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Learning from innovative staff practices that led to virtual disability services using the lens of Complex Adaptive Systems

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ABSTRACT

This paper draws on a Complex Adaptive Systems lens to develop an understanding of the staff practices that supported the development of Virtual Disability Services in Ireland amid the COVID-19 pandemic. The study involved twelve interviews with service providers, which were analysed using Reflexive Thematic Analysis, leading to two overarching themes. The first theme focuses on the logistics of constructing the response. This includes dynamic adaptiveness, technological readiness, a positive attitude towards technology, resource availability, digital skills, and the level of take-up. The second theme centres on the enacted response, which encompasses sensemaking, developing technological expertise, managing upward, fostering creative innovation, cultivating a systems sensibility, and creating conditions for psychological safety and authentic engagement. We conclude that staff practices are key for creating conditions conducive to safe spaces, sustaining well-being, and reshaping power dynamics and emphasise the importance of embracing technology as a tool for innovation within complex operating environments.

POINTS OF INTEREST

- Virtual Services offered a good alternative to face-to-face services for some disabled people during COVID-19: they supported people to stay connected while self-isolating.
- Even though some staff and disabled people did not have many technology skills before COVID-19, they learned in real-time, using the resources available to them.
- Online relationships were seen as more equal as everyone was learning as they went. People with disabilities developed new skills and sometimes co-facilitated sessions. This gave them greater choice and control over how they interacted with services and changed power relationships within services.

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Virtual disability services; COVID-19; Complex Adaptive Systems; staff competencies; psychological safety; technology

- Having choices about how to access services is in line with enhancing rights and choice under the Convention of the Rights of People with Disabilities.
- Promoting digital inclusion may protect people against future societal disruptions.

Introduction

This paper explores the development of virtual disability services in Ireland during the first half of 2020. Face-to-face services were suspended after the World Health Organisation declared COVID-19 a global pandemic, and despite limited digital literacy amongst both disabled people and staff, virtual programmes mushroomed quickly across day services, independent living programmes and university disability services (Fortune et al. 2024).

This paper focuses on understanding if and how services innovated. This is important as digital inclusion is not only a right under the UN CRPD it is becoming increasingly intertwined with social inclusion (Chadwick et al. 2023). As staff often act as gatekeepers to internet access (Engwall 2023; Seale 2023), how they innovate is important for future service design.

Digital engagement of people with disabilities prior to the pandemic

The value of online engagement for people with disabilities was established in the international literature before the pandemic. The Internet offers a way to access peer support and develop new relationships without having to leave home (Braithwaite, Waldron, and Finn 1999; Seymour and Lupton 2004). It opens up new opportunities to enhance creative expression (Finn 1999) and facilitates a choice to explore identities, as disclosure of disability is sometimes optional (Caton and Chapman 2016; Borgström, Daneback, and Molin 2019). While the role of digital inclusion in reducing stigma attached to disability is inconclusive (Ueland, Hinds, and Floyd 2021), people with disabilities indicate that it enhances their sense of control over their lives (Borgström, Daneback, and Molin 2019). For example, young people with intellectual disabilities view social media as a way to enhance friendships, social identity and self-esteem (Chadwick and Fullwood 2018). Despite the advantages reported by people with disabilities, digital engagement was not a common practice within Irish disability services prior to the pandemic, which meant that they were not geared up for digitalisation entering the pandemic.

Disability services prior to the pandemic

Three critical contextual factors contributed to the logistical complexity of developing virtual services in Ireland. Firstly, services consisted of a complex mix of diverse organisations – both state and NGOs – of varying focus, size,

and geographical spread. They serve 643,000 people, including 18,000 attending day services spread over 1000 locations, and 15,500 in third-level education (HSE 2020). This diversity presented challenges in coordinating and implementing consistent responses across a range of services and supports. Secondly, entering the pandemic, staff digital skills and the digital skills of disabled people using services were poor. A new Digital Literacy strategy was developed during the pandemic (Solas 2021). Competency frameworks for staff that recognised the potential of technology to enhance the lives of people with disabilities were developed but did not come into operation until 2023 (CORU 2019). Thirdly, the National Disability Inclusion Strategy (NDIS 2017) was coming to the end of its life during the pandemic and did not include technology or comply with the UN CRPD, which the new strategy currently in development, promises to do. This points to a lack of policy direction entering the pandemic, which combined with low digital literacy among disabled individuals and staff, exacerbated a lack of preparedness for the disruption of COVID-19 (Walsh, Cormack, and MacLachlan 2020).

Together, the organisational landscape, staff competencies and lack of national policies, point to a complex and an ill-equipped landscape, and poor engagement online despite the known benefits.

Disability and risk during the pandemic

People with disabilities were at a higher risk of contracting COVID-19 due to co-occurring health issues (Maric et al. 2022) but also due to pre-existing structural inequalities in healthcare, poor access to information, stigma and marginalisation (Pincock et al. 2024; Kamalakannan et al. 2021; Sabatello et al. 2020; O'Sullivan et al. 2021). In May 2020, the UN urged countries to prioritise their needs (UN 2020); while Irish health services recognised the risk (McCarron et al. 2021), disability services were not considered essential and remained closed.

There is a growing body of literature focusing on concerns posed by disability during the pandemic including: the impact of systemic disadvantage prior to the pandemic (Armitage and Nellums 2020; Jesus, Landry, and Jacobs 2020; Mladenov and Brennan 2021); the need to review service design (Trip et al. 2022; Bradley 2020); issues around the digital divide (Cho and Kim 2022; 2022); and improvements needed to access technology including Assistive Technology (Puli et al. 2021; Smith et al. 2021; Mccausland et al. 2021; Brooks et al. 2020). Individuals with disabilities faced higher levels of trauma and stress due to marginalization, systemic oppression, and ableism (Lund et al. 2020; Mladenov and Brennan 2021) and mortality amongst people with intellectual disabilities was higher than other populations in some countries (Lunsky et al. 2022; Williamson et al. 2021). Mental health was affected (Hyland et al. 2021) and this extended to family carers (Willner et al. 2020) many of whom were elderly

parents now caring alone (Kelly 2015). Staff also had concerns for their own health, well-being and financial security (McFadden et al. 2021; McMahon et al. 2020).

People with disabilities during the pandemic

People with intellectual disabilities experienced overwhelm and anxiety due to the disruption of routines and loss of social contacts: connecting online supported better mental health (Lake et al. 2021) and mitigated against isolation (Brooks et al. 2020; Spassiani et al. 2023). Online contact was viewed by people with intellectual disabilities as being critical to maintaining interpersonal relationships, social inclusion and resilience (Mccausland et al. 2021; Scheffers, Moonen, and van Vugt 2021). Not only did they receive support, they gave it also (Lake et al. 2021). Many different activities drew people together, but staying connected was a thread throughout: for people with dementia, stroke, Chronic Obstructive Pulmonary Disease and Parkinson's disease choirs provided a space to meet and experience a sense of togetherness (Tamplin and Thompson 2023), exercise programmes for people with Multiple Sclerosis were as much about connecting as the activity itself (Galway et al. 2024; Maric et al. 2022).

Barriers to online engagement are also well documented. It did not suit everyone: some people got frustrated with the complex task of getting online or did not like to see themselves on the screen (Fortune et al. 2024). Many found the technology inaccessible, and could not access resources to participate (Chadwick et al. 2022). Service provider perspectives point to the benefits of not having to travel or spend time setting up meeting rooms, but note a cost in being less able to have one-to-one informal chats with service users and feeling connected to colleagues (Fortune et al. 2024). Safeguarding concerns and assumptions about the capability of people with disabilities to participate online often inhibited migration to online settings, even when the benefits were acknowledged (Gelfgren, Ineland, and Cocq 2022). Since the pandemic there have been calls for governments and service providers to develop skills and capacity for virtual service delivery (Wenger-Trayner et al. 2015; O'Sullivan et al. 2021; Smith et al. 2022). However, the focus is often on digital skill competencies rather than innovation or facilitation. This paper addresses a gap in the literature by focusing on learning about what disability services did to innovate in the midst of the complexity of living through the pandemic.

Taking a complexity approach to understanding the development of virtual services

Complexity theory is being increasingly used in health systems to understand how complex systems operate (Kwamie, Ha, and Ghaffar 2021; Kwamie 2015;

Carroll 2021). A complexity framing sees organisations as evolving organically through interactions with their environment (Boulton, Allen, and Bowman 2015) and helps understand the impact of disruption and instability (Jackson 2019). Complex systems that exhibit the capacity to change and learn from experience through interaction are often described as Complex Adaptive Systems (CAS) (Holland 2014). CAS offers a metaphor for qualitative research that embraces rather than tames or ignores complexity (Rosenhead et al. 2019).

Prieser et al. (2018) outline six organising principles of CAS that may help to characterise innovation in disability services. Firstly, they are comprised of a complex web of interlocking relationships, structures and activities that form a living system (Capra and Luisi 2014). Secondly, they can adapt and self-organise to develop complex structures without external strategic control (Ashby 1947) in response to external (meta) environmental impacts and opportunities (Kauffmann in Ramage 2009; Sturmberg, 2016). The third organising principle relates to their dynamic nature, which allows them to function far from equilibrium or stability, making them adaptable in extreme conditions. Fourthly, they are radically open to allowing flow of information and resources in and out whilst sustaining the integrity of their identity. The fifth principle is that CAS are also determined contextually: their functions change as context changes. The sixth principle points to the emergence of different and often novel outcomes due to the difficulty in tracing cause and effect. Its opposite might be regarded as dynamic conservatism, where an organisation seeks to maintain its current identity and functioning even when faced with crisis (Schon 1971). Our research seeks to contribute to an understanding of what some services did to adapt and to create a safe space for attendees, even if ill-equipped, in the high-stakes context of a pandemic.

Research process

A purposive sample of managers, service co-ordinators and AT specialists involved in the development and delivery of online adult services across four categories of disability supports were interviewed for this research (see Table 1). Ethics approval was granted by Maynooth University (ID: 2409706). An invitation to participate was issued through a gatekeeper – FreedomTech – a collaborative project between the Disability Federation of Ireland (representative organisation) and Enable Ireland (national service provider organisation). Respondents consented to participate in semi-structured interviews conducted online between June and September 2020. Twelve interviews followed an interview guide with 9 questions. Interviews were recorded and transcribed by JO'D.

Table 1. Profile of interview participants.

Category	Organisation descriptor	Service type
Physical and sensory organisations		
Large national service	Health and Social Care	
	Large national service	Education and Training
Intellectual disability	National sensory organisation	Health and Social Care
	Large national provider	Health and Social Care
	Local Rural service	Health and Social Care
Condition specific	National organisation	Education and Training
	National organisation – Musculo-skeletal disorder	Education and Training
	Small national organisation – neurological condition	Health and Social Care
	National organisation - neurological condition	Health and Social care
Purpose driven	University Disability Service	Education
	University Disability Service	Education
	Disabled Person's Organisation	Training and Education

Data analysis

Data were analysed using reflexive thematic analysis (Braun and Clarke 2006, 2021; Braun, Clarke, and Hayfield 2019) underpinned by a systemic constructionist approach to understanding social phenomena as systemically interconnected and complex (Jackson 2019). The balance of analysis favoured inductive over deductive analysis in order not to over-simplify complexity in the data (Braun and Clarke 2020). The procedural steps helped steer a clear path between acknowledging the positionality of the researcher (Holmes 2020) and ensuring that interviewee accounts were not dissected or decontextualised through overreliance on a code: book; researcher reflexivity supported iteration and rigour at critical decision points. A data familiarisation process was used to develop codes and candidate themes which were reviewed and refined through the development of mind maps and constant checking with data to ensure a good fit between data, code and theme. The themes were reviewed for patterns and clusters, further revised, and refined to construct a narrative that embraced both descriptive themes centering on the logistics of the technical response and latent themes around the experience of being within the virtual environment as a living process. MAXQDA software was used to assist with coding. All interviewees are quoted in the results: quotes are chosen for relevance and representativeness.

Results

Two meta-themes were generated: *constructing the technical response* and *being in the virtual space*, sustaining virtual connections and engaging in continuous sensemaking. Together they represent the dual concern articulated by Heidegger (1967) between building or constructing something whilst at the same time dwelling/being within it. To use an analogy: developing online

services could be described as building the plane (constructing the technical response) whilst flying it at the same time (being in the virtual space).

Constructing the technical response

Regardless of size or purpose, all services faced significant technical challenges. Successful transition was the product of a dynamic interplay between organisational style, level of dynamic adaptiveness, technological readiness, orientation towards technology as an empowering tool for clients, and how these factors interacted with the availability of resources and staff willingness and know-how to adapt and innovate. It also relied on sufficient levels of demand and participation amongst disabled people to proceed.

Level of dynamic adaptiveness

For most organisations, migration to online services was first initiated by individual staff who set up ad hoc sessions such as yoga classes on Zoom. As time progressed, larger organisations co-ordinated responses across services but others were slower to respond, leaving staff to run solo. Staff in one organisation brought computers home prior to the official lockdown to test how everything worked. A small family-centred organisation took a week to respond, while another seized the opportunity to expand their reach:

I thought, great, I can push this now and push it with the organisation...everyone bought into it. So we had quite a quick turnaround; within a week of the lockdown we had already started doing scheduled zoom activities.

Some took time to redesign courses or develop internal capacity, but a delayed response often related to a desire to preserve their current way of functioning. Some organisations favoured the continuation of in-person services as essential services. Dynamic adaptiveness could also be detected in the extent to which organisations engaged beyond their own boundaries: several organisations engaged external support to design services by reaching out to potential funders, policy-makers, course designers, industry and a community of practice for AT. A university disability service moved from the periphery to become a central resource to online teaching across the college.

Technological readiness

The sophistication of the organisations' technological infrastructure impacted on their start point. While a strong internal infrastructure smoothed the transition somewhat, even those with dedicated assistive technology services struggled to create viable infrastructure. One service was unable to use technology already installed due to a lack of training, another had recently

transitioned to a new record management system which gave staff confidence to transfer their learning to a virtual service:

I think the fact that that group were working on a new system and working on that system together, helped...if anybody did have a fear of the technology...it's encouraged them to realise it's manageable.

Most organisations, however, did not have technology infrastructure that could support the transition. They lacked up-to-date hardware, accessible websites, access to smartphones and internal IT support. For example, one website was '*held together with rubber bands*' making it impossible to upload an accessible timetable of events. Another could not embed videos deemed essential to communicate with clients and a small national organisation relied on their external IT contractor for guidance on accessible platforms and GDPR.

Orientation towards technology

Organisational orientation towards the role of technology in people's lives also impacted on their response. Technology was a given in third-level institutions and organisations with existing AT services. The use of WhatsApp was discouraged by the Health Service Executive and organisations drew a boundary between in-service supports and encouraging use beyond the context of the service. Safeguarding dilemmas were ongoing:

I was meeting a lot of resistance, in terms of "oh but you can't use WhatsApp, oh what about GDPR? but that wouldn't be secure - then you would be teaching them to use social media and what if they did something afterwards that wasn't ok?"

A broad lack of understanding of the potential of technology to enhance the quality of people's lives prior to the pandemic also impacted understanding what was needed now:

There's inventories of PC's and printers and coffee machines, but there's no inventory of equipment that people could use to enhance the quality of their day.

When it came to developing a virtual service, this team operated in isolation, with little support from higher management. In organisations with a poor understanding of the role of technology, staff and disabled people alike were also likely to have issues around digital literacy.

Availability of resources

Organisations varied in their approach to funding virtual services, staffing and time.

Funding. Some interviewees developed proposals to divert funding that were immediately accepted by internal management and the Health Service Executive. Others sought external funding for equipment, and one described

how they '*emptied their shelves*' of all the equipment they had to equip both staff and clients. However, virtual services were not a priority in all organisations: one interviewee from a large national organisation described how they relied on a free Zoom account, citing a '*rigidity*' within the governance of the organisation that made it impossible to access resources:

We ran out of Wi-Fi at one stage and staff were using their own mobile phones as hotspots to create zoom classes,... where staff have gone beyond what they would be expected, so they were basically using their own equipment, their own phones, to still make that contact.

Staffing. The availability of staff impacted the development of virtual services. Some staff within large national service providers were initially redeployed, and most services had a reduced staff-client ratio. This limited their capacity to contribute or support participation in virtual services where other priorities intervened, particularly in residential settings.

Technology and Broadband. Broadband access often depended on geographical location, resulting in an inability to work for some staff, as well as a lack of access to services for some people with disabilities.

Time. The transition to online services required extensive time investment in the provision of devices and training to use them, ensuring internet access, as well as allowing space for people to become acclimatised to using online platforms. One interviewee described the multiple tasks thus:

...delivering sessions, then to be off, driving across the city, collecting the device, cleaning the device down, setting the device up and doing exactly the same, bringing it back. And that was never just a one-off, it constantly had to be redone.

Supporting people to get set up with technology and access broadband was most difficult from a distance and often involved face-to-face meetings or house visits. Getting students set up with accessibility features and AT in preparation for college was impossible remotely: it required preparing laptops with accessibility features and observational competency assessments. There were concerns that supporting this remotely would have a greater cost in the long run:

It's gonna be so difficult to support a student who has technical difficulties with a device or service or a software - the flip side -that this will be pushed out so much and I need to meet them at so many more regular intervals.

Staff digital skills. A lack of digital literacy amongst staff was overcome by willingness to work and learn together. While organisations with a specific AT remit had a head start, frontline staff were not recruited for their technological

skills and pre-existing digital skills did not necessarily correlate with successful transition as this interviewee suggests:

Some staff would have been similar to clients in terms of their use of technology – it would have been very minimal. So, then you have to bring them on that journey as well. Some people were going “yeah, I really know this stuff” and some people said “I haven’t a clue”. But sometimes the people that didn’t have a clue were interested in adapting, but not everybody was.

Staff needed to be one step ahead of those joining a session and have one tech-savvy person on a team to guide them. However, not everyone adapted due to a lack of digital access, redeployment, and family or caring responsibilities compounded by the pandemic.

Level of take-up amongst disabled people

Online services suited some people with medical or anxiety issues who struggled with face-to-face services, but did not suit everyone. Some were ‘intimidated’ by technology. Others did not want to see their own image mirrored back to them or be put on the spot in an environment where they felt exposed. Some people experienced greater mental ill health, along with all the other complications of living through a pandemic. Many disabled people did not have phones, and where they did, they were limited to phone calls and texting. Again, digital literacy and access to technology was not always a deciding factor in participation, and those who found value in online services, often found ways to participate, even when it meant borrowing a phone. Staff support influenced the level of take-up: they encouraged people to onboard *via* phone, developed individually tailored stepping-stones to participation, including one-to-one or hybrid sessions. Written instructions and etiquette guidelines also ensured everyone understood they could be seen on camera and had opportunities to contribute.

Being in the virtual space

The following section deals with themes associated with being in the virtual space, were divided between the development of virtual connections and enacted sensemaking amongst staff. Virtual connections refers to sustaining connection and a growing sense of interdependency and autonomy, that put traditional power dynamics into flux. Enacted sense-making involved working through complexity and consideration of the future of services.

Virtual connections

Sustaining connection. Staying connected with peers and staff was regarded as the most valuable aspect of meeting online. It allowed everyone to spend

time with friends and peers who were 'going at the same speed'. In some instances the named activity acted as a vehicle for spending time together, and getting emotional support as the following account conveys:

They can catch up with each other and give each other mutual support and maintain the really valuable relationships that they've made in the groups and they get to laugh and joke, cry at times and share the good things and the positives.

Familiarity was a prerequisite for success, whether it was with peers, day service staff, volunteers or facilitators for sessions, or familiar locations. Familiarity created conditions for banter and humour in interactions. This created a ground from which to extend levels of comfort, including amalgamating services and groups. Familiar environments also impacted positively on participation and exam performance for some people with autism or anxiety. Familiarity for people with severe to profound intellectual disabilities involved embodied cues from facilitators and content showing familiar environments.

It was important for people to see each other, and it was also important to be seen. For education services, this meant staff turning on their video when talking to disabled students and developing video-based web content. It was equally important to be heard and free to say what they wanted to say and be listened to. One service kept a chat room open all day that ran beside programmed activities:

When I go into the chat room I see the people really suffering from isolation - they were in there - they could talk. They'd have a staff member there, they'd have their friends there...a couple of people, while this was all going on had a loss, they had parents who passed away.

An understanding of the significance of informal 'kitchen-table' conversations formed part of the design of online services, but the coffee break in more formal training sessions also translated well online. Being in a virtual space together brought a level of transparency and equality that meant everyone could see what was happening and get their view across, and the Chat function meant they didn't have to talk over each other or compete for space.

Growing appreciation of interdependency. As services 'entered' people's homes in novel ways and family members became part of online events, human interdependencies (rather than one-directional dependencies) became explicit as '*everyone got to see a little bit of each other*' and supported each other. Parents supported their adult son or daughter to access sessions, siblings supported cooking lessons, and everyone engaged in the 'banter' and 'craic'. Staff were also being observed as they worked:

There's a lot of magic involved in what happened and a lot has got to do with the willingness to be transparent and expose yourself like this into somebody's home.

Staff were cautious about respecting the privacy of families. Whilst some acknowledged that their primary purpose was to support the disabled person, they were equally aware that some families also struggled and needed support. There was a heightened sense of appreciation for each other resulting in a high level of positive feedback and a new understanding that everyone needed each other:

Some of the parents said that they {disabled person} just waited - that this is all that they wanted to do that day. They were waiting half an hour ahead of time for the thing to kick off and it made their day.

Disabled people expressed a renewed appreciation for each other including the smoothing out of longstanding relational difficulties and a levelling of hierarchies within peer groups.

Individual autonomy. Engaging remotely from the safety of home gave some people greater autonomy to make active choices about when and how to engage and to access courses at their own pace. It gave power back to the disabled person about how to participate as the following quote exemplifies:

There's one person who absolutely flourished in the online way of doing things. I think what works really well for him is the element of control that he has. He can decide whether he wants to be there or not. He can mute himself if he wants. He can turn off his camera if he wants to. I think those little controls meant quite a lot to him.

Autonomy was curtailed in ways beyond the control of virtual supports: some people had little privacy to speak to staff about issues they would rather not discuss in earshot of family, and others were reliant on those around them for support with setting up calls and participating. Some students no longer had access to the Personal Assistants they would have had in college, making tasks such as turning on the computer to attend lectures difficult.

Power relations in flux. The move to virtual services impacted traditional power dynamics between staff and policymakers, staff self-organised without national policy guidance and this produced new opportunities for meaning-making. The power relations between 'user' and 'provider' were also put into flux as everyone began to develop greater agency and autonomy, and at the same time came to a new understanding of how dependent they were on each other. A felt sense of everyone being in it together created greater parity within relationships between disabled people using services and staff. In some instances, attendees co-facilitated or led sessions and at other times, they led without staff direction or facilitation.

This shift in dynamics was a source of discomfort at times: one interviewee told of a colleague's decision not to run sessions with breakout rooms due

to frustration that her prepared activity was being overshadowed by conversations between participants. In other instances, management prioritised meetings over supporting participation in virtual services and staff who had worked with the same people for a long time made decisions *for* them about their capacity to participate:

We asked people, do they have a smartphone? And do they have a computer? And if they didn't have either of those, we went, "well, they can't do it", instead of saying "Ok, maybe there's a family member has this; maybe somebody in their family could come over and show them". So, there were decisions made that ruled people out of things.

These incidents prompted internal reflection that led to changes in practice.

Relational power between disabled people and organisations. As technology replaced geography as an access point to services, potential to migrate to different organisations was regarded as a risk to the future of face-to-face services. One interviewee, reflected that day services were not investing in creating the kind of stimulating environments that attendees needed to sustain well-being and would need to 'up their game' to retain levels of attendance beyond the pandemic. Others suggested that disabled people might make different choices if they controlled their own budgets and could choose between services, while a Disabled Persons Organisation member reported that were already experiencing an upsurge in participation, stating that people were leaving day services to join:

quite a lot of our participants are involved in day centre activities, and with the lockdown, their contact stopped. Also, there was very little IT contact with participants, compared to what we were doing...we had a lot of participants.

Relational power between staff and organisations. Power shifts included increases in staff agency to initiate and contribute to the collective response to going online. Some staff 'managed-up' by preparing plans within their teams for sign-off by management, and proactively securing permission to repurpose funds; others with AT expertise found themselves central to the task of coordinating the organisational response. These shifts led to a growing realisation that governance structures constrained staff capacity to deliver a valuable service on the ground under usual circumstances. One interviewee described it this way:

The guys come here for a place to go every day, in place of going to work. So this is their life. And what they do during the day here - it's got to be beneficial, nourishing, rewarding and worthwhile, that they actually want to come here. I think

service providers would be doing a better job if they took seriously what the content of the day consisted of, because it does affect mental well-being to a large extent... but I think the system needs to be given a jolt, in the same way COVID has given us all a jolt.

Virtual disability services created a shift in relational power at different levels of the system, prompting greater ownership amongst attendees and reflection amongst staff.

Enacted sensemaking among staff

Creating and working within online environments required balancing of complexities of working in a crisis context in which services operated far from their usual equilibrium. Uncertainty around personal and family health, job security and the trajectory of the virus formed an ongoing backdrop to the enacted response.

Sensemaking and self-organising. Services were enacted as a live interaction between people working in concert with each other to create the conditions for positive and healthy engagement.

Staff found themselves continuously managing complexities in:

- developing session content and session delivery
- navigating technology and facilitating
- balancing activity and conversation
- ensuring equity of contribution and participation
- creating an upbeat social space and a safe space for tougher personal issues
- balancing individual and group needs
- balancing individual and family needs
- dealing with work and home life in one space.

Getting the balance right required a new level of alertness and constant sensemaking. Figuring out what was needed and when relied on collaborative work practices that emerged as a relational dynamic between different contributors, and a level of self-organising beyond the usual organisational hierarchy. One interviewee observed learning amongst peer trainers:

We had two people who are very newly trained- that amazed the whole lot of us – [they] just knocked it out of the park, just like they were natural. But they spent a lot of time talking to each other and saying: 'let's do it this way'.

Everyone stepped up and beyond their usual roles and 'embraced new responsibilities' and made the most of organisational resources to craft a meaningful response. In doing so, they found new levels of creativity within

themselves. They kept contact with people where they could, often going over and above their working hours. In doing so, they innovated and developed new skills in real time.

The future of virtual services. Interviewees viewed COVID-19 as an opportunity to reorganise services and all but one expressed a preference for blended services in the longer term. There was a strong desire to continue to provide services beyond 9 to 5, and to continue to create greater parity of esteem between participants and staff. Interviewees spoke of the opportunity that the disruption of *'business as usual'* had created and how it had unstuck a system in which it was sometimes difficult to serve beneficiaries effectively: they would be 'disappointed' if the innovations fell away post-pandemic.

Discussion

The findings of this research are consistent with literature that indicates that going online requires investment in time and is dependent on staff attitudes towards technology (Fortune et al. 2024; Chadwick et al. 2022; Gelfgren, Ineland, and Cocq 2022), and that relationships can be sustained online and are critical for reducing isolation (Brooks et al. 2020; Spassiani et al. 2023). This study identifies two overarching characteristics of virtual services that distinguish virtual from face-to-face services, though they share similar purpose. Firstly, they can be described as CAS, and secondly, staff practices explain how to engage with complexity so that connections are sustained, and lead to the emergence of new possibilities for service users. When considered together, they support learning about future innovation.

Disability services as a Complex Adaptive System

The urgent need to find alternative ways to support diverse populations of disabled people left services in a double-bind: face-to-face contact was potentially life-threatening as much as isolation was potentially devastating. Some developed alternatives, when strategy and policy offered insufficient guidance, in a way that is consistent with the six principles for CAS (Preiser et al. 2018):

1. *Constituted relationally*: the interaction between different parts of disability services determined capacity to adapt, rather than individual departments or functions such as IT, management or policy alone.
2. *Adaptive*: services adapted to external conditions by self-organising to craft responses that fitted their needs and engaged in active sense-making to calibrate responses over time, rather than being incapacitated by restrictions that forced physical distancing.

3. *Dynamic*: the emergent sense of interdependency between staff, attendees and their families all of whom were giving and receiving feedback from each other shaped how services developed.
4. *Determined contextually*: each response was shaped by organisational purpose and people served rather than a preconceived generic design.
5. *Radically open*: cooperation cut across hierarchy, roles, and boundaries within and beyond individual services to create a new flow of information that contributed to sensemaking and learning.
6. *Emergence of novelty*: responses were characterised by nonlinear causality in the present study which could not have been planned for: a fresh level of innovation and creativity, a new sense of agency amongst attendees, and a reframing of relationships with families, in a way that contested traditional power dynamics. Staff worked around external conditions, responded to feedback, and learned iteratively resulting in the creation of something new (Maturana and Varela, 1987)

These principles offer a good understanding the conditions necessary to adapt in highly complex and unpredictable environments where the very fact that organisations were operating 'far from equilibrium', supported innovation (Jackson 2019).

Staff practices

While CAS is a good descriptor of the systems in motion, it does not describe the practices that support practitioners engage with complexity (Jackson 2019; Kwamie, Ha, and Ghaffar 2021). Exploring *what staff did when they did what they did* in practice (Ison 2017) can account for the embodied practices that effectively reframed services as a relational dynamic between people and parts of the system rather than defining services by roles and functions (Raelin 2011, 2018; Chia and Holt 2006). These practices included developing technological know-how, engaging in sensemaking in real time, managing up and out and innovating creatively using a systems sensibility. Practices also involved creating conditions for containment and safety while engaging authentically. These practices, evident in the subthemes identified, were critical to allowing the system to operate as a CAS (Table 2).

Prior to the pandemic, a lack of understanding of the potential of technology for individuals with disabilities had led to exclusion from the digital world (Ueland, Hinds, and Floyd 2021). Even so, the most novice users of technology travelled considerable ground to develop enough technological know-how to construct and deliver online services as part of a team. While Hilty (2017, 2020) uses 'technological know-how' to describe cross-disciplinary

Table 2. Staff practices demonstrating a complex adaptive system evidenced by sub-themes.

Practices	Leading to the emergence of CAS	Evidenced by sub themes
Developing technological know-how	Adaptive	Level of dynamic adaptiveness Technological readiness Orientation towards technology Availability of Resources Staff Digital Skills Level of take-up
Sensemaking in real-time	Determined contextually Adaptive	Working through Complexity: sensemaking and self-organising
Managing up and out	Radically open	Resourcing the response Power relations in flux
Innovating creatively	Emergence of novelty Developing systems sensibility	Resourcing the response Sustaining connection Dynamic Growing appreciation of interdependence Individual Autonomy Future of services
Creating containment/safety	Constituted relationally	Sustaining connection Level of take-up
Engaging authentically	Constituted relationally	Growing appreciation of interdependency Power relations in flux Sustaining connection

tele-behavioural health competencies, it is used here to describe the use of technology using procedural and tacit knowledge as part of a shared practice.

Staff engaged in continuous ‘mutual participatory sense-making’ (Varela et al. 2017, 819) through social interaction, which made a collective response possible. Virtual services were designed as bespoke responses, requiring constant calibration to balance complex concerns. Sensemaking was an embodied activity bringing congruence to mental and bodily sources of intelligence, to process feedback through the screen and sense the next right thing to do.

Most initiatives started on the ground amongst staff, who then managed up by bargaining for resources and legitimacy to continue. Many acted as boundary-spanners (Wenger-Trayner et al. 2015), seeking support from across the organisation and sector in a way that could be described as self-sustaining as well as self-organising. This capacity to be radically open is crucial to the survival of a self-organising system, which might otherwise ‘starve’ itself of the resources it needs to remain viable (Maturana 1992). Localised innovation, where staff ‘managed-up’ impacted on some entrenched power dynamics, producing new opportunities for meaning-making and filling the void left by the traditional holders of symbolic role-based power (Bourdieu 1979) who lacked the capacity, information and access to resources to respond at scale.

Staff drew on their personal and collective creative capabilities, harnessing skills beyond their job roles and stretched their creative capacities, making

the most of limited resources, even when it took them far beyond their comfort levels.

By opening up the boundaries to include other family members, where appropriate, and develop an appreciation of the interdependencies between everyone, they also harnessed a sense of interconnectedness, that changed the relational and power dynamics between everyone.

Staff worked together to create a space experienced as sustaining and psychologically safe. Psychological safety is a shared belief within a group where individuals feel safe to engage and innovate, take risks without fear of negative consequences, express ideas, opinions, and concerns without judgment or retribution (Schein and Bennis 1965; Edmondson 1999; Edmondson and Bransby 2023). It has also been regarded as an initial step towards belonging in research with people with disabilities (Milner and Kelly 2009). They developed a tolerance for staying with the discomfort of not knowing how to be or what to do which allowed attendees to exercise greater agency over their participation and contribution even when it felt risky. This required a strong sense of presencing, described as a deep listening to what is emerging beyond old ways of engaging in order to make sense of the now and serve that which is evolving (Davies 2006).

Staff shared openly in a way that created the conditions for conversations considered authentic (Krippendorff 2009). This required a willingness to be seen as vulnerable whilst sustaining a sense of safety. The quality of relational presence included using facial expressions, gestures, voice and humour as well as conveying ease with the technology that gave people accessing services confidence in their ability to adapt in an environment experienced as safe.

Implications for future learning

Online services cannot be equated with in-person services: they do not suit everyone, but it does not mean they are an inferior offering. Rather they are emerging as a distinctly complementary way of sustaining connection that leads to life satisfaction and happiness (Navas et al. 2021) enhanced choice and greater creativity (Lake et al. 2021; Chadwick et al. 2022). The boundary between what can be seen or not online means that courses need to be redesigned to take account of the limitations of the screen, maintaining privacy when entering someone's home virtually also demands keenly attuned facilitation and involves new levels of transparency and vulnerability for everyone. Most importantly it offers an opportunity to develop digital skills and be socially included in an increasingly digitalised world (Chadwick et al. 2022). This research points to a clear appetite for change within services, which is echoed in research calling for governments and services to invest in

digital skills in line with enhancing rights under the UN CRPD and Sustainable Development goals (O'Sullivan 2021, Smith et al. 2022).

This study identifies three recommendations for future service design. Firstly, investment in staff innovation skills alongside greater autonomy and commensurate accountability structures is recommended. When organisational equilibrium is thrown out of synch by disruptive events, the impetus to innovate is strong. As time goes on, systems seek stability, including a return to face-to-face services (Fortune et al. 2024) and this poses a risk to long-term adaptability. Secondly, we recommend investing in staff facilitation practices, and service user facilitation skills that support co-facilitation. Staff practices can contribute to unsticking organisations (Smith 1997), in line with the UN CRPD mandate to move towards greater choice and self-determination. We found a significant shift in the relationship between people attending services, families and staff which was grounded in an appreciation of their mutual interdependency. The facilitation of a safe space allowed people to see each other in new ways and also to have greater autonomy and exercise greater choice over their interactions. Staff observed disabled people moved from being 'occupants' of services to being 'contributors' (White et al. 2010).

Thirdly investment in digital literacy amongst service users and staff is recommended. This research points to the value of technology to support resilience in services and sustain connection and social inclusion (Chadwick et al. 2022). Technological know-how is critical for all staff working with people with disabilities to avoid attitudinal barriers and gatekeeping (Seale 2023; Lake et al. 2021).

These three recommendations are indivisible: innovation alone does not imply facilitation capabilities, and facilitation plays a role sustaining contact, but requires technological know-how. In the same way, technological skills must not become an end in themselves in human-centric services (O'Donnell, Desmond, and MacLachlan 2022). Together they point the way to developing virtual services and capitalising on the learning from the pandemic.

Conclusion

Services are poised at a crossroads: the impetus to develop virtual services requires an appreciation that disruptive events can occur at any time. It also speaks to the right to have a choice of if, where, when and how to participate. It is not a choice between either location-based or virtual services: it is about creating optimal points of connection for each person. This research does not discount the severe hardship of living through the pandemic, or the significance of digital poverty, but it does point to an emerging level of resourcefulness and resilience amongst some services and disabled people,

and recalibration of power dynamics that cannot be easily reabsorbed into previous practices. This speaks to the growing appetite for virtual co-created spaces consistent with the organising principles of complex adaptive systems. In conclusion, the enacted practices of people working together in self-organising groups led to the creation of psychologically safe virtual services that sustained relationships, pointing a way forward for further investment in innovation, facilitation and digital skill development.

Limitations of research

This research focused on staff perceptions of virtual services across all types of disability services. Those interviewed self-selected and no disabled people or their families attending services were interviewed. This complements research on service user experiences during the Covid-19 pandemic (Fortune et al. 2024). Future research could investigate what happened for staff, services and disabled people who did not adapt to virtual services, as well as to policy-makers.

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Data availability statement

The data that support the findings of this study are available from the corresponding author JO'D upon reasonable request. Armitage, Richard, and Laura B. Nellums. 2020. "The COVID-19 Response Must Be Disability Inclusive." *The Lancet. Public Health* 5 (5): E257. [https://doi.org/10.1016/s2468-2667\(20\)30076-1](https://doi.org/10.1016/s2468-2667(20)30076-1).

Ashby, W. R. 1947. "Principles of the Self-Organizing Dynamic System." *The Journal of General Psychology* 37 (2): 125–128. <https://doi.org/10.1080/00221309.1947.9918144>.

Borgström, Åsa, Kristian Daneback, and Martin Molin. 2019. "Young People with Intellectual Disabilities and Social Media: A Literature Review and Thematic Analysis."

- Scandinavian Journal of Disability Research* 21 (1): 129–140. <https://doi.org/10.16993/sjdr.549>.
- Boulton, J. G., P. M. Allen, and C. Bowman. 2015. *Embracing Complexity: Strategic Perspectives for an Age of Turbulence*. Oxford: OUP.
- Bourdieu, P. 1979. "Symbolic Power." *Critique of Anthropology* 4 (13-14): 77–85. <https://doi.org/10.1177/0308275X7900401307>.
- Bradley, Valerie J. 2020. "How COVID-19 May Change the World of Services to People with Intellectual and Developmental Disabilities." *Intellectual and Developmental Disabilities* 58 (5): 355–360. <https://doi.org/10.1352/1934-9556-58.5.355>.
- Braithwaite, Dawn O., Vincent R. Waldron, and Jerry Finn. 1999. "Communication of Social Support in Computer-Mediated Groups for People with Disabilities." *Health Communication* 11 (2): 123–151. https://doi.org/10.1207/s15327027hc1102_2.
- Braun, Virginia, and Victoria Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77–101. <https://doi.org/10.1191/1478088706qp0630a>.
- Braun, Virginia, and Victoria Clarke. 2020. "One Size Fits All? What Counts as Quality Practice in (Reflexive) Thematic Analysis?" *Qualitative Research in Psychology* 18 (3): 328–352. <https://doi.org/10.1080/14780887.2020.1769238>.
- Braun, Virginia, and Victoria Clarke. 2021. *Thematic Analysis: A Practical Guide to Understanding and Doing*. 1st ed. Thousand Oaks: SAGE Publications.
- Braun, Virginia, Victoria Clarke, and Nikki Hayfield. 2019. "A Starting Point for Your Journey, Not a Map: Nikki Hayfield in Conversation with Virginia Braun and Victoria Clarke about Thematic Analysis." *Qualitative Research in Psychology* 19 (2): 424–445. <https://doi.org/10.1080/14780887.2019.1670765>.
- Brooks, Samantha K., Rebecca K. Webster, Louise E. Smith, Lisa Woodland, Simon Wessely, Neil Greenberg, and Gideon James Rubin. 2020. "The Psychological Impact of Quarantine and How to Reduce It: Rapid Review of the Evidence." *Lancet* 395 (10227): 912–920. [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8).
- Capra, F., and P. L. Luisi. 2014. *The Systems View of Life: A Unifying Vision*. Cambridge: Cambridge University Press.
- Carroll, Á. 2021. "The Irish Healthcare System as a Complex Adaptive System." *Irish Medical Journal* 114: 332.
- Caton, Sue, and Melanie Chapman. 2016. "The Use of Social Media and People with Intellectual Disability: A Systematic Review and Thematic Analysis." *Journal of Intellectual and Developmental Disability* 41 (2): 125–139. <https://doi.org/10.3109/13668250.2016.1153052>.
- Chadwick, D., C. Richards, M. Molin, and I. Strnadová. 2023. "Digital Inclusion and People with Learning Disabilities." *British Journal of Learning Disabilities* 51 (2): 119–124. <https://doi.org/10.1111/bld.12530>.
- Chadwick, Darren D., and Chris Fullwood. 2018. "An Online Life Like Any Other: Identity, Self-Determination, and Social Networking Among Adults with Intellectual Disabilities." *Cyberpsychology, Behavior and Social Networking* 21 (1): 56–64. <https://doi.org/10.1089/cyber.2016.0689>.
- Chadwick, Darren, Kristin Alfredsson Ågren, Sue Caton, Esther Chiner, Joanne Danker, Marcos Gómez-Puerta, Vanessa Heitplatz, et al. 2022. "Digital Inclusion and Participation of People with Intellectual Disabilities during COVID-19: A Rapid Review and International Bricolage." *Journal of Policy and Practice in Intellectual Disabilities* 19 (3): 242–256. <https://doi.org/10.1111/jppi.12410>.
- Chia, Robert, and Robin Holt. 2006. "Strategy as Practical Coping: A Heideggerian Perspective." *Organization Studies* 27 (5): 635–655. <https://doi.org/10.1177/0170840606064102>.

- Cho, Minhae, and Kyung Mee Kim. 2022. "Effect of Digital Divide on People with Disabilities during the COVID-19 Pandemic." *Disability and Health Journal* 15 (1): 101214. <https://doi.org/10.1016/j.dhjo.2021.101214>.
- CORU. 2019. *Social Care Workers Registration Board: Standards of Proficiency for Social Care Workers*. Ireland: CORU.
- Davies, A. 2006. "Peter Senge, C. Otto Scharmer, Joseph Jaworski and Betty Sue Flowers, Presence – Exploring Profound Change in People, Organizations and Society, Nicolas Brealey (2005) 304pp., \$27.95." *Long Range Planning* 39 (1): 92–93. <https://doi.org/10.1016/j.lrp.2005.11.005>.
- Edmondson, Amy. 1999. "Psychological Safety and Learning Behavior in Work Teams." *Administrative Science Quarterly* 44 (2): 350–383. <https://doi.org/10.2307/2666999>.
- Edmondson, Amy C., and Derrick P. Bransby. 2023. "Psychological Safety Comes of Age: Observed Themes in an Established Literature." *Annual Review of Organizational Psychology and Organizational Behavior* 10 (1): 55–78. <https://doi.org/10.1146/annurev-orgpsych-120920-055217>.
- Engwall, Kristina. 2023. "Online Activities for Individuals with Intellectual Disabilities at a Day Centre in the Wake of COVID-19." *British Journal of Learning Disabilities* 51 (2): 229–237. <https://doi.org/10.1111/bld.12512>.
- Finn, J. 1999. "An Exploration of Helping Processes in an Online Self-Help Group Focusing on Issues of Disability." *Health & Social Work* 24 (3): 220–231. <https://doi.org/10.1093/hsw/24.3.220>.
- Fortune, Jennifer, Manjula Manikandan, Sarah Harrington, Owen Hensey, Claire Kerr, Sebastian Koppe, Thilo Kroll, et al. 2024. "Understanding the Use of Digital Technologies to Provide Disability Services Remotely during the COVID-19 Pandemic; a Multiple Case Study Design." *BMC Health Services Research* 24 (1): 323. <https://doi.org/10.1186/s12913-024-10652-6>.
- Galway, Sarah C., Olivia S. Parker, Matthieu Dagenais, and Kimberley Lyn Gammage. 2024. "Perceptions of Community-Based Online Exercise Programming for Persons with Multiple Sclerosis during COVID-19: A Qualitative Case Study." *Qualitative Research in Sport, Exercise and Health* 16 (1): 86–101. <https://doi.org/10.1080/2159676X.2023.2245403>.
- Gelfgren, Stefan, Jens Ineland, and Coppélie Cocq. 2022. "Social Media and Disability Advocacy Organizations: Caught between Hopes and Realities." *Disability & Society* 37 (7): 1085–1106. <https://doi.org/10.1080/09687599.2020.1867069>.
- Heidegger, Martin. 1967. *Being and Time*. Chicago, IL: Chicago University Press.
- Hilty, D. M., M. M. Maheu, K. P. Drude, K. M. Hertlein, K. Wall, R. P. Long, and T. L. Luoma. 2017. "Telebehavioral Health, Telemental Health, e-Therapy and e-Health Competencies: The Need for an Interprofessional Framework." *Journal of Technology in Behavioral Science* 2 (3–4): 171–189. <https://doi.org/10.1007/s41347-017-0036-0>.
- Hilty, D., S. Chan, J. Torous, J. Luo, and R. Boland. 2020. "A Framework for Competencies for the Use of Mobile Technologies in Psychiatry and Medicine: Scoping Review." *JMIR mHealth and uHealth* 8 (2): e12229. <https://doi.org/10.2196/12229>.
- Holland, John H. 2014. *Complexity: A Very Short Introduction, Very Short Introductions*. Oxford: Oxford University Press.
- Holmes, A. G. D. 2020. "Researcher Positionality—A Consideration of Its Influence and Place in Qualitative Research—A New Researcher Guide." *Shanlax International Journal of Education* 8 (2): 1–9. <https://doi.org/10.34293/education.v8i2.1477>.
- HSE. 2020. *Framework for the Resumption of Adult Disability Day Services*. Dublin: Health Service Executive.
- Hyland, Philip, Frédérique Vallières, Orla McBride, Jamie Murphy, Mark Shevlin, Richard P. Bentall, Sarah Butter, et al. 2021. "Mental Health of Adults in Ireland during the First

- Year of the COVID-19 Pandemic: Results from a Nationally Representative, Longitudinal Study." *Psychological Medicine* 53 (8): 3766–3768. <https://doi.org/10.1017/S0033291721004360>.
- Ison, R. 2017. *Systems Practice: How to Act: In Situations of Uncertainty and Complexity in a Climate-Change World*. 2nd ed. London: Springer.
- Jackson, Michael C. 2019. *Critical Systems Thinking and the Management of Complexity*. Newark: Wiley.
- Jesus, Tiago S., Michel D. Landry, and Karen Jacobs. 2020. "A 'New Normal' following COVID-19 and the Economic Crisis: Using Systems Thinking to Identify Challenges and Opportunities in Disability, Telework, and Rehabilitation." *Work* 67 (1): 37–46. <https://doi.org/10.3233/WOR-203250>.
- Kamalakkannan, Sureshkumar, Sutanuka Bhattacharjya, Yelena Bogdanova, Christina Papadimitriou, Juan Carlos Arango-Lasprilla, Jacob Bentley, and Tiago S. Jesus. 2021. "Health Risks and Consequences of a COVID-19 Infection for People with Disabilities: Scoping Review and Descriptive Thematic Analysis." *International Journal of Environmental Research and Public Health* 18 (8): 4348. <https://doi.org/10.3390/ijerph18084348>.
- Kelly, C. 2015. *HRB Statistics Series 28 Annual Report of the National Intellectual Disability Database Committee*. Dublin: Health Research Board.
- Krippendorff, K., 2009. Conversation: Possibilities of its repair and descent into discourse and computation. *Constructivist Foundations* 4 (3): pp.135–147.
- Kwamie, Aku. 2015. "Balancing Management and Leadership in Complex Health Systems Comment on "Management Matters: A Leverage Point for Health Systems Strengthening in Global Health." *International Journal of Health Policy and Management* 4 (12): 849–851. <https://doi.org/10.15171/ijhpm.2015.152>.
- Kwamie, Aku, Solip Ha, and Abdul Ghaffar. 2021. "Applied Systems Thinking: Unlocking Theory, Evidence and Practice for Health Policy and Systems Research." *Health Policy and Planning* 36 (10): 1715–1717. <https://doi.org/10.1093/heapol/czab062>.
- Lake, Johanna K., Patrick Jachyra, Tiziana Volpe, Yona Lunsky, Carly Magnacca, Amanda Marcinkiewicz, and Yani Hamdani. 2021. "The Wellbeing and Mental Health Care Experiences of Adults with Intellectual and Developmental Disabilities during COVID-19." *Journal of Mental Health Research in Intellectual Disabilities* 14 (3): 285–300. <https://doi.org/10.1080/19315864.2021.1892890>.
- Lund, Emily M., Anjali J. Forber-Pratt, Catherine Wilson, and Linda R. Mona. 2020. "The COVID-19 Pandemic, Stress, and Trauma in the Disability Community: A Call to Action." *Rehabilitation Psychology* 65 (4): 313–322. <https://doi.org/10.1037/rep0000368>.
- Lunsky, Yona, Anna Durbin, Rob Balogh, Elizabeth Lin, Luis Palma, and Lesley Plumpre. 2022. "COVID-19 Positivity Rates, Hospitalizations and Mortality of Adults with and without Intellectual and Developmental Disabilities in Ontario, Canada." *Disability and Health Journal* 15 (1): 101174–101174. <https://doi.org/10.1016/j.dhjo.2021.101174>.
- Maric, Gorica, Tatjana Pekmezovic, Olivera Tamas, Nikola Veselinovic, Aleksa Jovanovic, Katarina Lalic, Sarlota Mesaros, and Jelena Drulovic. 2022. "Impact of Comorbidities on the Disability Progression in Multiple Sclerosis." *Acta Neurologica Scandinavica* 145 (1): 24–29. <https://doi.org/10.1111/ane.13516>.
- Maturana, H. 1992. *The Tree of Knowledge: The Biological Roots of Human Understanding*. Edited by F. J. Varela. Boston, MA; London: Boston, MA; London: Shambhala.
- Maturana, H. R., and F. J. Varela. 1987. *The Tree of Knowledge: The Biological Roots of Human Understanding*. Boston: New Science Library/Shambhala Publications.
- McCarron, Mary, Andrew Allen, Darren Mccausland, Margaret Haigh, Retha Luus, Fathima Rosmin Bavussantakath, Fintan Sheerin, et al. 2021. "The Impact of COVID-19 on People

- Ageing with an Intellectual Disability in Ireland: Protocol for a Follow-up Survey." *HRB Open Research* 4: 95. <https://doi.org/10.12688/hrbopenres.13340.2>.
- Mccausland, D., R. Luus, P. Mccallion, E. Murphy, and M. Mccarron. 2021. "The Impact of COVID-19 on the Social Inclusion of Older Adults with an Intellectual Disability during the First Wave of the Pandemic in Ireland." *Journal of Intellectual Disability Research: JIDR* 65 (10): 879–889. <https://doi.org/10.1111/jir.12862>.
- McFadden, Paula, Jana Ross, John Moriarty, John Mallett, Heike Schroder, Jermaine Ravalier, Jill Manthorpe, Denise Currie, Jaclyn Harron, and Patricia Gillen. 2021. "The Role of Coping in the Wellbeing and Work-Related Quality of Life of UK Health and Social Care Workers during COVID-19." *International Journal of Environmental Research and Public Health* 18 (2): 815. <https://doi.org/10.3390/ijerph18020815>.
- McMahon, Martin, Chris Hatton, Julie Stansfield, and Gaynor Cockayne. 2020. "An Audit of the Well-Being of Staff Working in Intellectual Disability Settings in Ireland during the COVID-19 Pandemic." *Tizard Learning Disability Review* 25 (4): 237–246. <https://doi.org/10.1108/TLDR-09-2020-0027>.
- Milner, Paul, and Berni Kelly. 2009. "Community Participation and Inclusion: People with Disabilities Defining Their Place." *Disability & Society* 24 (1): 47–62. <https://doi.org/10.1080/09687590802535410>.
- Mladenov, Teodor, and Ciara Siobhan Brennan. 2021. "The Global COVID-19 Disability Rights Monitor: Implementation, Findings, Disability Studies Response." *Disability & Society* 36 (8): 1356–1361. <https://doi.org/10.1080/09687599.2021.1920371>.
- Navas, Patricia, Antonio M. Amor, Manuela Crespo, Zofia Wolowiec, and Miguel Á. Verdugo. 2021. "Supports for People with Intellectual and Developmental Disabilities during the COVID-19 Pandemic from Their Own Perspective." *Research in Developmental Disabilities* 108: 103813–103813. <https://doi.org/10.1016/j.ridd.2020.103813>.
- NDIS. 2017. *National Disability Social Inclusion Strategy 2017-2021*. Government of Ireland: Department of Justice and Equality.
- O'Donnell, Joan, Deirdre Desmond, and Malcolm MacLachlan. 2022. Shaking up Services: Reframing Service Delivery as a Self-Organising Complex Adaptive System to Sustain Innovation." ICCHP-AAATE 2022 Open Access Compendium "Assistive Technology, Accessibility and (e)Inclusion." <https://doi.org/10.35011/icchp-aaate22-p2-01>.
- O'Sullivan, Katriona, Serena Clark, Kevin Marshall, and Malcolm MacLachlan. 2021. "A Just Digital Framework to Ensure Equitable Achievement of the Sustainable Development Goals." *Nature Communications* 12 (1): 6345. <https://doi.org/10.1038/s41467-021-26217-8>.
- Pincock, K., N. Jones, K. Baniodeh, A. Iyasu, F. Workneh, and W. Yadete. 2024. "COVID-19 and Social Policy in Contexts of Existing Inequality: Experiences of Youth with Disabilities in Ethiopia and Jordan." *Disability & Society* 39 (3): 571–593. <https://doi.org/10.1080/09687599.2022.2087488>.
- Preiser, Rika, Reinette Biggs, Alta De Vos, and Carl Folke. 2018. "Social-Ecological Systems as Complex Adaptive Systems: Organizing Principles for Advancing Research Methods and Approaches." *Ecology and Society* 23 (4): 46. <https://doi.org/10.5751/ES-10558-230446>.
- Puli, Louise, Natasha Layton, Daniel Mont, Kylie Shae, Irene Calvo, Keith D. Hill, Libby Callaway, et al. 2021. "Assistive Technology Provider Experiences during the COVID-19 Pandemic." *International Journal of Environmental Research and Public Health* 18 (19): 10477. <https://doi.org/10.3390/ijerph181910477>.
- Raelin, Joe. 2011. "From Leadership-as-Practice to Leaderful Practice." *Leadership* 7 (2): 195–211. <https://doi.org/10.1177/1742715010394808>.
- Raelin, Joseph A. 2018. "What Are You Afraid of: Collective Leadership and Its Learning Implications." *Management Learning* 49 (1): 59–66. <https://doi.org/10.1177/1350507617729974>.

- Ramage, M., and K. Shipp. 2009. *Systems Thinkers*. London: Springer.
- Rosenhead, Jonathan, L. Alberto Franco, Keith Grint, and Barton Friedland. 2019. "Complexity Theory and Leadership Practice: A Review, a Critique, and Some Recommendations." *The Leadership Quarterly* 30 (5): 101304. <https://doi.org/10.1016/j.leaqua.2019.07.002>.
- Sabatello, Maya, Teresa Blankmeyer Burke, Katherine E. McDonald, and Paul S. Appelbaum. 2020. "Disability, Ethics, and Health Care in the COVID-19 Pandemic." *American Journal of Public Health* 110 (10): 1523–1527. <https://doi.org/10.2105/AJPH.2020.305837>.
- Scheffers, Femke, Xavier Moonen, and Eveline van Vugt. 2021. "Assessing the Quality of Support and Discovering Sources of Resilience during COVID-19 Measures in People with Intellectual Disabilities by Professional Carers." *Research in Developmental Disabilities* 111: 103889–103889. <https://doi.org/10.1016/j.ridd.2021.103889>.
- Schein, Edgar H., and Warren G. Bennis. 1965. *Personal and Organizational Change through Group Methods: The Laboratory Approach*. New York: Wiley.
- Schon, D. A. 1971. *Beyond the Stable State: Public and Private Learning in a Changing Society*. London: Temple Smith.
- Seale, Jane. 2023. "It's Not All Doom and Gloom: What the Pandemic Has Taught us about Digitally Inclusive Practices That Support People with Learning Disabilities to Access and Use Technologies." *British Journal of Learning Disabilities* 51 (2): 218–228. <https://doi.org/10.1111/bld.12497>.
- Seymour, Wendy, and Deborah Lupton. 2004. "Holding the Line Online: Exploring Wired Relationships for People with Disabilities." *Disability & Society* 19 (4): 291–305. <https://doi.org/10.1080/09687590410001689421>.
- Smith, Emma M., Malcolm Maclachlan, Ikenna D. Ebuenyi, Catherine Holloway, and Victoria Austin. 2021. "Developing Inclusive and Resilient Systems: COVID-19 and Assistive Technology." *Disability & Society* 36 (1): 151–154. <https://doi.org/10.1080/09687599.2020.1829558>.
- Smith, Emma M., Stephanie Huff, Holly Wescott, Rebecca Daniel, Ikenna D. Ebuenyi, Joan O'Donnell, Mohamed Maalim, Wei Zhang, Chapal Khasnabis, and Malcolm MacLachlan. 2022. "Assistive Technologies Are Central to the Realization of the Convention on the Rights of Persons with Disabilities." *Disability and Rehabilitation. Assistive Technology* 19 (2): 486–491. <https://doi.org/10.1080/17483107.2022.2099987>.
- Smith, Kenwyn K. 1997. "Paradoxes of Group Life: Understanding Conflict, Paralysis, and Movement in Group Dynamics." In *The Jossey-Bass Business & Management Series*, edited by David N. Berg, 1st ed. San Francisco: New Lexington Press.
- Solas. 2021. *Adult Literacy for Life: A 10-Year Adult Literacy, Numeracy and Digital Literacy Strategy*. Dublin: Government of Ireland.
- Spassiani, Natasha A., Mojca Becaj, Clare Miller, Andrew Hiddleston, Aaron Hume, and Stephan Tait. 2023. "Now That I Am Connected This Isn't Social Isolation, This is Engaging with People': Staying Connected during the COVID-19 Pandemic." *British Journal of Learning Disabilities* 51 (1): 99–110. <https://doi.org/10.1111/bld.12478>.
- Sturmborg, J. P. ed., 2016. *The Value of Systems and Complexity Sciences for Healthcare (No. 8801)*. Switzerland: Springer International Publishing.
- Tamplin, Jeanette, and Zara Thompson. 2023. "How Health-Focused Choirs Adapted to the Virtual World during the COVID-19 Pandemic – An International Survey." *The Arts in Psychotherapy* 82: 101997–101997. <https://doi.org/10.1016/j.aip.2023.101997>.
- Trip, Henrietta, Ruth Northway, Elizabeth Perkins, Brigit Mirfin-Veitch, and Reece Adams. 2022. "COVID-19: Evolving Challenges and Opportunities for Residential and Vocational Intellectual Disability Service Providers." *Journal of Policy and Practice in Intellectual Disabilities* 19 (1): 102–115. <https://doi.org/10.1111/jppi.12414>.

- Tsatsou, Panayiota. 2021. "Is Digital Inclusion Fighting Disability Stigma? Opportunities, Barriers, and Recommendations." *Disability & Society* 36 (5): 702–729. <https://doi.org/10.1080/09687599.2020.1749563>.
- Ueland, Jeffrey S., Teri Lyn Hinds, and Nancy D. Floyd. 2021. "Equity at the Edge of Chaos: Applying Complex Adaptive Systems Theory to Higher Education." *New Directions for Institutional Research* 2021 (189–192): 121–138. <https://doi.org/10.1002/ir.20356>.
- UN. 2020. *Pandemic Reveals How Excluded Are Society's Most Marginalized, Secretary-General Says, Launching Policy Brief on Persons with Disabilities and COVID-19*. New York: United Nations.
- Varela, F. J., E. Thompson, and E. Rosch. 2017. *The Embodied Mind, Revised Edition: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press.
- Walsh, M., R. Cormack, and M. MacLachlan. 2020. *Digital and Assistive Technology Use in Disability Services during Covid-19: A Report on the Experiences of 120 Service Providers "Right to Connect"*. Ireland: National Clinical Programme for People with Disability, Health Services Executive.
- Wenger-Trayner, Etienne, Steven Hutchinson, Chris Kubiak, Beverly Wenger-Trayner, and Mark Fenton-O'Creevy. 2015. *Learning in Landscapes of Practice: Boundaries, Identity, and Knowledgeability in Practice-Based Learning*. 1st ed. London: Routledge.
- White, Glen W., Jamie Lloyd Simpson, Chiaki Gonda, Craig Ravesloot, and Zach Coble. 2010. "Moving from Independence to Interdependence: A Conceptual Model for Better Understanding Community Participation of Centers for Independent Living Consumers." *Journal of Disability Policy Studies* 20 (4): 233–240. <https://doi.org/10.1177/1044207309350561>.
- Williamson, Elizabeth J., Helen I. McDonald, Krishnan Bhaskaran, Alex J. Walker, Sebastian Bacon, Simon Davy, Anna Schultze, et al. 2021. "Risks of Covid-19 Hospital Admission and Death for People with Learning Disability: Population Based Cohort Study Using the OpenSAFELY Platform." *BMJ (Clinical Research ed.)* 374: N 1592. <https://doi.org/10.1136/bmj.n1592>.
- Willner, Paul, John Rose, Biza Stenfert Kroese, Glynis H. Murphy, Peter E. Langdon, Claire Clifford, Hayley Hutchings, Alan Watkins, Steve Hiles, and Vivien Cooper. 2020. "Effect of the COVID-19 Pandemic on the Mental Health of Carers of People with Intellectual Disabilities." *Journal of Applied Research in Intellectual Disabilities: JARID* 33 (6): 1523–1533. <https://doi.org/10.1111/jar.12811>.