards Critical Perspectives on Rural Ageing*. Routledge: London (ISBN 9780367894795).
- Kurniawan, S. (2007, October). Older women and digital TV: a case study. In *Proceedings of the 9th international ACM SIGACCESS conference on Computers and accessibility* (pp. 251-252). ACM.
- L. Fozard, Jan Rietsema, Herman Bouma, JAM Graafmans, J. (2000). Gerontechnology: Creating enabling environments for the challenges and opportunities of aging. *Educational Gerontology*, 26(4), 331-344.
- Neves, B. B., & Vetere, F. (Eds.). (2019). Ageing and Emerging Digital Technologies. In B. B. Neves, & F. Vetere. (Eds.). *Ageing and Digital Technology: designing and evaluating emerging technologies for older adults* (pp. 1-14). Singapore: Springer.
- O'Connell, M. E., Scerbe, A., Wiley, K., Gould, B., Carter, J., Bourassa, C. & Warry, W., 2018. Anticipated needs and worries about maintaining independence of rural/remote older adults: Opportunities for technology development in the context of the double digital divide. *Gerontechnology*, 17(3), 126-138.
- Papa, F., Sapio, B., & Pelagalli, M. F. (2011, June). User experience of elderly people with digital television: a qualitative investigation. In *Proceedings of the 9th European Conference on Interactive TV and Video* (pp. 223-226). ACM.
- Pinto-Bruno, Á. C., García-Casal, J. A., Csipke, E., Jenaro-Río, C., & Franco-Martín, M. (2017). ICT-based applications to improve social health and social participation in older adults with dementia. A systematic literature review. *Ageing & Mental Health*, 21(1), 58-65.
- Poscia, A., Stojanovic, J., La Milia, D. I., Duplaga, M., Grysztar, M., Moscato, U., ... & Magnavita, N. (2018). Interventions targeting loneliness and social isolation among the older people: an update systematic review. *Experimental gerontology*, 102, 133-144.
- Raymond, E., Sevigny, A., Tourigny, A., Vezina, A., Verreault, R., & Guilbert, A. C. (2013). On the track of evaluated programmes targeting the social participation of seniors: A typology proposal. *Ageing and Society*, 33(2), 267-296.
- Saito, T., Kai, I., & Takizawa, A. (2012). Effects of a program to prevent social isolation on loneliness, depression, and subjective well-being of older adults: a randomized trial among older migrants in Japan. *Archives of gerontology and geriatrics*, 55(3), 539-547.
- Shvedko, A., Whittaker, A. C., Thompson, J. L., & Greig, C. A. (2018). Physical activity interventions for treatment of social isolation, loneliness or low social support in older adults: A systematic review and meta-analysis of randomised controlled trials. *Psychology of Sport and Exercise*, 34, 128-137.
- Skinner, M. W., Herron, R. V., Bar, R. J., Kontos, P., & Menec, V. (2018). Improving social inclusion for people with dementia and carers through sharing dance: a qualitative sequential continuum of care pilot study protocol. *BMJ open*, 8(11), e026912.
- Stojanovic, J., Collamati, A., Mariusz, D., Onder, G., La Milia, D. I., Ricciardi, W., ... & Poscia, A. (2017). Decreasing loneliness and social isolation among the older people: systematic search and narrative review. *Epidemiology, biostatistics and public health*, 14(2).
- Van der Heide, L. A., Willems, C. G., Spreeuwenberg, M. D., Rietman, J., & de Witte, L. P. (2012). Implementation of CareTV in care for the elderly: the effects on feelings of loneliness and safety and future challenges. *Technology and Disability*, 24(4), 283-291.
- Walsh, K., O'Shea, E., & Scharf, T. (2019). Rural old-age social exclusion: a conceptual framework on mediators of exclusion across the lifecourse. *Ageing & Society*, 1-27.
- Waycott, J., Vetere, F., & Ozanne, E. (2019). Building Social Connections: A Framework for Enriching Older Adults' Social Connectedness Through Information and Communication Technologies. In *Ageing and Digital Technology* (pp. 65-82). Springer, Singapore.
- Zhou, J., & Salvendy, G. (Eds.). (2017). *Human Aspects of IT for the Aged Population. Aging, Design and User Experience: Third International Conference, ITAP 2017, Held as Part of HCI International 2017, Vancouver, BC, Canada, July 9-14, 2017, Proceedings* (Vol. 10297). Springer.