

# ULRR

## The applications of mainstream music technology to facilitate access to creative musical experiences for people with disabilities

Item Type	Thesis
Authors	Noone, Jason Francis
Download date	2026-06-14 19:24:53
Item License	<a href="https://creativecommons.org/licenses/by-nc-sa/1.0/">https://creativecommons.org/licenses/by-nc-sa/1.0/</a>
Link to Item	<a href="https://hdl.handle.net/10344/7570">https://hdl.handle.net/10344/7570</a>



UNIVERSITY *of* LIMERICK

OLLSCOIL LUIMNIGH

The Applications of Mainstream Music Technology to Facilitate  
Access to Creative Musical Experiences for People with  
Disabilities.

Jason Francis Noone

Submitted for the award of PhD

University of Limerick, Ireland

Supervisors: Professor Jane Edwards & Dr Sandra Joyce

Submitted to University of Limerick June 2018

## Table of Contents

<b>Abstract.....</b>	<b>i</b>
<b>Declaration.....</b>	<b>ii</b>
<b>Acknowledgements .....</b>	<b>iii</b>
<b>List of Tables .....</b>	<b>iv</b>
<b>List of Figures.....</b>	<b>v</b>
<b>List of Presentations and Publications .....</b>	<b>vii</b>
<b>Chapter 1: Introduction.....</b>	<b>1</b>
<b>Chapter 2: Background and Context.....</b>	<b>7</b>
<b>Chapter 3: Research Development and Methodology .....</b>	<b>51</b>
<b>Chapter 4: The Limerick PAR Project.....</b>	<b>79</b>
<b>Chapter 5: The Ennis PAR Project.....</b>	<b>172</b>
<b>Chapter 6: Analysis.....</b>	<b>229</b>
<b>Chapter 7: Discussion .....</b>	<b>287</b>
<b>References .....</b>	<b>303</b>
<b>Appendix A: Recruitment information Sheet .....</b>	
<b>Appendix B: Parent/Guardian information sheet .....</b>	
<b>Appendix C: Consent form .....</b>	

**Appendix D: Assent protocol .....**

**Appendix E: Digital appendices outline.....**

## Abstract

This study investigated applications of mainstream music technology for creative music making by people with disabilities within a person centred music therapy context. The research was undertaken with service users from two Enable Ireland facilities in Ennis and Limerick, Ireland working as independent communities of inquiry. A participatory action research (PAR) methodology was employed (Bradbury, 2015), engaging participants as co-researchers with full control over the research process. The guiding research question was “how does music technology help us to make music together?” The research incorporated an *extended epistemology* to acknowledge and incorporate different ways of knowing of the functionally diverse research groups (Reason & Riley, 2015). Music was considered the primary meaning-making modality optimising voice and agency of the co-researchers. Each group took part in three iterative cycles of planning, action and reflection to explore and develop skills with MIDI controllers, digital audio software, hand-held devices and apps, electric guitars and adapted video game controllers. The Limerick group conducted public concerts, research lectures and an interactive workshop. The Ennis group performed at their day facility and at an Arts & Disability event and curated a CD of their favourite improvisations. The research suggested that developing and sharing practical knowledge through music technology was an empowering experience. Rhizoanalysis was conducted to resolve and clarify the analysis of the research groups while maintaining a participatory perspective. Rhizomatic readings of selected events from the PAR research sessions identified connective dimensions in the group’s interactions and instances of *becoming-musician* as facilitated through the deterritorialisation of music technology, and of the interpersonal relations within the communities of inquiry themselves. Themes of modularity, isomorphism, affective synchrony, rhizomatic awareness, the role of effort and DMI fit and disruption of participatory hierarchies were identified by the readings.

## Declaration

This thesis concerned participatory action research with participants acting as co-researchers. While the research project was conducted in a participatory and democratic manner, the thesis reporting on it is an original work by the author. Parts of Chapter 2 *Background and Context*, reuse or reference material from a previous article by the author:

Noone, J. (2008). Developing a music therapy programme within a person centred planning context. *Voices: A world forum for music therapy* (8),3.

## Acknowledgements

Sincere thanks to my supervisor, Professor Jane Edwards for all your support, insight, patience and expertise over the course of this research. I am so grateful for all you've done for me.

Special thanks to everyone who took part in the research projects. In Limerick: Caroline, Darren, David, Eddie, Mark, Ricky, Thomas Trevor K. and Trevor R. In Ennis: Chime, Gerard, Jonathon and Paraic. Your energy, creativity and perseverance made this research possible and kept me going when things got tough.

Thanks to Dr Sandra Joyce for additional support and supervision.

Thank you to staff and management at Enable Ireland for supporting the research, especially Barbara Curley, Dolores Ryan and Tony Murphy.

Thanks to my brother Dr Chris Noone for proofreading and soundboard duties

And finally, thank you to my dear and beautiful partner Caroline for, just – everything.

And to my darling daughter Sophie, I will be around a lot more now, hope you don't mind.

## List of Tables

Table 1: Overview of the Limerick PAR project.....	3
Table 2: Overview of the Ennis PAR project .....	3
Table 3: The inductive codes developed after Cycle 1 in Limerick .....	285

## List of Figures

Figure 1: An effect rack .....	31
Figure 2: The Korg PadKontrol and Akai LPD8 drum pad MIDI controllers with examples of scene layouts .....	34
Figure 3: MIDI keyboard controllers.....	35
Figure 4: Launchpad, AT switches, iPad and Electric guitar .....	36
Figure 5: Action research cycles.....	60
Figure 6: Whiteboard notes taken during project orientation meeting .....	88
Figure 7: Whiteboard notes taken during project orientation meeting (2).....	88
Figure 8: Whiteboard notes taken during project orientation meeting (3).....	89
Figure 9: The microcycle format .....	92
Figure 10: The whiteboard summary of the discussion in Session 1 of lessons learned, future directions and research themes .....	107
Figure 11: The Quneo MIDI controller with lighting touch pads.....	114
Figure 12: The concert project file with the co-researchers' tracks. Caroline's guitar track is armed and set to solo mode.....	115
Figure 13: Trevor R.'s DMI interface with multiple VST and effect racks in multiple tracks.....	116
Figure 14: MIDitar Hero control scheme for diatonic scale fingering.....	116
Figure 15: The UL concert DMI settings.....	118
Figure 16: The Touchable isomorphic keyboard .....	129
Figure 17: Limerick Group Anniversary Photo .....	146
Figure 18: The 'Jonathon LP' instrument rack.....	150

Figure 19: An instrument rack displaying three instruments and key range settings .....	188
Figure 20: An audio effect rack with 3 effects in sequence.....	188
Figure 21: The email drafted by the PAR group to the Arts & Disability coordinator .....	190
Figure 22: The blurb written by the group to promote the performance .....	191
Figure 23: The GarageBand Smart Drum Grid.....	205
Figure 24. Gerard’s ‘strumming guitar’ MIDI effect rack.....	209
Figure 25: Ricky’s DMI interface for the UL concert .....	250
Figure 26: An illustration of how the wireless drum controller’s signals were mapped to the DAW’s drum synth to best resemble the layout of an acoustic drum kit .....	263
Figure 27: The Smart-Guitar graphical user interface (GUI) on Garageband.....	271

## Presentations and Publications

- Baines, S., Edwards, J., McCaffrey, T. & Noone, J. (2014) Including service user perspectives in research: Reflections of the *Music & Health Research Group* at the University of Limerick. *Irish Association of Creative Arts Therapists Journal*. 2 (1).
- Noone, J., Edwards, J., & Baines, S. (2014). User voice in research. 3<sup>rd</sup> International Conference of the International Association of Music and Medicine, Toronto, Canada., 26<sup>th</sup> June 2014, IAMM.
- Noone, J., Ennis PAR group & Limerick PAR group. (2014). Music therapy and technology: A collaborative perspective. Music Therapy Symposium Irish World Academy of Music and Dance, 2014.
- Noone, J. (2015). Music therapy, music technology and participatory action research. Accessible Music Technology and Practice Seminar. Dublin, Ireland 23<sup>rd</sup> February 2015. Enable Ireland Assistive Technology Service/Institute of Art and Design Dun Laoghaire
- Edwards, J., & Noone, J. (2016). Developmental Music Therapy. In J. Edwards (Ed.) *The Oxford Handbook of Music Therapy*. OUP: Oxford.
- Noone, J., Fahy, C., Coonan, R., Kennedy, T. & Ryan, E. (2017). Music Therapy, music technology and participatory action research. Arts and Health Research showcase, Irish World Academy of Music and Dance. 27<sup>th</sup> November 2017. University of Limerick

## Chapter 1

### Introduction

This study investigated applications of music technology for creative musicing by people with disabilities (Small, 1998) using a participatory action research approach (Bradbury, 2015; McTaggart, 1997). The research arose out of ongoing music therapy work already taking place with people with disabilities at two Enable Ireland facilities, in Ennis and Limerick in the west of Ireland. Creative and idiosyncratic applications of mainstream music technology within music therapy were developed in collaboration with those accessing the programme. These applications were perceived to be innovative within wider music therapy practice as reflected in an absence of relevant literature. Shared ownership of the research interests between all participants was reflected in the collaborative research methods chosen and employed in this study.

A guiding question, “how does music technology help us to make music together?” was developed by the co-researchers in each group. Responses were developed into *thematic concerns* relevant to interests, preferences and capacities of participants (McTaggart, 1997). The groups explored various uses of mainstream music technology and shared their learning in different public fora over three iterative cycles of planning, action and reflection apiece. An *extended epistemology* which acknowledged multiple forms of knowing was integral in optimising voice and participation of the functionally diverse co-researchers. Co-researchers were thus facilitated to generate and mobilise experiential, intuitive, artistic and skill based knowledge, as well as the more dominant verbal form (Bradbury, 2015).

Inductive coding and arts-based reflection were used to supplement the meaning-making processes of the groups within the PAR process, yielding themes of chaos and coherence, pride and agency, humour and support within an ongoing dialectic of talking and musicing. By focusing on immanent meaning in the group’s improvisations, the notion to *let*

*the music do the talking* informed the adoption of rhizoanalysis as an analytical frame. This allowed completion of partial analysis of the knowledge generated by the two groups in a way that preserved the improvisatory and participatory nature of work within the groups as communities of inquiry (Reason, 2006).

Based on Deleuze and Guattari's idea of the *rhizome* (1988), rhizoanalysis is a form of analysis concerned with creating and articulating connections between heterogenous elements of an assemblage or rhizome; in this case, the PAR groups. This is an approach considered useful in accounting for mess, creativity, open-endedness and performativity in research (Coleman & Ringrose, 2013). Five salient events were identified for each of the research groups in Ennis and Limerick. These events were read rhizomatically and presented as vignettes, with accompanying video clips. The readings identified connective dimensions in the groups' interactions and instances of becoming-musician as facilitated through the deterritorialisation and reterritorialisation of music technology, and of the interpersonal relations within the communities of inquiry themselves.

Tables 1 and 2 present a visual representation of the Limerick and Ennis research processes over the course of 3 cycles, as well as highlighting rhizomatic events.

Table 1: The Limerick PAR project

Limerick PAR Project					
Cycle 1	Rhizomatic Events	Cycle 2	Rhizomatic Events	Cycle 3	Rhizomatic Events
<b>Planning</b> Orientation meetings Generate thematic concern – “Show what we can do”		<b>Planning</b> Review inductive codes Progression presentation “More public”		<b>Planning</b> Concentrate on musicing Deemphasise performance	
<b>Action</b> <i>Microcycle</i> structure Musicing/Exploring technology Organise concert On-site concert	<b>ABR</b> David’s musical story idea	<b>Action</b> UL Lecture New DMIs Concert options Public concert Planning	<b>ABR</b> Initial reflections on recordings shared with group	<b>Action</b> Interactive workshop Continued musicing New roles and relationships	<b>ABR</b> “Let the music do the talking” – notion of immanence of improvisations
<b>Reflection</b> Find more public space to perform Clear roles/preferences ABR discussion Inductive Coding	Establishing the rhizome (Session 8)	Proud of skills Ambivalent about audience response	Locking in (Session 11) The UL concert (Session 17)	Exit interviews IAMM presentation	Chatting and playing (Session 8) Ricky in Charge (Session 15)

Table 2: The Ennis PAR project.

Ennis PAR project					
Cycle 1	Rhizomatic Events	Cycle 2	Rhizomatic Events	Cycle 3	Rhizomatic Events
<b>Planning</b> Orientation meetings Generate thematic concern – “Plan a concert”		<b>Planning</b> Plan a public performance		<b>Planning</b> Concentrate on musicing	
<b>Action</b> <i>Microcycle</i> structure Musicing/Exploring technology Organise concert On-site concert	<b>ABR</b> “How will we use our videos?”	<b>Action</b> Incorporate songs/styles Refining playing styles Public performance at <i>Embrace</i> event	<b>ABR</b> Video reflection	<b>Action</b> Continuing to improvise and record Finding new roles within group <i>Best Of CD</i>	<b>ABR</b> Curating the <i>Best of CD</i>
<b>Reflection</b> More public Clear roles/preferences ABR discussion Inductive Coding	Tainted Love (session 4)	Mixed reaction to performance. Facilitator’s personal reflection on assent	Knocking on Heaven’s Door (session 4) Coming together (session 7)	Exit interviews IAMM presentation	Serendipity (session 4) Paraic’s voice (session 10)

The thesis proceeds as follows:

After this section, Chapter 2, titled *Background and Context*, describes the context in which the research took place. This includes a description of the research site; a facility run by the disability service provision organisation, Enable Ireland. The chapter also includes information about the service provision model; person centred planning (PCP). Attention is given to the value of technology, assistive or otherwise in promoting empowerment for people with disabilities. The music therapy programme is also outlined including the therapeutic underpinnings related to the PCP model. The role of mainstream music technology within the music therapy programme is discussed and situated within the broader discipline of music therapy. Specific applications of mainstream music technology developed collaboratively within the Enable Ireland music therapy programme informed the development of the research question and methodology.

Chapter 3, *Research development and methodology* outlines the development of the research question “how does music technology help us to make music together?” and the decision to employ Participatory Action Research (PAR) as a collaborative research methodology. The principles of PAR are discussed, as well as the emancipatory and empowering potentials PAR offers to give voice to people with disabilities within the research process. This is mainly due to the participatory inquiry paradigm (Heron & Reason, 1997) which acknowledges multiple forms of knowing – experiential, presentational, propositional and practical. This facilitates the incorporation of arts-based research methods (ABR) into the PAR methodology. Ethical issues of PAR and practitioner research are discussed, particularly in terms of research so-called *vulnerable* populations. The insider status of the practitioner is posited as a potential strength of the research.

Chapter 4, *The Limerick PAR project* is a descriptive report on the Limerick strand of the doctoral research project, covering ethics, recruitment and the three PAR cycles that took place between April 2013 and June 2014. The planning, action and reflection phases of each

cycle are described. Ten service users with disabilities were initially recruited and collaborated as a community of inquiry on their thematic concern *to show what we can do* with mainstream music technology. In Cycle 1, the group worked towards an on-site concert before engaging in a research lecture and public performance in Cycle 2. In Cycle 3, the group conducted an interactive workshop and ended the research with exit interviews, material from which was incorporated into a conference paper for the 2014 International Association of Music and Medicine conference in Toronto. Exploratory ABR work was conducted throughout the three cycles.

Chapter 5, *The Ennis PAR project*, covers the Ennis strand of the doctoral research which ran from May 2013 to July 2014. This includes the recruitment of four men with disabilities who were attending a pre-existing music therapy group together under the name *The Enable Ireland Band*. This group also wanted to share their skills with music and developed their skills with music technology through improvising together. Cycle 1 ended with an on-site concert while in Cycle 2, the group incorporated more song material and took part in an Arts & Disability event, performing songs and improvisations. Cycle 3 focused on curating a *Best of* CD of the group's favourite improvisations from the cycle, as well as contributing to the IAMM presentation.

Chapter 6, *Analysis* describes the development and application of a rhizoanalytic approach to resolving the *protoanalytical* work undertaken by the two research groups. Rhizoanalysis uses Deleuze and Guattari's (1988) concept of the rhizome to deal with heterogenous data immanently. This method was chosen to preserve the participatory character of the groups' meaning-making processes and to deal with the large amount of data generated in different formats. Five rhizomatic readings are presented from each group, presenting meaningful moments from the PAR process.

Chapter 7, *Conclusion* synthesises the learning and insights generated by the two groups in exploring and interacting with mainstream music technology over the course of their PAR projects. Theoretical contributions are discussed as are limitations of the research. Future research possibilities for the author and the co-researchers from Ennis and Limerick are also suggested.

## Chapter 2

### Background and Context

This chapter outlines the context in which the research took place. The service at Enable Ireland, the participants, their service knowledge and expertise by experience, and the venues in Limerick and Ennis are described. The background to the development of the current music therapy programme at Enable Ireland, and the music therapy programme developed and enacted for this research project are presented and discussed.

#### **The Research Contact: Enable Ireland**

Enable Ireland is a voluntary organisation that provides services for children and adults with disabilities across the country. Children's services offer physical educational and social development from early infancy through adolescence (Enable Ireland, n.d.). Adults accessing the service are offered opportunities for personal development, independent living, supported employment, social and leisure activities (Enable Ireland, n.d.) The term used to refer to programme participants is *service user*.

Adult services are provided via day centres which provide rehabilitative training, life coaching, recreational and creative activities, and therapies. Adults with developmental disabilities are also supported to access educational and employment opportunities within the community. The needs of service users attending adult services are broad. Service users may have mild to severe/profound physical disabilities, sometimes in conjunction with intellectual disability. People who have cerebral palsy or spina bifida are the most highly represented participants in programmes. People with metabolic disorders, acquired brain injury (before the age of 21), sensory impairments, and other neurological disorders also use Enable Ireland's services.

The core values of service provision at Enable Ireland are derived from the social model of disability (Barnes, 2012; Shakespeare, 2010). Enable Ireland has engaged a rights-

based approach, and person centred principles are embedded in the operation of the organisation (Enable Ireland, 2015). These are emphasised in various quality assurance protocols but especially through adherence to the Person Centred Planning (PCP) model of service provision (O' Brien, O'Brien & Mount, 1998). The role of technology in empowering people with disabilities is also a central part of the organisation's strategic plans year-on-year (Enable Ireland, 2015).

The provision of services within Enable Ireland is based on the social model of disability which “focuses attention on the person not the impairment. Access, inclusion and equality are considered for people with physical disabilities as for people without” (Enable Ireland, 2005, p. 33). This model contrasts with what is known as the *medical model*, which has been criticised for locating disability within the individual. The person is understood as experiencing a series of symptoms that are the focus of interest for treatment and cure (Barnes, 2012; Owens, 2015).

A social model of disability presents the individual as needing access to support and assistance in the same way as any other person. For example, in a lecture hall chairs are provided for the audience to sit. These are not considered *aids* or *specialist devices*; they are normalised as part of the expectation that people would become tired if they had to stand up for any length of time. Chairs are provided for the comfort and assistance of the audience in a completely unremarked way. Yet if someone needs *special* access to a room or venue this can sometimes be presented as a *difficulty* and problematised. The principles of inclusive design recommend that it is not only people who walk into a venue who should be considered but all members of society including wheelchair users and parents with prams/buggies. Aspects of this social model of disability appear in the WHO biopsychosocial model (World Health Organisation, 2002) in which equal consideration is given to participation restrictions, access

limitations and environmental factors in determining functioning and disability as to the physical or psychological challenges inherent in a person's situation.

At Enable Ireland, services, supports and activities are provided based on the expressed needs, abilities and interests of the service users. This is primarily achieved through engaging person centred planning (PCP). In PCP, each service user can direct and design his or her own service. The process is "firmly embedded in the work of the organisation as a basic requirement of a partnership approach to service delivery" (Enable Ireland, 2005, p. 7).

### **Person Centred Planning**

The person centred planning process is the defining feature of the service offered by Enable Ireland adult services. The doctoral research reported in this thesis was undertaken within a Participatory Action Research (PAR) approach aligned with PCP objectives. Therefore, this next part of the chapter provides extended detail about PCP to contextualise the process for developing and undertaking the project reported in this thesis.

The PCP process develops a holistic personal profile with the service user setting objectives based on personal aspirations and using a capacity searching approach. Through a process of listening, sharing power and responsive action, PCP supports people with disabilities to discover and act upon what is most important to them (Kilbane, Thompson & Sanderson, 2008). It involves putting the person who is accessing the service at the centre of his or her own service provision. The person's goals, preferences, and desires dictate their service provision. This approach has its basis in Rogers' Person Centred Counselling with a notable emphasis on listening and creativity (Kilbane, Thompson & Sanderson, 2008; Rogers, 1961). The PCP model has also been described as the *Ordinary Living Paradigm* (Sanderson, 2000).

Person centred planning may be implemented in different ways, although differing practices will still have core features manifesting implicitly or explicitly (O'Brien & Lovett, 1992; Sanderson, 2000). The presence of these features ensures the centrality of the service user in their service development and the primacy of their goals, preferences and desires.

**Features of person centred planning.** Person centred planning is defined by the following core features (also discussed in Noone, 2008):

**Capacity driven.** PCP is driven by the capacity of the person rather than focussing on what are sometimes described as *deficits* (O'Brien, 1998). These capacities are identified, not only in the focus person, but also in friends and family, community and service workers (O'Brien, O'Brien & Mount, 1998).

Diagnostic labels are avoided where possible but PCP “does not ignore disability” (O'Brien et al., 1998). Specific limitations are considered in order that creative ways can be developed for the person to pursue their chosen lifestyle (O'Brien et al., 1998). This usually involves an assessment where the impairment is quantified and analysed as to its effect on the person's life (Sanderson, 2000). This contrasts with a more traditional disability service model in which service delivery is informed by types of impairment; for example, learning difficulty, sensory impairment or loss of mobility. Plain-language literature explaining the PCP model for potential service users de-emphasises therapeutic interventions as being based in pathology rather than ability (National Disability Authority, 2005).

**Focus on the individual.** Person centred planning requires a focus on the individual rather than the group. The individual and his or her wishes are the most important reference for the entire process (National Disability Authority, 2005). As Sanderson (2000) put it:

Traditional planning has sought to fit people into existing service models and solutions, an available ‘bed’ or a place in the day centre. Person centred planning describes the support needed from the perspective of the

person, and then designs a unique arrangement for getting that support. (p. 7)

***Flexible, dynamic and informal Process.*** Person centred planning is characterised by a flexible, dynamic and informal process (O'Brien, 1998) based on learning through shared action (O'Brien & Lovett, 1992). The aim is to find “creative solutions rather than fitting people into boxes... about problem solving and working together” (Sanderson, 2000, p. 8). This process can be challenging and requires clarity, commitment and courage of those involved. Treated simply as a technique, the person centred planning process will have little to offer the focus person (O'Brien & Lovett, 1992).

***Collaboration, not competition.*** Collaboration is a key component of implementing person centred plans (O'Brien, 1998). While it may be likely that the perspectives of the focus person, family members, friends and professionals may differ or even conflict (O'Brien et al., 1998), person centred planning requires “collaborative action and fundamentally challenges practices that separate people and perpetuate controlling relationships” (O'Brien & Lovett, 1992, p. 6).

The focus person is considered the first authority on his or her life with dialogue with other people – family, friends, or service workers – building on this (Sanderson, 2000). Professionals involved must recognise “personal commitment and knowledge [as] the basis of involvement and authority rather than administrative responsibility or professional role” (O'Brien et al., 1998, p. 19). This can be a challenge for professionals who are more used to working hierarchically (Sanderson, 2000).

***Shared understanding.*** Ultimately, shared understanding about the focus person will reflect those things which are most important to them, both in their present experiences and in their desires for the future. Through the person centred planning process, the person begins to experience tension between what is desirable and what exists (O'Brien and Lovett, 1992).

This energises action for:

**Positive change.** This is the final feature person centred planning (O'Brien, 1998).

**Outcomes of person centred planning.** The outcomes of the person centred planning process can be considered in terms of five essential accomplishments or “valued experiences” which ensure inclusion in a community and promote quality of life (O'Brien, 1998). These are “ordinary positive experiences” which, though worthwhile, people with disabilities are likely to have difficulty accessing (O'Brien, 1998, p. 134).

**Community Participation.** Being part of a network of growing relationships is considered a significant outcome of a mindfully implemented PCP process (O'Brien, 1998). Valuable activities provide active opportunities for a person to meet variety of people and develop variety of relationships.

**Choice.** The experience of choice is also important as it expresses and defines identity (O'Brien, 1998). Smull (1998) identifies three concepts as influencing the degree of choice a person has: preference, opportunity and control. These are complex concepts for focus persons and those helping to implement to negotiate (Smull, 1998). For example, in the satisfaction of a preference, capacity may influence control while timing may influence opportunity (Smull, 1998). In addition, it is in increasing the power held by people with disabilities that choice is maximised (O'Brien et al., 1998) which “challenges the culture of most human service agencies” (O'Brien & Lovett, 1992, p. 8). Traditional service delivery tends to value uniformity and predictability more than the needs of the individual (O'Brien & Lovett, 1992).

**Contributing.** By developing the skills to perform functional and meaningful activities, a person with a disability experiences a sense of competence and of contributing. This usually involves focused effort on the part of all who participate in the process – providing opportunities, instruction and assistance (O'Brien, 1998). Valuable experiences

“increase a person’s power to define and pursue objectives which are personally and socially important” (O’Brien, 1998, p. 135).

**Community Life.** Community life is defined by the experience of community presence; the sharing of ordinary places (O’Brien, 1998). This may need to be achieved by changing common patterns of community life, the aim being to reduce segregation, denial of opportunity and the perpetuation of stereotypes (O’Brien & Lovett, 1992). Valuable experiences increase the number and diversity of spaces a person may have access to while (O’Brien, 1998), as the PCP model stimulates “community hospitality and enlists community members in assisting focus people to define and work towards a desirable future” (O’Brien & Lovett, 1992, p. 6).

**Dignity.** O’Brien defined the experience of dignity as essential to ensuring inclusion and promoting quality of life (1998). Authentic person centred planning can only be achieved by respecting the dignity of the focus person (O’Brien & Lovett, 1992). Dignity is experienced when a person has a “valued place among a network of people and a valued role in community life” (O’Brien, 1998, p. 135). Valued activities can “challenge limiting negative stereotypes and provide access to valued roles” (O’Brien, 1998, p. 135). Developing ways to communicate the importance of respect and equality to others involved with the focus person is also helpful (O’Brien & Lovett, 1992).

In bringing about the optimum and most authentic realisation of a focus person’s goals, facilitation of a person centred plan should be approached as an *art* according to Pearpoint and Forest (1998) as dreams first become sustainable images, and then practical movements towards realising those dreams under one’s own control. The overall emphasis on voice, choice and participation (Prilleltensky, 2005) is essential in ensuring that service users are empowered to live the fullest life possible. This model also resonates with Naess’

components for quality of life -activity, interpersonal relations, self-esteem and basic happiness (1987; see also Nordenfelt, 1993).

### **Assistive Technology and Disability**

This section describes the role of technology in promoting inclusion and empowerment for people with disabilities. The development, provision and refinement of assistive technology (AT) is a core strategy of Enable Ireland in maximising quality of life for service users. The use of technology within the music therapy programme is influenced by these principles and rationales will be discussed in a later section.

Assistive technology (or AT) can be defined as “any piece of equipment, or product system, whether acquired commercially off the shelf, modified or customised that is used to maintain or improve functional capabilities of individuals with disabilities” (World Health Organisation & World Bank 2011, p. 101). It has been argued that for people with disabilities, the application of technology will be the equalizer of the 21st century (Flippo, Inge, & Barcus, 1995; Cavanaugh, 2002).

Assistive technology can be thought of on a continuum from high; for example sophisticated electronic devices such as computers and associated peripherals, to low; for example devices which do not require power, such as a magnifying glass for someone with a vision impairment. While assistive technology may involve the development of specialised devices by assistive technology researchers, engineers, product designers and so on, mainstream devices that are well-designed enough can support the functioning of a person with a disability also. In general, mainstream technology is becoming more accessible, offering user-friendly, cost-effective alternatives to specialised assistive technology devices (Van Woerden, 2006). The growing emphasis on universal design in product development has increased the applicability of mainstream technologies as assistive devices (Emiliani, 2006).

The purpose of these technologies is to function as an interface between the individual and their environment (Breines & Pellerito, 2003; Ripat and Woodgate, 2010), with the fit between user, technology and environment as key to successful implementation (Ripat and Woodgate, 2011). Issues of identity must also be considered when developing solutions. People “assign a symbolic value to AT based on socio-cultural norms; for example, it may be a symbol of improvement or decline, a tool of competence and capacity, or may serve to stigmatise or marginalise” (Ripat and Woodgate, 2010). That is, technology can become integrated into a person’s sense of self while enhancing their efficacy in the world, or it may highlight what they cannot do.

### **Assistive Technology at Enable Ireland**

A core strategy of Enable Ireland’s provision of services is the value of technology in ensuring inclusion, empowerment and quality of life for people with disabilities (Daly, 2001; Hammel, Jones, Smith, Sanford, Bodine and Johnson, 2008; Enable Ireland, 2009). The assistive technology department of Enable Ireland researches and develops new ways to enhance functioning for people with disabilities in Ireland as well as finding new ways to adapt mainstream devices for easier use as well as offering training to service users, family members and service workers in developing AT solutions.

### **Music Therapy Programme at Enable Ireland**

This section outlines the multiple theoretical perspectives from which the music therapy programme draws to support people attending the facilities. These groundings directly informed the research development. Humanistic, developmental music therapy, particularly as described by Boxill (1985, see also Edwards & Noone, 2016) is a theoretical cornerstone of the programme. This can be seen in the goals of working towards self-actualisation of each person, particularly those with more severe disabilities. Elements of Community Music Therapy (Stige, 2002) can be observed in the ways that the programme

developed as a form of milieu therapy that would adapt (and contribute) to the culture and context of the facilities. Resource-oriented music therapy (Rolvsjord, Gold & Stige, 2006) influenced programme development; eschewing a deficit-based clinical perspective and aiming to empower service users through the engagement and enhancement of existing capacities.

Since the inception of the music therapy programme in 2006, service users engaging in music therapy have been active in defining and refining the aims and methods of their individual and group therapy sessions. This active and flexible engagement with service users and their needs was stimulating to me as a practitioner and beneficial to the service users themselves. This occasionally required a new approach to assessment, programme design and facilitation, though still grounded in established music therapy principles and methodology.

The potential of music therapy to promote well-being in all domains of functioning for people with disabilities had been conveyed strongly to me from my music therapy training, my reading and from my practical/clinical experience. As the music therapy programme at Enable Ireland evolved, a participatory strand of practice began to emerge as issues of independence, empowerment, individuation and self-expression became more common aspects of referrals and inquiries. The positive and affirmational use of music through application of many music therapy methods and techniques, including song recreation, improvisation, instructional music therapy and therapeutic song writing (Bruscia, 1998), has become a meaningful resource for many service users.

Opportunities for working outside the traditional therapy space were developed to promote a sense of musical community within the facilities I attended. This involved planning and conducting concerts and music-based projects, as well as engaging with service users and staff to support the use of music as a personal resource of wellbeing on an everyday basis. A notable example of a successful initiative that I developed in collaboration with

service users was the founding of a community radio station, QCFM (Quinn's Cross FM). This was launched in 2009, offering in-house radio programmes as well as online podcasts produced and presented by service users.

Over time, I became more familiar with the person centred ethos and operation of the facilities I was working in. This was stimulated through my day-to-day interactions with service users, key-workers, PCP coordinators and management, as well as through literature and documentation on the PCP model and its embodiment within Enable Ireland's provision of services. As this familiarity increased, the complementarity of the PCP model with my evolving therapeutic perspective became clearer (Noone, 2008). That is, the principles, insights and clinical observations that were informing my work seemed to have clear correspondences with the PCP model, with positive implications for the effective running of my music therapy programme and the context-sensitive engagement of service users to promote their well-being should these correspondences be incorporated and coordinated effectively.

Acting as a therapist within an empowerment philosophy required an approach that was faithful to my professional practice as a music therapist, and to the promotion of wellbeing through music. It also required the development of a style of relating within my practice that allowed for flexibility and negotiation between client and therapist. The next section outlines the models, theories and concepts that informed the development of a dynamic and responsive music therapy programme within a person centred context at Enable Ireland. Supportive parallels were found in the theoretical work of other music therapists. Initially these were noted as congruent with the emergent practice, and later were incorporated more deliberately into the programme.

### **Humanistic Music Therapy**

Boxill (1985) recommended music therapy as a primary treatment modality for people with developmental disabilities due to its capacity to establish contact on a psychobiological basis, facilitate and develop awareness of self, other and the environment as well as to stimulate motivation and intrinsic learning. Her model of music therapy is fundamentally a form of *developmental music therapy* (Edwards & Noone, 2016) that encourages a holistic perspective on developmental growth in the domains of physical, social, emotional, communication musical and adaptive functioning. The humanistic roots of Boxill's approach lie in the goal of affirming the "dignity and worth of the human being" (Boxill, & Chase, 2007, p. 98) as well as supporting individuals' unique potentialities towards the actualisation of self. Drawing from the current humanistic theories, core concepts in Boxill's model of music therapy include creativity, emotional wellbeing, basic needs gratification, naturalness, self-growth, self-actualisation, courage, and responsibility (Boxill, 1985).

Boxill developed the central concept of her model, the *continuum of awareness* as a guiding model of human consciousness as part of a clinical improvisation approach that allows for effective music therapy work to take place with clients of all abilities. This model considers that human awareness manifests on different levels, and the therapist seeks to engage the client at his or her level guiding them from awareness to excitement, to contact in cycles This is achieved through a reciprocal process of intrinsic learning leading to action. (Boxill and Chase, 2007).

Music therapeutic interactions stimulate intrinsic learning, or "internalised changes in awareness" (Boxill, 1985, p. 73), thereby "increasing levels of awareness of self, other and the environment, and the self in relation to others and the environment" (Boxill & Chase, 2007, p. 101). Singing, instrument-playing and movement can be used to develop awareness, agency and skill acquisition by activating a person internally and setting in motion the cycle of awareness that leads to action. Areas of functioning or development that are at different

stages (such as communication or motor skills) can be worked on simultaneously (Boxill & Chase, 2007). As therapy continues, responsiveness to musical stimuli increases (Boxill, 1985) allowing progress from simpler to more complex musical interactions to transfer to other domains of functioning (Boxill & Chase, 2007).

Boxill developed strategies of clinical improvisation designed to awaken, heighten and expand awareness in people with disabilities of any level of functioning. *Reflection* involves the “mirroring and matching in musical form of the here-and-now client” (Boxill, 1985, p. 75) and is analogous to Rogers’ (1961) psychotherapeutic techniques, being fully present with the client, expressing unconditional positive regard for the client and establishing a strong therapeutic relationship (Boxill & Chase, 2007). *Identification* is a more symbolic reflection used to feed back the here-and-now client and what is happening in their environment through improvised songs or rhythmic chants to heighten awareness of self, other and the environment. In keeping with the developmental underpinnings of this model (Edwards and Noone, 2016), the multi-modal responses integral to these strategies in facilitating musical contact have been likened to the empathic quality of parent-infant interactions in early infancy - “finding ways to make contact with another human being in the simplest, most elementary nonverbal levels” (Boxill, 1997, p. 68).

The strategies are used in the development of the final strategy *Our Contact Song* - a composed or improvised song that signifies reciprocal musical expression between client and therapist, initiated by the client. This arises from the client’s interests, strengths, behaviours and difficulties and can be adapted throughout the therapy process to affirm the therapeutic relationship and attain goals and objectives (Boxill, 1985).

Within this process-oriented model, goals are emergent as the therapist works naturalistically and responsively with the individual. Boxill suggested that music therapy has a broad scope for addressing psychosocial, physical and emotional issues in an

interdisciplinary manner supplementing and reinforcing other disciplines “while implementing its own program” (Boxill 1985 p. 16). However, facilitating and maintaining the experiential nature of participation and relatedness is considered more important within this model than adherence to predetermined procedure (Boxill, 1985).

### **Community Music Therapy**

In addition to Boxill’s developmental approach, concepts and discussions from Community Music Therapy (CMT) have helped to broaden the therapeutic frame of the programme to acknowledge the person-in-context; their relations within their community and the role of music in supporting interests, aspirations, and connections with others. CMT has been described as an *anti-model* that encourages resistance to traditional models in favour of following the needs of the clients, the context and the music (Pavlicevic & Ansdell, 2004). In various iterations of the CMT philosophy or approach, collaborative and context-sensitive music making is described as giving voice to the disadvantaged (Stige, Ansdell, Elefant & Pavlicevic, 2010).

Stige et al. (2010) acknowledged the broad, and possibly fluid theoretical bases of CMT, drawing from ecological systems theory, anthropology, sociology, and community psychology, in addition to medicine, special education, psychology and psychotherapy. Precursors of community level music therapy work are present within the earliest models of music therapy – in the work of Nordoff and Robbins, Juliette Alvin and Mary Priestley, for example (Stige et al., 2010). The distinctiveness (or lack thereof) of CMT from what might be termed *traditional* or *consensus* music therapy training has been also debated (Ansdell, 2002; Edwards, 2002; Ruud, 2002). For the purposes of the therapy work at Enable Ireland I adopted a selective position with regards CMT, using certain concepts commonly discussed within CMT literature to inform my on-site therapy work – community, musicing and participation. Other concepts incorporated into, but originating outside of CMT theory - for

example, communicative musicality (Trevarthen & Malloch, 2000), empowerment theory (Davieson, 2001; Procter, 2001) and social capital theory (Procter, 2011) have also been informative.

**Community.** Ansdell (2004) has suggested that considering the relationship between music and community – that is, the relational aspect of making music in a context – can offer new ways for music therapist to think about their roles in promoting well-being for their clients through music. According to Ruud, the purpose of community music therapy is to make therapy “more relevant to the actual social life of the clients and specifically his/hers partaking in the society at large” (2004, para. 3). This involves the cultivation of *musical communities of practice* (Ansdell, 2010) reflecting the musical identities of those taking part while supporting a feeling of *belonging together* (Ansdell, 2010).

**Musicing.** A common feature of community music therapy approaches is perspective on the meaning and function of music itself. This involves thinking about music as something that is *done* rather than as an artefact or object (Ansdell, 2004). To this end, Christopher Small’s concept of ‘musicking’ (or ‘musicing’) has been incorporated into music therapy theory as one way to conceptualise the relational nature of music experience (1998).

To music “is to take part, in any capacity, in a musical performance, whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composing), or by dancing” (Small, 1998, p. 9). Musicing is about the creation and performance of relationships, the meaning of which is social and co-created (Small, 1998).

**Communicative musicality.** The human capacity for musicing has been suggested to be rooted in an intrinsic musicality or *communicative musicality* present in early infancy, demonstrated by the reciprocal and flexible attunement between child and caregiver through vitality affects – innate knowings in terms of time, intensity, shape, contour and duration

(Stern, 2000). This, in turn founds the basis of human interaction, communication and intersubjectivity throughout the lifespan (Trevarthen & Malloch, 2000) and underlies both formal and informal music making (Pavlicevic, 2003).

Some Community Music Therapy literature points to the foundations of musical connections as a common form of human interaction. For example, Pavlicevic (2003) described how attuning to others through music requires harmonious and congruent responsiveness or “interactional synchrony” (p. 185). Collaborative musicing as described by Ansdell (2010) involves navigation and negotiation of an intersubjective matrix around relative measures of tempo, tone and texture – in a balance of sameness and difference (Ansdell, 2010). This rhythmic flow establishes a *groove* that signifies authentic musical participation (Ruud, 1998). Grooving is made possible by “an ability to connect with others in unique ways that preserve our separateness...hence groove is a necessarily social activity” (Aigen, 2002, p. 25; cited in Ansdell, 2010).

**Community Music Therapy and disability.** When the capacity for attunement is disrupted or absent (as in some cases of mental illness, emotional trauma, severe depression, neurological impairment or disability), musical communication in music therapy can support rhythms and gestures central to human communication (Pavlicevic 2003). The role of the therapist working from a Community Music Therapy perspective is to facilitate for client/s “different aspects of interpersonal relatedness, emotional exploration, celebration or communal feeling ... working directly with the manifestations of pathology – though the ultimate aim is to get beyond pathology” (Ansdell, 2002, para. 86). Community music therapy approaches can help to facilitate relationships, friendships and community inclusion that might otherwise be difficult for people with disabilities (Elefant, 2010).

According to Elefant, Community Music Therapy involves “the opening of wider circles [...] expanding conventional music therapy practices and entering new, sometimes

unknown areas” (2010, p. 90). This is a helpful framework to consider issues such as role ambiguity that are sometimes experienced by music therapists (Ledger, 2010). In a “circumstantial community” (Ansdell, 2004, p. 77) like Enable Ireland, developing as a musical community has been empowering for service users allowing new relationships to develop as social capital is mobilised through individual and group musicing (Procter, 2011).

### **Resource-based Music Therapy and Empowerment Theory**

To develop a clear, mindful, non-pathologising music therapy programme, Rolvsjord, Gold and Stige (2005) suggested principles for music therapy. Essential to their resource-oriented music therapy model are; focusing on the client's strengths and potentials; recognising the client's competence related to her/his therapeutic process; collaborating with the client concerning goals of therapy and methods of working; acknowledging the client's musical identity and being emotionally involved in music and fostering positive emotions. These principles are congruent with person centred planning.

Similarly, Daveson recommended that music therapists blend empowerment theory with clinical methods so that they “are provided with opportunities to enable themselves and the people accessing their programs” (2001, p. 36). She emphasised participation, ownership, growth and collaboration as qualities required to promote empowerment within the therapeutic process. Brown’s action dimensions of empowerment (1991; cited in Daveson, 2001) read much like the core features of PCP (O’Brien, 1998). They are to affirm people's humanness and uniqueness, link people with resources and hence, open up greater life opportunities, provide an open space, establish a sense of togetherness and to connect people with each other encouraging them to work together, legitimise or validate individual or group experiences and to develop a heart for justice and compassion, a mind for analysis and hands for skilful, sensitive and disciplined action.

### **Music therapy and PCP**

The principles, goals and outcomes underlying the service provision ethos of Enable Ireland, share compatible features with the therapeutic principles I have drawn from in developing and maintaining the music therapy programme. The common foundational principles of PCP resonate clearly with humanistic and community music therapy literature and practice. The common emphasis on listening, genuine contact and creativity show the strong roots of both PCP and my own music therapy perspective in the humanistic thinking of Rogers (1961).

The centrality of the social model of disability within the PCP model and the music therapy approach I developed has meant that empowerment and inclusion of people with disabilities are of primary importance; acknowledging the need to work with the physical, cognitive, communicative and social-emotional capacities of everyone to maximise quality of life, while also developing meaningful relationships between service users and with the broader community. There is a shared emphasis on dynamic and creative responses to need and the avoidance of traditional power dynamics within disability services that creates a potent space for people with disabilities to define, plan for and reach their goals within the music therapy programme.

A point of contact between the music therapy concepts outlined above and the PCP model is the notion that musicing itself can be considered a valued activity that can bring about the various positive outcomes a person centred process aims to achieve. That is, musicing, facilitated within a sensitive and responsive therapeutic context, can build capacities and strengthen identities, enhance relationships and facilitate community experiences, mobilise creativity, voice and choice, thus empowering those who engage, at whatever their functional level (Noone, 2008). Ruud (1998) has made a similar connection between musical improvisation within music therapy (and the consequent development of musical identity) and with Naess' components of quality of life (mentioned above) – activity, interpersonal

relations, self-confidence and basic happiness, particularly in the capacity of music to provide awareness of feelings, agency, belonging and meaning.

Creating and contributing to a community defined by shared interests and identity is an important aspect of person centred practice to promote inclusion (Kennedy, Poll & Sanderson, 2008). The music therapy programme at Enable Ireland has among its aims, the goal of promoting a musical community, building relationships between service users, between service users and staff and, where possible, with the broader community (particularly through public performances and podcasts recorded in the community radio station). As a musical community of practice comparable to Ansdell's description (2010), service users at Enable Ireland, of all functional capacities, can experience inclusion in an active manner.

The sympathetic tenets of the music therapy programme and the service provision context in which it runs means that there is a useful common language for communicating the potential benefits of music therapy to service users, staff and management. This lends support to the therapeutic process for individuals accessing the programme as well as providing a conducive environment for work at the facility/community level (Noone, 2008).

The PCP model has been referenced in music therapy literature elsewhere. Watson (2007) made brief reference to PCP and its relationship with music therapy for adults with developmental disabilities. Metell (2014) acknowledged the value of person centred music therapy programmes being developed within a sympathetic organisational ethos as opposed to potentially disempowering medical model contexts. Pavlicevic has also drawn from PCP literature to conceptualise the relational difficulties, due to internal and external barriers, that people with disabilities may experience, and which a music therapist can help to address and overcome (2010).

These synergies have been beneficial to the Enable Ireland programme and those accessing it and have been worthwhile in my own development as a practitioner (Ledger & Noone, 2011). My personal commitment to optimising these congruencies has included the incorporation of concepts of personal wellbeing within organisations into my professional reflections. Prilleltensky & Prilleltensky (2006) have identified signs of organisational wellbeing and their associated sources. Signs include: optimism and self-efficacy, sense of control and self-determination, environmental mastery, growth and meaningful pursuits/challenge, positive relationships/cooperation. The sources of these are: emotional climate and group cohesion opportunities for growth engagement and self-determination and intersection of work and family. These criteria bear such similarity to the core concepts of PCP that I see these as principles of wellbeing for myself as a practitioner as well as for the service users I worked with.

### **Music Technology**

The value of technology as a facilitator of community participation is one of Enable Ireland's key person centred strategies (Enable Ireland, 2015). This is also reflected in the value of music technology within the Enable Ireland music therapy programme as a means of facilitating access to musicing, giving people with disabilities innovative ways of choosing and manipulating musical parameters and giving optimal gestural control of musicing through technology.

Music technology has taken on a greater utility within the music therapy process, facilitating musicing in a direct and simple manner. The increase in use has been due mainly to the appeal of this technology to individual users within the music therapy programme. The versatility of the available technology is mainly due to the MIDI protocol, a standardised set of messages for communicating musical and gestural information between digital devices and software. As an adjunct to the music therapy process, mainstream music technology can

increase access to music making (and the music therapy process) and facilitate participation and relating in a user-friendly and appealing manner. Musical input devices in combination with digital recording software offer the possibility of highly flexible and customisable user interfaces, with many opportunities for service users to control and direct the parameters - musical, gestural and technical- involved. Mainstream technology is predominantly used as off-the-shelf devices have been found to be easy to use, portable and relatively inexpensive.

### **Music Technology Resources**

Service users attending music therapy have access to a diverse range of electronic music technologies or EMTs (Magee & Burland, 2008) which facilitate quick and easy access to music making. These are typically mainstream music devices, which either operate using the MIDI protocol or generate their own sound. MIDI controllers (keyboards, drum pads etc.), iPads (and their associate music apps) as well as microphones and electric guitars offer service users many forms of gestural transduction (Crowe and Rio, 2004) as well as aesthetic and expressive opportunities through the available sound choices (synthetic sounds and samples), and options for the manipulation of sound (effects).

At the centre of this interface is the DAW (digital audio workstation), usually a music production programme that records both MIDI and audio signals, has VST (virtual studio instrument) functionality, MIDI and audio effects, and editing, sequencing and exporting functionality. The DAW favoured in my music therapy programme is Ableton Live. This has all the usual features of a software DAW but is also designed to be controlled on-the-fly by musicians, DJ's and producers (hence "Live"). In developing and refining individualised combinations of hardware and software, a high degree of choice and control is available to musicians with disabilities that might not otherwise be possible with more traditional, acoustic instruments.

The overall interface, which is adapted to service users according to capacity and preference, can be thought of in terms of input, processing and output options.

**Input.** This refers to the tangible part of the interface that is controlled by the user. This may be a device that generates sound such as a microphone or electric guitar or other sound source (iPad, MP3 player etc.), or it may be a MIDI controller (keyboard or drum pad controller) that sends MIDI information to the virtual instruments in the digital audio software, thus triggering sound.

MIDI controllers tend to have gestural controllers (wheels, sliders, X/Y pads or rotary knobs) with associated MIDI control messages as well as keys or pads for sending note and velocity information. They may also have buttons for transposing by octaves or semitones or for controlling the overall velocity of the keys (velocity is a quantifier for the level of force used to strike a key or pad, determining the relative intensity of the triggered sound). MIDI controllers can also be configured to control specific parameters within the DAW either through MIDI mapping (discussed further below) or through Native mode. MIDI mapping involves manually assigning a gestural control's MIDI CC message to a parameter. Native mode is when the controller automatically assigns a gestural control to the most contextually appropriate parameter at a given time (i.e. whatever set of parameters is open on-screen).

Assistive technology devices (particularly switches of various types) can also be used as input devices, either connected directly through the MIDI controllers' pedal ports (thus controlling a MIDI message) or through a dedicated switch interface allowing specific keystrokes to be assigned to any one switch. This is described in more detail below.

Ableton Live also has a *computer keyboard to MIDI* function. In Ableton Live keystrokes on the middle and top row of the QWERTY layout can act as a MIDI keyboard. Assigning a switch to one of these keys means a pressing a switch triggers a single MIDI note message. If the *computer keyboard to MIDI* function is switched off, any key stroke can be

assigned a function within Ableton Live through the *key mapping* function. Specific input devices are discussed further below.

**Processing.** This is how the signal, audio or MIDI is manipulated or transduced once it has been generated and transmitted to the digital audio software.

**Audio.** Audio signals (such as those from microphones, electric guitars, mp3 players and tablets) need to be routed into dedicated audio tracks within the DAW. This is usually facilitated using an USB audio interface with multiple channels for different cable types (phono, ¼ inch jack, XLR etc) and integrates with the DAW for monitoring and playback. Once an audio track has been set up, global audio settings (panning, send/return, volume) can be adjusted for each input.

**Audio effects.** Effects of different types can be loaded into a track as patches (for example, delay, reverb, distortion or compression) to manipulate the sound further. Ableton Live has *effect racks* which are pre-programmed combinations of effects grouped into a single patch to augment voice, drum, DJ/performance, instrument sounds as well as for overall mastering. These augmentations vary from the very subtle to the completely transformative. Audio *clips* (short segments of music – single notes, samples or phrases) can be loaded into the software for editing and triggering as loops and can also be augmented with audio effects.

**MIDI.** This involves the routing of the MIDI signal from a MIDI controller (via USB) into a track in the DAW. A VST (virtual instrument) sound or software sampler must be loaded into the track before sound can be generated. VST's may simulate real-world instruments (brass, strings, percussion, piano etc.). They may also be used to create more electronic or abstract sounds. The sound can be configured through the VST/sampler's own settings, or an audio effect may be loaded into the track also. Global audio settings like panning, send/return and volume can be controlled in the track also.

**MIDI effects.** These can also be used to manipulate or transduce the incoming MIDI signal in terms of the musical parameters of note value, velocity, and note length. The most commonly used MIDI effects are:

**Velocity:** this effect can control the incoming velocity messages (that is, how hard a certain note was played). A constant velocity can be set to standardise the output volume or intensity of a VST.

**Scale:** this effect can transpose all incoming notes by a chosen number of semitones, or it can transpose notes by different intervals, leaving the other notes alone. It can also mute specific incoming notes.

**Chord:** this adds up to six additional notes according to intervals chosen by the user to the incoming note, creating a chord.

**Arpeggiator:** this effect takes individual notes from a held chord or cluster (or an individual note) and plays them rhythmically. The rate of the arpeggio can be set in note lengths relative to the global tempo (from whole notes to 1/64 notes).

**Random:** this effect can randomly (at a chosen level of probability) transpose an incoming note within a specified semitone range.

These MIDI effects can be combined to give a high degree of control, choice and creativity to a service user in the setup phase of a music therapy session, as well as ensuring optimum access to musicing. A MIDI note can be routed first to a *velocity effect* to set a constant velocity. This means a player does not have to worry about hitting a key or pad to softly or too hard. From here the signal can be routed into a *chord effect* to add additional notes creating a chord. Adding an *arpeggiator effect* after this allows the notes in the chord to be played separately, creating a melody with a defined rhythm and pattern. Adding a *scale effect* allows for easy transposition. Thus, it is possible for a user/musician to play complex melodies with a single key or pad, based on parameters set by the user themselves.

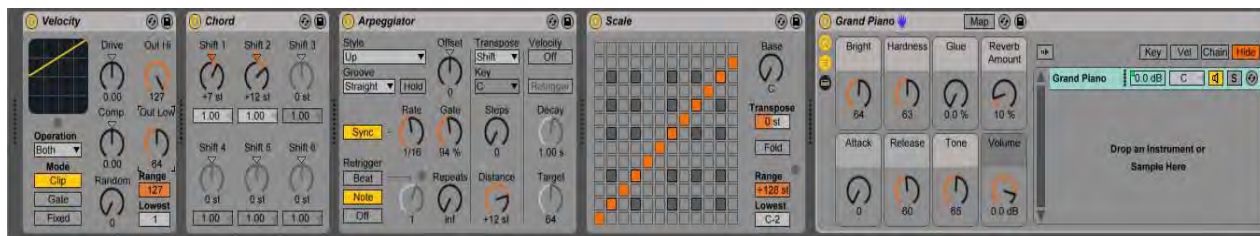


Figure 1. An effect rack which standardises the incoming velocity parameters, adds intervals to create a chord and separates the intervals into an arpeggio for a piano VST.

**MIDI Loops.** These can be programmed directly into a MIDI track (and VST) through a note (piano roll) x time (beats and subdivisions) grid and can be then be routed into MIDI and/or audio effects.

**Global settings.** These are settings within the DAW software controlling the overall sound. Panning determines where each track appears in the stereo mix (between the left and right speakers), while track volume determines the relative volume of each track. Master volume controls the overall volume of a mix. A global tempo may also be set to dictate the tempo of the piece being recorded. This also affects the rate of certain time-based effects (*arpeggiator, delay, autopan*) as well as determining the speed of the in-programme metronome. Time signatures may also be set globally.

**MIDI Mapping/Key Mapping.** MIDI mapping is a mode within the DAW whereby MIDI control or MIDI note signals can be reassigned to control parameters or levels, turn functions on or off or trigger a loop or bank of loops. Key mapping mode works the same way using the computer's alphanumeric keys.

**Loop triggering.** This is a distinguishing feature of Ableton Live as a digital audio software. Live was initially developed as a way of triggering and arranging audio loops (Future Music, 2017). Later versions added MIDI capability for composing and sequencing MIDI loops. Loops can be arranged into *scenes* (loops that play concurrently in an arrangement) and triggered either individually or collectively. Loops can be triggered with the computer mouse, by a MIDI

controller or computer keystroke (using MIDI mapping or Key mapping modes). There are also MIDI controllers designed to integrate specifically with the loop triggering functionality of Ableton Live, such as the Novation Launchpad (used in this research project), the Novation Push and the Akai APC40. These are MIDI devices designed specifically for loop triggering, (although they can be used as MIDI music devices also). The behaviour of each loop – how it is triggered (instant, toggled, gated), how many times it repeats, or whether it triggers subsequent loops – can all be programmed before playing.

***Quantization/warping.*** These are features for standardising timing in MIDI and audio recordings. Quantization moves incoming MIDI notes to the nearest beat or fraction thereof (as set by the user), either in real time, or post-recording. This can also be applied to loop triggering so that loops can be set to trigger within a certain time signature (as opposed to immediately when the pad or key sends the trigger message).

***Output.*** Once processed the signal can be monitored live, recorded and/or exported onto other media.

***Monitoring.*** The overall mix is heard by the users over speakers connected to the external soundcard. It is important that the mix is clear so that, in group musicing situations, each musician can hear their own sounds clearly in relation to the other instruments.

***Recording.*** The performance may be recorded. Performers can multitrack and overdub with Ableton. Editing recordings with cut and paste functions is a straightforward process.

***Exporting.*** When a recording is completed, the final mix, or parts thereof can be exported as a .wav file. This can be burned onto CD or converted into MP3 format and uploaded onto an MP3 player, smartphone, tablet or onto the internet.

### **Developing the Role of Technology within Music Therapy Sessions**

The incorporation of technology into music therapy sessions at Enable Ireland occurred gradually. It began with a single device - an Edirol UA-4FX USB soundcard, which had on-board effects (pitch shift, delay, distortion, reverb, and chorus) that service users could use to manipulate their voices, or other sound sources – and some simple sequencing software, Fruity Loops. These resources were popular with some of the service users, however the interface was generally controlled by me on their behalf. Consequently, the degree of control for the clients was limited.

It was the introduction of a MIDI drum pad controller (Akai MPD16) and MIDI keyboard (M-Audio Oxygen8) that allowed for a more collaborative and empowering use of music technology within music therapy sessions. An introductory version of Ableton Live (version 6) was included with the Oxygen8, making for a very cost-effective bank of music technology resources. In the intervening years of the music therapy programme additional USB MIDI controllers have been procured, having the same general features of the original MIDI controllers.

The Akai MPD16 drum pad controller was replaced by the Korg PadKontrol, a 4x4 drum pad controller. The pads can be programmed directly from the device into different note layouts or *scenes*. This was used for creating a *drum scene* to emulate the layout of a drum kit using Live's drum synth, Impulse. Programming adjacent pads with the same note allowed for easier bilateral playing. A *chromatic scene* has also been used to facilitate melodic playing, with notes programmed from C3-D#4 from the bottom to the top of the pad grid.

The PadKontrol also has a programmable X/Y pad with that acts as a pitch-bend (X-axis) and velocity control (Y-axis) in default mode as well as two programmable rotary knobs. There is also a *fixed velocity* mode that allows the user to control the velocity, or intensity of played note.

The Akai LPD8 is a smaller drum pad controller with eight drum pads, has velocity control and has a chromatic setting that works well with drum synths and melodic synths. It also has an on-board arpeggiator function and eight assignable rotary controls. Of its note presets, the diatonic C4 – C5 preset allows for easy playing of drum synths and melodic synths.



<p><b>Padkontrol</b></p> 	<table border="1"> <tr> <td>F4 (tom2)</td> <td>F4 (tom2)</td> <td>C5 (Crash)</td> <td>C5 (Crash)</td> </tr> <tr> <td>E4 (tom1)</td> <td>E4 (tom1)</td> <td>G4 (tom3)</td> <td>G4 (tom3)</td> </tr> <tr> <td>D4 (snare)</td> <td>D4 (snare)</td> <td>B4 (open hihat)</td> <td>B4 (open hihat)</td> </tr> <tr> <td>C4 (kick)</td> <td>C4 (kick)</td> <td>A4 (closed hihat)</td> <td>A4 (closed hihat)</td> </tr> </table> <p>Drum Scene</p>	F4 (tom2)	F4 (tom2)	C5 (Crash)	C5 (Crash)	E4 (tom1)	E4 (tom1)	G4 (tom3)	G4 (tom3)	D4 (snare)	D4 (snare)	B4 (open hihat)	B4 (open hihat)	C4 (kick)	C4 (kick)	A4 (closed hihat)	A4 (closed hihat)	<table border="1"> <tr> <td>C4</td> <td>C#4</td> <td>D4</td> <td>D#4</td> </tr> <tr> <td>G#3</td> <td>A3</td> <td>A#3</td> <td>B3</td> </tr> <tr> <td>E3</td> <td>F3</td> <td>F#3</td> <td>G3</td> </tr> <tr> <td>C3</td> <td>C#3</td> <td>D3</td> <td>D#3</td> </tr> </table> <p>Chromatic Scene</p>	C4	C#4	D4	D#4	G#3	A3	A#3	B3	E3	F3	F#3	G3	C3	C#3	D3	D#3
F4 (tom2)	F4 (tom2)	C5 (Crash)	C5 (Crash)																															
E4 (tom1)	E4 (tom1)	G4 (tom3)	G4 (tom3)																															
D4 (snare)	D4 (snare)	B4 (open hihat)	B4 (open hihat)																															
C4 (kick)	C4 (kick)	A4 (closed hihat)	A4 (closed hihat)																															
C4	C#4	D4	D#4																															
G#3	A3	A#3	B3																															
E3	F3	F#3	G3																															
C3	C#3	D3	D#3																															
<p><b>LPD8</b></p> 	<table border="1"> <tr> <td>G4</td> <td>A4</td> <td>B4</td> <td>C5</td> </tr> <tr> <td>C4</td> <td>D4</td> <td>E4</td> <td>F4</td> </tr> </table> <p>Diatonic Scene</p>	G4	A4	B4	C5	C4	D4	E4	F4																									
G4	A4	B4	C5																															
C4	D4	E4	F4																															

Figure 2. The Korg PadKontrol and Akai LPD8 drum pad MIDI controllers with examples of scene layouts.

The music therapy programme uses a variety of 25-key midi keyboards. These have many of the same functions and gestural controls though certain differences affect their appeal and usefulness within music therapy session. The M-Audio Axiom keyboard has additional drum pads while the Novation Launchkey has pads that can act as MIDI inputs or can integrate with Live’s loop triggering functionality and trigger audio and MIDI loops

directly. Each keyboard has transport control, that is, the user can control playback and recording within the DAW directly from the keyboard. They are light and portable, fitting easily onto the lap or table of a wheelchair if necessary.



Figure 3. MIDI keyboard controllers.

#### Others

The Novation *Launchpad* is designed specifically to integrate with Ableton Live. It has an 8x8 grid of pads for playing up to 64 clips but can also be used as a 64 key MIDI controller. It is useful for playing notes or drum samples and offers a large load-out of sounds within a small area.

Assistive technology switches can be connected to Ableton Live through the expression pedal ports in any of the MIDI controllers, or through a dedicated switch interface (such as the Crick Box). When plugged into a MIDI controller, the switch controls the MIDI message of the port on the MIDI device (sustain, expression or note value) which can be remapped or transposed. When using the Crick Box, the switch signal can be assigned an alphanumeric key value and used with the *computer keyboard to MIDI* function in Live, or as a *key-mapped* control for loops or patches.

Some service users accessing music therapy use iPads, either as assistive devices or as recreational devices. Many music apps, such as Propellerheads' *Figure* app or Novation's *Launchpad* app, make innovative use of the iPad's touch screen for playing synths and triggering loops or samples. Music production/sequencing apps like GarageBand or FL

Studio are useful within music therapy and allow the service users to develop ideas and build musical skills outside of sessions. The iPad can be lined into Ableton Live through an audio cable.

Electric guitars have been used by service users and by the therapist within sessions. Electric guitars can produce a high level of output or feedback for minimum input when configured appropriately for someone with a physical disability and with appropriate amplification. Adding effects in the software allows for different styles, genres and moods to be explored.



Figure 4. Launchpad, AT switches, iPad and electric guitar.

MIDI controllers send both musical and gestural messages, which can be assigned specific functions within the software for controlling or augmenting synths, loops or effects. This can be combined with assistive technology like the *buddy buttons* to further facilitate access, agency and control. Electric guitars and microphones can provide a lot of feedback for minimum input or effort. Synth sounds can be modified to respond to someone's movement profile to give optimum feedback also – sustained sounds from momentary touches for example (where holding a key or button is difficult for the user), or loop triggering as has been described above. The modular nature of Ableton Live's user interface has meant that effects (MIDI and audio) and instrument sounds can be added, combined, rerouted, reprogrammed, or removed within a user's track in real time. It became more and

more commonplace for service users to choose the configuration their own interfaces (input/processing/output) with less and less help from me. Configurations of instrument sounds and effect presets (or *racks*) can be saved as a single file, under a service user's name.

### **How Music Technology is Incorporated into the Music Therapy Process**

Music therapy sessions in which mainstream technology is used tends to involve many of the standard music therapy interactions and methods - improvisation, composition/therapeutic song writing, song recreation and therapeutic instruction (Bruscia, 1998). Sessions usually begin with an orientation, or set-up period where the focus of the session is decided. This may involve a brainstorm around the musical parameters involved (melody, harmony, rhythm or tempo) as well as the physical/gestural factors (the movement range and style of the musician, the number of keys or other controls needed) and the technical issues (how the software and hardware will be configured for optimal control and access).

For improvisation work, there involves a choice phase, where the user/s decide on input devices, triggering options, sounds and effects before playing. Musicians establish preferences for devices and sounds that can be considered in setting up the interface. Service users can record their improvisations for later review, to be saved and exported or to form the basis of a composition created from their favourite motifs and phrases.

Service users engaging in therapeutic song writing have multiple options for sounds and styles for the accompaniment. Musicians can learn and perform the song in full or in part. Chord progressions can be programmed as loops to be triggered by drum pads. This versatility allows musicians to have a high degree of control of their musical products regardless of physical functioning.

Sometimes a session will be built around a musical question or idea initiated by the service user ("how can I...?") or the desire to recreate certain song material or styles. This often requires a lot of collaboration and shared learning between therapist and service user,

resulting in novel combinations of features to achieve the appropriate sound, rhythm or melody in a manner that is easily performed by the service user.

Given that many acoustic or traditional instruments can be difficult for people with physical disabilities to manipulate, the accessibility, control and agency offered by music delivered through other technology can enhance access to musical expression, and promote the development of new skills and capacities, and support the music therapy process. The lack of associations to traditional instruments is sometimes helpful in engaging service users. The relative inexpensiveness of some devices means that some service users have been able to purchase their own equipment and/or apps.

Music technology applications and interfaces used by and with music therapy participants at Enable Ireland to access meaningful music making were developed through practice, negotiation and collaboration. This occurred within a therapeutic process consistent with the principles of the humanistic, resource-based approach I have employed over 10 years' work with this client group. The value of music technology for enhancing people with disabilities' access to music making has been discussed from the perspective of community music (Samuels, 2014) and education (Challis, 2009; Farrimond, Gillard, Bott & Lonie, 2011) also. Insights from these fields resonate with the applications of technology in the Enable Ireland music therapy programme.

In the next section the emerging role of music technology in music therapy is presented focussing on the research literature. Music technology has a modest representation in the literature although it is likely that most music therapists use some sort of digital technology in their practice.

### **Music Technology in Music Therapy**

This section of the chapter outlines the status of music technology within music therapy to situate my own work in the field. Several technology applications have been

described in music therapy literature in recent years, within diverse contexts and client populations. Isolated examples of discussion of music technology appeared in music therapy literature in previous decades (see, for example Robert Krout's ongoing column on the topic in the *Journal of Music Therapy*). However, since the late 2000s a more nuanced view has emerged that includes the potential roles and functions, indications and contraindications, of technology in music therapy (for example, Krout, 2014; Magee, 2014 and Nagler, 2014). Several factors point to a shifting and evolving relationship between technology and music therapy. These will be presented and discussed below.

**History and definitions.** Crowe and Rio (2004) reviewed music therapy literature to determine the most commonly used technologies within music therapy practice since 1960. These were categorised as adapted musical instruments, recording technology, electric/electronic musical instruments, computer applications, medical technology, assistive technology and vibroacoustic technology (Crowe and Rio, 2004). Within current literature on technology in music therapy, the categories appear to have remained much the same (Krout, 2014; Nagler, 2014). However, the sophistication of the technology has evolved, becoming more useful in music therapy in the process (Magee, 2011; Cevasco & Hong, 2011), especially as new forms of user interfaces have emerged (Krout, 2014; Nagler, 2014).

Technology has been integrated into many areas of music therapy practice (Crowe and Rio, 2004; Cevasco and Hong, 2011), and the literature on the vast array of practices is growing. However, since the work at Enable Ireland focused on music making this section will concentrate on technologies for music creation sometimes referred to as electronic music technologies (EMTs). EMTs have been defined as concerning "the activation, playing, creation, amplification, and/or transcription of music through electronic and/or digital means" (Hahna, Hadley, Miller and Bonaventura, 2012, p. 456). This is broader than Magee and Burland's (2008) definition of EMTs referring solely to devices that trigger MIDI sounds by

“specialist input devices such as switches or sensors” (p. 125), though perhaps more inclusive of available devices.

### **Electronic Music Technologies (EMTs) and Digital Musical Interfaces (DMIs).**

There are a variety of electronic music technologies that are commercially available for use in music therapy or have been specifically developed for that purpose. Krout categorised the current “dizzying array” of EMT’s for potential use in music therapy as 1. self-contained, 2. software, 3. recording, 4. listening and additional (2014, p. 45). Considerations for their use include cost, availability, ease of use and appropriateness (Krout, 2014).

Commercially available interactive interfaces for instruments and other computer-based devices with music making capability, such as touch-screen tablets and other hand-held devices have emerged in the last decade (Krout, 2014). Nagler (2011) has commented that, though these devices are commonplace within health setting, there is still much potential for their incorporation into “enhanced clinical interventions” (p. 198). The accessibility of these devices for music making and music therapy is determined by the available apps as well as the interface (Krout, 2014). Some Android and iOS apps music apps work in a stand-alone manner or can be integrated for collaborative music making with other devices, and software, through wireless or Bluetooth.

Commercially available music devices have also been developed specifically for use by people with disabilities with diverse input and control modalities such as the Skoog (tactile), the Magic Flute (breath and axis control), the Soundbeam (gestural control) and Quintet (switch-based MIDI control). These devices act as MIDI controllers when attached to MIDI modules or DAW software, though some have their own on-board sound banks allowing them to work as stand-alone instruments. These devices can be quite expensive – a Magic Flute system can cost around €2000 ([touchthefuture.com](http://touchthefuture.com)). Software support can also

be limited or become outdated. For example, as of 2016, the desktop Soundbeam cannot run on any Windows operating system later than Windows XP.

Less widely available, or *bespoke* music devices have also been developed for use in music therapy such as Lem and Paine's camera-based dynamic sonification device (2011), designed to support free improvisation for people with disabilities. Oliveros, Miller, Heyen, Siddall and Hazard (2011) have developed a similar device – the Adapted Use Musical Instrument (AUMI). Challis' *Octonic* instrument was also developed as a non-contact device for use by people with disabilities, though for community music groups (2011). The CYMIS (Akazawa, Kawai, Okuno, Masuko, Nishida and Horai, 2012) uses switches to trigger pre-programmed melodies. Mainstream video game controllers (Nintendo WiiMotes) have also been adapted as gesture-based MIDI inputs for group music therapy work (Benveniste, Jouvelot, LeCourt and Michel, 2009).

The development of these interfaces would seem to require a high degree of facility with hardware/software architecture and protocols (such as Glovepie, OSC or Max/MSP), or collaboration with someone appropriately qualified. Their bespoke nature brings a risk of obsolescence such as in cases where MIDI modules are required to create sounds rather than integrating with updateable mainstream DAW's for sound production and recording.

Accessibility in terms of these devices could be having a double meaning. What is shown to be useful for people with disabilities is not always easily available to practitioners. While the innovation and collaboration at the core of these devices is essential in ensuring newer and better opportunities for music making are possible for people with disabilities (Nagler, 2011); for a peripatetic music therapist seeking to incorporate music technology into their practice (such as myself), music technology needs to be more easily available, and more easily operated (Krout, 2014).

Hunt, Kirk and Neighbour have suggested that assistive technology can facilitate access to music (and thus to music therapy) by transducing limited physical movements into musical expression (2004). Assistive technology interfaces such as switches can be used to control MIDI applications for both composing and recording as well as for improvising and performance (Krout, 2014; Zigo, 2014). These can be controlled by hand, foot or head movements to provide access to recording devices, computer applications or electronic instruments. Overlays can be created for use with the Intellikeys keyboard to allow clients to use computer music programs to compose or perform music (Anderson, 2002). The MidiGrid is a customisable computer program which converts the movement of a computer mouse into MIDI information to facilitate composition, improvisation and performance. Hand gestures “are thus converted, via the mouse, into notes, chords and sequences” (Hunt & Kirk, 2003).

Mainstream MIDI controllers, perhaps the most easily obtained, and occasionally most inexpensive EMTs are mentioned briefly by Krout as means of “real-time” MIDI input (2014, p. 54). While surveys have shown that they are in use by music therapists across the world (Hadley et al., 2014; Magee, 2006; Magee and Burland, 2008), MIDI controllers have not received much attention in literature from a practice-based perspective

**Common applications of EMTs in music therapy.** Traditional, acoustic instruments can be difficult for people with disabilities to use, and this is one of the arguments to support greater use and knowledge of music making technology within music therapy (Hunt, Kirk and Neighbour, 2004; Krout, 2014; Magee, 2014). EMT’s can help to overcome access issues, increase environmental control, develop communication and self-concept, and stimulate motivation to engage for people with disabilities (Burland and Magee, 2014). EMT’s, particularly MIDI based devices, offer diverse means of gestural transduction, so that a client or service user’s movements can be matched to meaningful (to the client) musical parameters, output or feedback (Crowe and Rio, 2004). Incorporating the intentionality and

choices of the user is essential to the inclusion of EMT's in music therapy practice (Nagler, 2014). This engenders agency in the client to engage in music as a health resource (De Nora, 2005).

Many music therapists acknowledge changes in how music is created and consumed because of technology (Burland and Magee, 2014). Using EMT's can be more aesthetically and culturally appropriate – having the potential for reproducing modern music styles (hip-hop, electronic dance music etc.) more authentically than traditional acoustic instruments (Nagler, 2014). Media players, smartphones, tablets and personal computers offer ways of sharing and enjoying music that can be utilised within the therapy process, both during sessions and between sessions (Burland & Magee, 2014; Krout, 2014; Magee, 2014b; Nagler 2011). The appeal of technology can support the development of therapeutic rapport (Steele, 2011; Krout, 2014).

Music technology currently in use by music therapists frequently includes recording technology, amplification equipment, electronic MIDI instruments, electronic hardware and software, software with specialist inputs (such as Soundbeam and MIDIcreator) and vibroacoustic therapy equipment (Hadley et al., 2014). Music therapists also employ switch-based inputs (buddy buttons or BIGmacks), video game controllers such as Wiimotes, hand held devices (smartphones, MP3 players or tablets), audio loopers or DJ equipment (Hadley et al., 2014).

Current applications of music technology in music therapy have been reported in diverse clinical contexts from NICU care (Cevasco, 2014), special education (Zigo, 2014) and disability contexts (Adams and Lajoie, 2014; Krout, 2014, Martino and Bertilami, 2014; Noone, 2008) to mental health contexts (Sadnovik, 2014), and neurorehabilitation (Street, 2014). In medical contexts, music technology has been used to work in oncology (Kubicek, 2014), paediatrics (Whitehead-Pleaux and Spall, 2014) and end-of-life care (Lindeck, 2014).

As with traditional instruments, not all EMTs are equally accessible to clients. While EMT's can, when used sensitively, directly address issues within the domains of motor, communication, cognitive and social-emotional functioning, contraindications of their use must be identified where necessary (Magee, 2014). Configuring EMT's to bypass these issues may also be possible to ensure successful access to music making (Magee, 2014). Considerations of possible fatigue, frustration or capacity to disengage from the musical device (having a "point of rest" – Magee, 2014, p. 89) may make EMTs unsuitable for some clients with physical impairments. This has been observed in my own clinical work with regard to gestural controllers such as Soundbeam.

Frustration may also occur if the developmental or cognitive levels of the client are not matched by the presented EMT's. Cause-and-effect understanding is considered a prerequisite for clients to engage with EMT's, while visual and sensory feedback and cues, or lack thereof can also enhance or inhibit access to EMTs. This is particularly true for clients with sensory impairments (Whitehead-Pleaux, Clark and Spall, 2011).

EMT's which are more intuitive to use, requiring less explicit instruction or explanation are recommended for clients with communication issues, again to minimise frustration and maintain therapeutic rapport (Magee, 2014). Sensory issues (particularly in the tactile or auditory modalities) may also eliminate certain types of EMT's from being used (Whitehead-Pleaux et al., 2011). While the motivational elements of EMTs' can support their use in music therapy (Krout, 2014), some music therapists feel they may not be suitable for clients who may become over-absorbed in the device/software, as can happen with clients with ASD (Magee and Burland, 2008). For clients with impulse control or behavioural issues, EMT's must be robust and relatively inexpensive, or otherwise easily replaced (Magee, 2014).

Krout (2014) recommended a playful, flexible and collaborative approach to incorporating EMT's into clinical practice, grounded in the needs of the clients, particularly where traditional acoustic instruments are not useful. Similarly, Magee encouraged "further exploration and refinement through both practice and research" in place of an authoritative stance on the place of music technology in music therapy practice (2014).

**Attitudes of music therapists to the use of music technology in sessions.** Some music therapists have questioned the value of music technology as a resource within the music therapy process. Concerns have been reported about ease of use, cost, and portability (Magee, 2006; Magee & Burland, 2008). Survey research findings have also pointed to concerns that technology *gets in the way* of the therapeutic relationship and is somehow lacking in essential features or nuances held by acoustic instruments (Magee, 2006). In follow-up research these attitudes were found to be little changed over time (Hadley, Hahna, Miller and Bonaventura, 2014). Efforts have been made to encourage training and familiarisation with music technology to correct some apparent misconceptions about the limited applicability of music technology in creating *live* music (Hadley et al., 2014). Cevasco and Hong (2011) identified the need for greater training in the use of music technology within music therapy courses, and in professional development of qualified practitioners.

There is a growing literature base on music technology in music therapy that has aimed to convey the potentials EMT's in sessions in a simple, practical and inviting way for music therapists of all levels of familiarity and facility. The contributions to the book *Music technology in therapeutic and health settings* (edited by Wendy Magee, 2014) are notable examples. Technology is presented by the music therapist authors as a clinical asset - offering new ways of engaging clients, creating new therapeutic spaces and enhancing practice – hopefully appealing prospects for any music therapist.

**Music technology and disability in related fields.** Samuels (2014), writing about community music with people with disabilities, described the capacity of music technology to be either *exclusionary* or *enabling*, depending on the design or openness to adaptation. In accordance with principles upheld in the social model of disability, inclusive digital musical interfaces (DMI's) have the potential to remove barriers to music making for people with disabilities (Samuels, 2014). Jewell and Atkin (2013) recommended using mainstream technology, adapted if necessary to suit the individual, or open source technology, over dedicated assistive devices, which are typically expensive. “Curated ecosystems” (Jewell and Atkins, 2013, p. 11) such as iOS and Android devices are also considered user-friendly for music making, but with limited flexibility and often, a high price.

Farrimond et al. (2011) reviewed the use of music technology in music education in special education and disability settings. They outlined three major aspects of DMI design and structure (adapted from Moog, 1988) that can be adapted in a modular fashion for optimum use by musicians with disabilities; 1. interface, 2. sound generator, and 3. visual reality. These can be configured to suit the abilities of any user in a flexible manner. They also identified different types of interfaces available to any musician using DMI's, but that can be considered explicitly for enhancing accessibility – distance and motion tracking technology; touch screen technology; tangible interfaces; wind controllers and biometrics (Farrimond et al 2011, p. 26-29). Challis (2009) described certain mainstream MIDI controllers as “naturally accessible” to people with disabilities in music education contexts.

**Distinctive aspects of EMT use in Enable Ireland music therapy programme.**

Farrimond et al.'s application of Moog's modular definition of digital musical instruments is useful in conceptualising the use of DMI's/EMT's in the music therapy programme at the centre of this research (2011). The current set-up of MIDI or audio input devices *integrated* through the Ableton Live audio software allows for the real-time manipulation and

combination of physical and virtual features of the available technology. The configurable communications between controllers, software and monitors are of great importance to the flexibility and adaptability of the entire input/processing/output system to the needs and preferences of the users. The MIDI protocol itself, and the way MIDI messages can be transposed or redefined offers unique opportunities for individualising control of musical parameters to optimise live, spontaneous music making by the disabled musician in collaboration with the music therapist.

Each new update of Ableton Live (the music therapy programme has upgraded from versions 6 to 9 since we began using it) brings new sounds and effects as well as features for recording, processing and exporting MIDI and audio information in general. The physical features of MIDI controllers remain relatively stable (drum pads and keyboards with different combinations of sliders, rotary knobs, modulation wheels and X/Y pads), save for specific features of certain devices that support integration with the Ableton Live, including transport controls or loop triggering functions; known as *native mode*. The increasing usability of the DAW with each version creates new opportunities for integration of available music technology resources, thus supporting access to musicing within music therapy for people of diverse abilities. The combination of controller, DAW settings and output will hereon be referred to as the user's digital musical instrument (DMI) rather than EMT, which is considered more of an umbrella term.

Accessibility of mainstream music technology is key to my practice. I have not had any specialised training in the use of the EMTs employed in the music therapy programme at Enable Ireland. I needed to find and use devices that could be installed easily and quickly, then configured and individualised within a session. The low learning curve required by commercial devices has benefitted my practice, allowing new ideas and interfaces to enhance the work. The low demand for technical proficiency or understanding aids speedy

incorporation into work within sessions. My relationship with EMTs is fundamentally as a *user*. These technology resources are only employed insofar as they are *useful*.

### **Conclusion**

This chapter provided an outline of the person centred ethos of Enable Ireland and the synergistic therapeutic underpinnings of the music programme running in two of its facilities since 2006. The organisational strategy within Enable Ireland of engaging technology in empowering and improving quality of life for people with disabilities has extended to the music therapy programme, where mainstream digital musical instruments (DMIs) offer unique affordances for accessing tacit musicality, and thus the music therapy process itself.

Standard music therapy methods and materials are used effectively in the music therapy programme at Enable Ireland. However, collaborative work on creative applications of music technology to enhance and support access to musicing for people with physical and intellectual disabilities has also occurred. This achieves the therapeutic goal of promoting skill development and empowerment while also facilitating more typical goals in the psychosocial and communication domains of functioning. The person centred service provision ethos is highly congruent with the therapeutic principles of the programme, meaning that collaboration, shared learning and resource building are familiar to service users as means of pursuing their goals and enhancing their well-being.

This doctoral research aimed to investigate how we – service users accessing music therapy and myself as music therapist – used music technology together within the person centred music therapy programme at Enable Ireland. Relevant aspects of the music technology resources might be identified in terms of appeal, accessibility, aesthetic and relational potentials in supporting tacit musicality and facilitating meaningful musicing. The guiding question was “How does technology help us to make music together?”. In keeping with the collaborative nature of the programme, participatory action research (PAR) was

considered the most authentic and inclusive way to approach the research and facilitate the reframing of the guiding question into a form that reflected the co-ownership of the applications developed to date.

The next chapter presents the relevant features of PAR in terms of principles, epistemology and ethical issues and how it was infused with an Arts-Based Research sensibility throughout the project.

## Chapter 3

### Research Development and Methodology

This chapter outlines the development of the research, the rationale for the methods chosen including participatory action research (PAR) and arts-based research (ABR). The ethical and methodological issues in practitioner research are discussed.

#### **Initial research idea**

The focus for this doctoral research emerged gradually. I began with the intent to deepen and share my understanding of the role of technology within a person centred music therapy programme for people with disabilities. As an experienced practitioner commencing a practice-based inquiry, I was interested in better understanding, and to be able to share with others, how technology supported the therapeutic aims of; building capacities, supporting creativity and expression, creating and maintaining relationships, and engendering empowerment. The initial steps in developing the research approach involved a practitioner-based, methodological perspective. I intended to examine ways to formalise, or even optimise, the way practice was conceptualised and undertaken. This intent gradually evolved into a more collaborative research perspective, reflecting the shared ownership of the technology resources and applications, by service users accessing the music therapy programme at Enable Ireland.

As Enable Ireland's service ethos is person centred, it was directly relevant to focus the research study on the ways in which music therapy, and specifically a technology-based interaction, facilitated person centred planning (PCP) goals and imperatives. The humanistic, resource-based music therapy approach aligned synergistically with the capacity-based and community-oriented ethos embodied in the existing service provision structure. Enable Ireland's core strategy of improving the quality of life and inclusion of its service users through assistive technology provided a rationale for the inclusion of technology in music

therapy there. This created enhanced potential for musicing afforded by music technology, and thus had positive implications for engagement with the music therapy process. Many service users had an active relationship with technology for enhancing communication, mobility, learning and recreation, accordingly those accessing music therapy tended to be very comfortable with its incorporation into sessions.

The accessibility of mainstream music technology used in the music therapy programme meant that many features and functions of the controllers and audio devices were under the direct control of the service users. Additional opportunities for collaboration and creativity within the therapeutic relationship were possible beyond the functional adaptations of the technology. This collaborative, exploratory approach to the use of technology within the music therapy programme informed the iterative development of the research project. Participants' experience and knowledge of the devices used allowed a naturalistic research study to emerge.

The core set of devices used in music therapy at Enable Ireland are; MIDI controllers such drum pads and keyboards, and electric instruments such as electric guitars, and microphones. Devices with which the participants are already familiar, such a tablets, smartphones, other handheld devices, and associated applications (hereafter apps), were also used to create music. These resources are used in group and individual sessions within the music therapy programme to facilitate access to musicing via digital audio software. The accessible features of these devices, and the adaptability of their functions to individual needs and preferences, made them ideal for use in music making during music therapy. As well as being accessible, additional beneficial aspects of the technology resources such as low cost, portability, ease of use, and general appeal, have supported their inclusion in the music therapy programme since 2008.

The devices are usually small and portable, convenient for transport, and easy for service users to hold on wheelchair tables, desks or in their laps, requiring only a USB connection to a laptop and audio software to function (in the case of MIDI controllers), or an audio cable (in the case of electric guitars, microphones or iPads). The *plug and play* functionality of MIDI controllers contributes to the ease of use of these devices, integrating with the DAW, Ableton Live and allowing quick access to virtual instruments, samples and loops. This is very similar to how an alphanumeric keyboard (i.e. QWERTY) works with a word processing programme, with musical information in place of written text, and similarly straightforward options for editing and manipulation.

The value of mainstream music technology within a person centred music therapy programme is due partly to the appeal of the technology to the service users. The unique designs of the EMT devices, for example the grid layout of the Launchpad, encourages engagement through simple and intuitive interface. These devices are also very sleek in design, sometimes with LED indicators or backlit pads that create a visual appeal for the prospective players.

The combination of these features creates distinctive possibilities for people with disabilities to choose a physical interface and control musical parameters to create spontaneous music, or to compose. The option of choosing effects (MIDI or audio) offers additional control as well as aesthetic possibilities. Diverse instrument sounds are also available to create authentic representation of genres or to blend genres. As most of the devices and software used in the programme are designed for use by anyone, they are highly accessible to people of all levels of functioning, but not identifying of impairment, as is the case with some assistive devices (Ripat & Woodgate, 2011).

### **Research Question**

The benefits and limitations of these music making technologies in facilitating creative music were of primary interest as the research question developed. I began to be more specifically interested on exploring the type of musical agency afforded by mainstream music technology, and its effect within the music therapy context. It emerged that one of the roles of a music therapist in supporting this agency was maintaining an awareness of the intentionality of the player and matching that to the technology resources as closely as possible. Technology could be a barrier to therapeutic progress as well as an enhancer if was expected to do too much of the work.

Music technology applications developed within music therapy sessions at Enable Ireland had unique features strongly influenced by the service users. The potential to individualise a music technology interface to a person's physical, cognitive, expressive and aesthetic profile was an important consideration in the development of the research concept. The flexible, modular nature of MIDI control, from the hardware itself, to the processing and transduction of MIDI messages within a DAW meant that numerous combinations of features and parameters could be possible. That these combinations could be refined *on-the-fly* within a music therapy session, with minimum impediment to the flow of music also seemed notable to me as a practitioner. Investigating this dynamic use of technology within music therapy sessions became a further research focus over time.

Accessing or enhancing a person's tacit musicality has been described as at the core of the practice of music therapy (Boxill, 1985; Nordoff and Robbins, 1971; Procter, 2011; Trevarthen and Malloch, 2000), especially with people with disabilities, where dormant musicality may be impaired or obstructed (Dimitriadis and Smeijsters, 2011; Pavlicevic, 2003). As technology's potential to support access and inclusion continues to grow (Enable Ireland, 2015; Ripat and Woodgate, 2011), a user-based research perspective on how technology could facilitate or impede music is warranted. As the applications of

mainstream music technology at Enable Ireland had been developed in collaboration with service users, the subsequent research study was also approached collaboratively.

The service users had ownership of the applications we developed together, and thus, potentially of any associated research. Developing research with people accessing the music therapy programme was intended to be as naturalistic and non-intrusive as possible. Selecting a research design that could align with the standard set up and flow of a regular music therapy session was key.

### **Choosing the Methodology**

Investigating the practice of using music technology for accessing music required an approach that involved all relevant parties, including the practitioner and participants (service users), incorporating their views and interests. The method chosen needed to ensure that the voices of a functionally diverse group of participants could be fully incorporated – from those with mild disabilities to those in the severe/profound range. This would mean a methodology where verbal interaction was not necessarily the primary medium of the research, where multiple forms of knowledge could be incorporated into the design.

Participatory Action Research (or PAR) was chosen as an appropriate form of practitioner research based on co-operative inquiry (Heron and Reason, 1997). That is – research *with* people, rather than *on* people (McTaggart, 1997). This ethos of PAR research is about people understanding and improving what they do – working toward tangible, positive change (McTaggart, 1997).

PAR has been described as a humanistic approach to knowledge generation (Goodley & Lawthom, 2005; Pedler and Burgoyne, 2008; Rowan, 2006). PAR works on a democratic basis (Stringer, 1999), and focusses on immediate benefits for participants; both of which were considered a good fit with the research context in practical, epistemological and ethical

terms. The role of researcher as *catalyst* for change, rather than direct agent corresponds with the person centred therapeutic approach (Stringer, 1999, p. 25).

PAR's emancipatory nature (Boog, 2003) is aligned with both the overall goals of the PCP model, and the music therapy service, at Enable Ireland. The pragmatic and ethical aspects of PAR have made it a popular method within disability research (Barnes, 2001; Goodley & Lawthom, 2005, Stevenson, 2010; White, 2002). The extended epistemology also facilitates the incorporation of arts-based research methodologies into the participatory action research process (Brydon-Miller, Kral, Maguire, Noffke & Sabhlok, 2011; Daykin, 2008; Lliamputtong & Campbell, 2008; Reason & Heron, 1997).

### **Participatory Action Research**

#### **Background**

Participatory action research is a collaborative research method used in diverse contexts such as community development, education, disability studies, health promotion, human geography and music therapy. As a form of applied research it is conducted *with* people rather than *on* people (Reason, 2006), PAR seeks effects that are immediately socially relevant for participants (McTaggart, 1997). Essentially, PAR is an affirmation of the idea that ordinary people “can understand and change their own lives through research, education and practice” (Brydon-Miller et al., 2011, p. 388).

This *lay participation* focus within PAR is intended to lead to shared ownership of the research as it aims to address the issues of a group or community (Stige, 2005). This incorporates an understanding of the plurality of knowledge and in turn, the acknowledgement that those “who have been systematically excluded from knowledge generation need to be active participants in the research, especially when it is about them” (Brydon-Miller et al., 2011, p. 389). Knowledge is considered in terms of “emerging and embodied processes situated within a context of shared practice” (Stige, 2005, p. 406).

## The Historical Roots of PAR

Brydon-Miller et al. (2011) identified the “deep and wide” roots of PAR in the early 20th century social sciences (p. 388). New forms of discourse brought collective action and an imperative for social justice to the inquiry process. This contrasted with traditional models of knowledge construction that privilege expert knowledge (McDermott, 2007, cited in Brydon-Miller et al., 2011). Through its evolution over the decades, PAR has sought to affirm that the capacity of ordinary people to understand and change their lives through research, education and action (Brydon-Miller et al., 2011). These origins have in common the goal to challenge forms of knowledge production where nondominant groups are positioned as *outsiders* (Brydon-Miller et al., 2011). This was characterised as a form of *activist scholarship* by Brydon-Miller et al. (2011).

Lewin’s (1946) work on industrial relations, management and education, has been credited with coining the term *action research*, though he may be more accurately credited with its definition and theoretical content (Stige, 2005). Action research, according to Lewin involved “comparative research on the conditions and effects of various forms of social action, and research leading to social action” (1946, p. 35). The cyclical nature of action research has also been attributed to Lewin (Stige, 2005), and continues to be a defining characteristic of the methodology. Boog observed that, “in Lewin’s work, all the important elements of action research can be found” (2003, p. 429).

In later decades, and particularly in the 1960’s, PAR became more politically informed and socially engaged; developing as an accepted form of knowledge construction. It gained credence through critiques of the “epistemological pathology” of positivist research claims as being value free, objective and expert-based (Wicks, Reason & Bradbury, 2008, p. 19). Feminist discourses on knowledge construction further influenced PAR through the acknowledgement that identities and positionalities influenced the research process, (Brydon-

Miller et al., 2011). PAR was also informed by social struggles and movements such as workers' movements (Adams, 1979, cited in Brydon-Miller et al., 2011), feminist activism (Maguire, 2001b, cited in Brydon-Miller et al., 2011; McTaggart, 1997) and human rights and peace movements (Tandon, 1996, cited in Brydon-Miller et al., 2011). These indicate PAR's emancipatory intent throughout its development (Boog, 2003).

A distinguishing feature of PAR throughout its history has been its relationship with the academy and with marginalised populations. Early work in the development of PAR took place "outside of traditional academic settings" in developing communities (Brydon-Miller *et al.*, 2011, p. 388). Adult education also provided a context for PAR projects to develop as alternatives to dominant, traditional education models were developed and implemented (Brydon-Miller et al., 2011). The role of PAR in enhancing voice and agency for people with disabilities within research and otherwise will be discussed in further detail in another section.

The United Nations Convention on the Rights of the Child (1989) recognised the rights of children to participate in projects that would affect them. This led to a growth in PAR projects with children as agents within research instead of objects of research (Fine & Torre, 2005). Young people brought their unique perspectives on problems and solutions differently from adults in the same settings (Cammarota & Fine, 2008; Fernández, 2002; Groundwater-Smith & Downes, 1999; Guishard, 2009; Hutzler, 2007; Lewis, 2007; McIntyre, 2000; Morgan et al. 2004; Tuck, 2009; cited in Brydon-Miller et al., 2011).

### **Principles of PAR**

Participatory action research aims to develop and improve the practical situations and competencies of the participants (Altrichter, Kemmis, McTaggart & Zuber-Skerritt, 2002). The contextually sensitive nature of PAR makes a single, clear definition difficult, but perhaps also unnecessary (Altrichter et al., 2002). Multiple contributors to PAR resist formal

elaboration of the processes of research. Projects are conducted *from the ground up* with a focus on emergent, local, and relevant interests.

General frameworks covering the nature, philosophy and methodology of PAR tend to be more common in literature than concrete definitions (Altrichter et al., 2002). PAR has been described in terms of *process* criteria of participation and emancipation (Altrichter et al., 2002). Although there is no single, agreed way by which PAR is to be implemented, White, Suchowierska and Campbell identified core features common to most PAR projects:

1. Meaningful consumer involvement in all phases of research.
2. Power sharing between researchers and consumers.
3. Mutual respect for different provinces of knowledge.
4. Bidirectional education of researchers and consumers.
5. Conversion of results into new policy, programmes or social initiatives.
6. Contrast to the traditional standard for conducting research in which

participants are treated as passive objects of study.

(2004, para. 4)

Though it seeks to address issues of importance to communities, PAR is not a “panacea for social issues” (Altrichter et al., 2002 p. 127). Rather, it offers a way of engaging with issues or questions (Altrichter et al., 2002). The significance of *participation, action* and *research* as fundamental principles within PAR is discussed further below.

**Participation.** Participation has been defined as a sharing of power (Kidd & Kral, 2005). Kidd and Kral elaborated that “a genuinely participatory attitude will guide the development of such sharing” (2005, p. 189). According to McTaggart, participation must be authentic, the researchers must share how research is conceptualised, practiced and brought to bear (1997). This requires of ownership, reasonable agency in production of knowledge and improvement of practice. Involvement not enough as this brings the risk of co-option and

exploitation. Participation is determined by a participant's role in setting agenda, participation in data collection and analysis and control over use of outcomes and whole process (McTaggart, 1997).

**Action – research cycles and thematic concern.** In PAR, theory and practice are not distinct, but inform and reflect each other (Brydon-Miller et al., 2011). PAR projects thus tend also to involve a spiral of steps of planning, acting, observing and evaluating around a general idea of improvement or change known as the “thematic concern” (McTaggart, 1997, p. 30).

**Research.** Participatory action research is “inclusive in its relationship with many other research frameworks” (Altrichter et al., 2002 p. 130). As a *meta-methodology*, PAR can incorporate quantitative or qualitative methods if the participants are in control of how design, implementation, data analysis and dissemination (Altrichter et al., 2002; Dick et al, 2015).

Data collection methods are flexible and attuned with local, cultural, economic, and political conditions. They are therefore highly context specific. Each cycle is refined in response to the insights gained from previous cycles (Altrichter et al., 2002). The research is necessarily iterative and unfolds as new understandings and insights are gained (Stevenson, 2010). Stige has suggested that in PAR, “specific research methods take second place to emerging processes of collaboration and communication” (2005, p. 408).

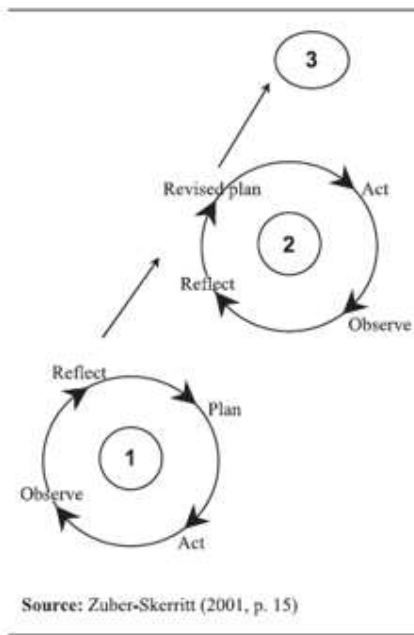


Figure 5. Action research cycles (Zuber-Skerritt, 2001).

**The role of the researcher.** While PAR is a method for a group or community to investigate its own issues, a *lead* or *academic* researcher is usually involved (Stige, 2005). The role of the researcher and his or her relationship with the *host culture* (Altrichter et al., 2002) depends on whether the researcher is an outsider, seeking to access a group (White et al., 2004), or an insider, someone already working within or for that community (Robson & McCartan, 2016). Whether an outsider or insider, the researcher has responsibility to consider and evaluate the gains for them in undertaking the research as against the gains for the participants in contributing.

*Outsider* researchers may have experience in developing PAR projects but must sensitively access the field in a way that is non-disruptive (Altrichter et al., 2002; White et al., 2004). *Insider* researchers, such as teachers, therapists, and other practitioners, may have unique knowledge of the context being studied as well as having established relationships with members of the community of practice. However, they may rely on the outsider for expertise in how to develop and evaluate the PAR programme. Accessing the field authentically may be easier where there is insider access but developing and implementing

the PAR methodology can be challenging (Altrichter, Feldman, Posch & Somekh, 2008). The expertise of the academic researcher, whether an insider or outsider, is put at the disposal of the lay researchers in the service of the overall goals (Carlisle & Cropper, 2009; Stige, 2005).

### **PAR and Disability**

Participatory action research has a unique capacity to “provide opportunities for those least often heard to share their knowledge and wisdom” (Brydon-Miller et al, 2011, p. 249). As such, PAR has a relevance for people with disabilities, historically a minority group not well served by traditional (positivist), or medical-model based research (Goodley & Lawthom, 2005; Mertens, Sullivan & Stace, 2011; Stevenson, 2010). The acknowledgement of the United Nations’ Convention on the Rights of People with Disabilities (United Nations, 2006) within research, as well as the incorporation of the social model of disability into research creates potential for the emancipation and empowerment of people with disabilities through participatory research (Mertens et al., 2011; Stevenson, 2010).

Determining the role of the academic researcher, or practitioner researcher is an important issue in PAR projects involving people with disabilities. Stevenson described the concept of an *activist researcher* as a “grounded and credible model of engagement” of people with disabilities in research (2010, p. 38). An anti-oppressive stance and democratic engagement with participants are recommended. The maintenance of a critical and self-reflexive stance is also imperative to ensure that the academic is aware of potential barriers within the research process itself that may disadvantage the participants/co-researchers and jeopardise dialogue (Stevenson, 2010).

Barnes also proposed principles for emancipatory disability research (2001, Stevenson, 2010). These are: control, openness and accountability, practical outcomes, the social model of disability, and appropriate methodology, methodological rigour and the role of experience.

These principles resonate with the PCP model and therapeutic principles described in Chapter 2.

Disabilities studies literature advocates using participative methods as a way of giving a stronger voice to people with disabilities in matters that concern them (Stevenson, 2010). This contrasts with traditional research approaches used to investigate disability which may not typically prioritise immediate benefits, interventions, or insights relevant to the participants (White, 2002). PAR aligns with the research philosophies of community psychology and disability studies. Its parameters and processes emphasise contextual sensitivity, the emancipatory nature of research action, and there is a focus on tangible benefits for participants, as well as shared, explicit, reference to the social model of disability (Goodley & Lawthom, 2010; Priestley, 1997).

PAR projects involving people with disabilities have investigated issue of service provision and social inclusion such as : the effectiveness of AT devices and services (Bauer, Elsaesser, Scherer, Sax & Arthanat, 2014; Hammel, Finlayson & Lastowski, 2003), the accessibility of AT services (Craddock & McCormack, 2002), community living and supported employment programmes (Bigby & Frawley, 2010; Sample, 1996; Sanderson, 2000), social activism, advocacy and policy development (Carney, Dundon & Ní Léime, 2012; Jaiswal & Gupta, 2017) and health promotion (Jurkowski & Paul-Ward, 2007). More personal issues such as sexuality and relationships (Harrison, Johnson, Hillier & Strong, 2001; Marshall et al., 2012), self-advocacy (Chapman, 2014; Davidson, 2015; Llewellyn & Northway, 2008) and oral history (Johnson, 2009) have also been studied by people with disabilities through PAR.

### **Participatory action research and Enable Ireland**

PAR within the field of disability involves the cultivation of *horizontal relationships* between researchers with and without disabilities (Abma, Nierse & Widdershoven, 2009).

These manifest through the sharing of control within the research process between all stakeholders (Abma, Nierse & Widdershoven, 2009). The anti-authoritarian ethos of person centred planning has resonant prerequisites for authentic and effective service provision for people with disabilities— *shared understanding* and *collaboration, not competition* outlined in Chapter 2 (O'Brien & O'Brien, 2000).

Accordingly, collaborative, or user-led research is considered favourably by Enable Ireland's research ethics committee when considering research proposals. Prior to this research project, PAR projects conducted at Enable Ireland had mostly involved collaboration in designing assistive technologies (Long, 2011, personal communication). The need for ongoing user-led research in assistive technology has been emphasised by Enable Ireland and the Disability Federation of Ireland as a way to improve quality of life for people with disabilities and to justify funding for new technologies and interventions (2016).

### **Participatory Action Research and Music Therapy**

Though congruent precursors have been identified, participatory action research projects are still relatively uncommon in music therapy research (Stige, 2005). More recently, music therapists have used PAR methods to investigate diverse contexts and typically with vulnerable, marginalised, or excluded populations. Hunt (2005) explored the benefits of music therapy with young refugees in a school environment. Tuastad and Stige (2018) reported on a PAR project with men in prison to assess the value of group musicing by starting a rock band. Vaillancourt explored the social value of community singing groups (2009). Elefant (2010) explored issues of *voice* through her collaboration with a choir for people with disabilities. Schwantes and Rivera (2017) explored issues of inclusion for people with disabilities at university using a community music therapy approach. These projects operated in context-sensitive ways, though with different levels of participation from the participants/co-researchers. Despite the differences in context, population and research

question, there was a common focus on agency, empowerment and interpersonal connection.

### **The Participative Inquiry Paradigm, Multiple Knowings and Arts-based Research**

#### **The Participatory Inquiry Paradigm**

Action research with a participatory worldview seeks to assert multiple ways of knowing that start from a relationship between self and other, through participation and intuition (Seeley & Reason, 2008). This *extended epistemology* goes beyond a positivist focus on the rational and the empirical to include “diverse ways of knowing as persons encounter and act in their world” (Reason & Riley, 2015, p. 209). From this perspective “a knower participates in the known, articulates a world in at least four ways: experiential, presentational, propositional and practical” (Reason & Heron, 1997, p. 5). These ways of knowing constitute “the manifold of our subjectivity” (Reason & Heron, 1997, p. 6). This perspective embraces pre-verbal, manifest and tacit forms of knowledge within the research process (Seeley & Reason, 2008). This has been described as the *participatory inquiry paradigm* (Heron & Reason, 1997).

The participative worldview has been related to Polanyi’s (1962) idea of tacit knowledge as a form of embodied knowledge that underpins all cognitive action (Heron & Reason, 2008; Reason, 2006). This tacit knowledge can be manifest, pre-verbal and often difficult to access (Reason, 2006; Seeley & Reason, 2008). Acknowledging multiple knowings asserts “the importance of sensitivity and attunement in the moment of relationship, and of knowing not just as an academic pursuit, but as the everyday practice of acting in relationship and creating meaning” (Reason and Bradbury, 2001, p. 9). The four ways of knowing are experiential, presentational, propositional and practical.

*Experiential knowing* involves face to face encounter with the associated immediacy of perceiving, empathy and resonance with a person, place or thing (Reason, 2006). All knowing is grounded in the experiential presence of persons (Heron & Reason, 2008). It

involves direct experience with people, places or things and as such is tacit and pre-verbal (Heron & Reason, 2008). Though real, experiential knowing can be elusive to express. It is based in encounter, not a positivist grasp of reality *per se*. To experience something is to participate in it, moulding it in the encounter (Heron & Reason, 2008). Experiential knowing is more immediate and less mediated than propositional knowing (Heron & Reason, 2008). This kind of direct knowledge grounds the more symbolic and conceptual forms of knowledge (Heron & Reason, 2008).

Within a research process, experiential knowing is a precondition of successful inquiry groups, where a tacit, unintentional level of communion connects participants (Heron & Reason, 2008). Issues of inclusion, control and intimacy must be balanced, thus requiring sensitive facilitation at times (Reason & Heron, 1997). Conscious awareness of experiential aspects of the research can generate insights into the inquiry, or act as a transformational outcome in the form of personal well-being and empathic relating (Heron & Reason, 2008).

*Presentational knowing* emerges from encounters, as form and process are intuited from that which is met. This involves forms or images that articulate experiential knowing in a communicable way. This may be non-discursive forms (visual arts, music, dance and movement) or discursive forms (poetry, drama, stories). Presentational knowing can be considered a fundamental part of an inquiry, a meaningful outcome, or a precursor to propositional outcomes (Heron & Reason, 2008; Seeley & Reason, 2008). It has been suggested that the conceptual power of language can constrain the potential to intuit significant patterns within an inquiry, which might perhaps be better expressed non-propositionally (Heron & Reason, 2008). This speaks to the *crisis of representation* in qualitative research, addressing the gap between experience and words (Altheide & Johnson, 2011; Denzin & Lincoln, 2011).

In the inquiry process, presentational knowing contributes to pre-conceptual communion among participants as presentational forms create possibilities for open encounter (Heron & Reason, 2008). It brings curiosity through new types of encounter, new stories, metaphors and patterns (Heron & Reason, 2008). Presentational forms can be used as a form of record keeping (for example, audio-visual recordings). Outcomes of research can be disseminated in presentational form, either in a stand-alone manner or with propositional text (Heron & Reason, 2008).

*Propositional knowing* is knowing *about* something, where ideas, theories or concepts are expressed in statements or as facts (Heron & Reason, 2008). It is expressed through spoken and written statements (Heron & Reason, 2008). Traditional research tends to treat propositional knowing as the dominant form of knowing, or a “regime of truth that describes reality” (Heron & Reason, 2008). However, this position has been challenged in literature on collaborative inquiry. Korzybski’s maxim “the map is not the territory” (cited in Heron and Reason, 2008, p. 374, see also Bateson, 1979) has been invoked to counter the notion of propositional knowledge as truth and the concomitant implications for social power.

Propositional knowing can bring clarity to the inquiry process, especially in the transfer of learning between cycles (Heron & Reason, 2008). Propositional outcomes may involve the articulation of emancipatory or critical propositions or theories (Heron & Reason, 2008). Information about the research context, descriptions and evaluations of processes are necessarily propositional aspects of the inquiry process, though they can be complemented or replaced by presentational outcomes (Heron, 1996).

*Practical knowing* is how to engage in a class of action or practice (Heron & Reason, 2008). It is evidenced by skills or competencies developed within the inquiry process, through transformative actions (Heron & Reason, 2008). This domain of knowledge draws from MacMurray’s description of the self as a knowing subject, whereby knowing is only

consummated through agency (1957, cited in Heron and Reason, 2008). As such, thought cannot be separated from action (Heron & Reason, 2008). This is the final stage in the *up-hierarchy* that is the four forms of knowing, encapsulating experiential, presentational and propositional knowings (Heron & Reason, 2008).

Within the research process, skills of knowledge generation, either personal or facilitative can enhance the attitude of inquiry, bringing curiosity both towards each other and to new experiences (Heron & Reason, 2008). This informs how decisions are made in the planning phase of research through the interplay of autonomy (individuals' idiosyncratic needs and interests), active hierarchy (creative leadership that promotes autonomy and cooperation), passive hierarchy (identifying and supporting the active hierarchical proposals of another) and cooperation (listening, engaging and negotiating). Skilful facilitation is needed to serve collaboration, and to manage confusion, chaos and frustration (Heron & Reason, 2008). In this way, diversity can be celebrated as essential to creating genuine unity – creative and social synchrony (Heron & Reason, 2008).

Practical knowing can thus manifest as research skills acquired as the inquiry process develops. This will depend on how many research cycles are planned, how action and reflection are balanced and whether the inquiry is convergent or divergent (Heron & Reason, 2008). There are two broad styles of research engagement, though not mutually exclusive – Apollonian and Dionysian (Reason, 2006; Heron & Reason, 2008). Apollonian inquiry takes a more rational, linear, systematic, controlling, and explicit approach whereas Dionysian inquiry is more imaginal, expressive, spiralling, diffuse, impromptu, and tacit (Heron & Reason, 2001). Dionysian inquiry tends to allow learning to emerge in creative actions that arise spontaneously (Heron & Reason, 2008). Skills and behaviours developed by participants during the inquiry can be considered practical knowing outcomes (Heron and Reason, 2008).

Facilitating a collaborative inquiry process within an extended epistemology involves an understanding of how each way of knowing contributes to the quality of the inquiry and is of value in and of itself. Awareness of experiential issues opens encounters, challenges habits, seeks newness and deepens contact (Heron & Reason, 2008). Presentational knowledge brings intuition and playfulness to the process, allowing the articulation of experiential knowledge in creative ways, and experimenting with redescription (Heron & Reason, 2008). Propositional knowing can create conceptual schemas around the presentational forms (Heron & Reason, 2008). This requires clarity of thought and critical sense making, as well as an awareness of the link between propositional knowledge and social power (Heron & Reason, 2008). New theoretical perspectives can be forged, and accepted theory engaged critically (Heron & Reason, 2008). The practical knowledge, rooted in the skills of the participants, is then evidenced in the worthwhile accomplishments of the inquiry (Heron & Reason, 2008).

These ways of knowing are typically employed in a tacit and interwoven way by people in everyday life but in cooperative inquiry they become more intentional (Reason & Bradbury, 2008). This *epistemological heterogeneity* creates a mutually enhancing effect between the four ways of knowing (Heron & Reason, 2008). Within a process of inquiry this can be considered a *virtuous circle* or – where “skilled action leads to enriched encounter, thence into wider imaginal portrayal of the pattern of events, thence into more comprehensive conceptual models, thence into more developed practice” (Reason & Bradbury, 2008, p. 327).

From an axiological perspective, the predominance of propositional knowing in health and social science research has been a source of marginalisation for what are sometimes termed *vulnerable* populations (Lliamputtong & Rumbold, 2008). The participatory inquiry paradigm has potential to be inclusive and participatory by creating space for people to articulate their world in the face of structures that silence them, opening the research process

to different realities or ways of telling stories (Reason, 2006). Participative forms of inquiry are therefore concerned not only with direct benefit, but also with empowering people through the practice of constructing and using their own knowledge (Reason & Riley, 2008).

### **Participatory Action Research and Arts-based Research**

Arts-based research (ABR) has been defined as “a set of methodological tools used by qualitative researchers across the disciplines during all phases of social research, including data collection, analysis, and representation” (Leavy, 2009, p. ix). ABR has been advocated as a means of incorporating multiple knowings into the research process (Daykin, 2008; Lliamputtong & Campbell, 2008), particularly in “action-oriented” research methodologies (Daykin, 2009, p. 133, see also Stige, 2005).

ABR can be used to convey aspects of experience that might not achieve optimal expression in narrative forms (Ledger & Edwards, 2011) or to *make* knowledge through an arts inquiry in a tangible or embodied way (Gilbertson, 2015). From the perspective of this research, incorporating an ABR perspective into the PAR process was intended to engage potential for inclusion in the research of people who were non-verbal or who had difficulty or disinclination with verbal, propositional or narrative modes of interaction. The precise function of musical data would have to be determined and developed by the co-researchers during the collaborative research process.

### **Practitioner Research and PAR at Enable Ireland: Ethical and Pragmatic**

#### **Considerations, Practitioner-Researcher Synergy**

In this section, issues of researcher role, power, and the pros and cons of practitioner-based research are deliberated. Ethical issues clarified in this section were instrumental in obtaining ethical approval and in initiating and maintaining the two PAR projects at the centre of this research; discussed further in Chapters 4 and 5.

Participatory action research offers the opportunity to develop, scope, and engage new ways of learning about the needs of participants, and the possibilities for future activities. These might not be able to be discovered another way, for example through interviews or surveys. PAR requires full commitment to the process of learning through engagement and doing. The PAR process does, however, elicit concerns about possible and potential ethical issues and difficulties. These were successfully navigated in the projects conducted and presented in this thesis. However, the ethical considerations and the ways in which they were addressed are discussed below. A challenge is offered to the idea that practitioner research must always be accompanied by concerns about coercion, and that so-called *vulnerable* populations are inherently more vulnerable when being recruited for, or participating in, research. Although not all practitioner research can incorporate PAR, Gibbs and Costley (2006) recommended that practitioner researchers consult PAR literature, whether they are using the methodology or not, as it has “the most dynamic range of publications which include ethics in relation to practitioner researchers” (p. 242).

Standard ethical principles of research regarding non-maleficence, autonomy and fidelity apply for practitioner research and action research (Helps, 2017; McLeod, 1999; McNiff & Whitehead, 2006). Additionally, a research site or context may have its own ethical codes or principles for proposed research based on its purpose, function or ethos (Gibbs & Costley, 2006). However, distinct ethical dilemmas may also need to be considered, particularly given the development and evaluation of research work within a therapeutic and/or educational context (McLeod, 1999; Zeni, 2001). A therapist has a responsibility to strive for beneficence for the client, not just the avoidance of harm, and action research also upholds this principle (Helps, 2017; Robson & McCartan, 2016).

Practitioner research usually requires consideration of issues arising from occupying a dual role as both the researcher and the practitioner. The practitioner researcher generates and

analyses data as alongside their responsibility to work for the client's therapeutic benefit and attainment of wellbeing (McLeod, 1999). There is a danger in practitioner led research that a client may become confused about the therapeutic contract, while the therapeutic process may be disrupted or diminished by the research engagement. In a practitioner researcher scenario the main benefit of the research may be for the practitioner-researcher; particularly in terms of external validation through, for example, publications, and award of a PhD (McLeod, 1999). Ethical issues arise when exploitation, manipulation and vulnerability can occur because of the researcher's need to achieve these status goals. Through an ethical disposition of care it has been proposed that these can be recognized and managed (Gibbs & Costley, 2006). This is achieved by undertaking research one is "comfortable" with, using methods appropriate to the context and working collaboratively with participants (Gibbs & Costley, 2006, p. 247).

Procedures of ethical research may be more difficult to implement when a practitioner is researching their own client (Helps, 2017; McLeod, 1999). A client may find it difficult to refuse a practitioner's invitation to participate in a study, seek to please the therapist, or fear the consequences of opting out, thus complicating the informed consent procedure. Confidentiality may be difficult to maintain when the therapist has a deeper understanding of the client than an *outside* researcher might. Additionally, the presence of a research component in therapy may cause the practitioner to *skew* the therapeutic process in a manner not beneficial to the client. (Helps, 2017; McLeod, 1999)

McLeod (1999) therefore suggested that informed consent be sought before therapy commences and that it is made clear that access to therapy is not contingent on participation in any proposed research. Multiple consent checks are necessary throughout the research process. McLeod also advised that the client have an "independent arbiter" (1999, p. 85) to whom any difficulties can be reported. This resonates with Dewing's suggestion of family

members or key workers acting as *gatekeepers* or *validators* (2007). Using collaborative research methods, involving client as co-researcher addresses potential power imbalances (McLeod, 1999; Wolfe, 2012).

In practitioner research, objectivity and anonymity can be difficult to manage. Zeni (2001) recommended adopting principles of responsibility and accountability. Zeni adapted a model from Kirsch (1999) laying out “checkpoints on a continuum of ethical issues” that can help a practitioner-researcher to consider ethical issues at play (p. xii). These are: location (what a researcher brings and how this connects with the research context), relationships (human dynamics threatened or enhanced by the research), interpretation/definition (how research represents subjective experience), publication (texts, forms and voices that are presented to the public, telling a complex story truthfully and respectfully) and institutionalisation (expectations of the institutions involved – university, facility etc).

Clay (1999) considered the ethics of action research to be the merging of the ethically defensible actions of the practitioner and the ethically defensible actions of the researcher. McNiff & Whitehead (2006) invoked Habermas’ (1979) assertion that truth emerges honestly and over time through a commitment to authenticity. Ultimately, ethical integrity and good research go together (Helps, 2017; McLeod, 1999). Groundwater-Smith & Mockler (2006) similarly suggested that ethical issues form the primary criteria for quality in practitioner research, adding that this, for the practitioner-researcher, requires an understanding of the technicalities of research and practice while maintaining an “unwavering commitment to ethics and the improvement of the human condition in the context within which they work” (p. 209).

### **Research Ethics, PAR and *Vulnerable* Populations**

Research ethics can be complicated when working with people “whose condition renders them unable to understand the nature of the research participation, or to give explicit

consent on the basis of this understanding” (Tsirir, Pavlicevic & Farrant, 2014, p. 26).

Research into disability does not always lead to tangible benefits for people with disabilities taking part (White, 2002). Recruiting people with disabilities as co-researchers in research that concerns them empowers them by giving control over knowledge generation and building capacities (Ripat and Woodgate, 2011).

Participatory action research has been recommended as an appropriate research modality for vulnerable, marginalised or excluded groups, if engaged correctly (Aldridge, 2017). It is a research stance that:

allows people with disabilities to shape research to meet their needs at every step of the process. This participatory process may exponentially increase the value of the research to benefit people with disabilities. Despite the challenges that participatory researchers confront, we believe that its potential benefits for people with disabilities outweigh its limitations. (Balcazar & Keys, 2006, p. 7)

This involves commitment to enhancing voice, collaboration and emancipation for participants rather than adherence to strict rules or formulae (Aldridge, 2017). Thus, a flexible, creative approach to research design, implementation and analysis is most preferable and allows for the maximisation of participant/co-researcher influence on all aspects of the research (Aldridge, 2017). This is a person centred, individualised approach to knowledge generation. Participants and data can *speak for themselves* to bring unique insights into subjective experience (Aldridge, 2017).

Aldridge (2017) recommended commitment to certain principles of participation:

- To design research with the needs, conditions and circumstances of the vulnerable population in mind.
- To maintain an ongoing dialogue on design issues, needs and rights and how voice is facilitated.

- Maintaining mutuality, trust and understanding
- Managing expectations and avoiding false claims
- Providing opportunities for reflection.
- Ensure that analytical or interpretative frameworks seek to enhance the *voice* of co-researchers within the research process.

While vulnerability is a significant consideration in ensuring an ethical and authentic research process, the concept of vulnerability itself is not rigid and should not be invoked in such a way to disempower research participants with disabilities or from other marginalised or excluded populations (Aldridge, 2017).

### **Practitioner-Researcher Synergy**

Working as a practitioner-researcher can have inherent benefits as well as challenges. McLeod (1999), Robson and McCartan (2016) and Shaw (2003) have recommended a collaborative, bottom-up research design when conducting practitioner research. When ethics of care and quality are maintained, and the voice of the participants maximised, user-led, participatory research can be “an antidote and counterbalance to ethical myopia” (Shaw, 2003 p. 25).

Literature on collaborative methods has characterised insider positions, partiality and multiple roles as strengths rather than weaknesses, though still requiring monitoring and consideration in ensuring clarity, rigor and validity (Shaw, 2003). Robson and McCartan (2016) referred to this as *practitioner-researcher synergy*. The knowledge of the situation and people involved as well as facilitation skills learned as a practitioner can reduce implementation problems and aid in design of the research.

Vernon (1997) and Kitchin (2005) advocated a mutual sharing of skills between lead researcher and co-researcher, acknowledging the expertise of each as equal but coming from different frames of reference. The academic researcher is advised to take an emancipatory

position and put his or her skills at the disposal of the group. Fawcett, (1991) advised the researcher to take the role of learner within the research process. Thus, the first-hand, individual, tacit and practical led knowledge of the participants is combined with the specialised skills, systematic and theory-led knowledge of the academic researchers throughout the research process. Recruiting people with disabilities as co-researchers in studies that involve them facilitates empowerment through knowledge and capacity building (Ripat & Woodgate, 2011). Oliver has also advocated using participative methods in disability research, again: conducting research *with* people with disabilities rather than *on* them (1992).

### **Conclusion**

Participatory action research was chosen to investigate service users' perspectives, insights and skills with music technology as part of the music therapy programme at Enable Ireland. Arts Based Research was combined with PAR as an innovation emerging through the process of undertaking the research. The participatory nature of the research methodology reflected the shared ownership of the research question – “how does music technology help us to make music together?”. PAR was considered an ethical way to conduct practitioner research with people with disabilities. The participatory inquiry paradigm offered an inclusive approach to knowledge generation – incorporating multiple ways of knowing beyond the dominant, propositional domain.

Issues of engaging in practitioner research with people with disabilities could be clarified, managed and monitored consistently through the adoption of a PAR approach. There was a strong theoretical fit between the principles of PAR and those that inform my music therapy approach and the service provision ethos of the research sites. My *insider* status meant that participatory relationships were already in place, with a high degree of power sharing and shared learning as a core principle of the music therapy work conducted

with Enable Ireland service users. The research question itself concerned generating understanding about a *collaborative* practice between myself and the service users using music technology to access the music therapy process within a community context. This distinguished the research from practitioner research where the practitioner is investigating their *own* practice (see Helps, 2017, for example).

Participatory action research is emancipatory, creating new practical knowledge as well as new capacities to create knowledge (Reason & Bradbury, 2008). In action research knowledge is a process of coming to know rooted in everyday experience; it is a verb rather than a noun (Reason & Bradbury, 2008). This means action research “cannot be programmatic and cannot be defined in terms of hard and fast methods, but is, in Lyotard’s (1979) sense, a work of art” (Reason & Bradbury, 2008, p. 5).

Ultimately, participatory action research reflects what McTaggart has described as “the conscientious objectification of concrete experience and change” (1997 p. 7). Through an extended epistemology, multiple forms of knowing can be acknowledged and explored in the pursuit of human flourishing (Reason & Heron, 2001) with the sincere intention of bringing about tangible and meaningful outcomes for the service users choosing to participate in and contribute to this research project

## Chapter 4

### The Limerick PAR Project

This chapter covers the initial development of the PAR project for Limerick including the early conceptualisation, ethics approval, and recruitment of co-researchers including the consent process. The PAR project reports for each cycle follow, representing the phases of planning, action and reflection.

#### **Project Development**

From the outset it was proposed to undertake a participatory research approach to explore the role of mainstream music technology in facilitating creative music for people with disabilities. This was intended to be open to reappraisal and redesign according to the preferences and decisions of the eventual participants.

It was intended that participants have the opportunity to meet together and make music using the available music technology resources as well as new ones as they became available. It was hoped that individuals could share attitudes and opinions about music technology as well as sharing specific personal insights into how the technology could be individualised and optimised. The guiding question, “how does music technology help us to make music together?” would be refined, reframed or possibly discarded during the project orientation sessions at the beginning of the first PAR cycle.

A participatory epistemology that acknowledged multiple forms of knowing – experiential, presentational, propositional and practical was intended to support diverse participants from the Enable Ireland services to contribute meaningfully to many or all levels of the research process. This potential was considered to be maximised when music making itself (presentational/practical knowing) is treated as the main medium for knowledge generation (Kramer-Roy, 2015). This arts-based approach to PAR was chosen to allow the

community of practice to develop into a community of inquiry in a person centred, inclusive and naturalistic way.

The project developed tentatively and iteratively in consultation with the people who were likely to participate. A tentative framework for a potential PAR project was developed in advance of the application for ethical approval and participant recruitment. The project outline was necessarily loose and open to change to account for the wishes and needs of participants (Kidd & Kral, 2005). The findings and outcomes were intended to develop organically during musicing to allow experiential, propositional, presentational and practical knowing to manifest and be acknowledged thereby shaping the research process in an inclusive manner.

Within the participatory inquiry paradigm (Heron & Reason, 2008) the *flourishing* of participants is a core principle. Flourishing occurs when practical knowing brings about enhanced personal and social fulfilment (Heron & Reason, 1997). Such human fulfilment “is consummated in the very process of choosing and acting” (Heron & Reason, 1997, p. 11). Flourishing as a research outcome or by-product was directly connected to the research focus of meaningful musicing through technology. The supportive correspondences with the research context (PCP) and the humanistic therapeutic orientation of the lead researcher were acknowledged and valued. Agency, voice and empowerment are concepts which permeate the research context, research focus, epistemology and methodology (see chapters 2 and 3).

The capacity of people of all levels of functioning to be musical (Berger, 2005; Boxill & Chase, 2007) was an important factor in conceptualising how participation and knowledge generation would be facilitated during the PAR project. An arts-based perspective was considered the most inclusive way to incorporate the participation of functionally diverse research group members (Lliamputtong & Campbell, 2008). Many of the invited participants had the capacity to engage with and direct the research focus through verbal input;

propositional knowing. Other invitees, whether due to sensory impairments or intellectual disability could engage in other ways such as experientially, through behaviours and responses. All service users could engage directly in presentational terms – through musicing itself. This offered a unique way of facilitating inclusion and connection among service users who might not usually share time in their day-to-day activities. Musicing was considered a form of tacit knowledge, expressed through the individual's preferences and choices of music technology interface as well as their interactions therewith (Kowalski, Yorks & Jelinek, 2008).

Participatory action research seeks to address a concrete issue or *thematic concern* of a group or community of practice through a democratised process of knowledge generation (MacTaggart, 1997). As such, this process had empowering and emancipatory potentials, particularly for service users at Enable Ireland, as people with disabilities, tend not to have a voice in matters that concern them, research-wise (Goodley & Lawthom 2005; Seymour & Garbutt, 1998; Tregaskis & Goodley, 2005). While the general idea of investigating music technology was developed by myself as the academic, or lead researcher, the *thematic concern* was to be determined through project orientation sessions at the beginning of the first cycle. This would require negotiation, informed flexibility, sympathetic presence, mutuality and transparency (McCormack, 2004)

The specific format of the research sessions was intended to be developed after recruitment. This was in part for pragmatic reasons, as the number and availability of participants was not yet known, but mostly for participatory reasons as the participants' preferences were intended as the key informants for the project's parameters, including the format of sessions. It was intended that PAR processes could either be integrated into existing music therapy sessions or kept separate through scheduling of dedicated research sessions, depending on project orientation discussions.

## **Ethics applications**

Ethical approval was first sought from the University of Limerick Research Ethics Committee. This was approved in November 2012. An ethics application was then submitted to the Enable Ireland Research Ethics and Quality Committee (REQC). This was approved in January 2013. The applications were quite different in that the Enable Ireland application required service user collaboration, whereas the participatory nature of the project was somewhat more difficult to articulate within UL application without appearing vague. This reflected the tension and disconnect between the ethical requirements of the university and those of PAR (Blake, 2007; Coupal, 2005; Sultana, 2007). Informally, management at Enable Ireland had expressed trepidation about allowing *outside* researchers to conduct predetermined designs, favouring the *insider* nature of a collaborative practitioner-research approach. This was based on their prior experience of the expectations of researchers.

The University of Limerick has a strong history of PAR (McNiff, n.d.) which may have mitigated this tension in the case of this project's application. The collaborative and service user-driven nature of the proposed research was commended by the Enable Ireland Research Ethics and Quality Committee.

## **Recruitment**

Every service user who had accessed music technology in music therapy, either currently or in the past was invited to participate. Both Limerick and Ennis facilities were included, for ethical reasons and for pragmatic reasons. Ethically, it was felt that a non-selective approach should be taken and that service users in both facilities had the right to contribute. Practically, it was thought that a large cohort of potential participants strengthened the potential for the projects to sustain through 3 cycles over a year-long period as recommended for a PhD level PAR project (Zuber-Skerritt & Perry, 2002). It was not practical to blend or combine the groups, so they were conducted separately and

independently. The two PAR projects were run concurrently from April/May 2013 to June/July 2014.

During recruitment, each service user who was eligible to participate was approached informally to discuss the research. If they were interested, they were given a plain-language information sheet and a consent meeting was scheduled with a gatekeeper, usually a key worker in the facility (See Appendix A). In the consent meeting, the information was read, and any clarifications the service user needed were made. I recorded the meetings on audio so that the prospective participant's own ideas, goals and preferences could be documented. Service users who could give their own consent were then presented with a consent form. Ethical issues of autonomy, right to withdraw, anonymity and confidentiality were explained, and those service users who were interested signed up (See Appendix C).

Some service users could not give consent, and so proxy consent was sought from parents/guardians by sending the information sheet and consent form home (See Appendix B). Where proxy consent was granted, assent was sought according to their perceived level of comprehension (Morrissey, 2012). An assent procedure was designed, according to guidelines taken from Morrissey (2012), using video recording and props (the musical devices themselves) to describe the research as simply as possible (See Appendix B). Key workers of such potential participants were helpful in determining assent, acting as *gatekeepers* or *validators* (Dewing, 2007).

Consent was treated as an ongoing process, to be revisited and revised throughout the research project. Initial consent procedures would be followed up for all participants as part of the PAR methodology, whereby each participant would have multiple opportunities during the planning-action-reflection phases of each PAR cycle to give feedback on their experience and influence the research methodology and project design accordingly. This could involve a participant withdrawing consent if they so choose. Process consent is essential in person

centred research (McCormack, 2003). Family members and key workers may be involved in this process as *gatekeepers* to aid transparency as part of the standard procedures of the PCP paradigm at the centre of all service provision at these facilities, for example, weekly PCP meetings with keyworkers or circles of support with family members, staff and other significant people chosen by the service user (Lunt, Bassett, Evans & Jones, 2008). This had been a useful medium for service users to share their progress in music therapy as well as providing feedback me as therapist.

During the consent meetings discussions occurred about the nature of research *per se*. Some service users were ambivalent about taking part in research due to their perceptions of nature and purpose of research. When one man was asked about his definition of research he answered, “people in white coats, asking you questions”. I found this an interesting parallel to the critiques of research on disability by writers such as Goodley & Lawthom (2005), Stevenson (2010) and White (2002) as treating people with disabilities as passive subjects. During information sessions, emphasis was put on the research being *with* people rather than *on* people throughout the recruitment process. The participatory nature of the research I was proposing did interest many of the service users, both in the informal meetings and the consent meetings.

By the end of the recruitment process, eleven service users were recruited in Limerick and four in Ennis. The Ennis group’s project is detailed in Chapter 5. Of the Limerick recruits, one (J.J.) withdrew after 2 weeks, while another was unable to attend for any sessions due to a change in their service provision arrangements. The general preference of the participants in the Limerick group was to schedule a dedicated research session rather than integrate the PAR methodology into ongoing music therapy sessions. A brief description of the people who signed up to participate in the Limerick strand of the PAR research project follows.

### **Co-researcher Profiles for Limerick PAR Group**

Ricky – Ricky is a 22-year-old man with cerebral palsy. He uses a powered wheelchair and favours his left hand for physical activities. He has a strong interest in music, particularly composition and theory. He is proficient with iPad music sequencing apps such as FL Studio and GarageBand as well as owning his own copy of Ableton Live that he uses at home.

Caroline – Caroline is a 48-year-old woman with cerebral palsy. She has difficulties with fine motor skills but can operate her power wheelchair. She owns her own half-size electric guitar which was adapted in music therapy to be played with one hand. She refers to the guitar as her “baby”.

David – David is a 47-year-old man with mild cerebral palsy and a severe visual impairment. He is an experienced musician who plays accordion and keyboard by ear. His tastes range from Scottish military music to modern ambient techno music.

Thomas – Thomas is 24 and functioned in the moderate to severe/profound range of disability. He requires assistance getting around the facility in his wheelchair. He has good receptive language and some expressive language skills. He has a mischievous personality, favouring expletives in his verbal interactions. He has experience using MIDI controllers and expresses preferences for sounds and devices through gestures or by answering closed questions.

Trevor R. – Trevor R. (24) has a diagnosis of cerebral palsy. He uses a powered wheelchair. Although his speech is sometimes difficult to understand, he has strong opinions and works hard to express them. He has broad tastes in music (from reggae to country). Trevor had collaborated with J.J. and Ricky in the past. He favours the Akai LPD8 pad controller which he holds and plays with two hands due to its relatively small size.

Trevor K – Trevor K. (34) has mild cerebral palsy and uses crutches to mobilise. He is known around the centre as someone to ask for help. Trevor uses MIDI technology in 1:1 work, for improvisation and composition. He had previously performed in concerts in the centre.

Eddie – Eddie (40) has cerebral palsy and a hearing impairment. He uses a manual wheelchair to get around. The severity of his hearing impairment has been reported as difficult to ascertain, although he does use hearing aids. He tends to attend to the visual feedback on Ableton Live's monitors when using MIDI controllers. Eddie communicates with an idiosyncratic version of Irish Sign Language (ISL), combining signs and manual coding (spelling words with the ISL alphabet) and gestures to communicate. He also uses his iPad both as a communication device and as a music device. Eddie frequently collaborates with David.

Mark – Mark (21) is a man with cerebral palsy and a wheelchair user. He had not been attending the facility for long at the inception of this research. Mark had some experience of recording songs with Ableton Live but was not familiar with MIDI controllers when the project began. He was interested in learning more about them and in playing music with the group.

Darren – Darren is a 28-year-old man with spina bifida. He uses a manual wheelchair. He has moderate hearing and visual impairments. He has an encyclopaedic knowledge of music and was instrumental in the setting up of the community radio station, QCFM (Quinn's Cross FM). He had developed different applications of MIDI controllers to learn and perform his favourite songs and to create remixes of dance tracks.

JJ (24)– had been attending a group improvisation session in which he frequently used MIDI controllers. He withdrew from the project after the second session as the research sessions conflicted with this timetable.

## PAR Cycle Reports - Limerick

### Cycle 1 – The Establishment of a Community of Inquiry

**Overview.** During this cycle, the thematic concern was established – *to show what we can do with music technology*. The group decided to explore the available music technology together with a view to demonstrating the skills they developed with a concert at the end of the cycle. A *micro-cycle* format was developed for research sessions attended by the 10 participants to plan each session, engage in improvised musicing and give feedback. Initially, technical problems with the USB devices had to be dealt with, though the group maintained focus and enthusiasm as these were resolved. New instruments and applications were introduced, and the group worked to create a coherent sound for planned concert. The concert was held on-site at the Enable Ireland adult services facility in front of staff and fellow service users. The group reflected on the successes and challenges of the cycle, while the I engaged in inductive coding of video material to generate themes and observations for the group to consider in planning Cycle 2.

**Planning Phase.** PAR research projects are typically begun when co-researchers come together to talk about their interests and concerns to agree on a focus of inquiry, developing a set of questions or propositions to explore through some action or practice (Heron and Reason, 2008). Data gathering practices, and dissemination may also be decided collaboratively in the early stages (Altrichter et al., 2002). White et al. (2004) advised researchers to orient recruited participants by presenting concrete images of expectations or benefits using dialogue and problem solving – potentially through activities. Zuber-Skerritt (2002) identified criteria for the success of an action research programme that were useful in facilitating sessions. There are success/worth, fun/enjoyment, freedom/choice and belonging/respect/love.

There were two project orientation meetings to establish the group and negotiate a thematic concern and plan of action for the remainder of the cycle. It was important to ensure that the thematic concern, research methods and dissemination issues were covered in a participatory manner. My supervisor was very helpful in ensuring this process was not too complicated. An emergent approach was deemed to be appropriate given the functional diversity of the group composition. The group would be allowed to develop organically, though explicit references to PAR principles would be made possible when directly relevant to the circumstances of the group or contributions of the members.

The first orientation meeting was structured around a general discussion of the participants' relationship with music technology and the more specific question "what we want people to know about what we do?". Seven participants attended, as three were absent and one was unavailable at the time of the meeting. The meeting was video recorded and salient points were written on a white board at the request of a participant with a hearing impairment, Eddie. I stated at the beginning that I had no set ideas about what the research project would be about or how sessions would be structured. One of the group members, Trevor R. began speaking about what he wanted out of the research ("more music"). This led to a lengthy conversation whereby group members talked about their interest in music technology and the direction they wanted to take (see Figure 6).

Some of these were very different, though in some senses compatible, but the explicit question of integrating the goals ("Is there a way we can mix all of these together?") was asked by David. Goals ranged from: developing new ways to use Ableton for DJing (Ricky), further development of skill with Garageband on the iPad (Eddie), "playing my own way" using MIDI interfaces (Trevor R.), integrating MIDI and audio functions of Ableton into template for ensemble performance (Ricky and I), using guitars and guitar sounds (Mark) or experimenting with vocal processing (Ricky).

There was a general desire to incorporate performance into the research process as a way of sharing the skills of the group. This would also require teamwork in the planning and execution/recording of the performance (see Figure 7). Initial ideas for this included inviting representatives of Ableton or the Human-Computer Interaction department at the University of Limerick for input or feedback on Ableton applications currently in use, public performances in different potential spaces and/or media – such as on-site (in the Enable Ireland centre), off-site (finding a public space to perform), or online (creating a YouTube channel or podcast for the project to host performances).

The idea of a concert persisted as something meaningful for all participants present at the initial meeting. Different timescales were suggested for doing regular concerts which might work well as prospective PAR cycles (See Figure 8). Similarities were drawn to our regular podcasts on the community radio project QCFM. This was mostly discussed by the group with some input from me. Some participants were more enthusiastic about this planning aspect but David and Trevor R., in informal check-ins afterwards, mentioned feeling bored and just wanting to play music (“too much talk, not enough action”). This necessity for balance between action and reflection is explicitly stated by Reason and Bradbury (2001) as a means of sustaining the work.

The only direct question the lead researcher put to the group was “What do we want people to know?” when the group was discussing the possibility of a public performance. Caroline answered, “That I can play guitar – that it’s not the technology doing it for me – I’m actually playing”. In a conversation after the meeting, David said “Nobody is doing what we do here – we should be telling people about it!” This sense of ownership of the music technology interfaces contributed to the thematic concern and strengthened the rationale for the role of performance as a research outcome and dissemination format.

Although some participants were not present for this meeting, there seemed to be promising implications for the development of a community of inquiry based around shared (or at least, compatible) interests. Thematic concerns of PAR can be technical, exploratory or emancipatory (Stige, 2005), and each of these perspectives was touched on in some way in the meeting. There were technical and exploratory concerns in the desire to understand the technology better and to develop musical skill in the process, with emancipatory goals presenting in the desire to share skills and capacities with the community. Different forms of dissemination – lectures, performances and podcasts/web-videos were suggested by the group.

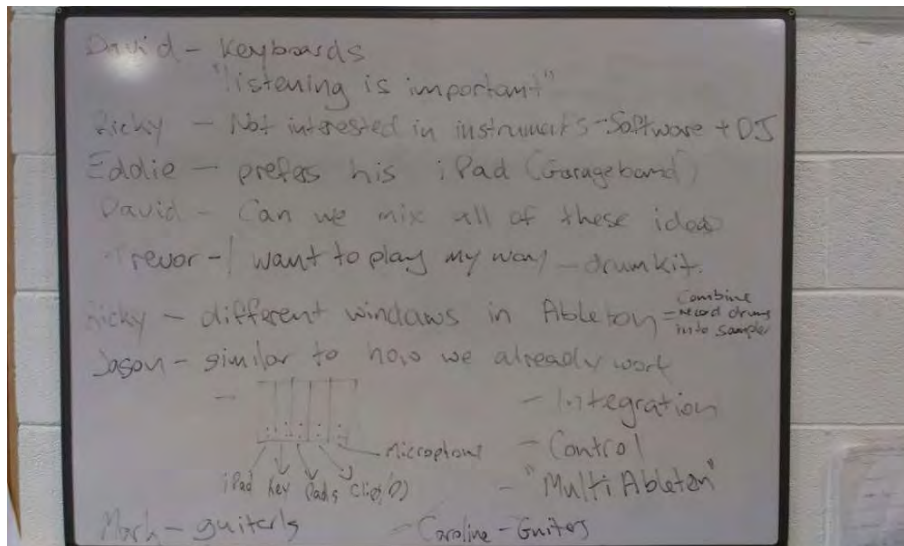


Figure 6. Whiteboard notes taken during project orientation meeting

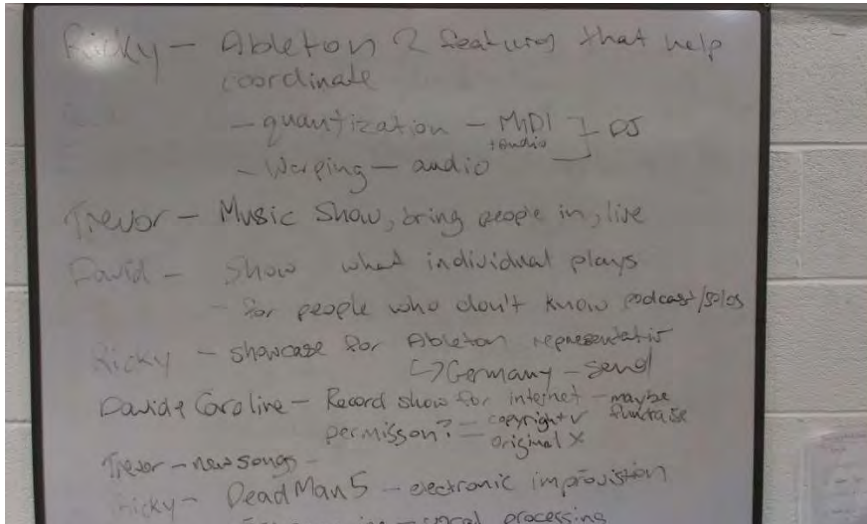


Figure 7. Whiteboard notes taken during project orientation meeting (2).

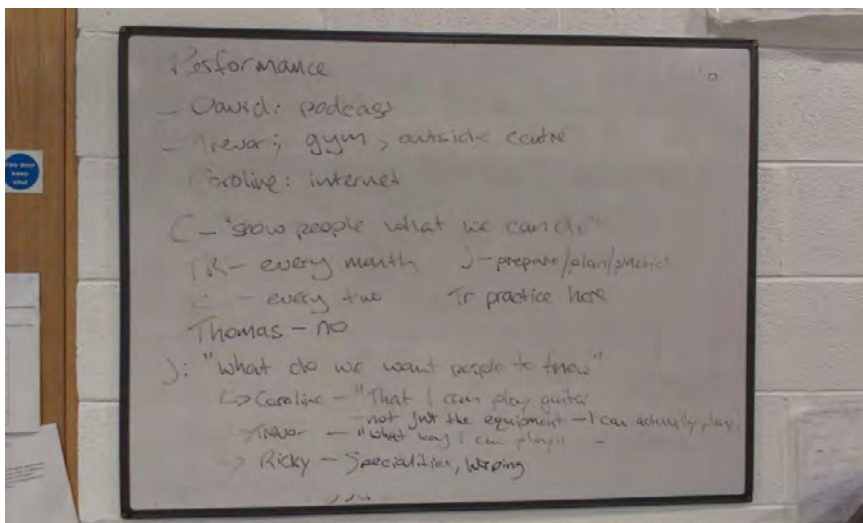


Figure 8. Whiteboard notes taken during project orientation meeting (3).

The second meeting was more experiential and presentational in nature. It also established a basic structure for the rest of the cycle's sessions. This consisted of a recap/setup phase followed by a musicing phase and finally a reflection phase. The consensus for this meeting was (in David's words) for "more action, less talking". The group decided to improvise together on their preferred DMI interfaces. This was the first time many of these participants had played together, and the largest group to have accessed the music technology resources at one time in the lead researcher's experience.

Group members had access to different roles during the session: set-up, listening/observing and playing. Devices and sounds were chosen verbally by most participants. One participant made choices using gesture/affect (Thomas) and another used ISL/manual coding (Eddie). As setting up took a long time expressions of frustration were noted from some participants. A short group improvisation was engaged in by the group and recorded on Ableton Live. This was noisy and somewhat directionless. Mixing and balancing the sound of each participant's playing was difficult, meaning it was hard for the musicians either to hear their own sounds or to hear each other clearly.

The participants gave feedback at the end of the session. While the idea of working toward a performance was still popular, there was agreement that the music need to sound more coherent with clear voicings. In Caroline's words: "at the moment it's not coherent. Everyone is just banging on their instruments. I know we're just trying it out but...". It was suggested by Trevor R. that improvisations be built up one musician at a time, giving me time to balance the sounds. Ricky also suggested choosing softer instrument sounds to improvise with. Caroline encouraged the group to listen to each other more during musicing.

***Thematic concern.*** While each member of the group expressed a slightly different focus for the research, Caroline's suggestion that the participants use the research process to "show people what we can do" (see Figure 8) was adopted as an overarching thematic concern. The group agreed to meet weekly and explore the available music technology resources through group improvisation. This would be documented by video recording and by recording the improvisations on Ableton Live. While an analytical frame for dealing with video and audio recordings was not immediately determined in the orientation meetings, recording was considered useful for reflections by the group and for bringing absent participants up to speed. The participants also agreed to be recorded when discussing the research outside of sessions. The dissemination of generated knowledge (i.e. the practical

knowing developed through the incorporation of experiential, presentational and propositional) would be achieved through public concerts and/or presentations. The concert for the end of Cycle 1 (March-June 2013) was planned to be held on-site at Enable Ireland. This broad thematic concern was open to clarification and refinement as the cycles progressed and the research process evolved. The emphasis on skill development and the sharing of those skills with a broader community places the research process on the emancipatory end of the PAR spectrum (Boog, 2003; Stevenson, 2010). There are also some technical and collaborative aspects to this process (Kemmis & McTaggart, 2000; Stige, 2005) in problem-based aspects around the refinement of the music interfaces necessary to facilitate skill development and the team-based aspects of the musicing itself.

**Action phase.** The action phase ran for eight sessions culminating in an on-site concert at the Enable Ireland day facility in Limerick.

**Sessions 3-5: *Developments and Setbacks*.** After the orientation meetings, the early sessions in the cycle focused on refining the session structure and content, with a view to preparing a concert at the end of the cycle. The group identified the best ways to set up MIDI and audio devices, and decisions were made about ongoing documentation methods. A *microcycle* format emerged (see Figure 9). This can be described as a process of the group a. making decisions regarding the broader goal/thematic concern, b. giving ongoing input and feedback about their individual musical interfaces, and c. decisions and feedback about the quality of the music produced.

The session *microcycle* (see Fig. 9) involved a set-up/recap phase allowing for a review of the previous session's events and discussions for all participants. This also involved the choice of devices and sounds and the structuring of the musicing (*action*) for that session. During the musicing, the interfaces could be refined or reconfigured in real time. Each session contained allowed feedback from the participants about their experiences.

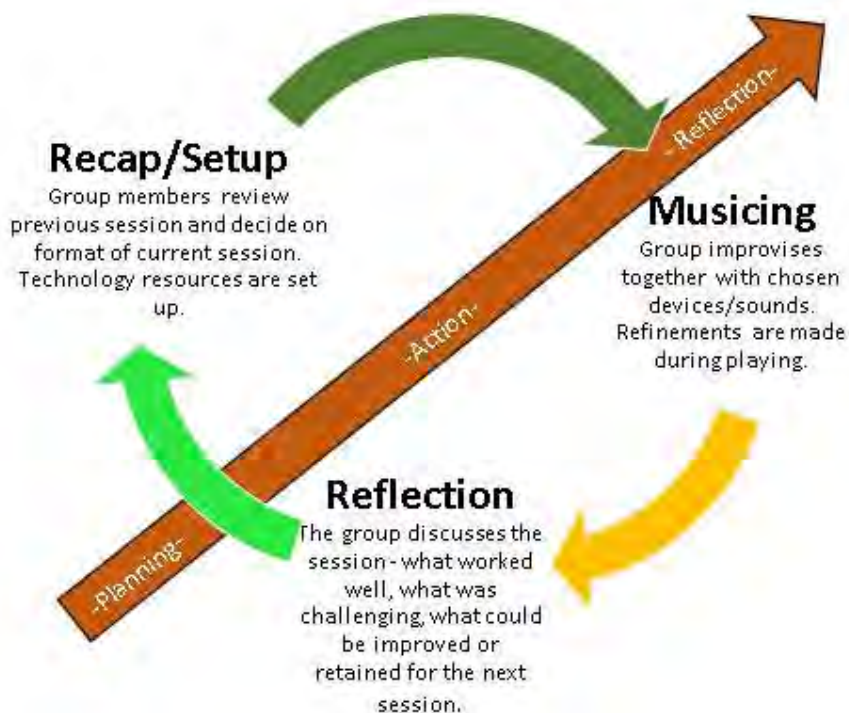


Figure 9. The microcycle format.

Group members had access to multiple MIDI controllers and an electric guitar. Some participants also brought their own devices or instruments (such as Ricky and Eddie's iPads and Caroline's adapted electric guitar). During the set-up procedure participants chose their devices and VST/effects were experimented with and decisions made, and a track was assigned within the DAW. Up to 7 MIDI devices were connected via a USB hub – 2 Korg PadKontrols, 2 25-key MIDI keyboards (M-Audio Axiom and Oxygen 8), a Quneo MIDI controller, Akai LPD8 and Novation Launchpad. Audio devices (iPad and electric guitars) were plugged into the external soundcard, a Roland Tri-capture, with audio cables.

Alongside the video recording of each session, a screen capture programme was trialled to record the real-time mouse movements on-screen for possible later review. The project file for each session was dated and saved to allow for replay of improvisations within sessions and for the recall and review of settings and parameters in across sessions. The combined documentation and DAW set up took a long portion of the early sessions. The

computer frequently crashed, requiring a restart of the entire setup procedure. The group expressed frustration at these delays. The reason for the crashing problem was identified and ultimately solved but it remained a source of tension and was referred to beyond these sessions.

Facilitation of research sessions therefore incorporated managing the technical aspects of the session as well as engaging in the musical and interpersonal dynamics of the group. The service provision structure of the facility, whereby some participants attended a day room, while others attended training, meant that some of the participants were new to each other, and had not worked closely together before. The research group was therefore a new experience for all involved bringing challenges and progress. Although the frequent interruptions in early sessions meant that sustained musicing was often difficult, a sense of enthusiasm and good humour persisted in the group.

*Sessions 6-8: New ways to relate.* With the technical issues better managed, and the session structures established, the participants were able to take more ownership of the project. By the sixth PAR meeting, the participants were introducing ideas and negotiating how to incorporate them and were more active in giving feedback. An example of this is Ricky's introduction of dance music loops he created on his iPad as the basis of the group improvisation (session 6).

Quicker set-up of interfaces meant longer musicing portions allowing non-propositional input to be more prominent, whether from non-verbal participants, such as Thomas' physical and paraverbal responses to music, or from participants subscribing to the *less talk, more music* notion introduced by David and frequently reiterated by Mark and Trevor R. Mark also tended to use metaphors in his feedback, for example, on hearing a heavy reverb effect - "that's too holy, it sounds like mass".

During this time, more explicit discussion of relevant PAR concepts was possible. The group discussed the thematic concern (to *show what we can do*) with reference to the upcoming concert, the potential role of video material and the guiding principles of PAR. These conversations were initiated by the participants, though I added some theoretical perspective where appropriate. In Session 7, Caroline asked “What are we meant to be helping you to do, Jason?”. This facilitated a discussion about the core principles of PAR and a reemphasis of the requirement of tangible benefits for participants and of their ownership of the research process. Darren added during that conversation that enjoyment was important in the project, echoing Zuber-Skerritt (2002). This could be considered as the beginning of the community of practice becoming a community of inquiry (Heron & Reason, 2008).

The group was afforded new ways to relate musically with the introduction of new devices and apps. A donation was made to the music therapy programme of the Xbox video game Rock Band™ along with a wireless guitar controller and wireless drum controller. Typically, these would only function with an Xbox game system, but as this is a Microsoft product, it was possible to connect them to a PC with an Xbox wireless dongle. Routing their signal into Ableton required some work for the lead researcher outside of research sessions, but the group was quite taken with them due to their resemblance to ‘real’ instruments.

Solutions were developed to convert the controllers’ signals to MIDI and route those signals into Ableton. Two different pieces of software were used to connect each controller’s signal into Ableton. The first, MIDItar Hero was a Max/MSP program specifically designed to turn wireless guitar controller signals into MIDI, which could then be sent to Ableton via a *virtual MIDI cable* (LoopBe or LoopMIDI). The other application, Joy2Key converted game controller signals into alphanumeric (QWERTY) signals which were then converted to MIDI by Ableton’s own *computer keyboard to MIDI* function. Mappings were programmed to connect the drum controller to Ableton’s standard drum VST *Impulse*. This took some work

between research sessions by the lead researcher, though it did allow for interesting interactive possibilities in the group musicing.

A new iPad was acquired for the group so that more participants could access the apps Ricky and Eddie had been using. *Garageband* had been popular, mainly for its intuitive *smart* instrument interface that allowed chords to be played, autoharp-fashion for different instrument sounds – orchestral, keyboard, bass and guitar. In addition to *GarageBand*, two additional apps were introduced, which had a considerable effect on the musicing options. *Launchpad* is a loop-based app based on the MIDI controller of the same name. This app arranges drum, bass, lead and vocal loops in a grid which can be toggled on and off. Different styles of electronic music can be played, and the tempo is variable. There are also touchscreen-based effects (delay, beat repeat, tremolo, etc.). *Touchable*, an app for controlling Ableton through a wireless server became very useful in facilitating sessions – allowing access mixing parameters, loops and VST's through a single interface on the iPad. VST's could be played in three different ways, a standard keyboard layout, a simple drum pad layout and, more uniquely, an *isomorphic keyboard* – a chromatic grid filling the whole screen.

These new devices provided more choice within the sessions allowing greater exploration within the musicing. Additionally, the autoplay function of *Garageband* (used for adding rhythmic patterns to chosen chords), the *Launchpad* loops and the use of arpeggiator effects on MIDI controlled VSTs allowed the coordination of musicing according by setting a predetermined tempo in each interface, allowing for more rhythmically coherent music with a high degree of control still possible.

By session 8 the group was comfortable setting the agenda of the sessions, engaging in dynamic musicing and giving feedback on modifications, sound quality and play rules with the overall aim to bring coherence to the improvisations while still allowing freedom of

expression. Some improvisations were given names like *Destruction Force* and *Jam in the Box*. These were usually suggested by David but validated by the group after discussion.

**Sessions 9-11: Working towards the concert.** Towards the end of the cycle, the research process became more explicit as a topic of discussion. A tacit understanding of the potentials of person centred research also became more apparent. Trevor K., during a recap conversation after missing a session, spoke of the need to use the learning of the previous weeks' research meetings to inform the next phase of the research. David began making frequent reference to the skills he had learned during the project to date. He expressed pride in his achievements and commitment to the research process. Participants became more involved in the setting up of equipment for sessions, this became a role of interest for Eddie, who would arrive early to help the lead researcher. The question of how to use or analyse the documentation so far became more explicit, in session 10 when David suggested a way to create an artwork from the audio and video recordings by selecting elements from the group's improvisations and conversations and editing them into a single piece of music (see Digital Appendix A – Cycle 1 – David's ABR idea).

Although arts-based research had been described during the information meetings as a possible analytical frame in the project, this was the first mention of it as a means of processing the recordings made by the group during first cycle. The re-introduction of this idea by a participant pointed to the value and consistency of the non-directive approach I worked at providing as the lead researcher.

Before the concert, new technical problems emerged when it was noticed that USB MIDI controllers were occasionally being disconnected when their MIDI tracks were armed for recording of improvisations. This was eventually attributed to the new wireless devices and patches interfering with the MIDI settings of Ableton Live. The exact cause of this was

not found before the end of the cycle, though fortunately these problems did not occur during the concert.

On the day of the concert, the DMIs were set up in the day facility's gym. Participants met before the concert to choose and configure their devices. Some participants chose interfaces they were familiar with while others chose a setup unique to the concert. Ricky chose to use Ableton's MIDI mapping function to trigger two drum loops and control a beat repeat effect on each (the beat repeat creates controlled or randomised repetitions of an incoming signal). Eddie played the Rock Band drum kit for only the second time. The overall instrumentation resembled a rock band (drums, guitars, bass and saxophone). The group decided that the I should not perform and concentrate on working the sound.

The performance was run according to the *one by one* play rule developed over the previous sessions. The group was introduced by a non-participant service user (the MC for the facility's summer concert) and played a single improvisation. I coordinated the sound and conducted the entrances of each musician as decided by the group during set-up. Ricky's drum loops and *beat repeat* effect provided a rhythmic grounding for the freer aspects of David, Caroline and Trevor K's melodic playing (on electric guitar, iPad and Rock Band guitar controller respectively). Eddie's drumming, though sparser and more arrhythmic than the loops, was dramatic and performative while Trevor R played long cluster chords with MIDI keyboard and upright bass VST. The VST was configured to *mono* mode to only play one note at a time, a setting chosen by Trevor to make his playing clearer. Thomas played a rhythmic synth on the Launchpad. The improvisation ended by players stopping one by one, ending in a final downward glissando from Trevor R. and a long guitar chord from Caroline.

The concert was attended by a large portion of the service users and staff present that day and the participants' improvisation received an enthusiastic round of applause. The concert was followed by a group meeting attended by the performers, though some other

participants (Darren and Mark) were not on-site that day and could not participate in the concert or reflection (See Digital Appendix A – Cycle 1 – The Limerick On-Site Concert).

**Reflection phase.** The reflection phase consisted a post-concert group discussion followed by inductive coding of the cycle’s video recordings by me. The discussion took place in the gym where the concert was performed, after the audience had left. The participants who were present discussed their experiences of the cycle to date, the performance and their ideas for the future. Two participants, Darren and Mark, were not present and did not perform in the concert.

The group first discussed the quality of the performance. There was some dissatisfaction with the quality of the music. Caroline recommended more practice “if we’re going to show people outside (the facility)”. David recalled feeling he was “not with” the group musically, as he had difficulty hearing himself. David and Trevor K. made observations about the emotional aspect of the concert, David describing the experience as “claustrophobic” while Trevor K. described the group as “flustered”. Trevor R. on the other hand, described the concert as “daycent” (slang for decent, or very good).

There was a desire to find new performance spaces and audiences. Caroline felt that the participants were “too used” to performing to staff and service users (“our own crowd” as Trevor K. put it). More public performances were thought to demonstrate more independence. It was agreed that these ideas would be revisited in the planning phase of Cycle 2. Finally, the group discussed the role of the documentation (audio, DAW files and videos). David’s idea of combining and overlaying improvisations and voice samples in session 10 was relayed to the whole group and clarified as a possible form of arts-based research. Caroline was particularly enthusiastic about this idea. I agreed to make a start on this during the summer break. The missing participants were acknowledged and were to be brought up to date at the beginning of the next cycle.

***Inductive Coding.*** With the permission of the co-researchers, I engaged in inductive coding of the video material in the summer break between Cycle 1 and Cycle 2 (Altrichter, Feldman, Posch & Somekh, 2008). Inductive coding is a way of organising participatory action research data generating categories or themes from recorded or transcribed material (Altrichter et al., 2008). This natural break in the project facilitated additional reflection and the identification of consistent themes within the sessions. These were then to be presented to the group in the planning phase of Cycle 2 to contribute to the core action research project as well as generating material for the thesis project (Zuber-Skerritt and Perry, 2002).

The videos from the cycle were first loosely transcribed and then coded. Some themes were clearly identified and referred to during the videos themselves, while others were more tacit. Aspects of the sessions relating directly to the thematic concern and the PAR process itself were identified also. Some of the identified themes had a dichotomous sense of qualities in balance or tension.

*Talk vs. Action* – From the first research session, some participants preferred to talk and discuss different aspects of the sessions/*microcycles* (recap/musicing/reflection) while others preferred to “get on with it” (that is concentrate on making music). The group worked hard to acknowledge and balance these perspectives. This was interpreted in the inductive coding as tension manifesting between propositional and presentational/experiential elements of the research process in the generation of practical knowing (as demonstrated in the concert).

*Chaos vs. Coherence.* Chaos was a term that recurred throughout the video transcriptions. This word emerged when the frequent technical issues occurred in early research sessions. The term was used in reflections on the musicing, to refer to the music created by up to nine musicians improvising at once. In terms of the thematic concern, to *show what we can do*, the need for greater coherence in the music was reiterated by many of

the participants at various times. This led to the adoption of the one-at-a-time play rule, and the deliberate choice of compatible instrument sounds for overall clarity. The importance of listening to each other was reiterated by participants in terms of working towards a coherent public performance

*Humour and Support.* Although the group experienced frustration when difficulties were encountered with the technology, a sense of good humour and support pervaded the sessions. The participants were enthusiastic about the project and were patient during occasionally long set-ups. I found the atmosphere of the group to be very conducive to reflecting on problems and developing creative solutions.

*Pride, ownership and agency.* As the group began to gel, some participants took opportunities to develop or further individualise their preferred music technology interfaces. Other musicians opted to try out different interfaces as a matter of course. In either case, there was a strong sense of pride in the agency offered by music technology and a strong desire to demonstrate this agency to friends, loved ones and the community at large.

### **Conclusion**

This cycle report details the coming together of musicians with a shared interest in music technology to form a community of practice. A thematic concern, based on the shared, or compatible interests, goals and preferences of the co-researchers was negotiated and explored with a view to developing a community of inquiry (Reason & Heron, 2002). Over 11 sessions, the group explored the available music technology resources through group improvisation, culminating in an on-site concert at the end of the cycle.

In the beginning, there were issues that had to be resolved before the musicing could be engaged in a significant way. Technical problems with the available hardware and software did not support the musicing of 9 musicians. These included an unreliable USB hub for connecting MIDI devices to the PC and the use of the newly-released, and therefore rather

buggy Ableton Live 9.0. Once these issues were identified and resolved, the group were able to spend more time playing together and sharing their insights into the experience. This challenging period at the beginning of the cycle still allowed the group to negotiate how they functioned as a community of practice. The patience and good humour many of the co-researchers showed when gear wasn't working correctly was a source of support for me as facilitator and an indicator of the commitment of the co-researchers to persevere with the thematic concern.

Once possibilities for musicing became more stable, this patience paid off and the group enjoyed developing their familiar DMI interfaces as well as incorporating new DMIs, such as the video game controllers and the iPad apps. A healthy tension between propositional and presentational modes created a stimulating atmosphere in the group as co-researchers exerted relative preferences for *talk* (planning) or *music* (action) within the *micro-cycles* constituted each session. Balancing these preferences was an important factor in ensuring inclusion and participation.

Towards the end of the cycle, possibilities for developing an analytical frame for the documentation – music recordings and video material – began to emerge from the group itself. Creating a cohesive representation of the group's learning by condensing or repurposing the group's improvisations, as suggested by David in session 10, was a popular idea within the group and formed the basis of the inductive coding by the lead researcher between cycles. Themes and notable events from cycle 1 were collated for review by the group in the planning phase of cycle 2, to engender continuity with the research process as well as to further the possibilities of developing a meaningful arts-based analytical frame.

The performance at the end of the cycle was a first step in satisfying the thematic concern – to *show what we can do*. The feedback from the group about their experience suggested that performance with DMIS could fulfil multiple research functions beyond being a shared goal

of the group. A performance could act as an outcome of the research by demonstrating practical knowledge (Reason & Bradbury, 2008) as well as acting as a form of dissemination when conducted in public. The group was determined to raise the standard of their group musicing as well as finding new spaces and audiences with whom to share their skills.

### **Cycle 2 – Performing in Public**

**Overview.** For this cycle, the group resolved to go *forward, not backwards* and find a new, more public space to perform. Over the course of 14 sessions the group worked to incorporate lessons learned in cycle 1 to improve their musical skills and to function better as a group. This was to facilitate a smooth and high-quality performance in the planned Christmas concert at the Irish World Academy at the University of Limerick, as the goal for the cycle.

Organising the concert, in terms of logistics, transport and content involved a lot of discussion and planning in early sessions, with group musicing becoming somewhat side-lined in the process. As the concert approached, the group refocused on the performance aspect itself and decided on a format for the concert of individual performances followed by a group improvisation. Feedback from the audience was positive, though the group members themselves expressed some ambivalence about the experience in terms of the fatigue of preparing for the concert and a perceived lack of audience response. The group decided to concentrate on musicing together in Cycle 3. Any public sharing of skills would have to be more interactive and dynamic.

In early sessions of this cycle the group contributed to my progression presentation as well as visiting the Irish World Academy in UL to discuss the PAR project with MA Music Therapy students as part of their research methods module. I shared my ongoing reflective work on Cycle 1's recordings with the group during this cycle. A sense of completeness or wholeness in the improvisations inspired the idea that, rather than creating an arts-based

response from these recordings, the meaning was *already in the music*. Later in the cycle, Mark and Caroline both left the group, shaking the remaining participants somewhat. Caroline returned to the group for the Christmas performance and remained into Cycle 3.

### **Planning phase.**

*Looking back and moving forward (Sessions 1 – 3).* The planning stage of the Cycle 2 took place over 3 sessions. Different levels of attendance for each meeting meant that some discussion material was reintroduced for participants who had missed one or more sessions. In general, the group discussed the past cycle, immediate issues and the future of the project. These topics were not discussed in chronological order as the participants jumped from issue to issue within and between sessions. A whiteboard summary of the main issues was created in session 1, both to keep track of the conversations and to ensure Eddie had access to the relevant details. Photos of this summary became a useful focal point for the group in subsequent sessions. The main points of discussion are presented in a more linear fashion here.

In the first session of Cycle 2, I began by restating the research methodology in plain language - “taking what we know and working out how to show it to people, what we’ve learned and stuff like that. And it has to be important to you.” David suggested that the group should do a Christmas concert in the University of Limerick (UL) “if we want to be known”. This called back to the group reflection about showing skills to the broader community and finding new places to play. Caroline added “Not many people know, apart from the staff and a few people who come into Enable, that I can play guitar, you know what I mean”.

I asked what the group learned from the concert in Cycle 1 that might help plan a larger-scale concert in Cycle 2. The main points suggested were to ensure the equipment worked, to listen to each other more and to stick to improvisation as the main musicing modality.

My progression presentation was scheduled for the day after session 1. The co-researchers present were given the opportunity to comment and contribute. I laid out the presentation topics in terms of background, why, and how the research was conducted. The group gave permission for video clips to be presented. Caroline was eager to know if footage of her playing guitar would be shown. Thomas assented to video of him dancing during a group improvisation being shared.

Outlining the presentation gave an opportunity for the group to respond to the themes from the inductive coding of the group's videos from Cycle 1. The inductive coding process was described as identifying "things people said, that I thought were important" in the video and audio material. The group were invited to discuss and affirm or critique the themes. Some video clips selected to demonstrate these themes in the progression presentation were shown to the group. The group discussed the use of real names in video material, specifically those that would be shown at my upcoming progression presentation. The co-researchers assented to their real names being used. This affirmed the ownership of the participants of the ideas in the research.

The following themes were presented:

Talk vs action: David was adamant that there should be less talk and more playing than in Cycle 1.

Chaos: This theme resonated with the group as having to do with the frequent technical problems.

Humour and Support: The group used this to tolerate frustration. Thomas was credited as he was "always making us laugh". A joke from session 5 that the research outcomes would be a list of "all the different ways things broke" was played on video for the group.

Ownership and pride: I highlighted that when the technology worked properly, the group gave good feedback and took on consistent roles

The progression presentation was to cover work to date, but the group were invited to make suggestions about how the group was likely to move on. Caroline wanted the point to be made that people with cerebral palsy can be serious musicians saying, “because we have disabilities, they think we can’t play music!” David was eager to attend the progression meeting, but the timings were not convenient.

In the second session, I reported on how the progression meeting had gone. The feedback had been positive, as the panel were impressed with the collaborative nature of the research. Specific points of feedback generated minimal responses from the group in terms of the role of gender in the research, my personal experience of the research and the role of tempo in facilitation.

Working towards a public concert was considered a valid plan for the cycle, with assent gained from the whole group across the three planning sessions. Caroline’s statement “we have to go forward not back” became a catchphrase for the group. I assured the group that the equipment had undergone extensive trouble shooting after the concert to stabilise the system. Caroline said, “we want to be confident in the gear”. Trevor was concerned with the logistics of organising a concert at the Irish World Academy. He and Caroline also expressed some trepidation about negative reactions from a public audience, despite the positive response from the audience to the Cycle 1 performance.

The group discussed next steps in arranging the end-of-cycle concert in UL. To go “forwards not backwards” as Caroline put it, more stability in the music technology resources was needed. This was suggested by Caroline to require less “breaking and restarting” of equipment. “If we stop, we can’t get into the music” added David. Trevor K. however, suggested that some stopping was necessary to “regroup”, to “plan and think” as Caroline clarified. The distinction was made between starting and stopping within a research session to

discuss and explore options and ensuring a fluid and continuous performance within a public concert.

Another topic covered was the group's invitation to present their work to MA Music Therapy students as part of the students' research module in three weeks. The group were enthusiastic, with some group members expressing individual perspectives they wanted to bring to the lecture. Darren wished to speak about his individual music therapy work, Caroline wanted to show the students her adapted electric guitar while David wanted to play for the class. Mark asked me to "help [him] to talk". The group decided to use the visit to the Irish World Academy at UL to investigate the performance space for the end of cycle concert.

In session 3 the group played together for the first time in Cycle 2. The participants were eager to play something energetic: "mad noise" and "in your face" as suggested by Darren and Ricky respectively. The group played a high tempo improvisation combining MIDI controllers, video game controllers and iPad triggered loops. The music ended in a crescendo, much to Thomas' amusement. In a brief reflection after the music, the group expressed satisfaction that the gear had worked smoothly.

***Thematic Concern.*** The group maintained their desire to demonstrate their skills with music technology to the broader community. The notion of moving out of the safe space of the day facility where these skills are well-known appeared to focus some of the participants on refining these skills further as a group to ensure a high standard of performance. This required better facility with the DMI resources and greater sensitivity to each other's musicing.

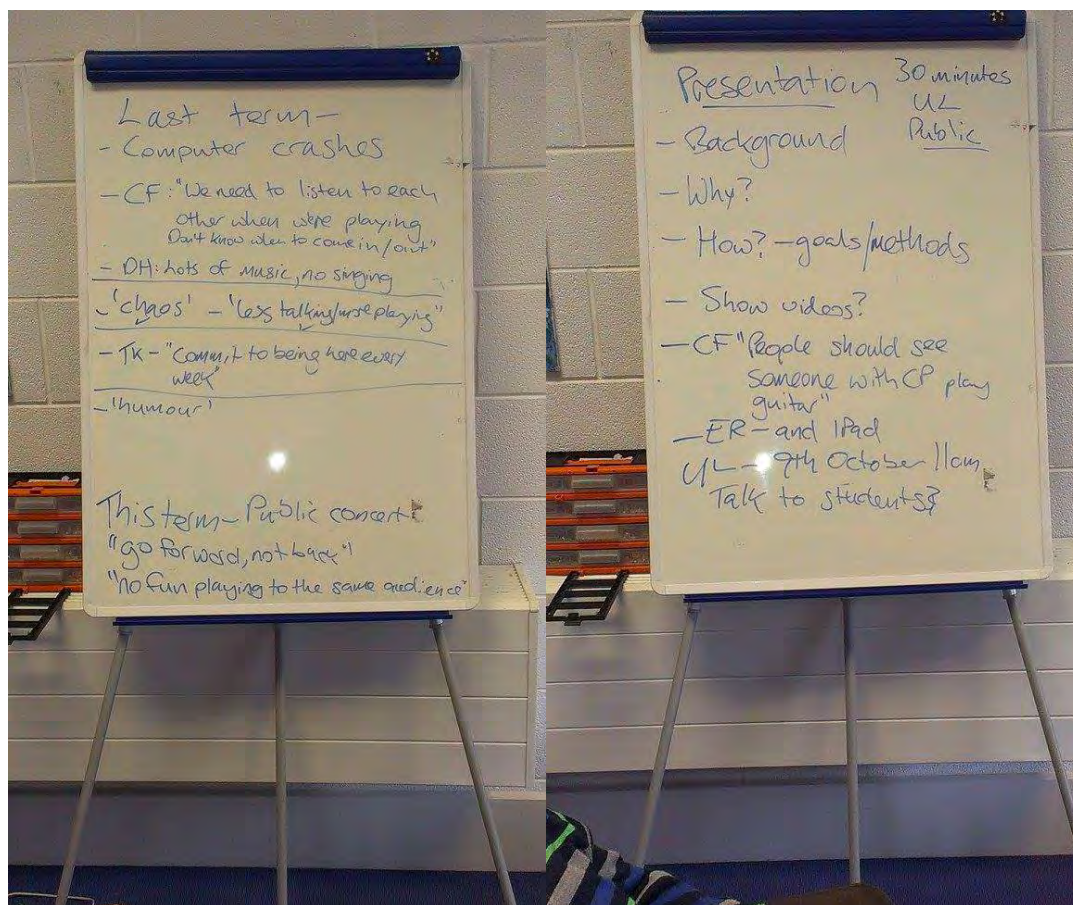


Figure 10. The whiteboard summary of the discussion in Session 1 of lessons learned, future directions and research themes.

**Action phase.** This phase consisted of nine research sessions followed by a concert.

**Research Lecture and Concert Planning (sessions 4-6).** The research lecture took place on 9<sup>th</sup> of October 2013. As planned, the group arrived in the middle of the lecture period, after I had finished presenting the core principles of PAR to the music therapy students. I introduced the co-researchers: Caroline, David, Thomas, Trevor K., Ricky, Eddie, Trevor R. and Mark. Darren was the only co-researcher who was absent from the presentation. I used ISL/manual coding to keep Eddie included in the flow of the conversation and used closed questions to check in with Thomas during the session also. Some co-researchers spoke about their individual areas of interest and/or roles within the group. Caroline told the class that she wanted to challenge the notion that “people assume

that if you have a disability, you are not able to play”. She recounted the experience of being laughed at when she told her parents she was learning to play the guitar. She then showed the class her adapted electric guitar and offered to share a lullaby she had composed in individual music therapy as a gift to a friend, using music technology.

David referred to the role of music in the Enable Ireland centre, saying that the presence of music in the “whole building” every day from the radio station, music therapy sessions and PAR sessions made him “happy as Larry”. He particularly enjoyed making friends through music, and described his experience in the research group in emotional terms:

“When I’m playing with Jason, I feel very relaxed and I feel very comfortable in the room with the lads as my friends are, here. We pick some of the sounds that we like, and Jason brings it up on the computer, and then, when we get that sound and play that sound, when it’s together, when it’s all playing – our emotion – it’s stronger than water”.

Similarly, Trevor R. described his experience of performing with DMIs in positive terms, “that is relaxing for me”. His tendency to be somewhat of a contrarian within the group was also highlighted. Reference was made to Trevor K.’s attention to organisational details, Ricky’s focus on technical issues and Thomas’s mischievous nature.

The group talked about the thematic concern, and the on-site concert at the end of Cycle 1. They described the technical issues that had to be overcome as well as the one-by-one play rule that was implemented to ensure clarity in the performance itself. A short excerpt of the concert’s audio recording was played for the class. The co-researchers also described their preferred DMI interfaces such as David’s guitar set-up, Ricky’s growing competence with Ableton’s production functions and Eddie’s use of the Launchpad app on his iPad. Thomas confirmed through closed questions that he enjoyed coming in to research sessions to make noise and have fun. The group also revisited the inductive themes I had developed: chaos, talk vs. action, pride and ownership, and humour and support.

When the music therapy students were invited to ask questions, a student observed that the group appeared to have some strong personalities and asked if it was easy to agree on things. Caroline answered with an emphatic “NO!”, adding, “there’s no right or wrong, but we never came up with a full finished piece of music – someone will always say: ‘it should be different’”. Trevor K. suggested that smaller groups worked better, though this meant bringing absentees up to speed in subsequent sessions could be difficult.

In answer to a question about naming improvisations, David described how he and Darren tended to suggest different names for the pieces based on their reactions and that the group would choose their preferred title. Titles like “Destruction Force” and “Jam in a Box” were considered evocative of the group musicing experience, adding a metaphorical dimension to the group’s reflections.

A final question was posed by a music therapy student about the future performances. The group reaffirmed some of their opinions from the planning sessions in talking about doing a more public concert at Christmas. David commented “to get noticed as musicians, it would be ideal for us to do it outside [Enable Ireland]”. Ricky felt that the people in Enable Ireland were “sick of us”. Caroline agreed: “the staff and carers know what we can do – we need to show different people we can play”. David affirmed the participatory nature of the proposed performance “Concerts are important, not just for me. They show what we can do outside. It’s important for the way the lads feel. What way they want it done. It’s not just my point of view.” Trevor R. expressed a desire to stage the concert at the Irish World Academy. Mark was ambivalent about performing (“I don’t mind”). While Ricky was more concerned with developing his technical skills, I suggested the concert would benefit from those skills. Thomas gave a spirited “F\*\*k off!” when invited to contribute. Caroline later shared her lullaby with the class as they shared tea and biscuits. (See Digital Appendix A – Cycle 2 – Limerick PAR Group Research Lecture Oct 13).

Only David, Thomas, Ricky and Eddie were present to discuss their experience of the lecture in session 5. David described the experience as “emotional” and “a great idea”, expressing pride in his own contribution – “there are no videos of me talking as good as that”. I felt that the participatory nature of the research had been well described. This was considered evident in the diversity of perspectives that were presented and the evident collaboration that went into planning and performing.

The full group was present for session 6. Still discussing possibilities for the Christmas concert, Ricky suggested “mini-collaborations” as a concert format, as he was interested in collaborating with Darren specifically. A lot of recapping was necessary in this session to update Darren on the UL lecture and to update everyone else on the post-lecture discussions from session 5.

Further discussions about the proposed concert took up most of the session. This concerned mostly the logistics – seating, timing, guest invitations, transports and a poster. The group also discussed musical content, mainly around whether the music should be lively or relaxing. The group did agree that UL would be an appropriate concert space, having visited the Tower Theatre during the Academy visit. Thus, it was agreed that I was to book the concert space, while the group would work on organising transport, invites/posters, and developing musical content.

***Change and refocus (sessions 7-9).*** In session 7, the group decided to concentrate on musicing rather than concert organisation. The co-researchers chose devices and sounds to ensuring clarity in the music. This meant choosing VST sounds in different registers, and with distinctive timbres or sound qualities. Trevor K. chose an upright bass sound (C1-C3), Eddie chose a piano sound (C3-C5) while David played synth pad sound in a high register also (C3-C5). I played a drum synth while Ricky joined in on processed vocals. The

participants reported being able to hear each other more clearly, a positive indicator for the concert performance.

Between sessions 7 and 8, Caroline informed me that she wished to withdraw from the group for personal reasons. She asked if she could re-join the group at a later point and expressed a desire to perform in the end-of-cycle concert. I supported her decision and affirmed her right to withdraw from the research at any time. When the group was informed of Caroline's withdrawal, David and Trevor K. were concerned about the implications for the research. David worried about "numbers dwindling", later saying "I had a feeling this would happen". Trevor K. hoped that transport planning for the concert would not be affected. I reassured them that concert preparations would not be disrupted. The group members present (Ricky, David and Trevor K.) accepted Caroline's right to withdraw and agreed that she could come back if she wanted, whenever she was ready.

Before session 8, I reviewed recordings from Cycle 1 to establish discussion points for the group on how an ABR component might be developed to analyse or otherwise reflect collaboratively on the group's work. I listened to the recordings, making note of responses and impressions, as well as highlighting passages that seemed interesting. Reviewing video transcriptions allowed identification of any events, quotes or ideas from the same session that would tie to the music thematically. The pieces were then given tentative titles, if they did not have names already. For example, the recording from session 2 was named "BSOD" (Blue Screen of Death – a term for when a computer crashes completely).

In session 8, I shared this work with the group. I delineated the improvisations created in the early, middle and late stages of the first cycle and talked about responses and interpretations of the music. I suggested that the improvisations throughout the cycle showed a transition from exploration and testing initially, to darkness and tension, as frustration with

the technical problems grew, to optimism and enthusiasm as these issues were resolved and the summer concert approached.

Excerpts from three improvisations (sessions 2, 5 and 10) were presented and discussed:

BSOD (session 2) – This improvisation (mentioned above) consisted of a long drone and some rhythmic percussion that was recorded on a day the computer setup was particularly problematic. The harsh timbre of the drone sound and the persistent percussion rhythm seemed to convey the frustration the group experienced in that session. The excerpt was described to the group as “glitchy” and “tense”. This tension was confirmed by the group and typified my sense that “it’s all there in the music”. That is, the music conveyed the experience of the group without requiring manipulation or augmentation. I explained my impression that “the music that we made [said] something about the work we did and how we were feeling”. Later I expressed it more concisely as a feeling that each improvisation “felt like it belonged to the session it came from”.

Visitation (session 5) – this improvisation came from another difficult session, with similar driving percussion. This piece had discordant piano chord pulses that Ricky described as sounding “like a horror movie”. I described a sense of determination in the music, reflecting a co-researcher’s quote from that session that whatever technical difficulties the group encountered, “we’ll get to the bottom of this”. Ricky likened this sense of emotion in the music to emotions conveyed through visual art:

“Yeah – you see the same thing with pictures, you look at them and get a particular feeling”

David agreed that the piece conveyed frustration – “When you’re hearing that one sound all the time, it CAN get to you, like anything in life – “Oh no, not again”. “You’re stuck!” Ricky responded.

Destruction Force (session 10) – this piece had already been named by David. It was characterised by high-tempo drum and bass loops from the Launchpad app along. This piece had been created in the session where the group decided they were confident to perform an improvisation at the summer concert without planning (to “go for it” as I had said). This piece felt more hopeful and optimistic to me. The group confirmed that the music sounded like they “were in a better place”.

David was highly enthusiastic during the session and recalled how he had introduced the idea of a musical story/soundscape as a way of using the documentation meaningfully. In his own words: “Jason came to me – what will I do with all this. I say, “chop it down to one piece, overdub it with our voices. Make it one piece of music”. Ricky was fascinated by the psychology behind the responses and interpretations I had described. He asked how the musical qualities of the improvisations were associated with what was happening in the sessions in which they were created. Although Ricky found the impressions accurate, I emphasised that these were personal responses and interpretations that the group could confirm, deny or modify as they pleased.

That same day, Mark withdrew from the research having opted out of the session. He reported being bored with the research due to “all the talking”. A gentle offer to incorporate his concerns into the group’s facilitation was made. Ultimately, I supported his decision and affirmed his right to withdraw, thanking him for his contribution. After Caroline’s withdrawal, some group members were quite shaken (“not another dropout” – David, “what’s the point now?” – Trevor R.).

In session 9, I initiated a check in about how the remaining co-researchers felt about the research, particularly around the balance of discussion and musicing. I acknowledged that there had been little musicing thus far in the cycle as the planning phase, UL lecture and concert discussions had taken up most of the research time. The group decided to concentrate

solely on musicing for the current session. The group chose devices and sounds, with Thomas using gestures to pick the Akai *LPD8* controller and answering closed questions to choose from a selection of sounds. Trevor R. chose the Launchpad with a bass VST while Eddie chose the *Axiom* MIDI keyboard with a piano sound. David chose the *Launchkey* MIDI keyboard and asked for a VST he had used in music therapy sessions named *Christmas in Vienna*. This was a dulcimer sound run through an *arpeggiator* and *ping-pong delay*. Ricky took on a new role in the group by using the Quneo MIDI controller to mix overall sound of the group. This device integrated with the Ableton's GUI to allow direct control of each player's volume and panning through the Quneo's fader strips and rotary pads.



*Figure 11.* The Quneo MIDI controller with lighting touch pads.

The musicing portion of the session was initiated by David playing *Silent Night* on his keyboard. The other musicians played along, though without a clear sense of connection between the individual performances. A second, freer improvisation had energetic playing from the co-researchers, drawing laughter from Thomas. By the third and final improvisation, Thomas was headbanging to the music.

***Finalising the concert structure (sessions 11-12).*** By session 11, the group had decided on a format for the concert – individual solo pieces followed by a group improvisation. With three weeks to go until the concert, it was necessary to create an effective way of configuring the MIDI and audio devices and DAW to allow the sharing or changing devices and sounds during the concert. Separate project files for each performer's solo would be time consuming



Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Master
Instrument rack	Synth bass -arpeggiator	Drum Loop +	Drum Loop (dry)	Drum loop (dry)	Drum Loop +	Ping Pong
-Pads synth (panned left)	- rate MIDI mapped to rotary 1	delay send -panned left	-panned centre	-panned centre	delay -panned right	delay -dry/wet MIDI mapped to rotary 7
-bell synth (panned right)	+ hold					

Figure 13. Trevor's DMI interface with multiple VST and effect racks in multiple tracks.

Trevor R. chose to perform Ring of Fire by Johnny Cash on the wireless guitar controller with an acoustic guitar VST. I accompanied on electric guitar. Trevor was the first co-researcher to attempt to use the MIDItar Hero patch to play specific notes to harmonise with a precomposed song. This required using the button combinations shown below (Figure 14) with the 'open note' set at C3. Trevor was encouraged to play notes 1, 4 or 5 (C, F and G) during the song, in whatever manner he felt. Initially, Trevor had difficulty holding the appropriate buttons down on the controller as demonstrated but was resolute in his choice of DMI and song choice.

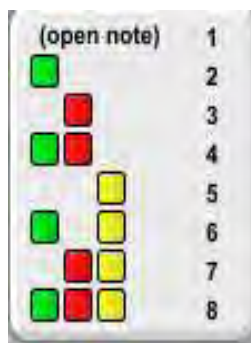


Figure 14. MIDItar Hero control scheme for diatonic scale fingering.

Before David played through his solo pieces – Silent Night and O Holy Night, he worked on an instrument rack that would suit the tunes. He asked to combine the *Christmas in Vienna* VST with a bell synth and a guitar sound “like David Gilmour”. A clean electric guitar synth and a toy bell synth were grouped with *Christmas in Vienna* and then saved under David’s name.

The group then practiced together for the group improvisation portion of the concert. Ricky continued to work on controlling the group’s sound mix, though using the LPD8 pad controller rather than the Quneo. Ricky asked for the rotary controls on the LPD8 pad controller to be mapped to the reverb sends of each track, so he could add reverb effects to each player’s sounds. He also chose to play a drum VST using the LPD8’s pads. Darren had chosen the Launchpad which had 64 trigger pads, to play a drum synth. Darren asked for all the pads to be playable, as most drum synths in Ableton contained fewer than 64 samples, thus leaving some triggers pads inoperable (and therefore silent). This was occasionally confusing for Darren. Luckily after a short search, a drum rack with 64 samples was found, giving Darren access to all the Launchpad’s trigger pads. Darren explored the controller by touch, memorising the position of his favourite sounds.

After the group improvisation, and possibly inspired by David, Darren and Eddie both decided to perform Christmas songs as keyboard solos in the concert. Darren, being familiar with keyboard playing, chose to play “Santa Claus is Coming to Town” by ear. Eddie decided to play the same song by following simple notation on marked keys. The group was excited about the upcoming concert and expressed that they were having fun.

A dress rehearsal was held in session 13, though the full group was not in attendance. This allowed the concert template project file to be finalised and saved based on the co-researchers’ choices. During this session, Ricky continued to have control of the reverb sends, though he later expressed a preference just to play. He opted for a piano VST using the

LPD8’s diatonic layout (C3 – C4). I chose to use the iPad app, Touchable, to manage the group’s sound in real-time, as well as playing a clavichord VST. Darren opted to play percussion samples (bells, triangles etc) to better create a Christmassy feel for the group improvisation. After the rehearsal, Ricky promised to perform a “sound art” solo, as he called it, using a combination of samples and effects he was developing on his own copy of Ableton at home.

The sequence for the concert was decided and the concert template was modified for clarity. Trevor’s DMI interface was too complex to integrate into the concert file, so he was asked to perform first, using his own project file, after which the concert file was to be loaded. Trevor then had access to a simplified version of his DMI within the concert project for use in the group improvisation.

The planned structure for the concert is laid out in figure 15, detailing the sequence of the performance as well as the controllers and settings each player would require. Some performers shared controllers but used different VST synth sounds.

Solos	Controller	VST
Trevor K (improvisation)	Launchkey (MIDI keyboard + loop triggers/drum pads)	Own DMI and Loops
Eddie(song)	Axiom (MIDI keyboard)	Piano
Darren (song)	Axiom (MIDI keyboard)	Bright Bells
David (songs)	Oxygen 8 (MIDI keyboard)	Own instrument rack
Ricky (sound manipulation)	LPD8	Own “sound art” device
Group Improvisation		
David	Electric Guitar (PRS)	
Caroline	Electric Guitar (1/2 size, adapted)	

Thomas	PadKontrol (MIDI drum controller)	
Darren	Launchpad (MIDI drum controller)	World percussion
Eddie	(as above)	(as above)
Trevor K	(as above)	(as above)

Figure 15. The UL concert DMI settings.

This plan later determined the seating arrangements of the co-researchers at the concert as co-researchers needed to share controllers or access multiple controllers.

***End-of-cycle concert at the Irish World Academy of Music and Dance (Session 13).*** On the 16<sup>th</sup> of December 2013, the Limerick group staged their end-of-cycle concert in the Tower Theatre of the Irish World Academy of Music and Dance (see Digital Appendix A – Cycle 2 – The UL Concert). Before the co-researchers arrived, accompanied by keyworkers and other service users, I set up the equipment and decided on seating arrangements for ease of access to the MIDI controllers and electric guitars. The event was promoted as a concert to the university community and a small audience attended. The concert was recorded on video and on Ableton. Thomas, Ricky, Trevor K., David, Darren and Eddie were present, as was Caroline, who had re-joined the group. Trevor R. was not present for the concert.

I introduced the group and the project, outlining the core principles of accessibility, creativity and fun that underlined the participatory action research project. The research approach was broadly described as was the thematic concern: to show what we can do with music technology. Trevor K. was the first performer to be introduced. He was invited to describe his DMI interface, emphasising its complexity in terms multiplicity of sounds being

controlled and types of keys or triggers being employed. Trevor performed a short improvisation and stopped it himself using transport buttons on the controller.

As the performance continued, Trevor's dedicated project file was closed, and the *concert template* project file was opened to load the group's settings. As was characteristic for this group by now, the loading time was treated as a source of trepidation and humour – “Fingers crossed it doesn't...[crash]” as Trevor joked. Eddie performed his instrumental version of “Santa Claus is Coming to Town” with a piano VST and velocity effect. This was a slow but reasonably accurate playing of my arrangement, using his left hand to play bass notes, while picking out the melody with his right hand.

Darren was introduced next. He was using the same keyboard as Eddie had, but with a different synth (Tubular Bells), which I activated remotely using *Touchable*. Darren performed “Rudolph the Red Nosed Reindeer” (Marks, 1949) instead of his planned piece “Santa Claus is Coming to Town” (Coots & Gillespie, 1934). He later stated that this had been a mistake, but he played the piece accurately by ear. David was invited to introduce his solo piece. He played two traditional tunes (Silent Night and O Holy Night) using his own instrument rack on a MIDI keyboard. I transposed the sound up by an octave between the two tunes with David's permission, using the *octave +* button on David's keyboard.

Ricky then performed a piece he had named “sound art”; comprising a descending tone created in Ableton's *Operator* device, a synthesizer program within Ableton with wave synthesis capability. This was saved on a USB drive and loaded before Ricky's performance. Ricky used the rotary controls on the Akai LPD8 to create panning and delay effects. This was a piece Ricky had developed in his own time, using Ableton functions with which I was not familiar. Ricky directed me in the configuration of the MIDI mapping of the LPD8 rotary controls to the *Operator* device parameters and the MIDI track's panning and delay controls before the concert.

I then introduced the group improvisation. David switched to electric guitar and told the audience, he was doing so to show that he didn't "just play keyboard and piano accordion and instruments like techno music", adding that he decided to play guitar in the concert so that the performance wasn't "all keyboards". The group began to play. Trevor K. created swells on keyboard, as Ricky played piano arpeggios. Darren played percussion sounds, favouring a maraca sample he found. I performed using the isometric keyboard in Touchable while encouraging Thomas to play. Thomas was moving excitedly to the music but did not join in on his MIDI controller. Eddie had no visual feedback from the screen, as he was accustomed to, but watched the other musicians as he played. To end the improvisation, David called out a countdown after which Ricky, David and Eddie each attempted to play the final note, leading to a humorous finish.

After the group improvisation David spoke to the audience again.

It's incredible, totally incredible that the whole lot of the friends of mine from Enable Ireland are here doing a concert at UL. We've never done a concert outside of Enable Ireland...But this group – we keep going every single Wednesday, and we keep knocking out sounds and music and improvisations and sounds that I've never heard before. And it's just incredible to do such music to keep everything alive. And I'm just proud to be among these lads. And proud to not only be in UL, where my mum worked and be able to play with these lads. It makes me happy, and I'm just delighted.

The concert wound down with three more solo performances. David performed "Hosanna in Excelsis" on the theatre space's grand piano. Ricky then played a short piece he composed, inspired by Beethoven's "Moonlight Sonata", using MIDI keyboard and piano VST. This was in remembrance of a friend of the research group who had passed away in recent weeks. Caroline showcased her lullaby composition. She asked me to describe the

creative process as well as the guitar adaptation on her behalf. She then played along with the recording. I ended the concert and thanked the audience for attending. After the final sign off, Ricky facetiously exclaimed “Never again!”

**Reflection phase.** For the final session of the cycle, most of the group convened to discuss their experience of the concert and the cycle. Trevor K., Eddie, Darren, Ricky and David gave positive feedback on the experience, with Trevor K. and David both describing the concert as “perfect”. David felt there had been an “awesome atmosphere” and that it had been a “new experience”. Darren had hoped for a larger audience but felt that the concert had gone well.

In discussing possible next steps for the research, I observed some fatigue in the group due to the amount of organisation and discussion. I suggested that the goal for the next cycle did not necessarily have to be another concert. David suggested collaborating with students from the Irish World Academy and “playing as one group”. I put forward options of smaller scale interactive workshops, to allow audience members to participate and learn about music technology. Ricky affirmed this idea as a way of sharing his idiosyncratic approach to using Ableton.

Finding new forms of dissemination, particularly online was also suggested. “We’re only known in Limerick. Other people are not tuned in” commented David. Creating a Soundcloud or YouTube page for the project was a possibility for reaching new audiences, although Ricky was concerned about getting negative feedback. I commented on the lack of musicing by the group during Cycle 2 and suggested foregrounding musical interaction within the research, whatever outputs were chosen.

Returning to the topic of the concert, Ricky speculated about the role of structure (or lack thereof) in the improvised performance. He thought an audience would need to be “open-minded” to enjoy improvisation. I suggested that the use of loops and rhythmic VST

sounds in the performance had helped to synchronise the players and make the music more accessible to listeners.

I asked the group about possibilities for an arts-based research response to the group's musical interactions. The sense of the improvisations being complete persisted, though the idea of creating additional layers or voices was interesting to the group. The possibility of my re-engaging with improvisations I had not originally been part of interested the group. This was conceptualised as a form of *non-linear participation*.

I shared some email feedback received from audience members. One email read: "Well done on a great concert – I really enjoyed it. It is an absolutely wonderful project. Its value was evident in both the great music and the obvious pride and pleasure of all involved" (personal communication).

A second email read: "We very much enjoyed the Enable Ireland concert last week in UL and were very impressed with the individual performances, the sound art improvisations and the ensemble pieces. It was great to see the musicians taking on the challenge of music technology and introducing their work with your support and encouragement".

I added that these responses made me think about how unique the group's performances were. David responded, "this is one of the greatest experiences of my life". He looked forward to the upcoming third cycle, to "get on with the music without any talk". Eddie requested a copy of the emails. The third cycle was flagged as the final phase of the research project, though not necessarily the end of the participants' collaboration.

### **Conclusion**

This cycle report describes the Limerick PAR group's planning and implementation of their goal of sharing their skills as musicians with music technology in a more public fashion, outside of the familiar context of the Enable Ireland day facility. During this cycle, the co-researchers decided on the work of Cycle 1 and evolve the thematic concern: *to show*

*what we can do*. The group wanted to find new spaces and audiences to share their skills with. This implied a higher standard of musicing according to the co researchers. They determined to focus on gaining proficiency with the available DMIs and collaborating more during improvisations to achieve this. I was charged with ensuring the stability of the music technology resources.

The group confirmed the relevance of my inductive coding work - agreeing that talk vs action, chaos vs order, humour and support, pride and ownership were valid themes. The tension between the propositional (verbal, discursive) aspects of the research and the presentational (aesthetic, musical) aspects continued to be present. In early sessions of this cycle, the balance tended more towards the propositional – the research lecture and concert organisation – requiring a deliberate rebalancing to ensure the musicians felt prepared and confident for the concert at the end of the cycle.

In terms of presentational/practical knowledge, more complex DMI interfaces came to be incorporated into certain of the co-researchers' work, with applications of music technology developed outside the research sessions being developed and shared. These included Trevor R. and David's bespoke instrument racks and Rick's sound art. Eddie also practiced his piano piece between sessions while David and Trevor R. both explored the guitars (stringed and otherwise) as new ways to music. I became more proficient with the *Touchable* iPad app as a means of controlling the overall sound while still being able to take part in improvisations. Darren's work to familiarise himself with a 64 trigger DMI interface was a notable step up in involvedness of participation also.

Reflective work to develop an arts-based analytical frame (Ledger & Edwards, 2011) yielded ideas about the inherent meaningfulness of the group's musical collaborations in the previous cycle. The sense that the improvisations could not (or should not) be deconstructed was both a validation of the group's work but also a source of some frustration to me in terms

of finding an appropriate way to curate these recordings within the PAR methodology and subsequently into thesis form. Though further clarification of the role of audio and video recordings within the research process was necessary, the notion of reading for *interestingness* and the idea of revisiting the recordings as a form of *non-linear participation* informed subsequent analytical work.

The concert, like the lecture earlier in the cycle, acted as a form of dissemination whereby the capacities and multiple knowings of this community of inquiry were demonstrated through performance. The solos were well-performed, while the group improvisation was a good representation of the group's weekly work together. The more personal presentations at the end by Caroline, David and Ricky were last-minute additions to the concert programme that showed the value of music as an expressive and connective medium for the co-researchers. The audience response, especially the emails received, was highly supportive of the group's efforts.

While the group discussed possibilities for sharing skills of performing in other contexts, the option was also suggested that the performance element be eliminated from the thematic concern, with the group concentrating solely on playing together. The next cycle's planning phase developed this dichotomy further.

### **Cycle 3 – Concentrating on Musicing**

**Overview.** The third and final cycle of the Limerick PAR project was also its longest, running for 20 sessions between January and June 2014. Musicing together was the agreed main goal of the cycle as determined by the research group. An eventual public or performative component to this goal was secondary to this musicing goal, rather than driving the work as in cycles 1 and 2.

The group decided to stage an interactive workshop to share their knowledge of music technology. The group described feeling fatigued by the organisation of the concert in cycle

2, and thus decided that this workshop should be spontaneous and improvisatory. The group still wished to disseminate their learning but wished to find a more direct way of engaging a potential audience, involving people directly with the music technology resources.

In research sessions, the co-researchers continued to explore the available DMI resources, in more nuanced ways than before. New DMI's were introduced as less popular or flexible ones were phased out. DMI configuration took on an element of deconstruction, where functions and effects were selected and combined in a more modular, and often unorthodox fashion. Co-researchers adopted new roles within research sessions, actively helping each other to access DMI interfaces and taking on group facilitation responsibilities.

In March 2014, the group conducted a workshop presentation for students from the MA in Music Therapy, at the Irish World Academy of Music and Dance. This was conceptualised as a dry run for a potential larger public workshop. The workshop did not eventuate to be interactive as the co-researchers had hoped, and was more of a standard musical performance, without direct participation from the audience. Some co-researchers expressed frustration and disappointment with the experience. Therefore, there were no plans to hold further workshops.

The research sessions continued as before though compromises and adaptations were necessary when my laptop was damaged and alternative music technology resources had to be utilised. Exit interviews were held in June 2014, using a group discussion format to reflect on the experiences and learning over the course of the PAR project. Excerpts of these interviews were used in a presentation on user voice in research at the 2014 IAMM Conference in Toronto.

### **Planning phase.**

*Sessions 1-4.* In the first session of the third and final cycle, the co-researchers began by reflecting on the experiences of Cycle 2, particularly the concert at UL. David maintained

that the concert was “exceptional”. While I acknowledged that “we wore ourselves out” working towards the concert, I suggested that options might be explored to make future concerts easier. Caroline felt that the group should take more pride in the work saying: “We don’t realise our talents – we’re so used to hearing it, we don’t realise how good we really are”.

The group decided to concentrate on musicing for the rest of the session, beginning almost immediately. The participants chose instruments based on previous experience or preferences. David took the electric guitar, asking for a sound like Hank Marvin or Pink Floyd. I added tremolo, reverb and phaser effects to his clean sound, adding delay and wah-wah effects at David’s request later.

Caroline chose to play the *Smart Guitar* patch in the Garage Band™ app and learned to change guitar sounds herself, settling on the acoustic guitar sound with the *autoplay* function set to *fingerstyle*. Trevor was offered an instrument rack he had favoured in the past mixing bass guitar and rhythmic percussion, but said “I want more”, choosing the 16-pad PadKontrol to play the synth instead of his usual 8-pad LPD8 and adding a rhythmic synth to the instrument rack. Ricky chose a MIDI keyboard with a piano synth and arpeggiator effect. I chose to play a drum synth with the *Launchkey*’s trigger pads. Eddie chose the *Quneo*, choosing an upright bass sound by signing. This configuration of sounds meant that three of the players had an element of their DMI interface coordinated with the global tempo of the DAW project or using a matched tempo in another program.

The group improvisation consisted of intersecting arpeggio patterns and guitar lines. David exclaimed while playing: “I never knew I could play like that!”, whooping throughout the improvisation. The music gained intensity as the group continued to play.

After the improvisation, David said “That was the most exciting music – it’s beyond me!” I played back parts of the improvisation and used the *track solo* function to highlight

each musician's playing. Caroline commented: "It was wicked – I like figuring out things, I've got a few ideas". David continued "I just can't say what I'm feeling", to which I answered, "it's in the music."

In session 2, the group chose to begin musicing immediately, without preamble or recap. David asked about using a slide on the guitar to prevent sore fingers while Caroline learned about the different scale settings on GarageBand's *Smart Guitar*. Eddie chose a piano sound from options I presented through sign. Eddie also sat where he could see the laptop screen clearly. Thomas chose the Padkontrol when presented and was given a rhythmic synth and velocity effect to ensure a high level of response and feedback. Ricky chose a bass sound and MIDI keyboard

The group played three improvisations. Thomas initiated the musicing, which was acknowledged by Eddie. Thomas's response, "Bug Off!" was incorporated into an improvised song. David asked for the final improvisation to be "a right fast go", prompting me to raise the global tempo. At this, the soundcard crashed, losing the project file. Thomas was praised for his role in anchoring the musicing as the system was restarted. Darren arrived at the session and chose a DMI asking for "a sound like David's". David and Darren acted as co-percussionists after David switched DMIs in favour of a drum synth. I took the guitar but promised not to use David's effects. Thomas vocalized as the group continued musicing. After another brief group improvisation, the system crashed again. Caroline expressed ambivalence about using the touchscreen again, saying, "I feel like I'm f\*\*king up". She indicated that she preferred the more direct feedback of her electric guitar.

In the reflection phase the group discussed the option on holding an interactive workshop as discussed at the end of Cycle 2. I offered to contact faculty in UL about a workshop with music therapy and community students. Ricky was curious about presenting each co-researcher's DMI's separately rather than as a group performance. I advised a "roll



pitch of his VST using the keyboard controls to create an uncomfortably high-pitched sound. David and Thomas both expressed disapproval of this, but in review, Ricky defended his perceived right to play what he wanted

Session 4 began with a similar imperative to begin musicing quickly. This was aided by working from the previous week's file. David chose a MIDI keyboard and *vocoder* VST, asking to add the audio effects been using for the electric guitar (crystal reverb). This was a new element to David's DMI choice routine, combining elements of different DMI interfaces. Trevor R. chose the electric guitar, tuned to *open G*, with a slide for ease of play. Trevor and I worked on a comfortable hand position, settling on an overhand pincer grip. Trevor K. chose the launchpad with had a drum synth loaded already. I configured Touchable to a dual screen – one to monitor the overall project, and the other with an isomorphic keyboard.

Trevor asked to do a Garth Brooks song. I suggested "Friends in Low Places" which was accepted. The group performed together enthusiastically. Trevor then requested the microphone and asked to perform a "Wet, Wet, Wet" song. I suggested "Love is All Around". David decided to listen rather than play along. Trevor sang into the mounted mic and played guitar also. Trevor K. sang along as he played drums, culminating in a crescendo at the end of the song.

In reflecting on the group improvisation, David and Trevor R. both described the music as "calm". I observed how each co-researcher had tried a different DMI configuration than they might usually have been accustomed to. The group also acknowledged the absent co-researchers. I informed the group that anniversary of the project's inception was approaching suggesting that it could be marked in some way.

***Thematic concern.*** In planning the cycle, the research group prioritized musicing as a goal unto itself. Early discussions showed a more positive perspective on the group's abilities and experiences. This contrasted with the concerns about the co-researchers either having to

prove themselves musically in public, or the risk of negative audience reactions that were frequently expressed in Cycles 1 and 2. The idea of sharing practical knowledge with the community persisted however. The group decided to engage in an interactive workshop during the cycle. This would potentially involve more direct contact with the audience than a concert or performance would. This workshop was scheduled for the 19<sup>th</sup> March 2014.

The group's desire to concentrate on musicing together was demonstrated both explicitly during the planning sessions, and tacitly in the enthusiastic participation of all co-researchers. The manner of musicing diversified as new DMI configurations were devised and as song material and vocalisation were incorporated. The desire to explore and experiment with different DMIs and sounds invited negotiation, and sometimes conflict between co-researchers.

**Action phase.** This consisted of twelve sessions including a research workshop.

***“Talking about music breaks it down” - Musicing for music’s sake (Sessions 5-7).***

Carrying on into the Action Phase of this cycle, the level of enthusiasm was high. Even with a smaller group, negotiation of access to specific DMIs occurred. Ricky and Eddie, iPad owners, were interested in using the *Touchable* app, both as a MIDI input and as a DAW controller. They were not expected to buy the app themselves, and so the only available copy of the app was on my iPad. Eddie chose to use *Touchable* to mix the group's sound, taking direction from me through hand gestures for track number, volume up and down.

A warm up improvisation was stalled to allow Thomas to use the microphone for his vocalisations. Then Ricky and I developed a groove around an arpeggio and *motorik*-style drum beat, with Trevor K. layering long legato notes on the Launchpad. Thomas laughed into the microphone.

After this, Ricky took his turn with *Touchable*, experimenting with the step sequencer, for *drawing* notes by touch on a grid to create drum or melody MIDI loops. Ricky compared the

step sequencer function, to the FL Studio app, which he owned on his iPad. Ricky created a drum loop, with which the other co-researchers joined in. Ricky was surprised by the ease with which he could create and edit loops in real time (i.e. as the group was playing) saying, “I can do drums on the fly, I didn’t know I could”.

After playing, I commended Thomas’ vocals. Ricky and Trevor also commented on my guitar accompaniment – rhythmic *chunked* chords, resembling the style of Nile Rodgers. The group discussed how strong rhythms made group musicing easier, whether generated by loops, arpeggiators or guitar. Ricky later reviewed the MIDI events within the Ableton file to see how the beat evolved as he edited his loop.

Session 6 began immediately with instrument choice, made quicker by using the previous week’s project file instead of a new file. David chose an instrument rack he had created in music therapy after ceding the guitar to Trevor R. Eddie chose the Touchable app, but after a delay in connection, took the PadKontrol instead. Trevor R. returned the guitar to David and chose the Launchkey asking for a bass sound. I added loops to the project that were triggerable from the Launchkey.

After a warm up during which I balanced the mix, the group played an improvisation. Eventually, Trevor R. made hand gestures for the group to stop playing, which were either not seen or ignored. I suggested calling a countdown, which was more successful. David described the music as “like a whale”, referring to the long guitar *dives* he played using the guitar’s tremolo bar. When invited to comment after playing, Caroline said “playing is enough”. Trevor K. commented that discussion would be “like dragging the bottom out of a pot”. However, the group did agree to replay the recording, during which Caroline described the music as “like something from a film”. David likened the improvisation to whale song, while Trevor R. said the music was “like a ghost”.

In Session 7 the group discussed some further ideas for the interactive workshop. I had difficulty setting the workshop up as a public seminar but felt a workshop could be run in a smaller scale as a “practice run”. The group talked about the growing sense of coherence in the music, suggesting that certain aspects of the DMI resources had helped with this, along with the co-researchers’ increasing familiarity with each other. I acknowledged the preference for playing over talking. Caroline said, “talking about music breaks it down”.

I described how Ableton’s arpeggiator MIDI effects and rhythmic VST’s allowed the group to play in a way that was coordinated by a global tempo. *Touchable’s* loop editing feature allowed real-time sequencing, so loops could be created, edited and switched in a spontaneous and improvisational manner. I suggested that playing over a steady rhythm made the music “less chaotic”, though possible affording less “freedom” for the players. David and Ricky both agreed a balance was necessary between rhythmically coordinated DMIs and arrhythmic interfaces during group musicing.

The group then chose DMIs for the improvisation. Each participant was eager to play and took some time to familiarize themselves with their interface. A high energy improvisation followed with David and Thomas vocalizing loudly. David became tired and chose to listen to the next improvisation.

Ricky changed the pace of the musicing by sequencing a slow drum loop he called a “heartbeat” loop. The group, excepting David, continued to play, with Thomas still vocalizing. Trevor K., playing the wireless guitar controller, commented that it was “the best session ever”. Eddie then took the iPad and created a drum loop, over which I continued my previously established synth motif. Ricky watched Eddie work on the step sequencer. Trevor K. reached over and played Thomas’s PadKontrol, as Thomas and I continued to sing.

Reflecting on the session, I noted the improvisation period as having been the longest yet since the research project began, over 30 minutes out of the 45-minute session. Thomas was

praised for taking the lead and making clear choice. The group ended the session with another improvisation based around a *tribal* drum loop created by Ricky.

***The interactive workshop that wasn't (Sessions 8-11).*** In session 8, the group discussed the upcoming workshop. I gave some general information about the location and the audience. There had also been an offer to the group from a colleague of mine to perform at an integrated dance event – a dance performance by dancers with and without disabilities. The group had some concerns about taking part in 2 events so close together. The timing of the event turned out to be problematic for some of the co-researchers. Since the full research group would not be available the group decided to pass on the offer.

In this session, Trevor R. offered to help Thomas with his playing and moved to where he could reach the PadKontrol Thomas had chosen and hold it up for him. David had been playing gentle music on an open-tuned guitar, which I praised as “calming” during the set-up period. Caroline opted for her own guitar, lined directly into the soundcard with a phono lead, as her amp was unavailable. Ricky asked for an “Indian guitar” and was offered a sitar synth for his MIDI keyboard. Trevor K. tried the Touchable app for the first time. I demonstrated the *isomorphic keyboard* GUI and showed him how to change the scale settings from chromatic, to diatonic to modal.

During the improvisation, based around a slow beat I played on the *Launchpad*, each participant added an idiosyncratic element to the music. David used a finger-tapping technique to create melodies over Caroline’s legato strumming. Trevor K. played glissandos using the touch screen keyboard. Eddie played long chords with both hands on a piano synth. Trevor R. and Thomas did not play, but Thomas vocalized while Trevor R. held his MIDI controller in position. Ricky established a short motif, which he repeated for a few bars before stopping to listen. David called a countdown to end the music, though the co-

researchers kept playing for a time afterwards. Eddie used the transport controls on the *Launchkey* to stop the recording.

Before ending the session, I commended Trevor R. for offering to help Thomas, the first time such an offer had been made between co-researchers. I pointed out the pitch bend X/Y pad on the PadKontrol for Trevor to try in future as a way of collaborating more with Thomas. This would allow him to affect the pitch envelope of Thomas' playing by +/- 3 semitones during musicing, or more if the VST was reconfigured within the DAW. David complimented Caroline's playing. Ricky played the group out at the end of the session.

Thomas and Trevor continued to work together in session 9, and shared the *Axiom* MIDI keyboard, as chosen by Thomas. The group members chose and refined their DMIs. Darren chose two drum synths grouped in an instrument rack and triggered with the PadKontrol. He also requested the velocity settings to be fixed at full. This meant his drum sounds would come out at maximum volume regardless of how hard he struck the pad. David asked for echo effects for the electric guitar. Thomas chose a rhythmic synth, also accepting a set velocity when offered. I chose an upright bass sound on the *Launchkey*. The group played a jazzy improvisation based around David's guitar playing. Thomas vocalized a lot, which I reflected and incorporated into the improvisation. Ricky mixed the overall sound using *Touchable*.

The workshop took place in Theatre 2 of the Irish World Academy of Music and Dance at the University of Limerick on the 19<sup>th</sup> March 2014 (See Digital Appendix A – Cycle 3 - Limerick PAR group Interactive Workshop). It was attended by the MA Music Therapy 1<sup>st</sup> Years and 2<sup>nd</sup> Year students and consisted of a presentation by me followed by the group musicing experiential. The students were informed by email, and again during the presentation portion of the workshop of the interactive nature of the workshop, that they were welcome to interact directly with the devices and co-researchers at any point if they were

interested. This was intended to be an informal experience for both the co-researchers and the attending students, in contrast with the class lecture and public performance from the previous cycle. The intention of the workshop was to explore new potentials for dissemination with a view to running a larger, more public workshop later.

For the first hour of the session, I gave an overview of the research to date, drawing comparisons between the philosophies and practices at play in the research (PCP, MT, assistive technology, participatory research and disability issues) as well as describing the technology itself. After a presentation, the co-researchers arrived. The DMI setup from a standard research session had been arranged at the front of the theatre before the lecture to expedite musicing. The co-researchers sat around the table and greeted the students. The workshop began with the co-researchers describing the weekly research sessions. Darren said, “we like playing different sounds and instruments”. “We mix it up” added Trevor K. “it’s different every week”. I suggested demonstrating the popular DMI configurations, opening the DAW file from the previous week’s research session.

David chose the electric guitar, declining to add effects to the clean sound. He described his guitar approach to the students “there are other ways of playing guitar than the normal way – more techno. I decided to put my own way of making it”. I commented on David’s ideas taken from his use of MIDI effects when playing keyboard. “I just love that”, replied David. I offered Eddie guitar, bass or drum sounds using ISL (Irish Sign Language). Eddie made the sign for *drums* and accepted the *Touchable* iPad app on the step sequencer setting.

Darren asked to play a drum VST on a MIDI keyboard, specifying that he wanted to play “fast and loud”. He accepted an orchestral drum kit named *Magnificent* with a *velocity* MIDI effect fixed at maximum. Trevor K. chose the *Launchpad* device, choosing a bass

guitar sound to complement the guitar and drum sounds chosen by the others so far, creating a rock/pop ensemble configuration of instrument sounds.

Ricky chose to use the *Traktor* DJing app on his own iPad and asked for an audio cable to connect with the external sound card. Trevor R. and Thomas agreed to work together as in recent sessions. Their previous collaboration was described for the students. They accepted a rhythmic synth sound they had used together previously. When the DMI choice and setup was complete I invited the attending students to come closer and interact with the co-researchers and DMI interfaces. Once the co-researchers had control of their DMIs, David shouted “now we’re off!”.

The group improvised for about ten minutes, following an EDM-style loop chosen and triggered by Ricky. During this time, the co-researchers were very focused on their playing, and the students did not leave their places to engage. After the improvisation. Ricky commented that his loop sounded “like drum and bass”. David and Darren both praised Ricky’s loop for setting the tone of the improvisation. Trevor K. was pleased that “no one conked out”, that is that the system had remained stable and all the DMIs had stayed connected.

Darren and I talked about the *Impulse* drum VST Darren had chosen, specifically about how the standard trigger mapping to the C major scale optimised playing drums on a MIDI keyboard but left blank pads when played on the chromatic layout of the Launchpad controller. Darren had found this confusing at first but worked it out as he played. The chromatic layout was more appropriate for drum VSTs in Ableton such as *Drum Rack* or third-party drum VST’s such as *Battery*, both of which used larger sample banks than *Impulse*.

I referred to elements of the thematic concern that were relevant to the group musicing experience, first mentioning the decision to “listen more”. Caroline said, “yeah, but

we need more practice – we’re getting there slowly”. Trevor noted that the space being used for musicing often affected co-researchers’ capacity to hear each other clearly.

David took the opportunity to say more about his guitar style, describing his ability to “play softly with guitar” in contrast to the “aggressive” playing he saw on television. Trevor R. was asked if he enjoyed helping Thomas. Thomas shook his head, laughing which chagrined Trevor. I suggested that Thomas had been joking. David returned to his favourite metaphor (as mentioned in the classroom lecture in cycle 2) - “I want to say to those that are here – music is stronger than water, strong as I’ve ever heard. Every Wednesday”. Trevor K. responded, “we’ve gotten better, haven’t we?” “Gotten worse” joked Trevor R. to laughter from the co-researchers.

At this point the Caroline noted that the students were “very quiet”. “I’d forgotten about them!” responded Trevor K. David invited questions from the students. One student asked, “How important is the opinion of listeners versus yourselves?” The answers were somewhat tangential though suggesting a personal connection to musicing that was not related to outside perspectives or responses. Caroline talked about her experience of having cerebral palsy, “I didn’t realise I could play, the type of CP I have is spasticity, means when I want to do certain things, I tense up or whatever, but the guitar helps me to relax also”.

David talked about his introduction to MIDI technology, “I joined Enable Ireland in 2008. When I heard Jason playing the [MIDI] keyboard, it was the first instrument I played at Enable. And I never stopped”. Trevor K. described a sense of uncertainty at the beginning of the research. “On the first Wednesday I thought, *what are we letting ourselves in for – I never tried this one, these devices*. With the equipment plugged in all at once – hiccups aplenty”. “We’re getting the hang of it now” came Caroline’s reply.

As the workshop ended, David said “We all deserve a clap for that”.

In the immediate aftermath of the workshop, informal feedback from some of the group – Darren, Caroline and Trevor - was that they were happy with how it went although slightly disappointed by the lack of hands-on participation from the students. After the workshop, I had asked a student why they had not joined in to be told that there didn't seem to be a good time to do so. I reflected on this issue in that week's PhD journal, writing:

Overall, it seemed that we settled into our usual way of working (within our standard time frame) in the absence of participation from the students. The participatory nature of our work had been articulated and skills, roles and identities were shared but a barrier between the group and the students seemed to exist.

I had a sense of dissatisfaction from the workshop, like what I experienced after the Ennis group's concert, which I decided to sit with rather than interrogate immediately. Over the following days, I considered different aspects of the experience – the time scale of the workshop, the physical layout of the room, and my own role regarding the students as a teacher (and potential authority figure). At the very least, it seemed we had taken for granted that students would be likely to join in.

(21<sup>st</sup> March 2014)

In session 10, the research session after the workshop, the group discussed their responses to the experience. Caroline was concerned about a possible negative response to her opinions of the workshop. I reassured her that her comments would be respected. I asked for comments on the workshop from the group. "There wasn't a workshop" answered Trevor K. Caroline concurred,

"Last week was a bit of a farce...it was meant to be a workshop and we ended up playing music, it wasn't what we...what it was meant to be. If we're going to do things like that, we have to explain to people more what we're doing, I felt really stupid sitting in that room".

Trevor K. added “that was a complete and utter...f\*\*k up”.

Ricky was more philosophical, “I think it’s difficult enough to set it up, get the students in, stuff can go wrong”. I agreed that the workshop had not gone as planned and had not been interactive at all. I assured the group that the format of the workshop had been explained to the students, but they hadn’t seemed to want to take part. Trevor R. commented, “that was stupid”. Caroline was concerned about the reason for the lack of interaction, “were they scared of us?”.

I suggested some possibilities in response based on his own reflections since the workshop. One was that the group were “working fast” and had settled into their usual way of working, which may have made it difficult for the audience to join in. Another possibility was that the students were more comfortable with the lecture format that the workshop had started with, making it difficult to get away from the “audience/performer thing, something we [the PAR co-researchers] were trying to get away from”. The layout of the lecture room may have affected the workshop, as the students were seated in a raised area separated from the front of the theatre by a partition. This might have made it more daunting to come down and take part.

Caroline continued to be concerned that the reticence of the audience to interact was a response to the researcher group themselves, “they have to get used to working with disabled people, we might look scary”. I responded that the students had been on clinical placements and had met the research group on multiple occasions before. I had heard good feedback from the students but had not inquired about why they hadn’t been more interactive. I suggested that perhaps the research group “getting into our groove” had made it difficult for students to get involved.

Trevor K. asked how the students had appeared during the lecture portion, before the co-researchers arrived. I observed that they had been quiet. Ricky suggested a smaller group of

“one or two should do it more directly”. I turned to other positive aspects of the workshop, observing that the group had achieved a lot in a single hour – explaining the research, demonstrating the DMIs and performing a group improvisation. I described hearing the music come together as “wonderful...it started with David but became a unified thing”.

Ricky suggested that the research group had gotten “into the flow, [the students] were afraid to break that...it wasn’t that they were afraid [of taking part]”. Darren commented that the time had gone quickly as he was having fun. David expressed gratitude for the experiences he had in UL during the project – performing, playing a grand piano for the first time, lecturing, and hearing music students practice in the foyer. He was still open to doing a longer workshop, of two hours at least, focused solely on playing music with IWA students.

The group had mixed feelings about organizing another workshop. While Caroline was positive about doing another workshop she said, “there’s no point in doing it if people won’t get involved”. Trevor R. said, “there’s no point in doing it over and over...it’s boring”. This reminded me of the group’s discussions at the end of Cycle 1 and the beginning of Cycle 2 around the value of finding new spaces and audiences and the risk of stagnation. I suggested that any new endeavour by the group should be “different and interesting”. Trevor R. agreed.

Trevor R and Trevor K asked about the timescale of the group. I informed them that three PAR cycles over the course of a year constituted a PhD-level action research project (Zuber-Skerritt, 2002). I added that the group could continue working after the PhD component was completed if they chose.

The group returned to the topic of the workshop. I commended David and Caroline for their speeches. Caroline was still concerned about the students’ lack of response – “I don’t understand – if they had been working with people with disabilities, you’d think they’d be more relaxed”. I suggested that there may have been a dual process in terms of the audience’s relationship with me specifically, as their lecturer/supervisor.

Caroline asked me, “how did you feel yourself?” I suggested that the session had many positive features, for example the speeches, and that opportunities to engage were plentiful. Feedback from the course director of the MA Music Therapy had been positive also. The group agreed to continue working until the summer. A second workshop was decided against, with the group preferring to concentrate on musicing together.

In session 11, I acknowledged Darren’s recent absences from the group due to a persistent illness. Caroline commented “he loves being here”. During the set up. David talked about the guitar styles of his favourite guitarists – Hank Marvin, Brian May and David Gilmour – saying they “play like me”. David continued to be interested in reproducing MIDI effects with an audio source, in this case, the guitar. He asked if an *arpeggiator* could be put on the audio track to create rhythms. Though it could not be done in quite that way, I suggested the *beat repeat* audio effect that “allows for the creation of controlled or randomized repetitions of an incoming signal” (DeSantis et al., 2016 p. 318).

Ricky began using Garageband on his own iPad to create a drum beat and improvised bassline. With both Caroline and David lined into the main inputs of the soundcard, Ricky’s iPad was lined into the stereo input of the Roland TriCapture soundcard, which meant his sound was being piggybacked into the tracks already taken by the two guitars. This made adding separate effects to each instrument difficult.

Thomas arrived somewhat late. Another practitioner had taken Thomas to a relaxation session when he was scheduled to come to a research session. When I found him, he was visibly relieved and loudly assented to be brought to the research session. Thomas then enthusiastically accepted the offer of a MIDI keyboard and joined in the improvisation on a rhythmic bass VST. Ricky and I decided on the tempo, setting a BPM of 92 on GarageBand and Ableton, respectively.

Ricky set up a bass guitar pattern using the autoplay function of *Smart Guitar* on Garageband. This created a shuffled, country music feel that Ricky called “Old West”. David was impressed, “I like it!”, while I sang some lyrics from “Wand’rin’ Star” (Lerner & Lowe, 1969). Ricky added a hip-hop rhythm and the group played a loose improvisatory version of the song. When David became tired due to the weight of the electric guitar, he was encouraged to lay it flat on the table and play it like a lap-steel guitar, in keeping with the country music style. He was offered a slide to use with the open-tuned guitar. Ricky modified the drum rhythm prompting a change in the feel of improvisation. I responded with a Phrygian mode keyboard line. David began playing long ascending glissandi with the slide, which were immediately answered by descending chord patterns from the *beat repeat effect*.

After the improvisation, David commented, “Ricky’s music is unbelievable. Professionally done. Besides everyone’s playing... We still got organized and got things down”. I mentioned David’s use of the *beat repeat* effect. David then asked using effects pedals to augment his playing. I suggested using the 12-step device (a foot operated MIDI keyboard) to trigger audio effects in Ableton through MIDI mapping. When Thomas was asked if he was glad to have attended, he reached towards the MIDI keyboard in front of him. Eddie gave a ‘thumbs-up’ signal when asked the same question through sign.

***Refocusing on the music as roles and relationships shift (Sessions 11-14).*** The group celebrated its first anniversary in session 12. The session began with Ricky showing his co-researchers a hip-hop remix he had created of a song by Meshuggah, a technical metal band known for creating unusually metered guitar riffs over a 4/4 beat. Ricky asked the group for other genres to create hip-hop remixes with. The group suggested rock, pop, musicals and country music.

I highlighted the anniversary with the group, to mark the “serious commitment” of the co-researchers to date. I then laid out cupcakes with candles for each co-researcher and one

for Darren who was absent, before asking a staff member to take a photo. Then I offered to share the photo with Enable Ireland's Facebook page and other outlets. The group moved swiftly into the regular session structure.

Trevor K. chose the *Touchable* iPad app. David asked for an audio effect on his guitar that replicated the *Evil Eddie* guitar VST. This was a distorted guitar sound that David had used on MIDI keyboards before picking up an actual electric guitar. This blending of modalities was becoming more common for David in articulating sounds he wanted to hear. I demonstrated some of Ableton's guitar distortion effects, and David selected one called *Aeroballz*.

Trevor R. and Thomas agree to continue their collaboration, until Thomas pinched Trevor R.'s arm during the DMI set up. I perceived this as a mischievous gesture by Thomas, but Trevor R. was quite hurt by it and refused to "help" Thomas any more. I reassured Trevor R. that he could work on his own DMI. He accepted the *Launchpad* device and I loaded some loops into Ableton's scene launch GUI to be triggered directly by the Launchpad's SESSION mode function. This integrated the device's pad layout with the DAW's on-screen functions. Each loop loaded into a slot in Ableton's scene GUI caused a corresponding pad on the Launchpad to light up. I dragged a random selection of loops from the clip folder on Ableton's menu initially, but Trevor asked for more loops later in the session.

The group improvisation was built around a percussion loop triggered by Trevor R. Trevor exclaimed "That's decent!" while playing as Thomas and Trevor K. contributed to the groove on synths. David left in the middle of the improvisation due to tiredness. The remaining group members reflected on the session with me – Trevor K., Ricky, Trevor R., Thomas. Trevor R. asked about the future of the project saying he wanted to do "more, not here".

I informed the group about a presentation I was preparing for the upcoming IAMM conference in Toronto (June 2014). The presentation, in conjunction with the *Music and Health Research Group* at the University of Limerick were to speak about user voice in research. I proposed that since in this research project, “everyone’s opinion [was] important”, then the co-researchers should have input into the paper. Thomas shouted “YEAH” when asked if this was a good idea.

Trevor R. suggested making a DVD using material from the research. I thought this would potentially be a good idea for the final thesis, that the curation of a DVD would help to “make sense of everything”. Trevor K. added that a DVD could help other potential PhD candidates to think about their work. For the short IAMM presentation, I suggested that a short video could be good to show how user voice was incorporated into the research.

Ricky observed that “we have people on different levels with different perspectives, into different things – but we work on a team”. I agreed, saying that how the team worked together and how they responded to problems was “part of our story” in developing musical skills and engaging in public performances. Since only part of the group were present, it was agreed that the idea of a video component to the paper would be developed in future sessions.

Wrapping up the anniversary session, Trevor K. commented “fastest twelve months ever!”



*Figure 17.* Limerick Group Anniversary Photo. From left to right: Trevor R., Thomas, Eddie, me, Caroline, David, Ricky and Trevor K.

David continued to work with the *beat repeat* effect in session 13. Ricky brought his own laptop with his own copy of Ableton, adding the *Launchpad* controller. The output of this PC was then routed into the external soundcard of my computer and into a track in my copy of Ableton. He proceeded to select loops from Ableton’s clip folder to trigger with the *Launchpad*.

Darren was back in the group after an absence. The group welcomed him enthusiastically. I noted that his was the first session with the entire research group in some time. Caroline chose to listen and give feedback rather than playing. Trevor K. chose a MIDI keyboard and ambient synth while Darren requested “heavy drums” on a PadKontrol. I suggested an Impulse drum synth named Massive a loud, heavily reverbed kit.

David asked for “longer notes” for his guitar interface, so I added a delay effect to create additional repetitions of the *beat repeat*’s artefacts. David also asked for “Electric Eddie”, his term for a guitar distortion effect. This was derived from the *Evil Eddie* guitar VST mentioned above.

Thomas accepted the offer of a MIDI keyboard and a rhythmic synth. Trevor R. requested the iPad and asked to play “bass drum”. I showed him how to create drum loops using *Touchable’s* step sequencer, and where the bass drum samples were located on the sequencer grid. I chose the 12-step foot operated MIDI keyboard with a bass synth. The *legato* setting of the 12-step allowed for sustained notes to be played without holding the key down, making it easy to improvise while facilitating the group and operating the DAW.

Once setup was completed the group played together. The initial sound was quite noisy. I muted the players and encouraged them to come in one-by-one, to “build [the music] back up”. Ricky began playing an EDM tune from his computer instead of the loops. Darren, a fan of the genre, recognized the piece and added a snare beat. Trevor R. added a new drum loop with *Touchable*. The rest of the group then joined in.

After the musicing, Ricky commented “Man, that was cool”. Trevor K. added “Ladies and gentlemen – the first time in weeks we were all together”. David said, “that was...WOW!” I asked if it was good to play together as a full group, and the group agreed. I also observed that many of the co-researchers had tried something new, particularly Ricky and Trevor R.

As the end of the cycle was approaching, ideas for wrapping up the project were solicited. David suggested a concert in the day facility’s hall (“without chaos” Caroline specified). Caroline suggested a workshop for Enable Ireland staff. David reiterated his previous idea to “put the recordings together into a single piece”. Similarly, Trevor R. suggested the “big DVD” idea from a prior session. Trevor K. was less enthused about an on-site concert, as he was concerned about fitting people into the available space.

David was curious about the other PAR group and whether the two projects could be brought together. This was the first time a co-researcher had asked about the other project. I explained that the initial idea of the research was to keep the groups separate to allow them to

develop different ideas and practices, but that coming together could be an option if both groups agreed.

Ricky shared an idea he had been working on to help the group music be more coherent. This involved greater use of arpeggiator MIDI effects “to coordinate rhythms better”. Caroline agreed, “If we’re going to get a bigger audience, it’s not going to happen with current sounds”. I felt this was being “hard on ourselves” but suggested that balancing structure and flexibility in our music could be explored more.

With the full group present it was possible to discuss options for the IAMM presentation in more detail. I explained the topic of user voice and how it related to our project. I suggested creating a five-minute video to show participant voices. The response was mixed. Trevor R. said, “this is hard for me” (to talk about the research), while David said, “this is relaxing for me”. I affirmed both positions, saying that this was a good example of how multiple voices and perspectives made up the group.

As the session wound down, Ricky offered to take the research group’s DAW project files home, with the intention of remixing them for clarity and coherence.

Session 14 was notable in that it was facilitated mostly by Ricky while I was indisposed. Ricky was the first to arrive to the session and used the time it took for me to locate the other co-researchers to set up a PadKontrol device with a piano synth and arpeggiator effect by himself. He improvised as Eddie, Darren and Thomas arrived. David then entered in a distressed state and asked for my help with an urgent matter. I agreed to help once the MIDI controllers were connected and Ricky offered to run the session from there. I then left with David.

Ricky asked Darren to choose a sound for the *Launchpad* controller he had selected. There was no signal initially as the *Launchpad* was in SESSION mode, which controls the software and loop triggering, but not MIDI input. Fortunately, Eddie spotted this and set the

*Launchpad* to USER mode, turning the device into a MIDI controller. Ricky then performed signal checks on the other devices by routing them all through the single piano synth he had initially set up for himself. He then gave each device a separate track and worked on finding drum sounds for Darren, offering a drum rack with an integrated arpeggiator.

Ricky then offered Thomas a MIDI keyboard, who accepted. Ricky then demonstrated some keyboard sounds for Thomas to choose. Thomas chose the second option presented, *Autosinfonie*, a gentle rhythmic synth. Thomas confirmed his choice when Ricky repositioned the keyboard for him.

At this point, I arrived back to the session, along with Trevor R. David's issue had been resolved, but he decided not to attend the research session. I decided to participate as musician rather than facilitator and requested a *glide* synth for the MIDI keyboard I had chosen. This was a monophonic synth with a portamento effect that created a smooth glissando sound between notes of different intervals. Trevor R. asked for his own *drum and bass* instrument rack. As described previously, this combined a frame drum synth with an *arpeggiator* effect set to play triplets and a bass guitar synth with an *arpeggiator* set to play quarter notes. This created an interesting polyrhythmic effect when played by a single MIDI controller.

The group played four distinct improvisations with Ricky and I handling refinements of the co-researchers' DMIs in between. Darren had asked for a drum rack that would respond to all 64 of the *Launchpad's* triggers. Since there were very few of these in the Ableton's files, I showed him a workaround for this I had developed for the Ennis group. This involved loading four drum racks of 16 samples each into a single instrument rack and then using a *Scale* MIDI effect on three of them set to -12, -24 and -36 semitones respectively. This meant that each rack could be played by separate 8x8 sections of pads in sequentially higher octaves. Using this method created some overlap between the kits and thus left unassigned pads at the top of the *Launchpad* which were filled by adding additional samples to the highest triggered drum rack.

Using increments of 16 semitones rather than octaves would have been more efficient, but Darren was satisfied not to have to remember the placement of *blank* or unassigned pads when playing percussion.

Drum Rack	Triggered by	Transposed (semitones)	New triggers	Grid Location
Kit 1	C1-D#2 (16 samples)	0st	C1-D#2 (16 samples)	Bottom left
Kit 2	C1-D#2 (16 samples)	-12st	C2-D#3 (16 samples)	Top left
Kit 3	C1-D#2 (16 samples)	-24st	C3-D#4 (16 samples)	Bottom right
Kit 4	C1-D#2 (16 samples)	-36st	C4-D#5 (16 samples)	Top right

*Figure 18.* The ‘Jonathon LP’ instrument rack which allowed four drum synths to be played separately on the *Launchpad* controller by transposing higher octaves down.

Trevor R. took a leading role in the second and third improvisations and shouted “That’s daycent!” while playing. The final improvisation ended with a long crescendo, augmented by Ricky turning up the reverb and delay sends on each musician’s track. After the improvisation I asked if Ricky had done a good job helping the group. Thomas quickly shouted “YEAH!”. I responded with humour, “it’s not often you’d get a compliment from Thomas”. Ricky acknowledged the difficulty of facilitating, “it took a while”. I commended him for developing his role within the group to apply his knowledge of Ableton to facilitate his co-researchers.

*Adapting to the damaged laptop, preparing for the end of the action phase (Session 15 – 17).* In advance of session 15, my laptop’s hard drive was damaged and sent for repair. This was a fraught time as there was a risk of losing some research data that had not been backed up. To keep sessions going, the laptop from my home studio was used as a substitute. This had Ableton, but with a different bank of sounds and effects. It also had fewer USB

ports for MIDI controllers and was not compatible with the docking station usually employed. The Belkin USB hub from early in the research was used, bringing back the risk of computer problems due to poor connections.

In session 15, the DMI setup went quickly. Caroline and Ricky had to negotiate access to my iPad, as Ricky wished to connect *Touchable* to his own copy of Ableton. When Caroline chose her own electric guitar instead, David asked if he had ever played her guitar. This led to a humorous discussion around ownership and individuality – as Caroline responded, “Nobody’s coming near this!”, while I explained how the guitar had been adapted specifically for Caroline’s abilities. Trevor K. chose a bass sound with the *Launchkey* while Darren chose the extended drum rack on the *Launchpad* described in figure 18.

During the improvisation, Ricky created a hip-hop loop while Darren added percussion sounds. Ricky then used the split-screen function of *Touchable* to control the isomorphic keyboard at the same time, playing a lead synth over his beat. David left early as he felt tired, stating his strong preference to work on the IAMM Toronto presentation in the next session. Two more improvisations followed with the group responding sensitively to each other. As Ricky began to add more and more elements; synths, loops and effects, I had to work to balance the musicians’ sounds on the DAW, eventually laughing, “it’s the Ricky Coonan show!”.

In the reflection Ricky was curious about how to merge the project files from both of our Ableton programs. This seemed difficult though intriguing. The group was happy with the improvisations, though comments were made about Ricky’s contribution as “blasting”. The conversation turned to the Toronto presentation. Caroline asked me, “what are you thinking?”. I answered that the idea of *user-voice* in research was somewhat novel, and that I wanted to include actual user voices in the presentation. I suggested that performance material could be created. Caroline wished to share her lullaby, which, though not created

during the research, had been presented multiple times in lectures and concerts as a demonstration of her guitar skills.

Session 16 was attended by a small group of co-researchers due to a schedule clash with a boccia tournament. David and Ricky were quick to choose the guitar and iPad respectively. Thomas chose the Launchpad by reaching for it. David asked for “ambient” effects and accepted the *Crystal Reverb* effect, which combined a heavy reverb, pitch-shifter and delay, creating a dreamy sound where each repeated echo of a played note was pitched up an octave. The *auto-wah* effect was added to vary the tonal envelope also. Ricky played a short composition he had created on Garageband. He then set it to loop and began to play bass guitar patterns on the *Smart Guitar* patch over it. Thomas accepted the offer of a pad controller and rhythmic synth while Eddie took a MIDI keyboard and asked for a guitar sound.

I spoke about bringing coherence into our improvisations according to a suggestion from a previous session, by following Ricky’s precomposed loop. I started playing along with a drum synth on the *Launchpad*, adjusting the global tempo in Ableton to match that of Garageband – 92 BPM. David joined in playing gently strummed chords on the open tuned guitar. He commented on the piece as “nice and soft – very relaxing”. He prompted the group to play as softly as possible, “then we bring it to a crescendo”.

Afterwards, the group listened back to the improvisation. Ricky described the music as “harmonious” with David commenting “that was out of the atmosphere!” Ricky offered the title of “Harmonious” for the improvisation, while David suggested “Sammy the Dolphin” asking for a copy of the improvisation on CD. David was still adamant that the group discuss the Toronto presentation in the next session, when the full group was more likely to be present.

In session 17, a few issues were covered, most notably the Toronto presentation. The group chose instruments as usual, while agreeing to discuss the presentation. As before, I explained the topic of *user voice* in research and my desire to have the co-researchers' actual voices as part of my presentation. David began to name famous Canadian musicians such as Bryan Adams and asked about the Canadian national anthem, which he wished to learn.

I asked the group "What do we have to say about ourselves?" Trevor R. answered "[it's] hard". Ricky added "less talking, more playing". I asked if we should explain that theme verbally or demonstrate it through performance. Caroline responded, "both – if it's just playing, people won't know what's happening". I signed this to Eddie "Some talking, some music", saying to the group "that's what this is all about". Caroline was concerned that people "[wouldn't] get the concept" of the group. Ricky reiterated the thematic concern "to show what we can do". "And show the glitches" added Trevor K. "How we worked through it and kept going", I suggested. "When we work together, everybody benefits".

The group agreed to make a short video under five minutes in length. I offered to brainstorm questions for the group to answer and made some initial suggestions – *What have you learned? What do you want to tell people?* and *What has technology helped us to do?* Ricky wanted to talk about Ableton's flexibility. David said "I didn't think the group would be the way we have it. It's taken off!"

I asked about the concept of a community of inquiry as a group learning about the same thing. I asked if this applied to the research group. Ricky felt that it did not, "I wanted to learn about Ableton and keyboards – that was different to the others". I suggested that we used the same area and space to explore technology, suggesting that the research combined the co-researchers' different perspectives.

Trevor R. was curious about the future of the project – "what about next year?" Trevor K and David both suggested that the group had come far enough and something new would

have to be developed. I suggested that the presentation offered a nice way of rounding off the project.

The group played a short improvisation to end the session, ending the action phase of Cycle 3.

**Reflection phase.** The research was concluded over two sessions.

*Exit interviews and IAMM presentation (Sessions 18 and 19).* Exit interviews for project were held over two sessions, 18 and 19 (See Digital Appendix A – Cycle 3 – Limerick PAR group Exit interviews). In session 18 a 30-minute group interview was conducted to discuss the PAR research over the three cycles and the learning and insights associated with it. This interview was video recorded and extracts therefrom were incorporated into my presentation for the IAMM Conference in Toronto on June 2014. I showed the group the final draft of this presentation in session 19, soliciting feedback from the group and confirming their consent for video material to be shared. Trevor K. was absent for the exit interview but was back in the group for the presentation run-through. Darren was present for the exit interviews but not for the presentation.

In session 18, David began the interview with a greeting message to the prime minister of Canada, and to the “King and Queen” of England, as he had been researching on the internet and learned that Canada was part of the Commonwealth. He then gave an overview of the research, using familiar imagery.

We’ve been doing music for years. Research is coming to an end. It still sounds as powerful as water. As strong as ever it’s been. I’ve always said that. Music, if you listen to it... a couple of people together, playing their hearts out, it sounds stronger than water and it always does because you’re playing at the same time. All through the research I have felt that. Every time I come in to play with these guys.

The group then spoke about collaboration and chaos in the research after David said, “Music is not just strings and guitars and keyboards anymore, it’s getting beyond that. Not only drums and of course the accordion. Its beyond that”. I responded, “It’s something that we do together”. David agreed, “It’s something we do together that makes the music, makes the sound and brings it all together”.

Caroline articulated some issues with collaborative musicing. “I prefer to play more singly, I can pick up more sounds. Working on our own is better”. I reminded the group of the theme of *chaos and order* which had come up throughout the research – the tension between which was always being negotiated musically, by incorporating play rules and coordinating musical parameters through the DMIs and digital audio software. David said, “It’s gone from *do-re-mi* and reading music, it’s beyond that”.

Darren joined in saying “what’s good is that you get to hear other people’s sounds, not just your own”. David agreed, “you can hear their talent, whether playing with one finger or what Ricky does [using the DAW and mouse] or play like the others”. “And you can make your own sounds” added Ricky. “But you want to play louder than their ones!” responded Darren. This reminded me of what Caroline had initially said about hearing each musician clearly during musicing, “We work together to hear clearly – sometimes that means playing solo”.

The conversation moved on to the roles of technology and emotion in the research. Ricky said, “I like that if you want to make a collaboration with someone, you can have as much MIDI controllers as you want to do a sketch”. I commented jokingly that that hadn’t always worked. David added another perspective

“It can be emotional, how we feel on the day, how we feel now. When we come in to the music [session], are we looking forward to playing? What are the feelings we get outside the room? Being among people? Hearing sounds, traffic? It’s like one big sound all together”.

I asked Trevor R. for his thoughts. With a sigh he answered, “I did a lot”. I acknowledged that he had made a lot of decisions in the research, most notably, choosing to help Thomas with his DMI interface. “That went really well...for a while” I joked. David said, “we’re a family of musicians – that’s the way I put it. We’re friends now, we’re like a family”.

The group also discussed next steps for the group. Trevor R. said he would like to “move on” from the research project. Caroline agreed. Both felt that they needed new experiences outside of the day facility and to meet new people. Trevor was interested in moving on from music altogether, while Caroline wanted to visit a “proper music studio”. Darren addressed Trevor “When you say move on, how far should we move?” Trevor R. answered, “out of here”.

The conversation turned to the off-site experiences the group had during the research as I brought up the research lecture, public concert and interactive workshops. Caroline said, “they were good. I wanted to do more stuff.”

David had a similar sense that more was possible:

The UL part was pretty exciting. UL is an important college to hold such a project. To play for the people in the college was important. The way I feel is that they didn’t ask us enough questions about how we came into music, came together, got our sounds. It didn’t really work. The only one that did was the Christmas concert.

Ricky responded to this, “we need to spend time with them – they weren’t comfortable with us”. I suggested that the workshop had been instructive as a “trial for something bigger” but that the timing of the exam period for IWA students made scheduling another workshop too difficult. Caroline suggested, “if we are going to do more workshops...bring students in so they don’t get frightened or embarrassed to ask questions”. I responded that I didn’t think the student who had attended the workshops were frightened or

embarrassed, but that “we locked into our usual way of working”. Darren thought a longer workshop would have been more enjoyable for the audience, which Ricky supported, though David thought “they wanted to listen and go”. “They had just had an hour-long lecture and were worn out from listening to me!” I joked.

At this point I asked Thomas some closed questions to get his perspective on the research. He demonstrated his typical sense of mischievous humour.

Me: “Do you like coming in?”

Thomas: [shook head, laughing]

Me: “Do you like listening?”

Thomas: [shook head, laughing]

Me: “Do you like playing keyboard?”

Thomas: “Go off!” [Gesturing at the door]

Me: “Do you like being able to roar your head off?”

Thomas: “F\*\*k off!”

“That’s what we needed to hear” I answered.

I signed to Eddie to ask his opinion using a combination of ISL and manual coding (spelling words with ISL alphabet) that was Eddie’s standard way of communicating. I spoke the questions aloud for the benefit of the group and verbalized Eddie’s answers.

Me: What did you think about work on Wednesdays and at UL

Eddie: Good

Me: More? Did you learn new things?

Eddie: Yes

Me: What was your favourite thing?

Eddie: Guitar and drums

Me: On the iPad?

Eddie: Yes

Me: You also played keyboards and the 12-step as well as making the poster.

Eddie: Yes

Ricky noted how Eddie had transferred learning from a FETAC (a further education body in Ireland) course on computers to create the poster. Caroline had taken the same course and said, “that class was heavy as it’s not all signed, so I think he gets lost”. I signed this comment to Eddie and asked: In music on Wednesdays, do I sign enough? Eddie answered Yes and said he wanted to do a FETAC course on radio production.

To wrap up I thanked the group on their contributions and asked permission to show the presentation the following week. I ended the exit interview by saying, “This is what makes the research ours. It shows that everybody put themselves into it. It wasn’t always easy or fun (the crashes were a nightmare) but we stuck together because we realized it was worth doing”. Darren answered, “we were a team”.

Between sessions 18 and 19 I worked on the presentation and the video material from the exit interview. I edited the 30-minute video into fourteen clips, representing the different topics covered in the interview. From these I selected (1) David’s greeting, (2) Chaos and Collaboration, (3) Technology and Emotion, and (5) Musical Family as the most salient interactions of the interview and most representative of the research group. These clips were made part of the *User Voice in Research – Participatory Action Research, Disability and Music Technology* presentation along with photo material, audio clips and slides describing the background, methodology and progress of the research. Material from the Ennis group was also used in the presentation.

In session 19, I ran through the presentation with the Limerick group. This session began with a quick statement of purpose – to resolve the project through exit interviews and to show the IAMM presentation. I went through the PowerPoint presentation slide by slide

and explained the relevant concepts along the way. The co-researchers added comments as we progressed. I gave the background to the research, describing the music therapy programme and its theoretical basis, using plain language. In describing the role of technology in music therapy I summated it as “we work together to find new ways of playing.”

The group agreed to watch a slide of a researcher from the Ennis group playing “Tainted Love” (Cobb, 1965) on the drums. David and Ricky were especially impressed, with Ricky commending the drum fills. I commented, “he’s a great drummer, and using the technology helped him to realise that”

After describing the principles PAR and its relationship to practitioner research and disability studies, I mentioned the arts-based research component of the project. Trevor R. was curious, “What’s that?” I described it as using poetry, drama or music to create research. David gave his own definition: “It’s like this – think of the music you like, have a blank sheet in front of you, why can’t I draw something similar, like a drawing”

I reminded David of his idea from the end of Cycle 1 to use the group’s recorded improvisations to tell a story. I also related ABR to the “talk versus music” theme that permeated the project. Ricky said, “let the music do the talking”. I was very taken by the phrase and asked if I could use it in the presentation.

Trevor K. added that we had the videos to “prove our work”. I agreed that the video material was a valid form of *text* that showed how central musicing was to the research. I recapped the progress of the research to date in terms of thematic concern, session structure and inductive codes before showing the exit interview clips. In the *Chaos and Collaboration* clip, Ricky was concerned about the intelligibility of his voice, though David said, “That sounds perfect”.

The session wound down quickly with an offer to check in after my return from Toronto and the promise to keep the research time slot open for new projects the following term. The session ended with Trevor K. wishing me, “best of luck”.

***IAMM presentation.*** The presentation changed very little from the version shown to the research group. On my return from Canada, I returned to Enable Ireland Limerick for final sessions before the summer break. During this time, I spoke informally to the co-researchers who were present (some were on holiday already) about how the presentation had been received. The co-researchers declined to schedule a recap session as they felt the research was finished. As such I proceeded to engage in the thesis strand of the participatory action research project. The issues involved in unifying the action strand and intellectual strand of the research into thesis form (McTaggart, 1997) will be discussed further in Chapter 6.

## **Conclusion**

### **Thematic Concern**

Concentrating on musicing together became the main goal for the final cycle and was reinforced as the cycle progressed. This came after some ambivalent responses to public engagements – particularly the concert at the end of Cycle 2 and the interactive workshop in the middle of Cycle 3. As such, the exploration of the thematic concern – *to show what we can do* took on a different connotation, as the notion of showing skills *to* an audience (staff and service users, university students, members of the public) was deemphasized, while the co-researchers continued to demonstrate and refine their skills in their weekly work together. It could be argued that the thematic concern became *to show each other what we can do*.

The evolution and resolution of the thematic concern was clearly articulated by the co-researchers themselves during the interactive workshop and exit interviews, though the propositional nature of both events may have unbalanced the level or type of feedback possible across the functionally diverse group. The idea that the value or meaning of the

research group's work together was immanent in the music made together was expressed at multiple points throughout cycle 3, culminating in Ricky's comment "Let the music do the talking" being used as a central point in the IAMM presentation given after the completion of the cycle.

In a similar manner to other presentations, the exit interview had something of a performative element as the group knew parts of it would be presented at the IAMM conference. The importance of collaboration as a fundamental feature of our work was emphasized in the exit interviews, both as a requirement for clarity in musicing and as a source of interpersonal connection (the "musical family"). The diversity of the group was acknowledged by co-researchers themselves, with the term "team" frequently used to emphasise the collaborative nature of the project. David's term "musical family" was also strongly evocative of the group's sense of connection. The group showed a willingness to keep working together in some capacity after the completion of the PAR project.

### **Musicing and Use of DMIs**

Over the course of cycle 3, the musicing portions of sessions became longer. There were also more discrete phases within the improvisations as the group members refined, explored or switched DMI interfaces more frequently and with more ease. There was more time for musicing due to the smoother set-up period due to a more stable system.

The group made efforts to create some level of synchrony or coherence within their improvisations, while maintaining freedom of expression. This was mostly possible due to the use of features within Ableton, Garageband and other apps and software that allowed coordination of tempo between musicians. Loops, *arpeggiator* MIDI effects, and various *delay* and resampling audio effects (such as the *beat repeat*) allowed for the generation of a common pulse over which the co-researchers could play. The level of synchrony, coherence

or clarity was also influenced by group decisions in terms of relative volume, timbral variety and tonality.

There was a certain element of deconstruction in the refinement of the DMI interfaces and the musical content of the improvisations themselves. The modular nature of Ableton's functions allow more control over musical parameters or to augment musicians' playing in some way. David's interest in reproducing the functions of certain MIDI effects with an audio input (the electric guitar) was an example of this. Different forms of music and musicing were also abstracted and combined. Multiple frames of reference were generated during improvisation as genres, excerpts and curated samples/loops were used within the group's musicing. Selecting audio effects and VST synth sounds also contributed to this *mélange*, such as when a heavy rock guitar sound was combined with EDM synth and drum sounds to perform a country music song.

Focusing on the musicing without a performance to work towards led to new dynamics within the group. Trevor R. helped Thomas to access his DMI interface for a few sessions. Ricky incorporated his own PC and version of Ableton into group improvisations, eventually using his knowledge of the software and familiarity with the structure of the research session to run a session himself. This was an interesting evocation of the concept of *participatory hierarchy*, whereby expertise was employed in the service of the group members' autonomy and cooperation (Heron & Reason, 1997). This concept usually referred to the role of the lead researcher or academic researcher in developing a community of inquiry with *lay* researchers (Carlisle and Cropper, 2009; Stige, 2005). For Ricky to take a leadership role, allowing him to use his understanding and competence with music technology in such a way showed the evolving and iterative nature of the community of inquiry and of the research itself.

### **Methodological Issues**

**Multiple knowings.** The broad thematic concern to *show what we can do* implied the acquisition and mobilization of practical knowledge – the exercise of discrete skills and competencies gained through the incorporation of experiential, presentational and propositional knowledge (Heron & Reason, 1997). The group’s feedback from the exit interviews, though mainly propositional in nature suggested that this remained an important issue for the co-researchers right up to the end of the project, and that the collaborative nature of the work was an essential factor in developing and sharing practical skill with music technology.

However, there was an ongoing issue around *how to show what we could do* in terms of the format and location of dissemination – lecture, concert or workshop. The group experienced some dissatisfaction with each of these modalities, while remaining confident of their abilities. In consolidating the Limerick group’s work over the course of three PAR cycles, considering the evolution of the thematic concern, and developing an approach to curating the work into thesis form, it was apparent that the group’s week-to-week work on the thematic concern showed the development of practical skill within a community of inquiry quite clearly, recorded for later dissemination on video and audio formats. As alluded to previously, revisiting this material from another perspective could provide another avenue for representing the group’s work on their shared thematic concern, the practical knowing generated in its exploration and refinement and any indication of *flourishing* associated with that (Heron & Reason, 1997).

**Learning.** There tended to be little direct feedback in reflection portions of sessions, beyond immediate emotional responses to the musicing experience. In some cases, discussion was explicitly avoided, like when Caroline said, “talking about music breaks it down”. David often spoke of his own musical style and his experience of playing with the group in very

figurative terms. Ricky expressed that enjoyed talking as a problem-solving exercise, while Trevor R. described talking about his experience as “hard for me”.

From an anecdotal perspective, the greater complexity of the DMI interfaces compared with previous cycles, the facility of their use and the sense of greater musicality and *communitas* within the improvisations suggests definite, if tacit, learning and application with the available music technology resources. This may reflect the Dionysian nature of the research, whereby it was not necessary to codify or formalise the knowledge generated by the group (that is in a propositional manner), but to engage learning more in the experiential and presentational domains. The practical skills (as a research outcome) were this developed in a “imaginal, expressive, spiralling, diffuse, impromptu, and tacit” way (Reason, 2006, p. 197)

**Analysis.** As a PAR project, it was vital for the co-researchers to control the data analysis or meaning-making process as much as possible. The group was engaged in a collaborative process of meaning making, though a complete analytical frame was not developed by the end of the project. As such the research group’s work could be described as *proto-analytical*. The idea of using video material in some way was revisited throughout the cycle. Although a final method for doing this was not established, the idea that the session recordings were meaningful and could help to *prove our work*, as Trevor K. put it, seemed to be consensual within the group. David’s idea from Cycle 1, of editing or distilling our recordings into a single *musical story* also persisted as a way of incorporating an analytical frame into the action research, that foregrounded the presentational nature of the research.

Within such discussion as occurred during cycle 3, the tacit or immanent nature of the musical interactions in the weekly research sessions was expressed by more than one co-researcher – Caroline’s comment “Talking about music breaks it down”, or Ricky’s “let the music do the talking”. This created something of a Catch-22 in approaching further analysis with the co-researchers and, later, curating the thesis (an inherently propositional medium).

Presenting the Dionysian nature of the research while ensuring quality of evidence might have required re-engaging with the data and documentation in another, possibly non-linear manner.

With the completion of the third and final cycle and after a lot of challenging and at times arduous work, the group was satisfied that their work was complete, and gave me permission to carry on with the completion of the thesis, including whatever analysis remained to be conducted. It was important to me that the participatory nature of the work be clearly represented within any analytical methodology I might employ.

**Dissemination.** Dissemination of skills was effective from the perspective of the research though the degree of interaction was disappointing for some of the co-researchers. The interactive workshop was an experiment in dissemination that had potential to be reworked for a larger audience. The ambivalence of the group and the logistics of the academic term meant this was not explored.

The group experienced some challenging reactions to the experience, though this did not affect the group's sense of pride in their capacities with DMIs. The idea of the co-researchers' status as people with disabilities as an obstacle for audience members to overcome remained prominent even until the exit interviews, even in the face of more prosaic explanations. The group's solid dynamic may even have been a factor in the workshop's lack of an interactive element, as we settled so quickly into our typical way of working together. Even so, the value of the experience was re-evaluated at the end of the research, with some resolution.

**Next steps.** In the exit interviews, there was a strong sense of the value of the work, though determined mostly through propositional means and without a specific analytical approach. It had proven difficult to convey the accumulation of practical knowing implied through the evolving musical interactions, at least in the time available. The idea of

immanence within the musical interactions and my own sense of *meaningful moments* between co-researchers as we improvised together resonated with me. Conveying this sense of completeness in the sessional improvisations became a lynchpin idea in conveying the group's meaning-making process as they developed practical skills with music technology within a community of inquiry. To this end rhizome theory and the associated qualitative research methodology *rhizoanalysis* came into use. This method helped to articulate the interaction of the multiple strands of this research group's experience and knowledge generation.

## Chapter 5

### The Ennis PAR Project

This chapter outlines the main events and learnings generated by the Ennis PAR group (*The Enable Ireland Band*) over the course of 3 PAR cycles. The group explored the available DMI interfaces, as well as new controllers and software as they worked towards the goal of a public performance, before curating a *Best of* CD of their favourite improvisations.

#### **Research Development and Ethics Application**

The ethics applications for the entire project across both Limerick and Ennis facilities were accepted by both the UL Research Ethics Committee and the Enable Ireland Research Ethics and Quality Committee (REQC) and are described in Chapter 4.

#### **Recruitment**

Any service user who had used music technology as part of their music therapy work, past or present was considered eligible to participate in this research. Once identified, these service users were given an information sheet and were invited to schedule a meeting to discuss the research. Those who were interested could sign up in that meeting if they wished and take part in the consent process. For service users who could not give consent, proxy consent was obtained from their legal guardians and a meeting was then scheduled with that service user and a *gatekeeper* (Dewing, 2012). An assent protocol was applied to determine whether the service user was willing to participate or not. The assent protocol was to be revisited regularly during the research.

From this recruitment process, four service users signed up (one with proxy consent/assent). These were four men who were already part of a music technology-based community music therapy group. They agreed to incorporate a PAR methodology into their ongoing work, rather than stage separate research sessions. As such they constituted an existing community of practice with established preferences for how they musiced together

## **Co-researcher Profiles for the Ennis PAR Group**

Jonathon - Jonathon is a 28-year old man who typically plays drum synths in sessions with a MIDI controller. He has cerebral palsy and uses a power wheelchair. He is more verbally active than the other group members, though he often apologises for “talking too much”. He is a spirited percussionist.

Paraic - Paraic is a 19-year old man who had joined the group more recently. Due to severe cerebral palsy, Paraic has significant difficulties with gross motor control and communication. He enjoys music and shows preferences when options were presented. Paraic understands cause and effect and reaches for MIDI controllers in front of him, which can take great effort. Paraic vocalises a lot during music also.

Gerard - Gerard is 29. He and Jonathon had gone to school together. Gerard has cerebral palsy, and though he can walk with the assistance of a walking frame, he has difficulty with fine motor movements due to strong tremors. Speech takes a lot of effort for Gerard, and he has a shy personality. His taste for Irish folk music informs his choices when configuring his DMI interface.

Chime - Chime is 27. He has cerebral palsy and uses a manual wheelchair with assistance to get around. He favours his right hand for playing music, though this is sometimes made more difficult due to him wearing a splint. Chime often gives feedback on the music and uses a switch interface to help to burn CDs at the end of each session.

### **PAR Cycle Reports – Ennis**

#### **Cycle 1 – The Enable Ireland Band**

**Overview.** The Ennis strand of this PhD research was engaged by a group of service users who were already attending the same weekly music therapy group – calling themselves *The Enable Ireland Band*. As such, they already operated as a community of practice with established preferences and roles. Integrating a PAR methodology into the ongoing work

potentiated the development of a community of inquiry working towards a common goal (Reason & Bradbury, 2008). The group began working towards a thematic concern – planning a concert to show their skills with music technology.

Facilitation of research sessions was dependent on validating diverse forms of communication and cognitive functioning, foregrounding musical interaction as a collaborative learning modality. The introduction of new DMIs opened new ways for co-researchers to explore tacit musicality. The cycle ended with a practice concert at the research site using the new DMIs. The group was pleased with the performance and decided to continue the research work and organisation of a public concert for the next cycle.

### **Planning phase.**

*Sessions 1 and 2.* The four service users from the Ennis facility who signed up for the research were already part of an ongoing weekly community music therapy group. This group was established as a way for the co-researchers to interact non-verbally, to share time and to generate and mobilise social capital (Procter, 2011). The group would meet weekly to improvise music on music technology interfaces: MIDI controllers and VSTs, typically augmented with MIDI effects. Concentrating on musicing and deemphasising verbal processing allowed for equalisation of the functionally diverse co-researchers. Group members had developed favourite combinations of controller/MIDI effect/VST interfaces during their time in the group. These interfaces were developed for ease of use or optimisation of control, as well as for aesthetic or stylistic preferences.

These interface preferences were stable at the time the research began, that is, each group member tended to choose the same interface each week. Gerard tended to play a MIDI keyboard with an acoustic guitar synth. By chaining the *random*, *chord*, and *arpeggiator* MIDI effects, Gerard could use a single keyboard key to play a sustained chord rhythm that would have a 50% chance of changing to a different chord if he retriggered the key. Jonathon

used the Korg PadKontrol to play a standard rock drum kit synth. The PadKontrol's *fixed velocity* button was turned on so that the volume of the drums was standardised regardless of how hard Jonathon hit the pads. Paraic had no typical preference for controller, but did like pads, or ambient sounds (what the group called "spacy" sounds). A favourite of Paraic's was the *NuHarp Patterns* synth – a reverbed harp sound that cycled up in octaves when played, creating interesting arpeggios when Paraic played cluster chords. Other synths were often presented to confirm Paraic's preferences through affective response.

Though Chime attended sessions enthusiastically, he often declined to play, choosing to listen instead, but had engaged with some interesting adaptations of the available MIDI controllers and Ableton's MIDI mapping function. One such adaptation was to use a MIDI keyboard's pitch bend wheel, set to +/- 12 semitones with a single looping note, to play melodies. Each loop would record the pitch bend information, meaning that if Chime liked a melody, or was simply tired, the loop could continue to play the most recently input information, keeping the melody going. Chime also sometimes used a large pad switch, plugged into the sustain pedal slot of a MIDI controller to trigger a melodic or percussive loop configured to play only for the duration of Chime's press (rather than playing an entire loop, or series of loops).

Research sessions began in April 2013. There had been extensive informal discussion of the possibilities of the research in previous weeks' group sessions as the consent forms and proxy consent forms were submitted. As the service users who signed up for the research were already part of an ongoing music therapy group, it was decided that the research methodology would be integrated into existing work as much as possible. That is, engaging in cycles of planning, action and reflection with the purpose of addressing a thematic concern, while exploring and interacting with digital musical instruments. The informal discussions

concerned certain group members' enthusiasm to learn more about music technology, and to share that knowledge publicly.

In the early sessions, the group discussed the idea of a concert as a primary means of sharing their knowledge about music technology. Some of the co-researchers had taken part in a public concert, performing with music technology as part of an Arts & Disability event in a local theatre in previous years (Chime, Jonathon and Gerard). There were positive memories of that experience that the group were shared during the planning process. These sessions were recorded on video, while the Ableton project file was saved each week, to be used as the template for the next session. As was standard procedure already, co-researchers were offered a CD of their group improvisation at the end of each session.

Initial discussions covered the general issues with organising a concert also – who to invite, what roles the co-researchers would take, what musical content would be involved. The differing communication styles and temperaments of the group members were a feature of these discussions. Jonathon and Chime were particularly vocal during these discussions, showing enthusiasm for the specifics of a public concert and the roles that would need to be filled (MC, performers, audience members, venue etc). Gerard, on the other hand was more reticent about contributing directly, showing more comfort with closed questions than with open ones. Páraic did not contribute to these discussions verbally, but was included in the conversations, and his affective responses often determined the length of the discussions. That is, it was clear when he was bored, and it was time to make music. In general, the idea of the concert was more appealing to the group than specific discussions of the DMI interfaces.

In exploring the concert idea from a musical perspective, Jonathon, in session 2 suggested a musical drama or story as the basis of the public performance. This led to an exploration of sounds on the themes of “spooky” and “seashore” – the first time the group

had explored themed improvisation together. By scanning the VST menu in Ableton, synths with seemingly appropriate names (such as “Phantasm”) were loaded and trialled. Paraic appeared to be distressed by these sounds, so the group decided to play a standard improvisation using their usual sounds, followed by a rendition of Paraic’s favourite song – *Friends in Low Places*. While the idea of a musical drama was ultimately rejected, the agency of the co-researchers was apparent, as was their interaction as a responsive community of practice.

The differing preferences and capacities in the group were acknowledged and as such musicing was emphasised as a primary interactive modality. This fit the established practice of the group. In the early sessions in the planning phase, the group members were actively musical as usual – taking time to choose and refine their DMI interfaces, engaging in improvisations (which were recorded), followed by reviewing the recordings and creating CDs for those that wanted them. In line with Zuber-Skerrit’s (2002) guidelines for successful PAR facilitation, the importance of fun and group enjoyment was emphasised, though this was another typical feature of this group already.

***Thematic concern.*** The thematic concern was generally identified in information sessions and early research sessions and refined over the course of the cycle. This was to plan a concert to show the group’s skills and capacities as musicians using digital musical instruments. Engaging with the idea of the concert allowed for reflection on these skills and how they might be shared. Musical (presentational) exploration of ideas of content and the role of new devices was more prominent than verbal (or propositional) discussion of the thematic concern. Throughout the cycle, the idea of a public aspect to the research, that is, the recognition of the group’s practical knowing persisted. In Cycle 1, the group planned a *practice concert* to be held on-site at the day facility in Ennis, leaving a more public concert, to be attended by family members and the public for the next cycle of research.

**Action phase.**

*Exploration – new devices, new possibilities (Sessions 3-5).* Little was added to, or changed from, the established session structure in carrying on the action phase of the research. The standard session structure of setting up/musicing/winding-down did allow for some recapping and checking in at the beginning of sessions, as well as some reflection at the end of sessions as CDs were being made. This corresponds with the *micro-cycle* format described in the Limerick PAR reports, where each research session consisted of planning/action/reflection phase analogues also.

Occasionally, I initiated discussion about how the group would reflect on the work, or use the video documentation, both during research sessions and at the end of the cycle, though without clear resolution. An emergent format to the research methodology seemed most appropriate at this point, and most faithful to the usual flow of the sessions before the research was engaged. The thematic concern continued to evolve as the concert idea continued to be a point of reference for how the group used their DMIs, especially when new devices were introduced.

In session 3, new DMI devices were introduced for the group to explore: wireless controllers from the Xbox game, Rock Band™ and an iPad Mini. The introduction of new devices created new possibilities for the group to expand their musical resources beyond the familiar DMI interfaces already in use. These devices and apps offered new ways for the co-researchers to engage in musicing as well as to incorporate their explorations and adaptations of these technologies into the thematic concern.

The wireless controllers were not designed as MIDI instruments or digital musical instruments *per se*, but rather acted as input devices for the video game Rock Band™ on the Xbox. They operated in the same way as a standard wireless Xbox controller, but housed in musical instrument shaped casings with button layouts to simulate instrument playing.

However, these controllers could be configured to operate as MIDI devices with a few adaptations. These controllers were donated to the music therapy programme and as such were unfamiliar to me. Research was required to determine how to connect the devices to Ableton. This needed to be a streamlined enough process to not affect the flow of the sessions.

The devices connected to a wireless dongle used to allow Windows PC games to be played with an Xbox controller. Both systems are compatible as they are both developed by Microsoft. Since each controller sent the same messages, corresponding to button and stick messages on a standard Xbox controller, two different software patches were used to route each controller's signals to Ableton:

- Joy2Key: This app converts game controller messages into alphanumeric messages (QWERTY). This was used to map the drum controllers' signals to the middle row of keyboard buttons (A-L), which are the default keys for the notes C3-C4 in Ableton's *computer MIDI keyboard* function. These notes trigger drum samples in the *Impulse* drum VST.
- MIDItar Hero: This is a Max/MSP patch specifically designed for remapping game controller button messages to MIDI messages. Once the appropriate device and layout options are chosen, the MIDI output must be sent to a *virtual MIDI cable*, such as LoopBe or LoopMIDI that Ableton can pick up as MIDI port.

Once routed into Ableton, the drum and guitar controllers could be set up in a MIDI track to control any VST synth in the same manner as a USB-based MIDI controller. The drum controller operated in a similar manner to a standard drum kit – consisting of four circular pads (played with standard drum sticks) and a foot pedal on a plastic stand. The guitar controller had buttons on the neck and a pivoting *strum bar* which needed to be played together to create sound. A tremolo bar acted as a pitch bend signal for triggered notes.

The iPad was loaded with the app, *Garageband*, which had multiple instrument patches with unique graphical user interfaces (GUIs) – standard keyboard/piano interfaces, interactive drumkits and guitars, samplers and grid-based percussion. The *Smart Guitar* and *Smart Keyboard* options contain interactive columns or strips for triggering chords. Arpeggios and rhythm patterns could be configured and controlled through these GUIs also, with a large selection of instrument sounds available. The iPad also had two Novation apps: *Launchpad* and *Launchkey*: a loop launching app based on the MIDI controller and an on-screen keyboard with touch-based parameters respectively. The iPad had to be connected to the sound card with a phono cable and configured as an audio input in Ableton to be recorded and monitored along with the other inputs.

Because of the controllers' distinctive physical attributes, it was felt that new interactive and performance possibilities might be interesting for the co-researchers to explore, though the appeal of this had to be confirmed by the group. The device set-up protocols had to be manageable in a practical and facilitative sense. The iPad also offered new touch-based apps for the group to engage with that were distinct from the keyboard/drum pad controllers. As a stand-alone audio device, it was now possible for users to generate and manipulate sound directly.

The group responded enthusiastically to these new devices. Jonathon and Gerard were drawn to the drum controller and guitar controller respectively, reflecting their preferences for those instrument sounds within sessions and their roles as drummer and guitarist in the group. Gerard played his usual acoustic guitar VST (*Campfire Guitar*) through a *chord* effect (to add 5ths and octaves to his played notes), but without the other MIDI effects that he used with the MIDI keyboard. Jonathon also chose his usual drum synth (*Trad Rock*). Chime was interested initially in the *Garageband* app for the *smart guitar* feature but found the touch-based aspect difficult due to the angle of the iPad. Over the subsequent two sessions, the

group continued to explore these new DMIs, developing adaptations to optimise control and aesthetic possibilities.

In session 4, Jonathon's drumming became the focal point of the session as he and I worked on refining the drum controller to suit his playing style and to explore new affordances made possible with the device. Gerard was absent for this session, while Chime and Paraic took passive roles. Jonathon was keen to use the foot pedal, but found the part included with the kit too difficult to operate. This was replaced with a buddy button switch with a more sensitive trigger, which was mounted on a cushion right below Jonathon's foot. Although Jonathon could not move his leg to trigger the switch, due to his cerebral palsy, he was able to trigger it by rocking his full torso forward, which tilted his foot onto the switch. Jonathon could now play the drum controller and associated VST in a way more like how an acoustic drumkit is played.

This was trialled by playing a version of the song "Tainted Love" (Cobb, 1965). An attempt at following the Imelda May version played on Spotify proved too fast for Jonathon. Instead Jonathon played along to a live version played on guitar and sung by me. Jonathon asked for his performance to be video recorded for his family to see. Although this was only his second time playing with this interface (and his first time ever using his feet for music), he kept a steady beat throughout the song, added complex drum fills and followed the simplified arrangement set by me. This was a spirited and joyful performance. Jonathon later commented after reviewing the video of the performance, "This is amazing, I can't believe this stuff", adding that he wanted his family to see his recording.

On Gerard's return in session 4, he spent more time working out the different input features of the guitar controller – strum bar, tremolo bar and solo buttons (these are note input buttons high up on the neck that can be played without needing to simultaneously trigger the strum bar). These different features allowed Gerard to play steady chord progressions as well

as more arrhythmic ‘lead guitar’ motifs on the solo buttons, as well as pitched-down ‘dives’ with the tremolo bar. Gerard worked hard to manage spasmodic movements in his arms to control the guitar and expressed determination to continue working and increase his control over the device in preference to the adapted MIDI keyboard interface he had been using.

Chime continued to work with Garageband during this time, trying out the orchestral patch, which simulated a full string section. On the *Smart* setting, he could play legato chords by continuously touching a vertical chord strip, or pizzicato chords by tapping the strip. Paraic was more passive in these sessions, apparently enjoying the sounds he was hearing, but not engaging intentionally with the interfaces he was presented with.

***Practice concert – preparation and performance (Sessions 6 – 7).*** With the new DMIs introduced into the research sessions, attention now turned to how they would be used to address the thematic concern, that is, their potential role in the eventual concert. As the end of the cycle approached (the facility’s summer break), the Ennis group chose to stage a practice performance in the facility as part of the annual summer concert using these new interfaces. One session (session 6) was given over to planning this performance. Jonathon and Gerard chose the wireless controllers as they had since their introduction. Chime chose the Garageband app on the iPad, this time with the keyboard patch on *glissando* setting. This created a continuous pitch contour when the touch-screen keyboard is played, rather than discrete notes.

The set-up portion of this session allowed for some discussion about co-researcher preferences throughout the cycle (see Reflection). For the group improvisation, Gerard began with an ‘open’ style of playing (triggering the strum bar only) which created a simple rhythm on an E5 chord, before changing to ‘solo’ playing (using the strum bar and the solo buttons) which sounded more chaotic and arrhythmic. Jonathon played a steady beat. Chime used the Garageband keyboard to play long sustained chords but soon opted out of musicing (though

not out of the concert). Paraic was distracted throughout the improvisation as I attempted to engage him in sharing a DMI. At the end of the improvisation, Chime cheered loudly.

The group decided to stick with these DMIs for the practice concert, also deciding that I should record their performance. The group discovered that Paraic was leaving the facility early that day and would not be present for the performance, to their disappointment. The format of the performance would be a group improvisation, followed by a song ('Tainted Love' – Jonathon's suggestion). The group decided that I should concentrate on recording the improvisation but should join in on electric guitar for the song.

The concert took place on same day as session 6, later in the afternoon. The performance took place in the communal area of the day facility as part of the annual summer concert. The PAR group performed first for just under 5 minutes, but also accompanied other service users who chose to perform that day. Gerard and Jonathon kept the same DMI interfaces from the earlier session. Chime chose a different Garageband patch – the *Smart Guitar* – whose GUI consisted of an interactive representation of an acoustic guitar from nut to 7<sup>th</sup> fret. The strings on this guitar could be tapped individually or in clusters/chords. The virtual strings of this guitar could also be bent to change pitch as in a real acoustic guitar.

I introduced the group and then recorded the performance (albeit in a slightly intrusive manner). The improvisation resembled those the group had been playing throughout the cycle. Jonathon kept a steady beat, cycling through the drum pads. Gerard alternated between playing a single chord and arrhythmic use of the solo buttons. He did find a new hand position, anchoring his thumb to the body of the controller to give more control of the strum bar. Chime played the iPad on a cushioned tray, using his thumb to play string bends on the *Smart Guitar* patch. The improvisation was short, and the group transitioned into 'Tainted Love', with me playing electric guitar and singing. (See Digital Appendix B – Cycle 1 – The Ennis On-Site Concert)

### **Reflection phase.**

*Feeding back on cycles and concert (Sessions 6, 8).* The reflection phase consisted of a discussion at the end of session 6, with the whole group, and a short meeting after the concert which was attended by Jonathon, Gerard and Chime. These reflections were initiated to discuss the co-researchers' experiences of the research to date, to determine preferences and dislikes, and to develop ideas for the next iteration of the research. These discussions were facilitated in a mildly directive fashion by me, to account for the idiosyncratic communication styles of the co-researchers, though the aim was to follow the co-researchers' lead wherever possible.

In session 6 I asked the group for feedback on the cycle to date - good things, bad things, things to do next. While Gerard was reluctant to answer direct questions from either me or Jonathon, his requests for CDs in each session was interpreted as indicating the music was meaningful to him. Gerard confirmed this when put to him as a closed question. Chime was willing to respond to some closed questions/comments.

Me: "You tried new things "

Chime: "Yes"

Me: "Like the iPad, did you like it? "

Chime: "Yes"

Me: "You watched Jonathon setting up his drums "

Chime: "Yes"

Me: "Are you still interested in the concert?"

Chime: "YES!"

Me: "Gerard thinks we should bring family members - "

Chime: "YES"

Me: “Jonathon wants to bring old school friends, should we invite people from your old school?”

Chime: “NO!”

I inquired about how the video recordings of the research sessions would be used, upon which Jonathon asked to replay the *Tainted Love* video for the group. Jonathon expressed pride in the performance and speculated what his old school friends would think about it. Paraic became very animated while watching the video, at which Jonathon commented “he likes songs!”. I suggested working more song material into the next cycle’s sessions for Paraic’s benefit.

After the concert, I sat down with Gerard, Chime and Jonathon to ask: “What did you think of the concert?”. Jonathon answered: “I enjoyed it”. I asked Gerard if he enjoyed the concert (“Yes”) and if it could be considered something to build on, suggesting contacting the local Arts and Disability initiative for help with finding a public space to perform. Chime then suggested a local theatre venue, Glór. I noted that the concert had been short, and the group would have to think of ways to work on something longer or more involved. I also noted Paraic’s absence and speculated that he would have liked the mix of songs and improvisation. I praised Chime’s playing on the guitar setting of GarageBand (the string bends in particular), as well as Gerard’s use of non-guitar sounds when playing with a service user not part of the research group. I commented that everyone seemed a bit tired after the performance. Jonathon answered: “it’s not easy”. The group accepted the offer of CDRs of the concert recording which were delivered the following week after editing.

### **Conclusion**

This cycle report conveys the group as an established community of practice, where different forms of communication were acknowledged and supported in an inclusive and participatory fashion. Musicing was the primary form of interaction in the weekly sessions

and this was maintained in the incorporation of the PAR methodology into the ongoing work. Planning through verbal discussion was still possible, though oftentimes this was led by me or by Jonathon, with less input from the other members. Gerard was engaged in planning but was uncomfortable with direct questions and self-conscious about his speech. Chime contributed with short comments and answers to closed questions. Paraic did not contribute verbally, his affect during discussions was always noted and incorporated. If he seemed bored or distressed, the discussion was concluded to concentrate on musicing, where his positive affective responses determined his musical choices.

This was a short cycle of 7 meetings and a concert. This could constitute a *proto-cycle* or extended project orientation phase (White et al., 2004) as the group gradually extended their work as a community of practice into new areas of learning through contact with new DMIs and with a view to working on the thematic concern of sharing their skills in a public forum. The *planning-action-reflection* format of a PAR cycle is present here, however and was maintained into Cycle 2.

Deciding how to use the video material (that is, data analysis and dissemination) was an ongoing issue for the group. However, reviewing the video of Jonathon's performance of "Tainted Love" was a clear source of pride for Jonathon, who could share the performance with the other co-researchers (particularly Gerard, who was not present in the session itself) and his family. Jonathon confirmed this sense of empowerment in a one-to-one conversation with me between research sessions where he said: "I don't know why I'm so happy – it must be the video I saw this morning".

The introduction of new devices offered new choices to the co-researchers as well as the possibility of refining existing DMI interfaces further. Jonathon and Gerard chose to work with new input methods, while keeping the same outputs (drum sounds and guitar sounds), finding new affordances to incorporate into their musical roles within the group. Jonathon

transferred percussion skills developed from playing MIDI pads with his fingers to playing with sticks and using his foot. Gerard moved from a highly adapted interface with a low degree of control to having full control of a device, with all the difficulty that attended. Chime's relationship with Garageband was both more utilitarian and more exploratory, as he used different configurations of touch-based GUIs to play an array of instrument sounds with minimal movement. Paraic's participation was at times difficult to interpret, although the whole group worked to validate and include his responses into the session flows. Even as a passive co-researcher – that is, when not directly engaging with a DMI, Paraic's affective responses, positive and negative, had an influence on the research.

The group's enthusiasm to share their work carried into the next cycle, where new applications of the technology resources, new forms of group musicing, and more involved forms of reflection took place while a more public performance was planned.

## **Cycle 2 – The Embrace Concert**

**Overview.** This cycle consisted of twelve research sessions leading up to a public performance as part of an Arts and Disability event. Musicing within the research sessions was characterized by increased use of wireless controllers and the iPad app Garageband by Jonathon and Gerard. Chime participated in non-musical and musical ways during this cycle as he explored alternative roles. Paraic continued to respond to music and, with effort, reach for the keyboard to play, with the group incorporating his behaviours into the sessions' workflow.

Sessions continued to follow the *micro-cycle* format of recap/setup – musicing – review with consistent interactions and themes. The group incorporated more song material into this cycle, as well as creating and reviewing videos of pieces and performances. The thematic concern, a public concert performance, was arranged as part of a local Arts &

Disability event. After the end-of-cycle performance, the group expressed mixed feelings about the experience, which later informed the final cycle.

### **Planning phase.**

*Deciding next steps (Sessions 1-3).* Cycle 2 of the Ennis strand of PAR research began in September 2013, after the summer break. The first session of the cycle began with a brief recap of the work to date, the thematic concern and the documentation resources. I acknowledged the need for indirect and non-verbal aspects to the group's planning process, where possible, to suit the communication preferences of the co-researchers. The group confirmed that they wanted to conduct another concert on a larger scale than that which concluded Cycle 1.

A brief recap of Cycle 1 was given to re-orientate the group, as well as an update on troubleshooting that had been conducted on the music technology set up to fix communication problems with Ableton's MIDI ports. A specific connection sequence was required to ensure MIDI messages from the MIDitar Hero patch and from the USB controllers did not interfere with each other. I highlighted the co-researchers' developing preferences for DMI interfaces. The group was eager to begin musicing together again, choosing their *own* interfaces – wireless drum controller with drum VST for Jonathon, wireless guitar controller with guitar VST for Gerard, Garageband *Smart Guitar* patch for Chime, MIDI keyboard with ambient synth for Paraic.

Jonathon suggested playing a song as a group – Survivor's "Eye of the Tiger" (Sullivan & Peterik, 1982) – something that was only done once in the previous cycle and not at all prior to the research. To create an authentic hard rock sound, I suggested adding distortion effects to my audio channel as well as to Gerard's guitar VST. This was the first time Gerard had added audio effects to his guitar sound. Playing through the song energized everyone, with Paraic, Chime and me singing together. Jonathon kept a solid bass/snare beat,

adding occasional drum fills. Gerard continued playing after the song was over, which led to a spontaneous group improvisation. Paraic had raised his arm over his controller but seemed to have difficulty completing the movement to connect with his MIDI controller. The group agreed to re-watch the video of the performance immediately at the end of the session giving a new dimension to the group reflection. No comments or observations were made, but the co-researchers smiled as they watched themselves, while Gerard requested a CDR of the video.

Subsequent sessions in the planning phase continued to involve discussions of the next concert, as well as the flexible mixing of song material and improvisation. The group discussed who to invite as well as possible content for the concert. Jonathon favoured inviting family members, while Chime preferred members of the public attend. Jonathon also had some elaborate ideas for bringing in a choir and a conductor. I talked about different styles of music the group had explored – rock, pop and folk as well as suggesting that improvisation and songs could both be used in the planned performance.

Little was decided firmly during these discussions, but many aspects of the thematic concern were covered. Questions about the thematic concern that were difficult to cover verbally were reframed as questions about the session itself – that is, the group seemed to find it easier, or at least preferable to choose the content of the immediate session, rather than decide it for the concert. I also relayed feedback from my PhD progression meeting to Jonathon's interest, who asked to invite the progression panel to the concert. Broad closed questions confirmed that the group were still enthusiastic about the research, developing the thematic concern and sharing their skills.

Paraic's capacity for assent was noted as something to be monitored rather than assumed and the group worked to validate Paraic's responses during discussions – any sign (affective, postural or vocal) of distress, boredom or any physical movement towards his

MIDI controller was taken as a sign to move on to musicing. Paraic's participation also influenced the musical content of sessions more at the beginning of this cycle, where his successful interaction with his MIDI controller formed the basis of the group improvisation, giving him a leadership role. Paraic often reached towards his controller but did not always connect. These moments of contact, whether fleeting or sustained were important for the group to recognise. The further incorporation of song material into sessions was predicated on Paraic's strong positive reaction to a group performance of a Garth Brooks song – The Dance (Arata, 1991), one of his favourites.

In a similar way to Jonathon in Cycle 1, (session 5), Gerard became the focal point for an early session due to absences in the group. Gerard continued to focus on his facility with the wireless guitar controller, adding new effects to his guitar VST, and working with the different parts of the interface (the tremolo/pitch bend for example). Gerard also worked on new ways to control the output of the device, avoiding the solo buttons in favour of the lower buttons which did not trigger as easily. He also worked on holding the “blank” section of neck (without buttons) and concentrating on strumming a single note, anchoring the thumb of strumming hand on the body of the controller to manage tremors due to cerebral palsy. Gerard was clear in his determination to increase his proficiency with this controller. His evolving playing style was a frequent source of, if not discussion (as Gerard disliked direct questioning), then observation and encouragement from me.

Chime's musicing was quite passive in this phase of the cycle, as he chose to listen and give feedback on the musicing of the group. He remained active in the propositional aspects of the planning phase and continued to help with the burning of CDs at the end of sessions. Chime's verbal feedback confirmed that he was happy to be part of the research and enthusiastic about the proposed concert.

***Thematic Concern.*** The group continued to value the idea of sharing their skills with music technology in a public context. While aspects of how this could be done were broadly acknowledged, no concrete plan for the concert was established as of the session 3. The incorporation of new musicing possibilities into weekly sessions – song material blended with improvisation, and the evolving preferences and playing styles of the co-researchers had direct implications on the eventual performance itself. The group took more direct action in arranging the performance in later sessions.

**Action phase.**

***Exploring songs and styles (Sessions 4-5).*** As sessions continued, the incorporation of song material into sessions became more involved, as did the decisions on how to replicate the styles of those songs. Session 4 was entirely composed of song choices from co-researchers, with the group performing “Cars” (Numan, 1979) chosen by Gerard, “Friends in Low Places” (Blackwell & Lee, 1990), chosen by Paraic, and “Knocking on Heaven’s Door” (Dylan, 1973) chosen by Jonathon. Gerard and I used different audio effects on our guitar sounds to create different styles – tremolo (for country music) and distortion (for rock music). A new audio effect – *patternizer* – provided new rhythmic opportunities for Gerard by ‘cutting’ his signal at regular intervals to create rhythm. Gerard’s playing itself became slower and more deliberate during these songs. The group continued to use improvisation as a means of musicing together.

Tension persisted between the propositional and presentational aspects of sessions with the group more eager to play music than to plan for the concert. During the set-up of session 5, the group decided to use a local venue, and to contact Embrace, the local Arts & Disability scheme for support in setting a performance up. This initiative coordinated Arts & Disability projects across Clare and frequently staged showcases of the groups’ work – exhibitions, concerts etc. The research group had taken part in a performance some years

prior and it had been a very positive experience. Given the research group's affinity for both songs and improvisation, I suggested using both in the concert.

In the reflection period of session 5, I asked the group: "Are we learning?". Jonathon replied in the affirmative, while the rest of the group confirmed some indications of learning by the group I had observed. These were: the group's growing understanding of Paraic's preferences, Gerard's developing style of play and Jonathon's enthusiasm for planning the concert. The potential for identifying learning through video review was suggested also.

***Refining the DMIs, working towards concert, co-researcher feedback (Sessions 6-8).***

As the cycle continued, the co-researchers developed new ways of interacting musically through their DMI interfaces. These refinements were mostly made within the DAW itself – new functions and configurations of MIDI effects, VST loading possibilities and MIDI mapping options. These new options offered increased control the MIDI and wireless controllers, as well as diversifying the aesthetic possibilities of the co-researchers' musicing.

A new method of VST configuration was introduced to track sound choices and changes during sessions. Ableton has a function called *grouping* which allows multiple VSTs to be loaded onto a virtual rack and operated together or separately by a single MIDI input. Using this function meant that adding new VSTs need not overwrite the previously chosen sound, thereby making it difficult to track choices. As new VSTs were loaded in a MIDI channel's rack, the previous VSTs could be muted rather than deleted or overwritten. Creating these *instrument racks* also allowed for additional musical options as multiple instrument sounds could be played at the same time. Key range and velocity settings for each instrument in the rack could be configured to give different responses – triggering selected instruments in the rack according to which keys were played or how hard they were struck. MIDI effect chains could be added to distinct VSTs to create layers of rhythm, intensity and harmony.

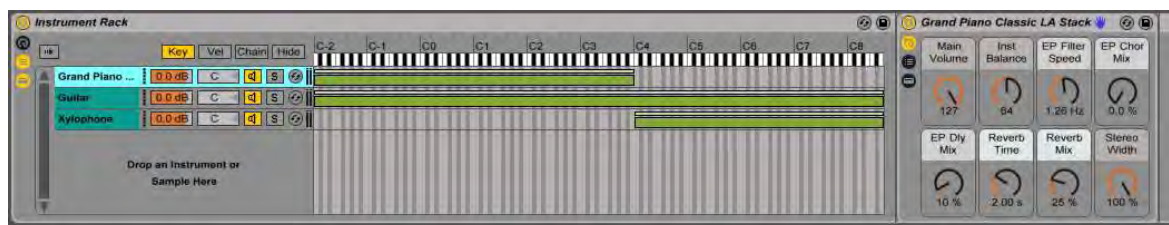


Figure 19. An instrument rack displaying three instruments and key range settings.

As similar method was learned for grouping audio effects, either in sequence, or in parallel. Grouping multiple effects in sequence meant that each effect's output was fed into the next effect, augmenting the sound cumulatively, and giving different outputs depending on the order of the effects. When grouped in parallel, each effect is output separately, effectively creating multiple outputs. It is then possible to selectively arm/disarm effects through MIDI mapping (see Chapter 2) to switch between effects. This method became useful for Gerard to control multiple effects for his guitar VST, using PadKontrol drum pads mapped to distortion and delay effects to explore different sound options .



Figure 20. An audio effect rack with 3 effects in sequence.

Another aspect of Ableton's functionality was incorporated, both to facilitate musicing by Chime and to aid me during group musicing. This involved the *arpeggiator* MIDI effect, which as described in Chapter 2, turns chords or clusters of notes into arpeggio patterns according to variable melodic and rhythmic parameters. A previously unused function of the arpeggiator was the HOLD function. When toggled, HOLD continues to play an arpeggio after the notes are released, until a new chord/cluster is triggered. This became a useful tool within sessions, allowing Chime to create sustained drum patterns with less effort than

before. It also allowed me to create a melodic pattern and let it play to concentrate on the overall sound mixing, or to facilitate changes requested by the other musicians.

As the cycle progressed, indicators of increased flexibility within the group became apparent. These could be described in terms of the co-researchers' use of the available DMIs as well as in the participatory aspects of the *micro-cycles* of each session. In terms of the use of music technology, co-researchers either tried out entirely new combinations of input/processing/output options or added new control elements to their preferred DMI interface to create additional affordances or options. Jonathon explored melodic playing with the PadKontrol, while Chime took on the role of group percussionist using the arpeggiator method previously described. Gerard continued to choose his guitar interface, but with additional options for controlling audio effects himself. This was done by mapping pads on a PadKontrol to the on/off switches of his chosen rack of effects.

Co-researchers became more active in giving feedback to each other and in reflection portions of sessions. Paraic's active musicing received praise from the group during sessions while Jonathon led the group reflections in session 6, asking the rest of the group's opinions of the music and reminiscing about the past Embrace concert. The use of playback allowed the group to highlight Gerard's playing style and his growth as a musician

During this time, the group decided to contact the local Arts and Disability coordinator about taking part in an Embrace concert. The group drafted an email together to inquire about taking part in any public performances that might be arranged through the Embrace initiative (see figure 21 below). The email was signed by the Chime, Gerard, Jonathon and myself, with an acknowledgement for Paraic. The A&D coordinator confirmed that there would be a concert in December but added that there were no free slots available for the action research group. The group responded by expressing a willingness to perform at short notice if another act was unable to perform.

Dear [Coordinator],

Just writing to let you know that we are working on a concert as a goal for our participatory action research project about music technology and music therapy. We really enjoyed playing at the Embrace concert a few years ago and are wondering if it would be possible to have a slot in a future Embrace concert. We have a lot of neighbours and colleagues from Limerick and Clare we would like to invite. We would appreciate any help or advice on this.

Thanks and regards,

johnathan browne.

b nbbb b bbbb bb bbbb b (Gerard Arthur)

ffff (Chime Brown)

Jason Noone

and the rest of the PAR group

*Figure 21.* The email drafted by the PAR group to the Arts and Disability coordinator.

The co-researchers typed their own sign-off, with names added by me, if necessary.

The group then decided to stage an independent performance. On the recommendation of the A&D coordinator, I contacted a local performance space, Cois na hAbhna, booking a date in December for the group to do their performance. This was less suitable as a way of satisfying the thematic concern, as it would be difficult to ensure a public audience for the group's concert. With the Embrace concert, there likely would have been a large audience, including members of the public, past schoolmates and staff and family members. Luckily, a

slot opened in the upcoming Embrace concert, which the group was happy to take. The group now had two research sessions in which to prepare for the concert. At the request of the Arts & Disability coordinator, a blurb was written by the group for the promotional materials.

The “Enable Ireland Band” will be rocking the house. They are group of musicians who create music with different types of technology such as keyboards, drum pads and video game controllers. As part of a participatory action research project with music therapist Jason Noone, their goal is to show their skills with different instruments and software. There will be a mix of improvisation and song.

*Figure 22.* The blurb written by the group to promote the performance.

***Countdown to the concert (Sessions 9 – 11).*** With two sessions to prepare, the group had some decisions to make about the content of their performance and the necessary arrangements for the co-researchers DMI interfaces. Session 9 was a difficult session due to technical issues, which caused some frustration for the co-researchers. The wireless controllers were inoperable, a situation which could not be repeated for the concert as Gerard and Jonathon both wished to use them. Jonathon approached me later to discuss the concert, saying that playing drums would be “a big achievement” for him, adding that his parents would be proud.

Session 10 was more productive, during which the group planned the performance through group improvisation. Some aspects of the performance were decided in advance, though the general idea was to mix improvisation and song material. The co-researchers chose and refined their DMI interfaces for the concert. Jonathon chose the wireless drum kit, while Chime chose the arpeggiated percussion interface he had been working with lately. Paraic was presented with an ambient synth with an integrated arpeggiator effect. Gerard’s interface was modified by adding an arpeggiator also. This meant that Gerard, Chime and

Paraic's playing would have rhythmic qualities synchronised by the global tempo of the project. Chime and Gerard both had controls for stopping and restarting their arpeggios – Chime by hitting a black key on his MIDI keyboard, Gerard by hitting a button on his guitar controller.

The group decided that I would play with the group. During the group improvisation, I developed a chord progression that reminded the group of the band U2. This pattern was maintained as the basis of the concert performance, though the group would still improvise around it. The group also decided to perform "Friends in Low Places". To fill the performance slot of 15 minutes, the group decided to perform an improvisation, followed by the song, leading into a final improvisation. This format was practiced twice. I used the final reflection portion of the cycle to acknowledge the thematic concern as a "big goal" for the group, involving organisation and practice by the co-researchers. At the request of Jonathon, the group also emailed a local special school, previously attended by him and Gerard to invite pupils and staff to attend the performance.

On the day of the concert, I arrived early to set up the group's DMIs, so they would be readily carried onto the stage area when the group's turn came. The group arrived by bus and were seated at the front of the venue. This event consisted of performances by multiple Arts & Disability groups from the locality, mainly dance, drama, or poetry recitals. The "Enable Ireland Band" was the only group performing live music. The audience consisted of adult service users from different organisations as well as staff and family members. Many of the audience members were past school mates of Gerard, Jonathon and Paraic. Some staff and pupils from the local special school attended the performance at the group's invitation also.

Paraic had appeared distressed on entry to the performance venue, whether it was because of the noise levels or from the unfamiliarity or the space or quantity of people around him. Though I spent most of the 40 minutes or so before the group played engaging with him,

he was still mildly agitated for much of the performance. A decision was required about withdrawing him from the concert, as part of the assent protocol developed for the research. Going by his facial expressions and tense body movements, he was clearly not comfortable. However, given that he had been unable to participate in the concert at the end of Cycle 1 it was felt that omitting him from the performance would be disempowering.

When the group's turn arrived, the co-researchers arranged themselves in a semi-circle around a table, with Chime and Paraic closest to the table within reach of their MIDI keyboards. Jonathon and Gerard were seated at either end of the arc to leave room for their wireless controllers. I performed a quick signal check on the MIDI controllers before introducing the group – outlining the idea of PAR, the group's chosen goal, and the nature of the performance. Before beginning the music, I stood *behind* the group, leaving the usual circular configuration of the group's seating arrangement open (See Digital Appendix B – Cycle 2 – The Embrace Concert).

The performance began, as planned, with an improvisation based on the *U2* chord progression in the key of E major. Gerard started a guitar rhythm alternating between the *open* E note of his guitar controller and high notes played with the solo buttons. The arpeggiator effect allowed him to create a sustained rhythm by holding down the strum bar, which would stop on release. Chime smiled broadly during the beginning of the improvisation while Jonathon created a steady snare beat in time with the guitar sounds. Towards the end of the improvisation, Chime started playing, leading to a syncopated beat between his repeating tom-tom rhythm and Jonathon's snare.

After two minutes of improvisation, I changed key to A major and began the song "Friends in Low Places". I also reached to stop Chime's arpeggiator, so he could reinitiate playing himself during the song, rather than have the HOLD function play through the

transition from improvisation to song. Jonathon kept a steady beat on the snare pad, adding drum fills at the end of phrases, ending with a flourish at the end of the song.

Although their DMIs were playing throughout the song, Chime and Gerard were not in full control during the performance. Gerard did focus more on his controller towards the end of the song. This happened after Gerard noticed someone in the audience, giving the thumbs-up (while still playing with his other hand). Chime did join in during the chorus of the song, laughing as the crowd joined in. Paraic appeared distressed during this performance and did not play his DMI interface.

The audience, recognising the song, began to sing along, clapping loudly during the chorus and giving a long round of applause at the end. A notable feature of this performance was that I omitted the second improvisation from the performance – ending the set after the song, even though there was more than enough time left to continue the performance. This became a focus of personal reflection for me after the conclusion of the cycle and was related with Paraic's apparent discomfort during the concert. This is discussed in the reflection, below.

After the performance, I checked in with the Chime, Gerard and Jonathon, who were happy with the experience although, due to time and transport issues, only a quick check-in was immediately possible. The group agreed to discuss the concert at the next research session. Members of the audience came up to congratulate the co-researchers before they left the venue.

### **Reflection phase.**

*Concert reflection (session 12).* Jonathon asked Gerard if he wanted to do another concert “in the summer or leave it ‘til next year”, adding that “Jason did a good job on the guitar”. I then asked if anyone was nervous before the concert. Jonathon answered first,

saying he was “a bit” nervous. His hands were shaking, and his stomach was “in bits” as it was the first time playing drums “with people watching”. He added: “I played my best, ever”

Jonathon asked my opinion. I recalled the applause of the crowd and the singing along during “Friends in Low Places”. When asked about the best part of the concert, Jonathon answered “they all know I was going to be a drummer, and a good one at that – see, *I* done it – on my own”. I noted that Jonathon really seemed to be enjoying himself in the video. I also observed that the noise and the large crowd seemed to distress Paraic. Chime was not nervous during the performance. He was eager to play and enjoyed the applause. Jonathon asked if I was nervous. I answered in the affirmative as I had forgotten to introduce the players by name, then sat in the wrong place.

I suggested that watching the video would be good for the research. Jonathon interjected “It’s about music therapy and what we liked”. I added “and our goals and how we used technology – leading to the concert”. I recalled that the initial goal of having a concert was to “show what we can do”.

I laid out the contributions of the members – that Jonathon wanted to show he was a good drummer; that Gerard had tried lots of different things, moving from keyboard (with MIDI effects) to the wireless guitar controller (which he really liked). Paraic’s discomfort during the concert was also acknowledged. I also suggested that there were people who had never seen DMIs (and particularly the wireless controllers) played live. I admitted cutting the performance short and offered to make a copy for the co-researchers to take home (to loud assent from Chime, Jonathon and Gerard).

The group watched the video of the concert performance. During my introduction, Jonathon commented about his nerves, complimenting my speech and identifying his fellow group members. In the video, Paraic was blocked by the position of the camera. I commented

on the improvisation - for example, how I followed Gerard's playing. Chime's happy expression was noted, while I commented on my guitar sound ("horrible").

When the song began, Jonathon exclaimed "Here we go!". During the song Jonathon commented: "I did a good beat, didn't I? I didn't see that day coming". Chime laughed when the crowd started singing (simultaneous with his own musical entry point). I attempted to engage in clapping with Paraic, who did not react. Jonathon continued to express his satisfaction with the video while Chime nodded his head in time with the music. I also commented on my odd seating placement ("I should have been sitting at the corner").

At the end of the video, Jonathon commented: "Amazing" and Chime shouted "OI!" loudly. Gerard concurred with facilitator's suggestion he was enjoying himself of video. Jonathon remembered "having tears of enjoyment". These were due to "strong feelings" rather than "bad feelings". I made some general comments for Gerard to respond to, commenting on his hard work and differing playing styles he employed. I also noted that Chime seemed to play a lot more in recent sessions than before.

When Jonathon said: "I'd do it all again" I asked group about the possibility of another concert. I relayed that the Arts and Disability coordinator had invited the group to perform at the next upcoming Embrace concert the following May. When I asked Gerard, he responded "That was enough".

I talked about what would happen after Christmas, asking if the group wanted to keep the research going and to try to find new ways of using the digital music interfaces. Chime and Jonathon expressed the desire to continue. I recommended finding new ways for incorporating Paraic's preferences. Jonathon suggested songs, but after I inquired, Gerard opted to "talk about it another time" and focus on making CD-ROMs of the concert performance. At the end of the session Jonathon commented - "it's not easy to play drums on my own...I could feel the tension in my hands...I did a good job anyway".

**Personal reflection.** In between Cycle 2 and 3 I engaged in some reflective work around the discomfort experienced during the concert, leading to the truncation of the performance, which persisted after the cycle ended. This was considered an important issue to generate additional insight into the group facilitation process. After exploring the issue in clinical supervision, I wrote a reflection, part of which is quoted here:

I remember feeling quite “off” during the performance and afterwards... I couldn’t shake the feeling of dissatisfaction I had with the experience, neither sure why I had rushed the introduction, nor why I cut the performance short (by not going into the second improvisation). One thing that occurred to me the following day was that I had (again in haste) sat *behind* the group, outside of the circle they made. This way I could only see one co-researcher clearly which may have made me feel disconnected.

In supervision, I described feeling vulnerable which I realise had pervaded the entire experience, not just on my own terms but on behalf of the co-researchers. As a performer, I am quite used to being in front of people, so the vulnerability I felt at this concert felt quite out of place for me. This may have been a reaction to the exposure of the co-researchers to a public performance, something I will be reflecting further on as a component of my role of practitioner researcher. (10<sup>th</sup> December 2013)

This sense of exposure was at odds with the feedback from Chime, Gerard and Jonathon. It was also not evident in their performance on review of the videos. My ambivalence may have more accurately been related to Paraic’s presumably negative experience, to the uncertainty about the decision not to withdraw Paraic from the performance. A broader ambivalence about how to be as sensitive as possible to Paraic’s capacities and preferences within the participatory action research process may have been implicated also. Ensuring authentic participation for all group members had been crucial to

the ethical validity of the work (McTaggart, 1997), but this need was consistently heightened in the case of Paraic, whose capacity to consent was lower than that of the other co-researchers.

### **Conclusion**

The thematic concern, to demonstrate musicing skills developed through music technology, was refined over the course of the cycle, culminating in the achievement of the group's goal of a public concert. Iterations of choice within research sessions influenced the development of the thematic concern more than direct discussion or planning. Working towards this goal involved some overt discussion and organisation – for example, the email contacts with the Arts & Disability coordinator and the final rehearsal for the concert. However, aspects of the work were more tacit, as material for the concert was determined more through the evolving choices, preferences and capacities of the group members from week to week in terms of DMI interfaces and musical content.

Although the group's goal for the cycle was reached, there were mixed reactions from the co-researchers, myself included, that warranted reflection and consideration leading into the next cycle. Chime and Jonathon were both very proud of their performance, though each found it nerve-racking also. Both were eager to take part in a future concert. Gerard's response to the concert was milder, and though still positive, he felt no need to do another performance. Paraic seemed to have experienced some distress during the performance and could not be expected to take part in something similar again. Gerard, Chime and Jonathon all determined to keep the research project going, though the focus of the work would have to be rethought if public performance was no longer a primary goal. Paraic's assent would need to be as closely monitored as always from week to week.

Reviewing work through replay of video or audio material became more prominent in this cycle. This was particularly relevant when the group watched the concert performance

together. The desire to revisit past work could be considered part of the reflective process and the confirmation of action learning for the co-researchers. Responses to recordings still varied in their modality or domain of knowing. Video review was considered a promising avenue for developing an analytical frame for the research.

From a facilitation perspective, it is the facilitator's role within the participatory hierarchy to balance expertise, collaboration and autonomy (Heron & Reason, 1997). This involved sensitively confirming observations of the co-researchers' choices and responses, avoiding partiality or directiveness. This became a jarring experience during and after the concert, when the perplexity of including or excluding Paraic from the performance proved difficult to resolve. Reflection, supervision and discussion with the co-researchers allowed for this discomfort to be treated with transparency, even without clear resolution.

Throughout the cycle, the group continued to demonstrate learning through musicing with the available DMI resources. The modular nature of Ableton's functions became more prominent within sessions as combinations of effects and VSTs became more refined and individualised. This allowed for increased accessibility of the DMIs, particularly for Chime. New aesthetic possibilities were also demonstrated by Gerard's use of guitar effects to replicate different styles. Jonathon's strong percussion skills found easy expression through the wireless drum controller, though he also began to explore other interfaces, while Paraic worked hard to participate, both actively and passively with the MIDI controllers and the VST sounds. A streamlined set-up sequence eliminated many of the technical problems that had slowed down sessions in the previous cycle, ensuring quick access to the DMIs and more time to music together.

Coming into Cycle 3, the final part of the group PAR project would mean rethinking the research focus and working towards a more consistent analytical frame, potentially incorporating arts-based reflection and group video review. The enthusiasm of the group to

develop practical knowledge persisted, as far as that could be determined. This desire to collaborate and share was a deciding factor in adding a third cycle, as the group rose to the challenge of building on their learning to date.

### **Cycle 3 – The *Best Of...CD***

**Overview.** The final cycle of the Ennis group's PAR project was the longest of the three, consisting of twenty-two sessions over six months. Due to ambivalence over the Christmas concert – the thematic concern of the research to date, the research focus needed to be revised, and multiple check-ins were performed throughout the cycle to track the evolution of the group's direction. The group opted not to perform publicly this cycle, but to concentrate on musical development and interaction. Over this cycle the co-researchers developed their idiosyncratic playing styles as well as exploring and integrating new DMI interfaces that were introduced. The group's sense of community manifested in coherent improvisations and sensitive reflections

The long-standing issue of developing a more coherent analytical frame for the group's PAR work received more attention this cycle. Tentative attempts to develop an ABR response to the group's recordings were initiated and evolved into a group effort to curate a *Best of ...* compilation CD of the group's favourite and most interesting improvisations. The notion that the improvisations functioned as a direct expression of the co-researchers' practical knowledge, whether overt or tacit, informed the analytical frame eventually chosen in curating the thesis strand of the research. Other aspects of the research relevant to developing an appropriate analytical frame were identified during this cycle, to be more conclusively addressed after the completion of the project.

The group had to adapt to technical setbacks after my laptop was damaged. Some of these adaptations were integrated in to the continuing work of the group after the laptop was fixed. As the cycle wound down, the group maintained their enthusiasm for musicing while

reflecting on selected edits of previous improvisations. My presentation for the IAMM International Conference in Toronto that year became a focal point for the reflection phase of the research, as the group contributed to its creation, as well as engaging in a recap of the conference at the end of the cycle. The group opted to continue working as a community music therapy group after the research cycle wound down.

### **Planning phase.**

*Reconnecting and renegotiating (Sessions 1 – 3).* As with the previous cycle, Cycle 3 began with a review of the work by the Ennis PAR group to date and a check in about observations and decisions made in the previous reflection phase. The group confirmed that there would be no more public performances as part of the PAR process. While the group had been invited to participate in another Embrace concert in May, only Jonathon and Chime were interested in the idea. It was suggested that the two men might stage a performance at the Embrace concert outside of the PAR project.

After flagging the cycle as the last in the project, I also gave a broad rephrasing of the thematic concern, without the performance connotations, as: to “think about what we learned [about music technology] – what we liked and didn’t like”. While Gerard was intent on continuing to work exclusively with the wireless guitar controller, Jonathon moved on to using the iPad to create rhythms as the group’s main percussionist. Chime continued to use his *held arpeggiator* interface, but tried using different controllers (Launchpad, MIDI keyboard) and sounds (percussion, flute, synth). The importance of monitoring Paraic’s responses was emphasised. The group’s standard session format was recapped: setup-musicing- reflection/burning CDs, although I also presented the option of incorporating new forms of musicing in addition to improvisation and songs, such as composition.

In the early sessions of Cycle 3, the group settled quickly into musicing despite the demands of dealing with new DMI interfaces. Jonathon was quick to learn the different

options of GarageBand, learning to create rhythms using the grid function of the *Smart Drums* patch, while also experimenting with switching to other instrument sounds while playing. A new instrument rack was developed for Paraic, grouping two instances of the same VST (*bell synth*) configured differently for different kinds of contact Paraic might make. One synth was loaded with a *velocity* MIDI effect, set to maximum velocity to maximise onset sound for momentary key strikes. The second synth had a *velocity* effect set at a lower, but constant velocity with an *arpeggiator* effect and to create softer, sustained arpeggios when Paraic held a key or keys down for longer periods. This was thought to maximise feedback for Paraic based on his movement profile. It is worth noting that I chose not to play guitar (my first instrument) for group improvisations, favouring MIDI controllers with bass sounds. Gerard began to routinely use a MIDI mapped table switch for turning on and off a distortion effect during play.

Early improvisations were described by the group in positive terms, emphasising a sense of connection or communion while playing. In session 1, I described the music as very coherent – “like our own piece”. Jonathon responded by placing his hand to his chest and saying: “it felt like we were together”. This sense of synchrony may have had some basis in the coordinated tempi of Jonathon’s *Smart Drum* grid and Chime and Paraic’s arpeggiators, though this should not imply rigidity in the co-researchers’ musicing. Paraic was very active in these sessions, frequently reaching for his MIDI keyboard, or vocalising in response to the music being played by the other musicians. His enthusiasm was noted by the group, especially if it took him a long time to make contact with his DMI.

A new device was introduced in session 3, the Keith McMillen *12-Step*. This was a foot-operated MIDI keyboard/controller with one octave of keys, configurable for synth playing or MIDI mapping. Initially I played this device to keep my hands free to manage the DAW settings during musicing. Jonathon was curious to explore the device as he had

experience using his feet for musicing with the wireless drum kit. The potential of the device for toggling audio effects was suggested to Gerard also as an alternative to his current switch setup

In reflections, I observed contrasts between the playing styles of the co-researchers. For example, a difference was noted between Gerard, who favoured refining a specific interface and Jonathon, who was growing to prefer changing and exploring multiple sounds and input methods in his musicing. Chime's approach to using DMIs was more pragmatic, based on his movement profile and energy level. Similarly, Paraic's engagement with his DMI controller was dependent on his capacity to coordinate his movements.

***Thematic concern.*** The group was eager to return to musicing together and continued to be interested in the possibilities of music technology – both refining their skills with familiar resources and integrating new devices into their DMI configurations. Through choosing not to demonstrate their learning in terms of a public performance again, this brought amore insular perspective on the work and on the value of group musicing for the co-researchers. The desire to keep learning justified the continuation of the research, and though the thematic concern now existed in a vaguer form: thinking about, as I suggested, “what’s easy to use” (Session 2), there was time and motivation to redefine the terms of the research project.

**Action phase.**

***Back to work (Sessions 4 – 6).*** Sessions flowed smoothly after the planning stage, whereby quick setups made for longer musicing phases with active musicing from all co-researchers. Paraic, was more active than in previous cycles, reaching for devices when presented and reacting to synth sounds when played as samples. He played more during sessions (and afterwards) and was also more attentive to the music when not playing. He was

also more likely to vocalise during musicing. These were taken as indicators of choice and preference that the group acknowledged.

Chime also played actively and gave feedback on the music, once leading an improvisation using an arpeggiated piano motif. He came to prefer not using the *hold* function of the *arpeggiator*, so that his synths no longer continued to play after he took his hands from the keys. He also became very committed to his role as the group's *CD Burner* – using a switch interface to control a left mouse-click while I moved the cursor on-screen. A *click protocol* was developed whereby I would say “click” for each part of the CD burning process. Chime was very serious about this job, though his enthusiasm often led to compulsive clicking, which amused the group. Chime often shouted: “I’ll make CDs next time!” at the end of sessions

Gerard continued to work on refining his skill on the wireless guitar controller, while Jonathon explored multiple sounds on the iPad. While he often apologised for switching too much, his changing of sounds often sparked changes in the group's musicing that were later noted in reflection. Jonathon was also proud of his skills, saying in session 5: “I get better every day”. Gerard impressed the group by playing a rhythmic synth on the 12-Step with his feet, at the same time as playing the wireless guitar controller.

***Checking in and moving on (Sessions 7 – 9).*** In session 7 I checked in with the group about the recent work. While the mixed feelings about the Embrace performance persisted, the group reaffirmed their desire to keep working together. I emphasised the voluntary nature of the project. The recap of the work acknowledged the co-researchers' competencies and hard work as well as the fun and humour involved in playing together.

Gerard developed his playing style further. In session 7, he began to hook his right-hand thumb to the body of the controller, which stabilised his hand tremors, giving him far more control of the strum bar, and his rhythmic playing overall. A new guitar VST

augmented his more minimalist playing. The *French Guitar* synth combined a momentary guitar sound with a sustained synth sound. This meant that Gerard could play melodies and rhythms with the strum bar, but also hold long notes by keeping the strum bar in the upright position.

Jonathon's explorations of GarageBand allowed him to play melodic bass guitar patterns on the *Smart Guitar* GUI while also becoming more proficient with the *Smart Drums* grid – whereby drum icons (bass drums, snares, cymbals etc) can be dropped into a grid which immediately plays a rhythm with the appropriate sample. The rhythm depends on where in the grid the icon is placed. Left to right placement determines complexity of rhythms (simple to complex). Top to bottom indicates relative volume (loud to quiet).



Figure 23. The GarageBand Smart Drum Grid (Source: arstechnica.com).

In session 8, I asked the group if there was a way to use the recordings to date. Up to this point, the group had used video and DAW recordings to review portions of the group musicing within and between sessions, as well as having the option of taking CD recordings home. The group was interested in creating a *Best of* compilation of their favourite improvisations – an idea that had been first introduced in Cycle 2.

I observed that the group improvisation period within each session seemed to involve phases of exploration, fixing and coming together. Exploration involved the co-researchers getting used to their chosen interface. Fixing involved refining the interfaces and making any changes the co-researchers need. Coming together happened when, comfortable with their

DMIs, the group members seemed most to connect in their musicing. I offered to review the group musicing recordings to find the “interesting parts” where the group “really seemed to connect” and edit them for review by the group. Due to the large number of recordings, the group would have to select their favourite edits to fit on a single CD.

*Finding a use for the recordings (Sessions 10-14).* For the next few sessions, the group began to incorporate more reflection into sessions, developing ways to use or otherwise revisit the recorded improvisations from earlier sessions. Sessions become denser as playback and review of old recordings became new part of the sessions. These discussions took place at different times during sessions and depended on the co-researchers’ preferences. There was a general preference to prioritise musicing within sessions, so discussions tended to be short. Feedback was at times very direct, as for Jonathon’s effusive feedback. More tangential responses, like Gerard requesting a CD or Paraic becoming animated during playback were also given and acknowledged.

In session 10, I initiated a conversation about how to use the recordings to date to generate insights into the group’s music making experiences with music technology. This began with a replay of the improvisation that was just recorded. The end portion of the improvisation, where grooving was most apparent was chosen. Paraic responded with smiling and enthusiastic movement, as he had responded when the improvisation was initially created. I highlighted Gerard’s recorded MIDI notes to show how consistent his single note playing had been. The group gave me permission to go through the accumulated recordings, to “pick out parts where we groove...and think of something to do with them”.

Presenting iterative samples of my reflective work was considered an appropriate way of engaging reflection in a less propositional manner, favouring experiential and presentational knowing. Given the group’s tendency towards non-verbal interaction, this approach was chosen to show “proof of concept” (Journal notes 21<sup>st</sup> March 2014) – to present ideas for

developing an ABR approach to using documented musicing to generate knowledge and insight into practice in a way that was most appropriate and accessible to this community of inquiry.

During the following week, I worked through recordings from Cycle 1, making notes and editing the improvisations for clarity. These notes were sparse, avoiding interpretation, only outlining the DMIs involved and noting passages of interest in the improvisations. These passages were presented to the group in session 11. At Jonathon's request, I read my notes and then played back an edited file (from 24<sup>th</sup> May 2013, before the wireless controllers were introduced). I described my impressions to the group, that around the 3-minute mark of the recording, the players "really settled in" and work together. Jonathon remarked "I can hear it". I asked Paraic, "What do you think?", who responded by uncurling his body, raising his arms, and kicking his legs. "He's dancing – I like that song" Jonathon commented. After playing part of the group's first improvisation with the wireless controllers, Gerard expressed an interest in my suggestion of tracking the development of his skills with the guitar controller over the course of the project through a compilation of selected improvisations.

Later in the session, after the active musicing portion, I brought up the ABR/editing work again and described the editing work done to bring up the voices in the recording of "Tainted Love" (070613). Jonathon asked to play along with himself, while Paraic brightened up immediately on hearing the recording (I sang along). Chime expressed interest in the recording. Jonathon commented on the recording "that's fantastic drumming, I should be a musician". Gerard requested a copy of "Tainted Love" on that day's CD since he had not been present on the day of the recording. I inferred that Gerard liked the idea of songs, or at least that song.

From session 13, the group began to look forward as well as back. I shared details of an upcoming conference (the IAMM Conference in Toronto, 2014) where I was scheduled to

present, along with my supervisor and a fellow PhD candidate on the concept of *user voice* in research. The group were interested in sharing their work on an international level, though the format for that would depend on the preferences and level of assent from each co-researcher. I suggested different forms of content that could be shared in the presentation and used as “exit content” for the project itself – interviews, videos segments or a dedicated performance. Gerard, Chime and Jonathon favoured interviews. Jonathon expressed a desire to talk about “playing drums for the first time [in public]”.

*Setbacks and Adaptations (session 15-17).* The week of session 15, the hard drive of the research project laptop was seriously damaged and was sent to be fixed. As a stop-gap measure, I used the laptop from my home studio instead. This laptop had Ableton Live installed already, but some functionality typically required for musicing and documentation in research sessions was initially unavailable. This laptop had no CD burner, and fewer USB ports than the research PC. The software for connecting and routing the video game controllers was absent from the replacement laptop also. Many of the DAW preset, in terms of effect and VST instrument racks, that had been developed and saved for co-researchers would have to be rebuilt, and the bank of available sounds was different from that on the research PC’s version of Ableton. The proposed ABR work of reviewing and editing the cycle’s improvisations had to be put on hold as the project files were not available while the laptop was being repaired.

This, for some co-researchers, meant a back-to-basics approach to musicing that I described as “like the old days”. For example, without the wireless guitar controller, Gerard had to return to playing a MIDI keyboard with a rebuilt version of his ‘strumming guitar’ MIDI effect rack. Jonathon was unable to use the wireless drums but was still able to use the GarageBand app through the external soundcard. Paraic and Chime’s choices were relatively unaffected. For me, facilitation was slightly more time consuming as work-arounds for absent

functions, sounds or controllers had to be devised. This arrangement lasted for 3 weeks, until the research laptop was repaired and returned. During this time, the wireless control software and virtual MIDI cable were installed on the replacement laptop, allowing Gerard to play the wireless guitar controller again, much to his relief.

Input →	Random →	Chord →	Arpeggiator	VST (output)
MIDI Key	25%	+ 5 <sup>th</sup>	Chord trigger	Campfire Guitar
	+12 semitones	+8ve	Swing 8ths	

Figure 24. Gerard's 'strumming guitar' MIDI effect rack. This creates a bouncy strumming sound on a Root/5<sup>th</sup> chord, with a 25% chance of being transposed to a different random note within the same octave.

The group continued to music together. Musical roles in the group were maintained despite the disruption in the availability and configuration of the DMIs. Gerard was still the guitarist, whether using a MIDI keyboard or wireless guitar controller, Jonathon was still the drummer, though using different methods – MIDI input (with the Launchpad) or loop building (with the *Smart Drums* on GarageBand). Chime who had declined to play during these sessions, could be described as the 'listener', as he was still engaged with the musicing that way, answering closed questions after improvisations to give feedback. Paraic's engagement fluctuated, depending on his energy levels, though his attempts to interact with his MIDI controller, successful or otherwise, were always praised and incorporated into the improvisations.

Gerard was keen to create CDs of the sessions' improvisations and was reassured that this would occur on the return of the research laptop. Recording, replay and CD creation were identified as valuable resources for the group, owing to the primacy of music making as a research modality. Gerard's personal investment in keeping tangible products of the ongoing research demonstrated the value he placed in the group's work. The value of recording was

further demonstrated in session 16, when Jonathon's video of 'Tainted Love' was replayed at his request, leading to a group improvisation based on the song's bassline.

The group discussed possible uses for the recordings in session 17, during a check-in to refine and clarify the thematic concern. I described the research as being "about the kind of technology we like, and why", observing the co-researchers' different applications and interests, contrasting Jonathon's eagerness to try many different interfaces, with Gerard's work to master a specific type of controller. When Jonathon expressed worry that his changing preferences were a problem, I answered: "I want people to do whatever they want, whatever's interesting, and then tell me about it" adding jokingly: "as long as nobody's smashing anything, they can do what they want".

Although public performance was no longer part of the thematic concern, I suggested that there may be other ways of "thinking about our work" and "showing what we can do" making the compilation album from recorded improvisations as discussed in previous sessions. The refined thematic concern would still be to *show what we can do*, but through sharing recordings rather than through public performance. The compilation thus would consist of recordings from the current cycle only. I promised to review the recent recordings when the fixed laptop was returned. The group would then could review and select their favourite excerpts while still having time for active musicing.

Another topic that received attention during this period concerned dissemination of the group's work, specifically by way of my upcoming IAMM presentation. There was interest in using video material, with debate over whether to use interview material, previously recorded video segments, a live performance or some combination of the three to share the group's insights. Care was taken to acknowledge the different communication styles of the co-researchers in choosing a format. For example, Chime, a gregarious and outgoing person was more in favour of interviews than Gerard, who tended to be more reserved.

*Curating the album, winding down the cycle (sessions 18-20).* By session 18, my research laptop had been repaired and returned. The software (DAW, Max/MSP patches etc.) was reinstalled in advance of the session. The recordings from the stand-by laptop in previous weeks were also rendered and put on CD for co-researchers. With the return of the laptop, and renewed access to the group's recordings, I began reviewing and annotating improvisations from an aesthetic perspective, marking changes and transitions in the music and identifying interesting or coherent passages of music to share with the group. These were then edited and rendered for the group to review.

A tentative notion of repurposing, reinterpreting or overdubbing the improvisations as part of an arts-based research approach was explored and then rejected. The evolution of a group improvisation from exploration to refinement to grooving/coherence came to be seen as the most meaningful aspect of the review process. That is, the most interesting parts of the improvisations were discretely identifiable as pieces of music *per se* and did not require further treatment or manipulation. This left the task of curation by the group of their favourite pieces into the *Best of* album format. This would then 'represent the generation of practical knowledge or flourishing during research sessions throughout the cycle (Heron & Reason, 2008). Minor edits were made to DAW project files to take out periods of silence where the group were not actively musicing. The recordings were also mixed into stereo to improve clarity but were otherwise unaltered.

In session 18, the group planned to improvise together, but also took time to review my initial edits and notes on the first four weeks' improvisations of the cycle (recorded in January/February 2014). During the set-up period of this session, I presented short excerpts of my favourite parts of the improvisations reviewed so far. These were passages where the group's playing appeared most coherent, collaborative, or musically interesting. Given the

number, and length of improvisations created during the cycle, the group co-researchers would have to be selective in curating a single CD's worth of music from these edits.

Over the following two sessions (19 and 20) the review process took precedence over active musicing. This allowed more time for group to review each of the completed edits in more detail. In session 18, three edited recordings were presented. Paraic responded to the pieces by vocalising, smiling and moving in his chair. Jonathon commented on the sounds of the pieces as "Like African or Indian music" (the first piece), "like a spaceship in the sky" and "like Halloween" (the second piece). He was pleased with the rhythms in the third piece ("I like that beat"), which I described as sounding like the band Cinematic Orchestra. Jonathon also suggested launching and selling the completed CD. I clarified and reframed this as indicative of pride in the music and of a desire to share with the community. This conversation was mostly driven by Jonathon, who became frustrated at the lack of verbal response from the other co-researchers.

All three pieces were chosen for the *Best of* compilation. Gerard asked for a CD of the recordings, usually a sign of his investment in the work. A CD created for Paraic, based on his animated response to the music with a note to his parents explaining his role in the recordings. The pieces were given names based on the group's feedback – "The African Piece", "The Ghost Spaceship" and "Cinematic Orchestra". I promised to work through as many edits as possible to present to the group in the remaining weeks of the cycle.

In the subsequent session (19), six recordings were reviewed, five of which were chosen for the compilation. I explained more of the editing and annotation process, including using the session videos to clarify roles and DMI interface changes during the musicing. I commented further that there had been minimal editing due to the sense of coherence in the recordings already.

The first three pieces attracted minimal response from the group. Paraic was far less animated than in previous weeks. Jonathon made occasional positive comments (“it’s a great beat”), while Gerard indicated his response to the music indirectly by reaching for the blank CDs and handing them to me. Chime was absent from this session. I gave overviews of each piece and commented on entry points by co-researchers as well as pointing out interesting transitions or changes in the music.

The fourth piece (210314) seemed to catch everyone’s attention. I began by pointing out the rhythm created between the cello synth (played by me) and drum loop (developed by Jonathon on Garageband). Jonathon said: “That’s amazing” and asked my opinion. I answered, “I like it, it’s us working together”. “As a team”, Jonathon added. Gerard began smiling as he listened to the recording. I commented on Gerard’s “different” guitar style and the good fit of the new synth, mixing momentary and sustained sounds. I said that I “love(d) the cello sound”. As the beat became more complex, Paraic appeared to pay more attention, straightening in his seat. I ranked the piece as one of my favourites while Jonathon was eager for his previous music therapist, a percussionist, to hear the piece. Gerard nodded when asked if he was happy with the piece.

I then played a fifth piece. This one had a different mix of instruments and sounds - me on electric guitar, Jonathon on *Launchpad*, Gerard on wireless guitar. I commented that Gerard and I “worked really well”. Jonathon laughed at some of the sound effects from his DMI drum rack and brought up the idea of doing another concert. As the groove developed on the recording, Paraic, listening, smiled broadly (“he loves spacy stuff” I noted). Jonathon asked when it was recorded (March). After the sixth improvisation was chosen for inclusion on the CD, I suggested that the quality of the music was a “sign of us getting better at our instruments”. Of the six improvisations presented, only the first was left off the *Best of* album.

Over these sessions, the co-researchers also decided how they wished to contribute to the IAMM presentation I was giving after the end of the cycle. I invited discussion about ways to “tell people” about their work. Discussions covered the type of content they wished to share (video/audio, musical/verbal) guided by a question based in the thematic concern: “What would you show them [conference attendees]?” The group chose to include the video for “Tainted Love” to demonstrate the group’s work. This was chosen because Gerard did not want to appear in the presentation and had not been present when that video was recorded.

**Reflection phase.** The reflection phase of this final cycle of research consisted of two research sessions conducted either side of the IAMM research presentation in Toronto. These sessions consisted of a final group improvisation experience, and a trial run of the Toronto presentation *User Voice in Research* (session 21) as well as a recap of the cycle, a report on the reception of the presentation at the IAMM conference and a brief exit interview with Chime, Jonathon, Gerard and Paraic (Session 22). The finished *Best of* album of edited improvisations was promised to the group for September, after the resumption of normal music therapy sessions (see Digital Appendix B – Cycle 3 – The Best of Cycle 3).

I offered to run through the Toronto presentation to get the group’s feedback. This was useful to clarify some of the research terms with the group and to provide an overview of the project. The presentation combined text, photos, video and audio from the Ennis group and from the Limerick group. After the presentation, the group approved the presentation. Jonathon commented: “We get better every day”. I was very impressed by this statement and asked permission to add it to the presentation. Further inquiry about what Jonathon meant by getting better elicited the response “we’re a good team”

The final session in the project (22) took place in July 2014, shortly after the International Association of Music and Medicine (IAMM) conference in Toronto, where I co-presented on the topic of User Voice in Research with my supervisor, Jane Edwards, and

another UL PhD candidate, Susan Baines. This short session was conducted as an exit interview of sorts for the group as well as an opportunity to report on how the presentation was received. Jonathon commented that the 9 months of research sessions were “not easy” for him. I concurred, saying: “it was hard work, but it was good work”. I informed the group that the presentation had been well received by the small audience, with great interest in the notion of collaborative research and praise for the musical performances in the video and audio clips.

Before the exit interview, I thanked the co-researchers for their work, noting that the group had learned a lot over the course of the project. I made observations about each member’s contribution – Gerard’s guitar playing, Jonathon’s diverse DMI choices, Chime’s CD burning role, and Paraic’s strong reactions to the music played, and his efforts to join in. Before turning off the camera “for the last time”, I asked some closed questions of the Chime and Gerard.

Jason: Did you think it was good Chime?

Chime: Yeah

Jason: Are you glad it’s over?

Chime: Yeah

Jason: Is there anything you DIDN’T like about it

Chime: No

Jason: Gerard, did you enjoy it

Gerard: Yeah

Gerard appeared uncomfortable with the direct questioning. I then affirmed the non-verbal aspect or presentational of the research, saying “it’s not all about the talking, or what we say – the *music* does the talking in some ways”. Gerard confirmed my observation that “you really think about what you’re playing”.

At this point, Paraic appeared to be asleep, so the group decided to play music.

### **Conclusion**

The conclusion of this cycle, and research project, came after a long series of sessions characterised by exploration and experimentation, as well as challenge and perseverance. The group's ambivalence towards public performance, following the concert at the end of Cycle 2, required a renegotiation of the thematic concern – to *show what we can do* with music technology. The group worked on different ways of thinking more deeply about their musicing and new ways to share their learning.

### **Thematic Concern**

The group indicated they wished to continue play music together and develop their skills with the available DMI (digital musical instrument) resources as well as recording their improvisations to create CD's. The curation of favourite improvisations into a *Best of CD* offered a product by which to refer to the PAR process. This outcome represented the growth of a musical community of practice into a community. These recordings were to represent individual flourishing through idiosyncratic contact with the music technology resources. The IAMM presentation in Toronto at the end of the cycle also acted as a tangible way to review and articulate the work. The group invested in, and contributed to the presentation, as well as hearing a report on its reception in the final research session – *showing what we can do* in a different manner than in previous cycles.

### **Musicing and Use of DMIs**

During this cycle, the musicians remained active in their engagement with their DMI interfaces and with each other. Gerard found new ways to control his guitar sounds, while Jonathon became proficient enough with GarageBand to be able to change sounds and control different GUIs mid-improvisation. Chime alternated between active musicing and active listening, but always took great pride in his role as CD burner of the group. Paraic was also

more active and responsive. His preferences, responses and movements were reflected in a VST instrument rack designed to give optimum response to validate the effort it frequently took for him to make contact with his controller. My musicing changed also, as I began to favour MIDI controllers over the electric guitar. In moving to a less familiar musicing device, I took on a more collaborative role, getting to grips with a DMI interface in the same manner as the rest of the group, instead of the more supportive or frame-working role (Wigram, 2004) that was taken with the electric guitar.

Although each co-researcher used different configurations of input, processing and output, it is interesting to note that each of Gerard, Chime and Paraic's usual DMI interfaces had some condition for continuous or sustained musicing with minimal input (a single movement or contact, for example), enhancing the accessibility of the interfaces. Matching of tempi between arpeggiators, rhythmic synths and autoplay functions in *GarageBand* also made coordinated musicing easier, without negating agency. Feedback after musicing often concerned a sense of communality and coherence in the musicing.

### **Reviewing the Data: A *Protoanalytical* Approach**

Over the course of this final research cycle there was a sense that the musical content of the research sessions became more pleasant, coherent, or otherwise improved. This was expressed during the reflections by the group immediately after the performances ("it felt like we were together" – Jonathon, session 4). The idea occurred again during the curation of the *Best Of...* compilation of edited improvisations. The main function of the CD was to serve as a final product of the group's work, an expression of the evolved thematic concern. However, the review process generated insights into the group process that had potential to coalesce into an arts-based analytical frame for the research, under the control of the co-researchers and expressing the multiple knowings of the co-researchers.

Using *interestingness* or vividness as a criterion for reviewing the improvisations offered a way of creating a selective curatorial process that allowed me to engage in reflective work and share the most salient aspects of that work with the co-researchers in a timely manner. The sense of completeness, or coherence in the latter, *grooving* parts of the improvisations obviated the need to engage in reinterpretation or manipulation through an arts-based analytical framework. Instead, this strengthened the idea of the musicing as the meaning-making *per se* – the generation of knowledge in the moment, within the research sessions themselves. The task of rendering this meaning-making into thesis form remained a curatorial one, like the *Best Of* album – choosing what was interesting or salient and allowing it to speak for itself. Maintaining the participatory nature of the co-researchers' work and its mostly non-propositional nature was an issue of importance also.

The group's curation of the album, contribution to the IAMM presentation and engagement in exit interviews constituted acted as participatory ways of rounding off the project and disseminating the skills and knowledge of the researchers in diverse forms. This engagement demonstrated the group's operation as a community of inquiry. It was felt that further possibilities existed to present the multiple knowings of the group members.

The group's preference for musicing had always been central to the research process. Exploring collaborative ways to revisit and reflect on the music generated some interesting insights on my part, but still created a paradox of needing to be dealt with in some overtly propositional manner. That is, requiring a verbal process of feedback and decision making that was potentially inaccessible or otherwise inappropriate for the co-researchers and their manner of engaging with the research. I would suggest that the co-researchers engaged in a meaning-making process, that, though partial, may have been a second-order process to the meaning making that occurred during the musicing itself, preserved in the video and audio recordings. The moment-by-moment meaning making within the music, along with the more

propositional reflective work is thought to constitute a *protoanalytical* approach to participatory action research – demonstrating engaged knowledge generation, but potentially benefitting from further work to fully present the outcomes of that approach.

### **Next Steps**

The participatory action strand of the research was completed in a manner that engendered shared learning and the development and resolution of a dynamic and evolving thematic concern. The co-researchers contributed to every aspect of the research as it progressed, generating practical knowledge through their musical interactions using DMI resources. Work to develop an arts-based analytical frame within the PAR methodology constituted *protoanalytical* work by the group.

Aspects of the group's process were identified that potentially warranted further attention and/or resolution. The improvisations tended to have a consistent structure of *exploration-refinement-grooving*. The album idea allowed for a top-down approach to reflecting on the work. Reading and responding the improvisations in terms of distinctiveness or interestingness offered a potential avenue for approaching the large amount of audio and video data generated by the group. Furthermore, these *interesting* portions of the improvisations, the *grooving* portions, resisted reinterpretation or manipulation, registering as relatively complete. That implied that the meaning-making, or knowledge generation of the group was immanent to these improvisations, with little further interpretation required.

To present the richness of the work in thesis form finding a way to engage further analysis was needed. In undertaking this analysis, it was intended it align and be congruent with the principles of PAR. That is, my analysis should avoid reframing or reinterpreting and at the same time correspond with the extended epistemology, wherever possible. Incorporate the musicing as *action research in the moment* (McKewn, 2008) was expected to allow the

identification of learning, meaning-making and flourishing within the improvisations as representative of the community of inquiry using DMIs.

The *micro-cycle* concept that juxtaposed the set-up-musicing-feedback structure of each research session with the broader PAR cycle of planning-action-reflection allowed for a different way of looking at the PAR process, to represent the group's work. This is an axiological, and perhaps ethical approach, prioritising the co-researchers' knowledge, however generated or expressed. This could be described as a deconstruction and reconstruction of the *moments of action research* (Kemmis et al., 2004) to foreground the co-researchers' idiosyncratic learning process.

Finding additional ways to authentically present knowing-as-practice as an outcome of action research (Reason, 2006) affirms the postmodern perspective inherent in Dionysian PAR – as a work of art, that emerges in the doing of it (Reason 2006, Reason & Bradbury 2008). That is, emergence in PAR has a postmodern resonance, emphasising heterogeneity and difference within the methodology (St. Pierre, 2011, Stringer, 1999). Rules are established along the way as meta-narratives are avoided (Lyotard, 1979). Instead, local narratives and events become the focus of meaning -making (Lyotard, 1979). This is particularly apt for work with people with disabilities who are often subject to a grand narrative that may need destabilising (Goodley and Roets, 2008).

In engaging in the review of the recordings, insights emerged that were perceived to be able to be resolved in a manner faithful to the participatory nature of the project, though performed after the completion of the action strand. Finding a way to re-engage with the group's work to develop these insights became a primary issue in the transition from the action strand of the project to the thesis strand (Zuber-Skerritt & Perry, 2002).

The group's research work created a large amount of documentation with data in different forms. Curating this information into a format that authentically presented the growth of this

community of practice into a community of inquiry involved incorporating an additional analytical frame to the research project. A rhizoanalytic approach (Leander & Rowe, 2010) was developed to capture the idiosyncrasies of the group's learning, manage the large volume of data and preserve the participatory nature of the research by using immanence as a criterion for analysis. The rationale and development of the rhizoanalysis will be discussed in more detail in the following chapter.

## Chapter 6

### Analysis

This section outlines the development and application of rhizoanalysis; the chosen analytical frame for the data generated by the Limerick and Ennis participatory action research groups. As described below this method was chosen as it was perceived to be highly conducive in 1. offering a way to engage the transition from action project to thesis project, 2. tracing the development of communities of inquiry, and 3. dealing with a large volume of heterogeneous data. Rhizoanalysis is a methodology developed from Deleuzoguattarian philosophy which resonates with PAR's emancipatory, creative and iterative character (Drummond & Themessl-Huber, 2007).

In transitioning this doctoral work from the action project to the thesis project (Zuber-Skerritt & Perry, 2002), it was necessary to choose an appropriate method to complete the analysis. As the research begun by the participants was engaged within a collective process, the preparation for thesis needed to preserve the participatory, multi-voiced nature of the PAR projects. Some inductive coding (Altrichter, Feldman, Posch & Somekh, 2008) had been conducted between cycles, and exploratory ABR responses were generated for completed cycles throughout the research. Each of these processes was conducted with the assent of the participants. The application and refinement of these methods was dependent on the engagement of the participants with themes and responses, along with the congruence of this reflective work with the evolving thematic concerns and the associated planning, action and reflection. Completing this thesis required further analysis through application of an appropriate method.

The multimodal nature of the PAR projects consists of multiple knowings, diverse forms of participation, and variety of data formats. These projects could be described as

having been carried out in a *Dionysian* manner (Reason & Heron, 2001). That is, characterised by being imaginal, expressive, impromptu, and tacit as opposed to systematic, linear or explicit (Heron & Reason, 2008). Incorporating these qualities into the analytical frame was consistent with the iterative nature of the research (Altrichter et al., 2008). In responding to the data, the development of an analytical frame that could incorporate the heterogeneous, and not infrequently messy (Daykin, 2009) data, was required.

Rhizomatic thinking, as proposed by Deleuze and Guattari (1988) conceptualises knowledge as multi-modal, dynamic and proliferating; comparable to a rhizome (e.g. ginger root). This contrasts with the more common arboreal (that is, root-branch) conceptualisation of knowledge which is hierarchical and concrete. Rhizomatic thinking has been used in qualitative research as a way of creatively exploring, managing, and analysing heterogeneous data (Coleman and Ringrose, 2013).

The three PAR cycles in each of the Ennis and Limerick projects included data collection and analytic processes conducted by each group collaboratively. The further analysis through adaptation of a rhizoanalytic process was undertaken to complete the thesis strand of the research. The music created within sessions and during the planned public events contributed to an arts-based process of inquiry relevant to the guiding question; that is, *how does music technology help us to make music together?* This analytic work was considered to be evolving, or at least requiring an additional analytical frame to curate the groups' insights and learning into thesis form. The next section describes the processes used in determining such a frame.

## Developing the Analytical Frame

### Engage the Transition from Action Project to Thesis Project

The reporting of a participatory action research project in the form of a doctoral thesis required the unification of the *action* strand of the project with the *intellectual* strand of the project (McTaggart, 1997). Seymour and Garbutt (1998) recommended separation of the academic and action aspects of an action research project, advising doctoral researchers conducting PAR to identify points within the project where they can step outside the PAR cycle and generate additional outputs. Zuber-Skerritt and Perry (2002) identified two distinct aspects of PAR projects conducted by doctoral researchers – the core project and thesis project.

Some tentative analysis work was ongoing between the research cycles with transcription of video and audio material, inductive coding of the transcriptions (Altrichter et al., 2008) and exploratory ABR reflections and responses to musical and DAW material (Ledger & Edwards, 2011). This was carried out with the permission of the research participants. Themes and observations were shared with the groups during the PAR cycles and developed or modified accordingly through incorporation into the ongoing research sessions. Time constraints and evolving thematic concerns became issues in the participatory analysis of these analytical strands.

In moving from the participatory action research cycles to reporting and thesis writing it was important to preserve the participatory nature of the project and represent the multiplicity of voices and knowings as fully as possible. That is, to avoid the pre-eminence of my voice in the thesis as lead researcher, and equally importantly, to avoid reframing the entire project solely in propositional terms. The goal was to maintain the presence of the relevance and influence of multiple forms of knowing as the research progressed.

In addition, during the inductive coding and ABR work, as well as in ongoing research reflection work, the richness of certain moments within research session stood out. These seemed to involve the interaction of many factors – individual, relational, musical, technological and conceptual, sometimes in a non-linear fashion. These moments, as much as the larger events and actions within the PAR process appeared to have the potential to signify *flourishing* and speak to the interconnectedness and ownership of all participants of the research projects.

### **Trace the Development of the Communities of Inquiry**

The purpose of this research was for co-researcher participants to collaborate on shared thematic concerns around the role of mainstream music technology in facilitating group music making. Within the participatory inquiry paradigm (Reason and Heron, 2008), the aim of collaborative research such as this is to identify and track the development of each group of participants as communities of inquiry as multiple forms of knowledge are generated and human flourishing is brought about through the manifestation of practical knowing.

As the iterative research cycles of the participatory action research project unfolded, data generation and analysis of the researchers' experiences and insights occurred through the action itself (that is, musicing) as well as through video and audio review and end-of-cycle interviews. Dissemination of knowledge occurred through concerts, lectures and workshops involving university students and members of the public. Reflection on these public activities, especially for the end-of-cycle concerts provided further knowledge and insight, which was used to refine the PAR process.

For each group the notion of data analysis, or analytical frame was only partially dealt with, though to different degrees. The Limerick group generated some ABR ideas and

engaged with the lead researcher's explorations during Cycle 2. These were considered interesting but were ultimately not developed into a participatory analysis.

As for the Ennis group, video review was used to reflect on performances, improvisations and songs, with feedback given in the moment. ABR reflections were similarly partial for this group, with a more practical *Best of* album created from the group's improvisations in Cycle 3.

The analysis of the data could be considered partial or *protoanalytical*, as each participant contributed to the generation of knowledge, as they did to the other aspects of the PAR process and showed reflection and learning from their musical interactions. In giving fullest voice to the participants, especially those who did not communicate verbally, there seemed the possibility of further analysis of the large amount of data generated. This would be based around small, but significant events and interactions *within* research sessions that signified flourishing and contributed to the growth of the groups as communities of inquiry.

### **Deal with a Large Amount of Heterogeneous Data**

The open-ended approach of the PAR methodology produced a large amount of multi-modal information, collected as video, audio and DAW data. This data represented the musical, verbal and behavioural interactions of the research participants in both groups over three PAR cycles. The role of recording was generally discussed as a means of getting everyone's ideas down so that we could think about our work or show it to others. The multi-modal nature of the data collection served to acknowledge and incorporate multiple knowings of functionally diverse groups of participants.

Data was collected according to the preferences and practices of each group. For the Limerick group, videos and DAW project files were created in each session. For the Ennis, videos and DAW files were created, but CDs were also created from the exported audio files for participants who requested them. CD creation was an established practice of this group

before the research began. This practice expanded to include the sharing of video files on CD-R for interested participants to save and keep. These were videos of song performances within sessions (“Tainted Love” and “Eye of the Tiger”) as well as the two concert performances. Between-session research conversations were occasionally audio recorded for both groups. These conversations tended to be either session recaps for absent members or check-ins initiated by participants.

In moving from action strand to academic strand, or from *within-cycle* work and *between cycle* work (Zuber-Skerritt & Perry, 2002), I engaged in loose inductive coding of video transcriptions of the Limerick group’s research sessions and improvisations. Themes were developed that appeared to underpin our applications of music technologies to interact and to work toward the thematic concerns of demonstrating our skills to the broader community. These themes (talk vs. action, chaos vs. coherence, pride/agency, and humour/support) were acknowledged throughout the research and affirmed the epistemological basis of the projects through the actions of the participants ourselves. That is, the academic and action strands connected and informed each other as the cycles progressed.

The iterative nature of the cycles, with and evolving thematic concern and associated actions made keeping up with the analysis between cycles a difficult proposition. Video transcription and exploratory ABR reflections could not be completed during the break between Cycles 2 and 3, which was far shorter than the break after Cycle 1, meaning some analysis of Cycle 2 was conducted as Cycle 3 was running. However, this tentative ABR and inductive coding work identified *meaningful moments* that involved the confluence of different factors within the session – the features of the interface, relational issues, level or quality of facilitation and multiple forms of knowing and communication issues.

Ongoing discussions were held with the research groups about what to do to either analyse or disseminate the data gathered during the research – video, audio and DAW

information – covering the musical, verbal, behavioural and relational aspects of each research session, in addition to the public lectures and concerts. A consensus grew that little *should* be done with the data, especially the music – that “it’s already in the music” (Ricky, Limerick PAR group, Cycle 2, Session 8).

By the end of the cycles, both groups felt the work was complete. This made sense to me, as the moment-to-moment interactions were rich and meaningful. I was wary of reframing this collaborative work in propositional terms, from my own perspective. I felt the work, as it was at the end of the 3 cycles could be presented as a piece of research – knowledge generated through collaborative action. Processing, interpreting or transforming the work seemed less appropriate than presenting or curating the groups’ efforts in as direct a manner as possible.

Ensuring optimum participation for people with disabilities in the analysis of participatory research and qualitative research in general can be difficult (Nind, 2008; Goodley & Lawthom, 2005; Sample, 1996). This seemed particularly true in such functionally diverse groups as took part in this research. However, the use of the participatory inquiry paradigm, and arts-based inquiry constituted an effective way of including all participants in the creation of knowledge and the reflection thereon.

As practical knowledge accrued, and as thematic concerns evolved, the heterogeneity of the collected information and insights increased. An analytical approach that could connect the different, yet meaningful aspects of the knowledge generated by the PAR groups was sought, which would allow the preservation of the participatory, multi-voiced nature of the data. Additionally, an analytical approach with a similarly open-ended approach to the rest of the project was needed, and particularly one which could deal with information in different modalities.

## **Reflection**

Having been directed towards the work of Deleuze and Guattari by my supervisor, I saw the possibility of presenting these *meaningful moments* in a consistent manner that acknowledged the multiplicity of factors involved. The correspondences between PAR and Deleuzoguattarian thought seemed to apply to the manner of implementation of our completed PAR cycles (Drummond & Themessl-Huber, 2007).

A way of reading the *messy texts* produced by our research – comprising of multiple voices, identities and meanings (Marcus, 1998; cited in Daykin, 2009) was required. To this end, Deleuze and Guattari’s concepts of the “rhizome” and “rhizomatic thought” (1988, p. 3-36) was adopted to conceptualise and connect or combine the different elements. Deleuze and Guattari’s concept of rhizomatic knowledge has been developed into a qualitative research approach – rhizoanalysis. This has been advocated as useful in accounting for mess, creativity, open-endedness and performativity in research (Coleman & Ringrose, 2013). This method offered a way to address the aim of identifying and presenting meaningful moments with minimal interpretation.

### **Rhizome theory/Rhizomatics**

This section describes the concept of *rhizome* and *rhizomatic thought*. These concepts developed by Deleuze and Guattari (1988) form the basis of the qualitative research approach *rhizoanalysis*, which was chosen to analyse the heterogeneous and multimodal findings of the participatory action research projects central to this research. This section deals with the general characteristics of rhizomatic thought, while subsequent sections will concern the application of these concepts in qualitative research.

**The rhizome.** The rhizome is a “biological metaphor that draws attention to unusual combinations, mergers, incorporations and associations, which wander like the roots of certain plants” (Wood & Ferlie, 2003, p. 52). *Rhizo-*, in an etymological sense refers, to “combining things” (Colman, 2010, p. 232). The rhizome concept is used to describe the

“movement or spread of energy and information, which actively scrambles discrete phases or stage-like lineages” (Wood & Ferlie, 2003, p. 52). Rhizomatic thinking is therefore concerned with multiplicity and overlapping connections where there would not be a fixed centre or order (Colebrook, 2002).

Deleuze and Guattari described rhizomatic thought in contrast to traditional *arboreal* knowledge structures which are described as consisting of a “pivotal taproot” from which knowledge grows in a linear order, as part of a singular, unified entity (1988, p. 5). Such knowledge “is constructed as centralized and modelled on linear progress; it is perceived as building in one direction, moving according to a fixed order; it categorizes and classifies; and, importantly, it is hierarchical” (Guerin, 2013, p. 138).

Knowledge and truth are therefore territorialised, layered and coded in ways that produce narratives, negating the possibility for other versions of truth and knowledge to be imagined (Riddle, 2013). But a rhizome, differing from a tap-rooted tree in its capacity to establish new connections (D’Adamo-Damery, 2015), spreads horizontally, in every direction (Guerin, 2013). Thus, in the rhizome model, knowledge is characterised as multiple, non-hierarchical, proliferating, and non-dualistic (Guerin, 2013).

The distinction between arborescent and rhizomatic avoids becoming oppositional or binary (which is itself an arborescent status) when considered as a way of creating pluralism – that is, to see that “all distinctions and hierarchies are active creations, which are in turn capable of further distinctions and articulations” (Colebrook, 2002, p. xxviii). Both models deal with epistemological imaginings (Riddle, 2013).

**Rhizomatic thought.** Rhizomatic thought therefore involves making “random, proliferating and decentred connections” (Colebrook, 2002, p. xxvii). Such thought “does not begin from a distinction or hierarchy between ground and consequent, cause and effect, subject and expression; any point can form a beginning or point of connection for any other”

(Colebrook, 2002 p. xxvii). Rather than seeking a “single, unified truth”, as might be the case when working to an arboreal model of knowledge (Guerin, 2013, p. 139), rhizomatic thinking recognises the contingent and temporary nature of what is discovered, understanding that what we learn can continue to move in new, often unpredictable, directions (Guerin, 2013).

Rhizomatic work can serve to challenge structures of rigid, fixed or binary thought and judgement (Colman, 2010). There are no singular positions on the networked lines of a rhizome, there are only connections between things (Colman, 2010). In rhizomatic writing, *being*, and/or *becoming*, is not simply a process of assimilating things, rather it is a milieu of dynamic transformation and relation (Colman, 2010).

Colman (2010) described the rhizome as a “powerful way of thinking without recourse to analogy or binary constructions”. She added:

...to think in terms of the rhizome is to reveal the multiple ways that you might approach any thought, activity, or a concept – what you always bring with you are the many and various ways of entering any body, of assembling thought and action through the world. (p. 235)

**Characteristics of a rhizome.** The rhizome “conceives how every thing and every body – all aspects of concrete, abstract and virtual entities and activities – can be seen as multiple in their inter-relational movements with other things and bodies” (Colman, 2010 p. 232). Deleuze and Guattari (1988) outlined six principles that characterise a rhizome and support rhizomatic reading or analysis – connection, heterogeneity, multiplicity, principle of asignifying rupture, cartography and decalcomania.

Connection and heterogeneity require that “any point of a rhizome can be connected to any other and must be” (Deleuze & Guattari, 1988, p. 7). Within a rhizome, connections between semiotic chains, organisations of power and issues of art, science and social struggle are continuously being established (Deleuze & Guattari, 1988). A rhizomatic method

analyses by decentring what is being analysed onto different dimensions and registers. Using language as an example Deleuze and Guattari explained:

A semiotic chain is like a tuber agglomerating very diverse acts, not only linguistic, but also perceptive, mimetic, gestural, and cognitive: there is no language in itself, nor are there any linguistic universals, only a throng of dialects, patois, slangs, and specialized languages. (1988, p. 7)

The principle of multiplicity states that there are no fixed points within a rhizome, only lines. A multiplicity “has neither subject nor object – only determinations, magnitudes and dimensions that cannot increase in number without the multiplicity changing in nature” (Deleuze & Guattari, 1988, p. 7). According to the principle of asignifying rupture a rhizome may be broken or shattered – but it will start up again on old or new lines (Deleuze and Guattari, 1988). A rupture occurs whenever segmentary (molecular) lines explode into lines of flight (becoming) where the line of flight is part of the rhizome. This principle informs Deleuze and Guattari’s concept of deterritorialisation. This is the idea that a rhizome is constantly *becoming-other* through the freeing up of fixed relations (deterritorialisation) and the establishment of new relations (reterritorialisation) (Deleuze & Guattari, 1988).

Cartography (mapping) and decalcomania (tracing) are further articulations of the differing operations of the rhizome and the arborescent models of thought. A rhizome is a map, “open and connectable in all of its dimensions; detachable, reversible, susceptible to constant modification” (Deleuze & Guattari, 1988, p. 12). Like a map, a rhizome has multiple entrances and has to do with performance more than simply representation. An arborescent tracing is a “topological explanation” (Deleuze & Guattari, 1988, p. 16) that is hierarchical, with connections limited to the next superior step in that hierarchy. Dynamic, performative connections mobilised by desire and are only achievable through the rhizome while the arborescent tracing is concerned more with reproducibility. A tracing can be connected back

into the map, allowing for duality over competition between models, which would itself be an arborescent notion (Deleuze & Guattari, 1988).

### **Rhizoanalysis**

Rhizoanalysis is a post-structuralist qualitative research method used to analyse and present data using the rhizomatic principles of Deleuze and Guattari outlined previously. Rhizoanalysis is “about making connections—connecting and mapping the data immanently, via affect and that which is transgressive” (D’Adamo-Damery, 2015 p. 118). Writing rhizomatically opens possibilities for perceiving what is already happening (Sellers, 2015). It is a way of mapping how feelings are mobilised or blocked (De Freitas, 2012). It aims to form connections between points/events/nodes where meaning is found (Riddle, 2013). There is no single way to do rhizoanalysis and thus has been described as a *(non)method* with a non-hierarchical and non-linear perspective (Masny & Waterhouse, 2011; Masny, 2015). Indeed, perhaps the only form in rhizoanalysis is that it has no form (D’Adamo-Damery, 2015).

Rhizoanalysis follows the emergence of relations and differences by mapping performance in motion. This facilitates understanding of performances in ways that more fully engage their affective intensities, the relationships they build and the ways in which they create unpredictable movements of texts and identities. Performances are considered in a decentred manner – as rhizomes without deep structure. A rhizome in this approach is more of a figuration than a metaphor (Hagood, 2004, cited in Leander & Rowe, 2006). In creating a rhizomatous cartography, beginnings and endings are nullified in a constant movement *between* (Alvermann, 2002). Writing rhizomatically may apply to writing itself, reading or understanding texts in rhizomatic terms and/or analysing linkages between texts and the talk of research participants (Honan, 2007).

The flexibility of this approach and its capacity to account for complexity is outlined by Leander and Rowe:

...rhizoanalysis recasts the problems of multimodality and the body as elements of a more general problem of connectivity, including the stabilizing and destabilizing effects that particular connections have. Similarly, rhizoanalysis reworks the problem of identity to focus on "becomings", or creative and affective movements that cannot be predicted by available types and resources. (2006, p. 432)

Rhizoanalysis has been used to examine children's play, treating play as a performance (Sellers, 2015). It has also been employed to identify emergent properties of classroom interactions, in terms of an assemblage of persons, things, forces and power differentials (De Freitas, 2012). Research studies of early childhood (Mazzei & McCoy, 2010), education (Riddle, 2013), literacy in the classroom (Leander & Rowe 2006; Masny, 2015), informal discussion settings (Alvermann, 2002) and community food work (D'Adamo-Damery, 2015) have used rhizomatic analysis.

These analyses have involved video analysis of complex interactions or rhizomatic reading of interview data. Some researchers have presented vignettes or text-based analyses based on affective reading of texts (D'Adamo-Damery, 2015; MacNaughton, 2005; Masny, 2015). Rhizomatic storylines and song-lyrics have been used to present rhizomes (Riddle, 2013). Sellers (2015) presented her analysis of children's play sequences using storyboards created using juxtapositions of words and images from video data. De Freitas chose to represent classroom interactions in the form of diagrammatic knots (2012). Leander and Rowe (2006) created matrix of data points using text and images to demonstrate flows in performance, presenting the final analysis as superpositions of *spacings* or *plateaus*.

In developing a rhizomatic approach to text/performance analysis, some issues have been identified in ensuring authentic reading and creation of cartographies. Firstly, the non-method nature of rhizoanalysis means there are few reference points for people seeking to learn about the method. Alvermann (2002) felt that there were few examples to follow in developing her approach. D'Adamo-Damery noted significant differences in operationalisation in the examples he sourced (2015). A degree of experimentation is required to develop an authentic rhizoanalytic approach and to prevent the final cartographies from being too linear, two-dimensional, or fixed (Alvermann, 2002; Leander & Rowe, 2006; Sellers, 2015).

Over-coding or overworking the data is also to be avoided (Sellers, 2015) while presenting emergent potential of an interaction or event (De Freitas, 2012). Accepting the partial and incomplete nature of rhizoanalysis appears to be a factor in its use also. In completing her rhizoanalysis, Sellers learned to *live with confusion* (2015) while Alvermann related the necessity of overcoming a proclivity to seek closure to complete her analysis (2002).

### **Participatory Action Research and Deleuze**

A key innovative perspective offered by this research is a consideration of the ways Deleuzoguattarian thought can offer insights to the conduct and analysis of participatory action research (Amorim & Ryan, 2004; Drummond & Themessl-Huber, 2007; Henderson, 2010; Smith, 2016; Wood & Ferlie, 2003; Yu, 2004). Deleuzoguattarian philosophy aligns with PAR in being concerned with initiating creative change “beyond fixed and dogmatic identities” (Drummond & Themessl-Huber, 2007, p. 446). The main purpose of considering PAR in conjunction with Deleuzoguattarian philosophy here is to critically rethink the cyclical nature of PAR, with the intention of moving away from fixed stages and protocols (Smith, 2016).

Concepts from Deleuze and Guattari have been recommended as *enrichers* of any PAR process. These are; the minoritarian/majoritarian research, the nature of problems and solutions, apprenticeship to signs and the reciprocal dialectic of continuous becoming (Drummond & Themessl-Huber, 2007). Many researchers have recommended art-making as a possible PAR approach as a form of deterritorialisation and creative knowledge generation (Beyes & Steyaert, 2011; Smith, 2016; Yu, 2004). In combining PAR and Deleuzoguattarian concepts here in this innovative combination, my goal is to demonstrate how such a synergic opportunity is not just conceptualised but also enacted.

**PAR and Deleuze – theory and practice.** Wood and Ferlie (2003) suggested that Deleuzoguattarian ideas can help to conceptualise the interpenetration of theory and practice that occurs within the PAR process. They took the view of knowledge as non-linear and rhizomatic, and based in lived experience (Wood & Ferlie, 2003). Shared learning through participatory research is considered a form of becoming within a dynamic rhizomatic system that does not begin or end, but always acts from the middle (Yu, 2004).

Reason and Heron's participatory inquiry paradigm is directly implicated in this perspective, which favours the experiential mode. Practical knowledge is considered "an important sense located at the interface between a subject and what is encountered" (Wood & Ferlie, 2003, p. 52). *Research* and *practice* are thus contextual labels within a more complex, transformative relationship consisting of rhizomatic connections within communities-of-practice (Wood & Ferlie, 2003). The interaction of research and practice creates potential to initiate lines of flight – new possibilities for learning and becoming (Smith, 2016).

**Deleuzian enrichers.** Drummond and Themessl-Huber identified points of contact between Deleuzoguattarian concepts and PAR that act as *enrichers* of the cyclical PAR process (2007). These can engender additional insights into the cyclical PAR process without compromising it (Smith, 2016)

***Minoritarian vs. majoritarian research.*** This differentiates research that privileges a fixed identity or term of reference (majoritarian) from that which is open-ended in terms of creative ways of becoming (minoritarian). The minoritarian “opens things which are excluded, un-expressed or unheard by breaking into, de-territorializing and altering the usual modes of doing and saying things” (Beyes & Steyaert, 2011 p. 111). Majoritarian action research processes concern a more orthodox, fixed identity through set protocols and recognised methods (Drummond & Themessl-Huber, 2007).

PAR is considered *potentially* minoritarian in that it can be implemented in a way that is fluid and grounded in creative action, as opposed to well-defined, concrete and rigidly imposed steps (Drummond & Themessl-Huber, 2007). This dimension of creativity opens connections that change the nature of the PAR process’s own becoming. Minor science engages directly with the substance of the project, not to investigate, but to create change (Drummond & Themessl-Huber, 2007). Within a dynamic research process, this could be thought of as *becoming-minoritarian* (Colebrook, 2002).

***The relationship between problems and solutions.*** Action research can begin with the *sense* of a problem, not as a lack, or an obstacle, nor as something to be resolved into negation, but something that gives rise to thinking, and learning (Drummond & Themessl-Huber, 2007). The relationship between problems and solutions is thus fluid, as aspects of the problem are clarified, obscuring others (Drummond & Themessl-Huber, 2007). Over the cyclical course of action research, problems become solutions, bringing new problems/solutions. This requires being “a friend to the problem” throughout the PAR process (Drummond & Themessl-Huber, 2007 p. 440). Continuous participative engagement with substance under investigation brings ongoing feedback, leading to new thought (Henderson, 2010). Since learning, from this perspective, is unpredictable, sensitivity to meaningful signs is needed (Henderson, 2010).

*Apprenticeship to signs.* This refers to the need for awareness of elements of unfolding *events* engaged with during shared learning within the cyclical process of PAR (Drummond & Themessl-Huber, 2004). This is achieved through participative engagement with the substance of the project, focusing on feedback over concrete results, bringing about new thought and ideas as a response (Drummond & Themessl-Huber, 2007). Individual learning styles of participants must be acknowledged and incorporated as paths of becoming, enriched by collaboration (Drummond & Themessl-Huber, 2007).

*Reciprocal dialectic of continuous becoming.* The enrichers so far described are implicated in a reciprocal dialectic of continuous becoming between the researchers and the PAR project, offering a different way of looking at PAR without compromising it (Drummond & Themessl-Huber, 2007). The ongoing direct engagement of the participants is a minoritarian process while the continuously differentiating data creates new connections and learnings in a fluid manner. Drummond and Themessl-Huber thus advocated the cultivation of sensitivity to signs that allow a minoritarian approach to the dynamic nature of problems and solution (2007). From a Deleuzoguattarian perspective, PAR projects are living phenomena that make creative change possible (Drummond & Themessl-Huber, 2007).

### **Art-making, Deleuze and PAR**

The role of art-making in creating knowledge is another way that Deleuzoguattarian thought that can be incorporated into PAR. Art-making allows the synthesis and articulation of the complex nature of PAR and can act as a way to deterritorialise the potentially fixed nature of PAR itself (Smith 2016). Yu (2004), used an improvisatory dramaturgical model to investigate health research processes so as to incorporate creativity and spontaneity into the action research component. Deterritorialisation becomes a goal within the research, affording reflection, sense making and the opening of new connections through art (Smith, 2016). Amorim and Ryan advocated a role for Deleuzoguattarian thought in terms of creative

writing about PAR, using a rhizoanalytic approach to articulate superpositions of heterogeneous elements within the PAR process (2005). This allows for events or singularities to be identified within the work in which two or more concepts or elements are combining in a novel or interesting way, leading to solutions and insights.

Art-making “offers the potential to create a new line of flight, initiate the process of deterritorialisation and change the territory of action research” (Smith, 2016 p. 42). As with PAR itself, art-making or arts-informed research is not inherently disruptive or rhizomatic, only potentially so (Henderson, 2010). However, Deleuze and Guattari have suggested that musical improvisation is rhizomatic by nature due to its spontaneity and innovation (1988), making it an interesting medium by which to incorporate Deleuzoguattarian concepts into a PAR process.

These concepts have informed the rhizoanalytic method developed for this project, adopted to complete the data analysis component of the research. The focus on immanent connections corresponds with the criterion of *interestingness* in the engagement with recorded group improvisations and the notion that these improvisations required no interpretation or reworking. The minoritarian nature of this research is reflected in the Dionysian approach to action research and knowledge generation, characterised by creativity, tacitness and improvisation (Reason & Heron, 2001). The related concepts of signs (Drummond & Themessl-Huber, 2007), events (Amorim & Ryan, 2004), encounters and interventions (Beyes & Steyaert, 2010; Smith, 2016) were useful in clarifying and refining early inductive coding work as well as resonating with the idea of *meaningful moments* in the research process. These signs could indicate *becoming* within the research sessions which is considered congruent with *flourishing* within the participatory inquiry paradigm (Heron & Reason, 2008) and resonates with the humanistic concept of intrinsic motivation in psychotherapy and music therapy (Boxill & Chase, 2007).

## **Conclusion**

The participatory action research process highlighted the voice of the users and placed whatever expertise was possessed by the practitioner-researcher at their disposal in addressing the thematic concern. The participatory epistemology allowed for the musical interactions to be considered as the research process *per se*, accessible to and influenced by participants of diverse functionality. Musicing was the expression of presentational and practical knowing for all participants and evidenced the degree of fit between user and music technology interface in the development of that expression. Thus, participants' engagement with the music technology resources collaboratively, within a community of inquiry can be said to have involved potential and actual flourishing as the research process iterated.

Using rhizome theory to identify and contextualise moments of *flourishing* or *becoming* furthers (but does not necessarily complete) the partial analysis conducted by the groups. These moments are considered to occur through the facilitated deterritorialisation of music via technology, offering unique opportunities for potential to be actualised. Rhizomatic reading of these *events* is intended to show facets of this ongoing process of deterritorialisation within the rhizome that is the research group. The nomadic and minoritarian character of the PAR groups' work is represented and maintained through the analytical frame of rhizoanalysis. The improvised musical interactions are inherently rhizomatic (Deleuze & Guattari, 1988), adding further conceptual resonances between analytical frame and the action research project.

## **The Rhizomatic Approach**

### **Development**

Rhizoanalysis offers a way to keep track of, and value, the multiple connections and becomings produced by performances, in the absence of which performances may appear as stable texts to be decoded (Leander & Rowe, 2006). In this research study the rhizoanalytic

method was engaged specifically to read the video and audio material generated by the two PAR groups, but with additional attention to the musicing portions of research sessions.

The aim was first to identify moments within the research videos or music recordings that seemed special or interesting and to describe why it was special in a way that tied in the different strands of the research. These were moments of joy, discovery or engagement that showed connections to music, to other participants and to the technology (actively or passively). This would allow the articulation of overlapping and interactive attributes of projects' heterogenous strands (context, epistemology, methodology, technology resources, participant interactions) that operated rhizomatically and engendered flourishing/becoming as a valid outcome of the research process, immanent within the participants' interactions as practical knowing accrued.

### **Identify Events**

A rhizomatic matrix was created from transcriptions and video reviews to map out the entire PAR project session by session, in terms of participant, DMI interface (input, processing and output), general features of the session, features specific to PAR and musical parameters or interactions. These were used to identify potential events within the PAR process that could be read rhizomatically for deterritorialisation, that is *becoming-music* within the rhizome of each group. Each potential event was located on the original videos for review (See digital appendix E).

### **Affective Reading**

Affective reading, or reading for difference, was engaged (D'Adamo-Damery, 2015). This affective reading allowed me to compile initial observations and responses and to identify specific signifiers of becoming (Drummond & Themessl-Huber, 2007) which were then edited into shorter clips for further consideration. The main criterion was that the event should stand out as particularly interesting and involve multiple connecting factors. This was

a more focused way of looking at the texts than the looser inductive coding engaged between cycles, though the initial codes were useful in expediting the identification of certain events.

### **Rhizomatic Reading**

The affective readings and video/music text were then interrogated with *rhizomatic questions* derived from Deleuze and Guattari's criteria for rhizomes (1988). These were adapted from MacNaughton (2005) and Leander and Rowe (2006) to reflect the multimodal nature of the texts being read.

- Heterogeneity – identify diverse data fragments
- Connection – consider how they connect, conjoin or overlap
- Multiplicity – consider how they connect with other texts/assemblages
- Asignifying rupture – identify what brought a difference or change
- Cartography – make a map, identify insights or connective dimensions.

For the purposes of thesis, readings and descriptions were folded together into vignette form to accompany the video clips.

### **Video Material**

The events, with brief summaries of the associated readings, were compiled and saved, to be viewed in conjunction with the rhizomatic vignettes.

### **Rhizomatic Readings**

This section presents five events and their associated rhizomatic readings or “cartographies” (Deleuze and Guattari, 1988, p. 7) for each of the research groups, Limerick and Ennis. These cartographies articulate the immanent connections between heterogeneous elements within events within the research assemblage that signify *becoming-musician*. The becoming-musician process occurs through the disruption or deterritorialisation of fixed relationships of musical parameters, digital music resources (input, processing and output), gestural affordances, and the reterritorialising of these into idiosyncratic digital musical

interfaces. This process is dynamic, as new possibilities or *lines of flight* are actualised and incorporated into the research sessions. These lines can then be broken, disrupted or deterritorialised themselves at another time. *Becoming-musician* is considered analogous to *flourishing*, the expression of practical knowledge as an outcome of participatory research (Heron & Reason, 2008).

The heterogenous elements of the research assemblage were present in most or all the events, though they connected differently and according to different affective intensities within each event. The events were chosen through affective coding (Altrichter, et al., 2008) or *reading for difference* (D'Adamo-Damery, 2015) of video extracts chosen from a rhizomatic matrix which was compiled from transcriptions of the video recorded sessions, reflections on group musicing and DAW data. The presented cartographies could be considered territories within the larger rhizome or assemblage that is the overall PAR process. These are not necessarily fractal or reductive representations of the whole, but integral parts that can be highlighted. The readings revealed issues of isomorphism, rhizomatic awareness, affective synchrony and the relation of user fit and effort and/or commitment as connective dimensions in the meaningful incorporation of DMIs into group musicing. (See Digital Appendices C and D for clips, and Appendix E for clip outlines).

### **Limerick Rhizomatic Readings**

**Limerick reading 1 – Establishing the rhizome.** This cartography maps an event early in the Limerick research where a group of co-researchers played together, adapting their DMI interfaces throughout the improvisation. Each musician was learning to use a music technology interface that was new to them to some degree. The players alternated between refining their DMIs in conjunction with me and concentrating on improvising with each other. This dynamic of collaboration between co-researchers came to be a common feature of the weekly sessions.

**Background (data fragments and connections).** This video clip was from Cycle 1, session 8. It was the first session of that cycle to have a sustained group improvisation uninterrupted by technical problems. This session also marked the first successful use of Rock Band™ wireless controllers during a session. I used the guitar controller to play a bass guitar VST. David chose the wireless drum kit and requested multiple drum sounds including *techno* and *kettle drums*. An instrument rack that allowed for multiple drum kits to be played simultaneously was created and loaded with *Klash Box*, a noisy EDM kit and *Magnificent*; a kit with timpani and other orchestral samples.

Three different iPads were used in this session – my own, Ricky’s and Eddie’s. Ricky was using the *Launchpad* app for the first time on my iPad, controlling EDM loops. Caroline used the *Smart Guitar* function of GarageBand on Ricky’s iPad, favouring an acoustic guitar sound with the *autoplay* function set to *fingerstyle*. Eddie also used Garageband on his own iPad, changing instrument sounds regularly.

Mark played a variation of his preferred DMI from previous sessions, with an unfamiliar controller. This was a Launchpad MIDI controller triggering an acoustic guitar VST, with *chord* MIDI effect to create chords from single note playing and *arpeggiator* MIDI effect to create a sustained rhythm (see Chapter 2). The *chord* effect was set to add 7 semitones to each played note to create a root/fifth chord or *power chord*. The *arpeggiator* was set to a *chord trigger* mode to play full chords rhythmically rather than splitting the intervals into an arpeggio. The *arpeggiator*’s rhythmic pattern was then set to play in a swing rhythm. Holding down a sustained note with this programming resulted in a sound like a guitar strummed in a country/folk style. The BPMs of the *Launchpad* app and the global tempo of Ableton were synchronised at 125 BPM.

While this event showed the group musicing together successfully for the first time in the research process, there was uncertainty and ongoing adaptation evident due to the use of

so many new or unfamiliar DMI interfaces. The co-researchers and I needed to check in often to refine the interfaces while continuing to play. The improvisation contained diverse stylistic elements for example the blend of EDM-style dance rhythms and country-style guitar sounds. This blending of genres or stylistic elements sometimes occurred within the same DMI interface, such as David's techno/orchestral drum kit. While there were short sections where the group appeared to be grooving, these were interspersed by co-researchers asking questions or requesting changes.

After playing, David named the improvisation "Jam in the Box" as a reference to the music ("jamming") and the room as a box. A version of this clip was used in the 2013 progression presentation under the title "Improvisation and Adaptation". The audio file "Jam in the Box" was played at the 2013 class lecture given by the Limerick group to MA Music Therapy students at the Irish World Academy of Music and Dance.

***Difference (Asignifying rupture).*** This movement between exploring and refining the DMIs and actively connecting with the other musicians seemed to have a certain rhythm or regularity of its own. The improvisation gained coherence and energy, only to lose it again as another refinement or change was engaged. At one point I reset the improvisation to allow the musicians to reconnect.

Though tentative, the sense of purpose in the group persisted as they played together. As far as an *intermezzo* goes, this may be identified as the transition between the familiar (MIDI technology in music therapy) and the unfamiliar (new DMI interfaces within a PAR group). The novelty of the new situation was tempered by the musicians' clear choices and efforts to engage practical and presentational knowing. In terms of this event, what is apparent is the establishment of the rhizome through a balancing of tensions and motivations.

***Cartography.*** The event expressed some of the conditions of the establishment of the rhizome that was the musical community of inquiry. Though each member of the group who

was present were familiar with making music using technology, each was using an interface that was unfamiliar in some way. Making sense of these interfaces in collaboration with me as facilitator drew attention and energy away from the group improvisation on a musician by musician basis. The musicians appeared confident in their efforts to control and optimise their DMI interfaces while establishing musical contact with each other.

Through the dynamic of exploration, improvisation and refinement, each musician had the opportunity to learn about the available music technology and put that learning to immediate use. This resonates with Drummond and Themessl-Huber's Deleuzian enricer of PAR – the *reciprocal dialectic of continuous becoming* (2007).

**Limerick reading 2 – Locking in.** The cartography presents the group's effort to *lock in* with each other during an improvisation, while I worked on ensuring the clarity of the sound mix. This process depended on the consistency of Ricky and Darren's rhythm, the clarity of the overall sound, and the co-researcher's familiarity with their DMI interfaces. The shift in roles offered new possibilities for the group to interact musically.

**Background (data fragments and connections).** This event came from Cycle 2, Session 11 (27<sup>th</sup> November 2013). The group members improvised together while following a beat created collaboratively by Ricky and Darren. The group had decided that I would not play, but facilitate only, checking that the DMIs were working correctly and balancing the sound levels. Aside from a general prompt from me at the beginning of the clip, the musicians negotiated the groove themselves. As this improvisation was practice for the upcoming Christmas concert, some *seasonal* sounds and effects had been chosen – e.g. vocal pads, toy bell or delay effects – sounds that were more atmospheric than musical, leading to a dense sounding piece of music.

Ricky chose the *LPD8* MIDI pad controller and a drum VST; the *Impulse* device on the *Trad Rock* preset. The *Impulse* device is a simple drum machine programme with 8 drum

samples per preset, with each sample triggered by a step on the C major scale (C3-C4). This allows drum beats to be played with the white keys of a MIDI keyboard. *Impulse* mapped 8 drum samples directly onto the *LPD8*'s 8 pads, when set to diatonic mode. Darren chose the *Launchpad* controller, with a percussion VST; the *Drum Rack* device on the *Core Percussion* preset. This mapped 16 orchestral percussion samples onto a 4x4 pad area of the device, the bottom-left corner.

Trevor R. played the *Rock Band* guitar controller with the strummed guitar VST/MIDI effect combination described previously. Eddie played an atmospheric vocal synth *Angels in Space* with a MIDI keyboard, while Trevor K. chose a MIDI keyboard and an instrument rack previously developed by David in music therapy, which he had named *Christmas in Vienna*. This combined a rhythmic harp synth – *NuHarp Patterns* with a tuned percussion synth *Tubular Bells* – also played with. David had been playing this DMI earlier in the session. David himself played electric guitar, in open-G tuning, with the *Crystal Reverb* effect. This combined a rhythmic delay with a pitch shifting function and a reverb effect, meaning that each echo created by the effect was pitched up by an octave. This effect was cumulative, meaning the pitch of the echo got higher with each delay repeat. Thomas had been presented with another multi-voiced synth on the Padkontrol – *Chimes and Warm Pad* – which combined a momentary high tuned percussion sound with a deep legato pad sound.

Prior to this improvisation, Ricky had offered to create a hip-hop drum beat for the group to follow. As Darren was also playing percussion, he offered to help. Throughout the improvisation, Ricky worked to hold a steady beat, occasionally stopping to reposition his controller. Though intermittent, the musicians were aware of Ricky and Darren's beat. A short sequence of play stood out when David found an octave voicing on the guitar and played a simple ostinato along to the beat, allowing the delay repeats to ring out. Trevor K. rocked rhythmically to the beat as he played, while Eddie played long legato notes while

watching Ricky intently. Trevor R. settled on a two-chord progression (G#5 – E5) towards the end of the clip. Thomas engaged with me while I demonstrated his DMI to him, but he seemed disinterested after I moved on.

Ricky's beat appeared bring the music into focus, possibly offering a point of orientation for the other musicians. Darren worked his percussion sounds around the beat. David synchronizing his octave motif to the beat. Trevor K's rocking when the beat was playing and stretching out when it lapsed. Trevor R's simple chord progression also became more rhythmic as the beat stabilized. The additional musical textures from the more atmospheric VSTs and effects reminded me of the music of Vangelis or Tangerine Dream, but the beat cut through clearly and gave the music more definition.

This event involved the group interacting musically without the connective element of my playing, or of the music therapy techniques I would usually employ in group work. Not playing with the group provided me with some mobility to move around during the session. My job was to optimize the sound quality of the group's music, but I also used this mobility to move between participants to interact, take feedback and check DMIs. The mobile facilitation became relevant in the end of cycle concert.

***Difference (Asignifying rupture).*** The shift in roles gave everyone in the group more freedom to negotiate the participatory discrepancies of the improvisation (Ruud, 1998). Ricky's efforts to create a steady beat brought coherence to the music by offering a clear reference point for everyone's playing. Freed from playing myself, I was able to concentrate on making sure everyone could hear the music clearly without interrupting the improvisation.

***Cartography.*** This event could be described as a deterritorialisation of the participant/facilitator dichotomy as new forms of relating were established within the group/rhizome. The co-researchers assigned me a role in working on the sound clarity at the expense of participating musically, as I might have done usually. This allowed group's

ongoing concern about the cohesion or clarity of the improvisations to be addressed. When the clarity of the mix was under control, the cohesion of the music was entirely under the control of the co-researchers.

**Limerick reading 3 – The UL concert.** This event concerned the group improvisation segment of a public concert performed by the Limerick PAR group. Each musician contributed to the performance, with the interconnection of their DMIs facilitating the connection between the musicians and the cohesion of the improvised music. This event highlights the collaborative nature of the co-researchers' *becoming-musician*.

**Background to event (Data fragments and connections).** This event was identified in the recording of the Limerick PAR group's concert performance at the Irish World Academy of Music and Dance at the University of Limerick (16<sup>th</sup> December 2013). This performance represented the culmination of Cycle 2's evolved thematic concern – to find a more public way to *show what we can do* with music technology. The concert structure was planned, along with the DMI preferences of the co-researchers. The event was taken from the group improvisation portion of the concert, which was performed between suites of solo performances by the co-researchers. The group was quite comfortable performing in public and played a dynamic and responsive improvisation with a playful finish.

Trevor K. played a complex instrument rack he had developed in individual music therapy and refined for the concert. This contained three VST sounds – a clear tuned percussion synth (*Pure Bell 8ths*), a rhythmic synth with a strong pulse and ambient sweeps (*Synth Reso2 16<sup>th</sup> Sweeps*), and a deep bass synth (*Sub2Sine Bass*). The bass synth was passed through an *arpeggiator* MIDI effect set to play minim rhythms with the input notes. This created the effect of a continuous legato bassline regardless of the tempo or rhythmicity of Trevor's playing.

Ricky played a piano synth through an *arpeggiator* MIDI effect with the *LPD8* pad controller on the diatonic setting (C major). The rotary controls of the *LPD8* were mapped to the delay and reverb send controls of Darren, Trevor R., Eddie, Thomas and Ricky's own tracks within Ableton. This allowed Ricky to add delay and reverb effects the overall mix. Pad 8 on the device was MIDI mapped to the *hold* function of the *arpeggiator* on Ricky's piano synth. This allowed Ricky to toggle the *hold* function, which sustained an arpeggio after the note was released. This way he could alternate between playing arpeggios and manipulating the group's send effects smoothly (See figure 25).

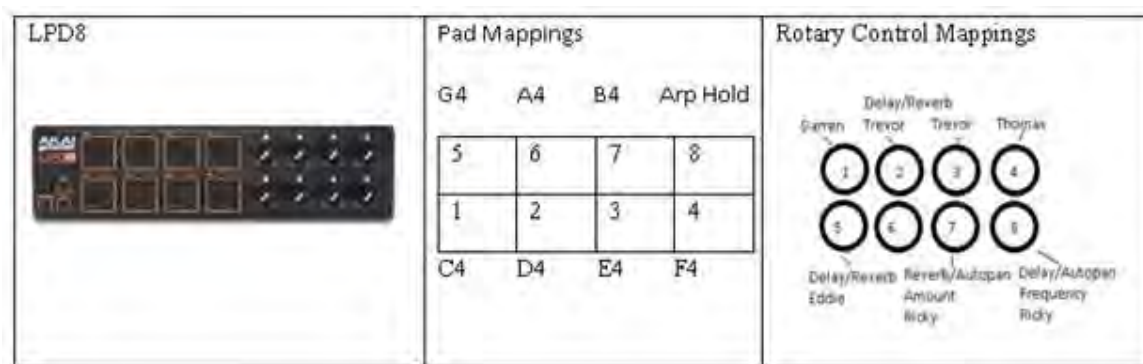


Figure 25. Ricky's DMI interface for the UL concert.

Caroline played her own electric guitar, though it could not be heard clearly during the performance. Eddie played a piano VST with a MIDI keyboard, as he had in his solo performance. Darren played the *Launchpad* controller with the *Core Percussion* preset of the *Drum Rack* device. David selected the electric guitar, asking for a clean sound and a tremolo bar, possibly reflecting his taste for Hank Marvin's style. Thomas had been provided with a rhythmic bass synth (*Bass Groove*) and PadKontrol as planned, though he did not use it during the performance. Trevor R. was absent for the concert. I used the *Touchable* iPad app's *split screen* function to control Ableton's sound levels remotely and to play a *clavinet* (amplified harpsichord) VST with the app's isomorphic keyboard.

In the event, the group improvisation portion of the concert was underway. I was crouched near Thomas, playing along and encouraging Thomas to join in. He was rocking to the music and eventually shouted out “F\*\*k off!”, though playfully. Darren was playing intermittent shaker and clave beats on his controller. David was playing open chords while looking around the table. The bassline on Trevor’s instrument rack was most prominent throughout, until he played a long, sustained chord cluster, which created a crescendo swell on his bell synth. Ricky was playing one and two-note patterns, before setting the *hold* function and moving on to the rotary controllers.

Ricky called me over to help with his DMI as the MIDI mappings did not seem to be working. After a quick adjustment, the mappings came into effect, and Ricky began adding delay/reverb effects to his own DMI. As Ricky’s DMI continued to play a rhythmic E4 note, David began playing ascending chords on the guitar, seemingly to find the same note. I began harmonizing with Ricky’s pattern, which was itself harmonizing with Trevor’s bassline.

Once Ricky began adding effects, I moved over to David, while still improvising and asked him to call and end to the improvisation when he was ready. David listened for a moment and then called out a countdown “3, 2, 1!” to end the musicing. Ricky continued to play after the other musicians had stopped. David played a loud tremolo dive on the guitar, after which Eddie played a loud piano cluster, both taken to emphasise the finish. I signed “finished?” to Eddie. David then called to the audience “That’s it lads!”. As the audience applauded, a voice was heard saying “Unbelievable”.

This event showed a section of the group having influence over the others’ music through the multiplicity of functions programmed into their individual DMI configurations. Ricky and Trevor both had complex DMIs that influenced the dynamics of improvisation, while my DMI allowed me to improvise and facilitate smoothly at the same time. Each musician was comfortable with their DMI, maximizing their potential to connect and create a cohesive

piece of music. Though Thomas did not actively participate with his DMI, he responded to the music being played and used his voice during the improvisation.

***Difference (Asignifying rupture).*** The event is notable for the multiplicity of functions available to the musicians through their DMI configurations as well as within the improvisation itself. This signifies the further deterritorialisation of boundaries between performers as their even their interfaces blend as they worked to connect musically. Almost all the musicians contributed to the dynamics and flow of the group's music beyond concentrating on their own playing. This group improvisation shows multiple players sharing lines of control and expression.

***Cartography.*** This community of practice aimed to show a public audience the skills they had developed with music technology. The collaborative nature of their work was highlighted in the dynamic and multi-layered musical improvisation. The blending of DMI interfaces and the sharing of control, both virtual and actual created a sense of cohesion and responsiveness within the performance. The group were collaborating deeply, *becoming-musician* together.

**Limerick reading 4 – Chatting and musicing.** This cartography maps a group improvisation characterized by dynamic musical and verbal interactions. Multimodal references were made to musical tastes and influences. In contrast with the dichotomous *talk vs action* theme that had pervaded the research to date, the group, appeared quite comfortable doing both at the same time.

***Background to event (data fragments and connections).*** This event took place in Cycle 3, Session 8 of the Limerick PAR project. The group had finished discussing the upcoming interactive workshop at UL and had opted to improvise together for the remainder of the session. In keeping with the evolved thematic concern, the improvisation was not in preparation for a public performance, but rather to connect with each other through music.

David played an open-G tuned electric guitar with multiple audio effects giving a heavily processed sound. The *Crystal Reverb* effect created pitch shifted echoes, the *Autopan* effect routed the guitar signal into the left and right stereo channels at regular rhythmic intervals, and the *Elastic Band* effect created EQ sweeps like a wah-wah pedal. Caroline played her own adapted guitar with no effects. As described previously, this was a ½ size electric guitar restrung into pairs of low/high strings and tuned to major 3rds. This gave her access to Emaj, Amaj and Bmaj chords, though other intervals were possible.

Ricky chose a MIDI keyboard with two VSTs on separate tracks – a *sitar* VST with a delay effect and a *velocity* MIDI effect set at 127 (full intensity), and a lead synth called *Speedbump Lead*. The velocity effect ensured that each note Ricky played came out at maximum intensity, regardless of how hard or soft he struck the keyboard. Trevor K. created an instrument rack combining a saxophone VST and an atmospheric guitar synth, *French Guitar*. He controlled this rack with the *Touchable* app on my iPad, through the *isomorphic keyboard* setting. Trevor K. had access to the *scale* setting of the *isomorphic keyboard*. Though it is unclear from the video which scale he selected, *Diatonic Major* was the default scale setting.

Thomas accepted the offer of a rhythmic synth *Soft Player* triggered by the PadKontrol. This VST played a syncopated rhythmic synth sound combined with a sustained drone. Trevor opted to help Thomas by holding the controller for him in an accessible position. I chose the *Launchpad* controller to play the *Dub Delay* preset of the *Impulse* drum device. This was a drumkit combined with a *Ping-Pong Delay* effect. As the name suggests, the delay effect bounced repeated signals from left to right speaker at an *offset* rhythm, giving a *swing* feel. Given that the *Impulse* device operated on the C major scale, I had to avoid the sharp and flat keys on the *Launchpad*'s chromatic grid.

The improvisation started with gentle chords from Caroline and David accompanied by a slow drumbeat. Ricky played rhythmic chord clusters. David commented “I love doing this”, referring to the finger tapping technique he was using. I complimented the technique. Thomas shouted, “Bug off!” which I incorporated into a short, improvised song. I stopped my drumbeat to sign to Eddie to explain how the pitch bend control worked on his MIDI keyboard. Ricky had been working out a motif on his MIDI keyboard which he mastered during this pause. Hearing it, I began a new drum pattern to accompany it. This was a short melody that Ricky had composed previously, using the opening bars of Beethoven’s *Moonlight Sonata* as inspiration.

Trevor R. held the PadKontrol for Thomas, encouraging him to play. Thomas reached out and made contact, though his synth was difficult to hear. As David continued to play he said, “I wish my father could see this” and began talking about his desire to buy his own guitar “a red one like Hank Marvin”. I commended him on his choice. Trevor K. became more adventurous with his playing and played a blues-sounding solo. Trevor R. was David and I kept talking about guitars – namely Brian May’s self-designed guitar and twin-necked electric guitars.

Caroline began playing a 2-note motif (F#-E), using the 1<sup>st</sup> and 3<sup>rd</sup> strings of her guitar. Her playing intensified as David called a countdown from three to end the improvisation. After everyone had stopped playing, Ricky played a loud, triumphant sounding chord.

***Difference (Asignifying rupture).*** This event shows the group improvising and interacting in a dense and dynamic manner. There were certain notable idiosyncrasies brought to the improvisation by the musicians which could be indicative of multiple processes of meaning-making within the community of inquiry explored and expressed

through the act of joint musicing. Throughout the event the music remained coherent, even as different musical or relational aspects gained or lost prominence along the way.

The tendency of some of the musicians to talk while playing provided an interesting counterpoint to the ongoing inductive coding theme, present since Cycle 1 of *talk vs. music*, whereby discussion or planning were considered incompatible with musicing. In this event, David and I and later, Eddie and I did both simultaneously, giving feedback while improvising. This could be considered a sign of the musicians' growing familiarity with their DMIs and with each other as a community of practice/inquiry.

***Cartography.*** This event shows the research group interacted on multiple levels, while maintaining musical contact throughout. The modified thematic concern had deemphasized the performative, and by association, evaluative imperative of the group's music making. This event shows a community of inquiry comfortable with itself and with little to prove.

**Limerick reading 5 – Ricky in charge.** This cartography maps a propulsive improvisation by the group, facilitated by Ricky. This was a first for the group and signified a further deterritorialisation and reorganization of the relations within the group. Ricky showed aptitude with Ableton as he comfortably managed the group's DMIs, while I was able to fully concentrate on musicing with Trevor R. and Darren.

***Background to event (Data fragments and connections).*** This event was identified in Cycle 3, Session 15 of the Limerick PAR group, during the group musicing portion of the session. During the set-up period of this session, I had been called away, so Ricky offered to set up the DAW software and MIDI controllers. He successfully facilitated Thomas, Trevor R. and Darren's choices of DMI and helped them to configure them. After my return, I joined the group as a musician while Ricky continued to facilitate.

Ricky controlled Ableton from my laptop. Using the mouse pad, he monitored the mix, as well as adding effects and changing synth settings on-the-fly. His personal experience with Ableton was considerable, though this was his first time working with multiple inputs and musicians. Darren had chosen the *Launchpad* controller and the *Jonathon LP* drum rack which routed 4 drum kits to fill all 64 pads (see Limerick Cycle 3 reports). Thomas had been offered a MIDI keyboard with the *Autosinfonie* rhythmic synth

Trevor R. had chosen an instrument rack he had created in music therapy which he called his *drum and bass* rack. This contained two synths played concurrently – *Persian drum*, a frame drum sound and *80's bass*, a muted bass guitar sound. Each synth was routed into a separate *arpeggiator* effect. The *arpeggiator* for the drum synth was set to a 1/16<sup>th</sup> note swing rhythm, while the bass guitar *arpeggiator* was set to a 1/16<sup>th</sup> note straight rhythm. The drum *arpeggiator* pattern was set to *random*, creating random patterns from input chords. The bass *arpeggiator* pattern was set to *play order*, creating an arpeggio in same order that notes of the input chord were pressed. This created a sustained polyrhythmic pulse with a *tribal* feel. The *hold* function was engaged to sustain an arpeggio after the chord was released. Trevor R.'s *drum and bass* instrument rack thus allowed him to create fast, intricate arpeggios with a single chord cluster.

I requested a *mono* synth with the *glide* function enabled. Ricky chose a simple lead sound (*Dual Osc*) and reduced to polyphony setting to 1 voice. This allowed me to play single note melodies, but not chords. Activating the *glide* function programmed the synth notes to slide in pitch from one note to the next. This configuration was useful for *legato* playing and creating *trills*. This DMI resembled the sound of the dance group Orbital.

The event began with Trevor playing a chord cluster, creating an ascending chromatic pattern on his DMI. As I worked to first match it, then to play a contrary motion motif, Ricky

informed me that he had added my DMI saying “can you hear that, it gives it a bit of a boost. Darren was cycling through the samples on the *Launchpad*, one-by-one.

Trevor R. played a second, higher chord cluster with a higher velocity. After taking his hand away, he appeared surprised that the bassline was still playing. I played short stabs to complement his playing. Darren answered with cymbal crashes. Ricky adjusted with the glide settings on my VST, increasing the time it took each note to glide to the subsequent note. This created a detuned effect as I played. Ricky laughed, saying “it sounds like you’re drunk!”. Trevor shouted, “Ah Jason!”.

Darren found a dissonant crash sound, then returned to cycling through the *Launchpad*’s pads. Trevor was very excited and seemed somewhat bemused by the sustained bassline, before triggering a new arpeggio. I asked Ricky to lower the glide percentage back as I was finding it difficult to play. As he did so I appeared confused as to why Trevor was so amused. Thomas began laughing also. Trevor began playing faster chord changes seemingly getting to grips with the *hold* function. I attempted to reflect his changing arpeggios. Trevor then hit a single key, creating a pulsed single note.

As I started matching this, Ricky added *Ping Pong Delay* to my track. Trevor and I continued this single note improvisation, as Darren cycled through more drum samples. Trevor called a countdown, but no-one responded. As he called a second countdown, I counted with him. Everyone stopped the second time with Darren ending on a flurry of cymbal crashes. Trevor’s arpeggiator kept playing. I pointed out the stop button on Trevor’s R.’s keyboard, which should have stopped the recording, but this did not work. Ricky stopped the recording from the laptop Darren stretched back. Trevor shouted, “THAT’S DECENT”. I laughed and credited Ricky for setting everything up.

***Difference (Asignifying rupture).*** This event showed the group operating in a new configuration, disrupting the relations with the assemblage of the group. Ricky facilitated the

group adeptly, as well as playfully manipulating and disrupting my DMI. Trevor R. had a strong reaction to this playfulness and created complex melodies that would have been very difficult otherwise, and that I struggled to match. Intensity was also increased with the force he used to play successive chords, which sustained as the arpeggiator repeated the pattern.

Thomas did not actively engage with his DMI but did respond to the energy in the room and vocalised accordingly. Darren, though mainly exploring the DMI to test its samples, did so rhythmically and joined in the group improvisation in contextually appropriate ways, with the dissonant piano sample during in the chaotic portion of the improvisation where Ricky was disrupting my DMI and at the end of the improvisation, following Trevor R's countdown.

Ricky's playful manipulation of my DMI, prompted amusement from the rest of the group. This was followed by a genuine effort to augment my synth sound with a delay effect. This took skill to do and allowed Ricky to contribute to the group's functioning at a challenging level. Though Ricky was in control of the facilitation and DMIs, it was Trevor R. who decided when to end the improvisation.

*Cartography.* This event shows the group operating in a new configuration, in terms of roles and access to DMI functions. This reflects the continuous deterritorialisation of the group's relationships through music throughout the research project. As Ricky led the session and I took part as a musician, this energised the group and engendered playfulness and humour. The *participatory hierarchy* had become more dynamic. It no longer concerned what expertise I, as facilitator, could put at the disposal of the group, but what expertise *any* co-researcher could use in service of their community of inquiry.

### **Conclusion**

These readings mapped five events that occurred within the Limerick PAR project, across three research cycles. The events were selected from a rhizomatic matrix that delineated the

different strands of the research – technological, musical, interpersonal and methodological. Selection was determined by *interestingness*. Where a dense group interaction appeared to have meaningful rhizomatic aspects – that is heterogenous factors operating in a connected manner that indicated *becoming-musician*. The focus on immanence allowed the participatory aspect of the research to be preserved, offering another avenue for the thematic concern *to show what we can do* to be articulated, and allowing for the more tacit aspects of the group's meaning-making process to be presented.

The modular nature of the available DMI resources created affordances for the deterritorialisation of musical parameters, functions and affordances that would be fixed and inflexible in many traditional acoustic instruments. The electric guitars were capable of being modified to suit different playing styles and movement profiles, augmented further by the signal processing options within the digital audio software.

The MIDI controllers had diverse interactive elements that could be configured directly to suit the musician's preferences, or *remapped* onto chosen functions within the DAW, Ableton. MIDI and audio effects offered additional options for transposing or augmenting notes as well as creating rhythmic or timbral effects. The capacity to play multiple VST instruments at once with separate effect chains gave even more control and choice to the Limerick musicians with which to express themselves and connect with each other musically. The incorporation of global controls into the DMI interfaces allowed musicians to influence and manipulate each other's music in a further expression of the minoritarian nature of the research process.

While the readings were selected independently from each other, based on their specific features, taken together, they indicated an evolution in the community of practice/community of inquiry regarding the *participatory hierarchy*. That is, my role within the group changed as the co-researchers' skills with the DMIs developed. This was a continuous disruption of the

group dynamic within the research context based on acquired practical knowledge, thus highlighting the centrality of participation, collaboration and minoritarian focus within this research project.

### **Ennis Rhizomatic Readings**

**Ennis reading 1 – Tainted Love.** Jonathon and I shared a moment of joy during a rendition of the song, “Tainted Love”, when using a newly acquired wireless drum controller. The quality of Jonathon’s performance surprised both of us, leading to a disruption in the musicing of both players. The event suggests a role of isomorphism – the similarity of the interface to the instrument sound or role being played in the Jonathon’s, *becoming-musician*.

The relevant elements of the event; Jonathon’s capacities, preferences and participation, the modular music technology resources, adapted song material, and my personal and musical responses, overlapped and interacted as they would in a standard session. It is the specific overlaps in *this event*, the ownership of the entire process that is thus afforded and possibly (given the nature of the recording itself), the *witnessing* of this skill that made the event interesting.

**Background (Data fragments and connections).** In this event, from Cycle 1, session 4, Jonathon and I performed the song “Tainted Love” (Cobb, 1965) on electric guitar and wireless drum controller. The controller belonged to the Xbox game Rock Band™ and had been recently donated to the music therapy programme. As the Xbox is Windows™ compatible, the controller was connected to the PC through a wireless Xbox controller USB dongle. Using a programme called *Joy2Key* the buttons were assigned to alphanumeric keystrokes. The keystroke messages, in turn, triggered MIDI notes through the *computer MIDI keyboard* function in Ableton. The *scale* MIDI effect was used to refine the configuration further. The MIDI signal was then routed into the *Trad Rock* patch of the *Impulse* drum VST. The controller was modified by replacing the proprietary kick pedal with

a *buddy button* assistive technology switch that Jonathon could trigger with his foot simply by leaning forward slightly.

Jonathon usually took the role as the group's percussionist, using the Korg Padkontrol and a drum VST. He was keen to play something more resembling a real drum kit and chose the song "Tainted Love" to perform with me. Chime and Paraic were also present for this event, as witness. Jonathon asked for a recording to be made for his family. The interface was not velocity-sensitive, so the drum samples were played at a consistent intensity and volume, regardless of how hard or lightly Jonathon struck the drum pads.

Each part of the DMI interface was configured to increase access for Jonathon to his tacit musicality, or presentational/practical knowing. There were different degrees of success, but new possibilities also. Jonathon seemed to play intuitively, using his whole body. He kept a steady beat, added drum fills and followed the simplified song structure set by me. His efforts delighted both himself and me.

***Difference (Asignifying rupture).*** A *line of flight* was identified in the literal *burst* of emotion, perhaps *joy*, between Jonathon and I every time Jonathon prepared for and completed a big drum fill prior to the chorus. This involved the actualisation of previously virtual, or implicit connections that released new capacities to act and respond. Jonathon successfully transferred his percussion skills from the previous version of his drum interface to the wireless drum controller.

At these moments, there was a build-up and release, both Jonathon and I laughed to the point of interrupting their musicing – I missed some lyrics, Jonathon stopped playing altogether. This is a literal rupture in the performance. In this moment, Jonathon seemed to have surprised himself at having exceeded his own expectations. Always an enthusiastic musician, this experience was a reference point for Jonathon's pride in his abilities for the rest of the project.

This line of flight was generated through new possibilities for interaction and musicing offered by the introduction of a new form of input (the wireless drum controller) into Jonathon's musical interface and the adaptation of the physical, technological and musical properties of the device to facilitate Jonathon's musicing. Some properties of the interface were preserved, even when tangible, interactive features of the input/processing/output were replaced (that is, the PadKontrol by the RockBand™ kit). Witnessing occurs in-session by Chime and Paraic, though Paraic is more directly engaged with me – and outside of the session, in the sharing of the video with family and with the group in subsequent sessions.

**Cartography.** Jonathon's interface was based on the *idea* of an acoustic drum-kit, using MIDI controllers and VSTs to approximate the real thing. In this event, the isomorphism between the *virtual* kit and the *ideal* kit was increased with the integration of the new controller into the virtual kit. The repurposing of the video game controller to a live MIDI instrument was an act of deterritorialisation, creating new connections and new possibilities beyond the initial function of the device. The virtual concept of the *drum-kit* was maintained while the actual DMI interface consisted of components and connections that could be switched, reconfigured or upgraded. That the MIDI signal could be routed and transduced in different ways made the MIDI protocol useful to us throughout the research. That is, the modular, flexible technology interface was a dimension of a larger multiplicity (Deleuze and Guattari, 1988).

Each level of the interface (input/processing/output) was configured/reterritorialised to Jonathon's abilities in a way that allowed new expressions of his tacit musicality (presentational knowing) that surprised even him within the performance. Jonathon's skill with the sticks and the use of his use of the buddy button revealed or generated a new dimension of practical knowing/flourishing, or *becoming-musician* quickly enough to surprise and please the main actors in the event, Jonathon and myself. I had simplified the

song structure, yet Jonathon intuited the structure, anticipating peak moments within the song.

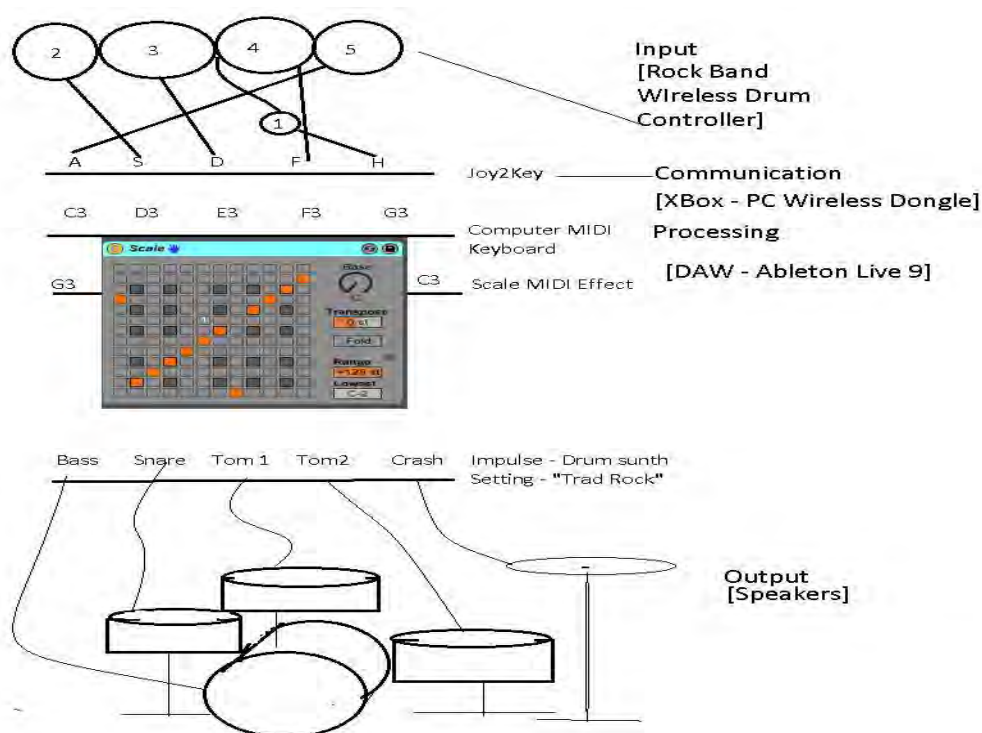


Figure 26. An illustration of how the wireless drum controller's signals were mapped to the DAW's drum synth to best resemble the layout of an acoustic drum kit.

**Ennis reading 2 – Knocking on Heaven's Door.** This cartography is of an event in which three members of the group played a song, “Knocking on Heaven's Door” (Dylan, 1973), while the other two participants attended. The end of the song led into an improvisation based around Gerard's playing. The addition of guitar effects to his DMI interface within the DAW created new musical possibilities for Gerard – leading to increased control and a modified style of playing. The question of affective synchrony between all participants regarding the song material, its tone and content occurred through the rhizoanalysis. Affective responses seemed to connect with tacit musicality in the moment – as something immediate rather than a quality of interpretation. Song material and improvisation

were also blended or deterritorialised. The effort, motivation or desire required to engage with the interfaces, however configured, is acknowledged as a connective dimension in musical becoming.

***Background (data fragments and connections).*** This clip is from the musicing section of Session 4 of Cycle 2. Jonathon and Gerard had chosen the RockBand™ wireless drum kit and wireless guitar controllers respectively, connected to the PC as MIDI controllers. Gerard chose familiar VST settings – a nylon string guitar sound with a MIDI effect (*chord*) adding a 5<sup>th</sup> to each note, allowing him to play power chords with single button presses. Paraic had a drum pad controller with a rhythmic synth but did not interact with it in the session. I played electric guitar. Chime chose to listen for that session.

The group played songs in this session. When Jonathon asked for Guns N' Roses version of “Knocking on Heaven’s Door”, I offered to change Gerard’s guitar effect to suit a rock/heavy metal style. I found and loaded a guitar effect called *ZZ Bop-A-Legro*. This effect combined distortion with a *patternizer* effect. The patternizer cut the incoming signal at pre-set intervals (either milliseconds or in time with the global tempo of the DAW), creating a rhythm from a sustained input. Gerard chose to keep the effect, which had the function of overriding the rhythms he played with the controller’s strum bar, standardising them to a certain extent.

Gerard’s playing in this song became more measured as he incorporated more pauses and silence into his playing. He held the neck of the controller in the space between the buttons, tending to play a single note, E, like an open string on an actual guitar. Jonathon worked hard as usual at his drum accompaniment, managing the foot switch while keeping a solid beat. He also shouted, “one more time!” for the last chorus. Chime and Paraic did not play but appeared to be attentive in a manner that matched the tone of the music. Their responses could be interpreted multiple ways, perhaps even as pensive or resigned. A short

improvisation was played at the end of the song, in which I built a chord progression around Gerard's single note and its rhythms.

An *affective synchrony* seemed to be present during the song material engaging all participants. The musicians concentrated hard on controlling their devices/sounds, while showing awareness of each other. The listeners were alert, seemingly attuned to the sombre tone of the song "Knocking on Heaven's Door". Some of this affective synchrony diminished during the improvisation at the end of the song, though the active musicians remained engaged.

The technology cannot make the task of musicing effortless, which would presumably render the experience meaningless, thus the work of the musicians (and listeners) should be acknowledged. Being relaxed and motivated or engaged through participation in music can "make the body forget what it cannot do" (Berger, 2002, p. 137). This refers to *functional adaptation* and *cenesthesia*, in music therapy, which requires *feedback control* of ongoing conditions and sensations. This connects with Bateson's discussions of the criteria of mind (1972, 1979), which in turn influenced Deleuze and Guattari in their development of rhizomatic thought (1988). Given the influence of Bateson's writings on my own development since my undergraduate studies, I found this connection rather satisfying.

***Difference (Asignifying rupture).*** The participants in this event, whether playing or not, appeared focused and engaged in this event. This was attributed to a sense of coherence in the music, aesthetically (the tone of the performance) and stylistically (reproducing the rock feel of the Guns N' Roses version of the song). The new audio effect, which smoothed out the rhythms of Gerard's playing influenced the overall coherence of the music is implied in solidifying the style and tone. The familiarity of the participants with the song material and the commitment with which the musicians recreated it speak to fixed relationships, but the

transition into improvisation is predicated on Gerard's role as guitarist and the incorporation of new elements into his interface.

**Cartography.** While rhizomatic reading is about making connections between fragments of data and identifying new linkages, it is also about the *intermezzo*, the in-between spaces. Much like Vygotsky's *zone of proximal development*, there is a gap, however small, between the musicians' abilities and the affordances offered by the technology. This gap is traversed through the efforts and motivations of the participants. The *affective synchrony* mentioned above could be described as the motivating conditions that bring the group members together, in a virtual sense (past familiarity with the piece) and in an actualised sense, (the performance itself).

The actualisation of the musical content signifies the dynamic tension between what is and what could be, the resolution of which, according O'Brien (1987, 1998), is positive change, which could be considered synonymous with *becoming* in Deleuzoguattarian philosophy and *flourishing* in the participatory inquiry paradigm (Reason and Heron, 1997). This is not a cause/effect relationship, the agency/intentionality of each participant is influenced by the *affective synchrony*, even as it contributes to its manifestation.

**Ennis reading 3– Coming together.** The event mapped here involved the group establishing a groove while improvising together. This was facilitated through moment-to-moment adaptation and reconfiguration of DMI interfaces during the musicing – the deterritorialisation of musical parameters, and reterritorializing into unique interfaces. This created a sense of novelty and spontaneity that energised the group (suggested by Paraic's response). This required my ongoing awareness of the heterogenous elements of the event – musical, affective, technological – described below as *rhizomatic awareness*. As with the previous reading, the balance between user effort and interface fit is acknowledged (Ripat & Woodgate, 2011) as a factor in *becoming-musician*.

**Background (data fragments and connections).** The event occurred during the musicing portion of session 7 of Cycle 2. Gerard was using the wireless guitar controller to play an electric piano VST. Jonathon had asked for “something different” than his usual interface and chose the PadKontrol drum pad controller with a saxophone sound. Paraic was presented with a rhythmic synth sound, his choice determined by affect. A drum synth was assigned to Chime’s keyboard and added an *arpeggiator* MIDI effect set to *play order*. This way, playing different clusters of white keys could create different rhythm patterns. This was the first time during the research that Chime was the only musician playing percussion in a session. I played electric guitar.

The event was identified in the session’s third improvisation. At the beginning, Paraic seemed to have withdrawn, lowering his head and curling up in his chair. Chime began to play a loud 4/4 snare pattern that caused me to comment “that’s more like it”, suggesting adding distortion effects to his Gerard’s sounds, accepted by Gerard. This created a *rock* feel to the improvisation. The musicing began again with the new sounds, which aroused Paraic, who reached for his keyboard. I stopped playing to check the keyboard was within reach, interrupting the music again.

The idiosyncratic DMI interfaces of the participants (and facilitator) involved cognitive, physical/ergonomic and aesthetic /expressive components that had little in common. Jonathon used the PadKontrol, a drum controller, to play a melody; Gerard played a piano sound with a guitar controller, adding distortion effects not usually used for piano. Chime and Paraic both used MIDI keyboards to create sustained rhythmic sounds, in different ways.

There seemed, however, a common sense of agency or ownership of their interfaces and a sense of meaningfulness to the connections and synchrony that could be experienced through their efforts. This means that people of diverse functioning shared a space on their

own terms while contributing and connecting with each other. These connections shifted, broke and were refined on an ongoing basis during the musicing. I managed these connections to some degree through my musical, technical and interpersonal/therapeutic resources. This happened dynamically and from moment-to-moment to greater or lesser degrees of success. This balancing of heterogeneous factors by me as facilitator could be conceptualised as *rhizomatic awareness*.

Ways of conceptualising the balancing and incorporation of functional diversity in group music making exist music therapy literature – the levels of mobilisation of intrinsic motivation through the continuum of awareness in humanistic music therapy (Boxill & Chase, 2007). Similar useful concepts exist in the epistemological basis of the research – the participatory inquiry paradigm’s acknowledgement of multiple knowings allows for participants to contribute to a community of inquiry according to their functioning level (Heron & Reason, 2008). The continuum of awareness and multiple knowings could be considered data fragments that exist within the rhizome/assemblage, on a virtual level.

Reason and Heron’s (1997) discussion of participatory hierarchy in the service of flourishing provides a counterpoint to the rhizomatic position on hierarchies. They advise lead researchers to manage the power balance with participants by putting their expertise in the hands of those with less power. This could be considered *arborescent* in nature, though the reciprocity implied by their recommendations suggests more flexibility than the Deleuzoguattarian notion of hierarchy.

***Difference (Asignifying rupture)***. Chime’s exploration of his new interface energised the group (particularly myself) when he discovered the snare key (D3). The incorporation of guitar effects added a new dimension to the improvisation that roused Paraic to engage and play, if only briefly. Incorporating these refinements and additions while keeping the

musician seemed to be a somewhat precarious balance. Each adjustment risked disrupting the musician further, as my last adjustment of Paraic's keyboard showed.

There was validation of each musician's contribution, combined with a sense of novelty as Jonathon, Chime and Paraic engaged musically in new ways, contributing to and drawing from their connections with the overall musical environment. The change – or becoming – manifesting in this clip/event was signified by Paraic's arousal and engagement with his MIDI keyboard, leading to a period of improvisation where the whole group was engaged. This occurred not necessarily through a single *rupture* or factor, but due to an accumulation of conditions that came into balance through ongoing refinement and negotiation. The sensitive responsiveness to the various factors at play could be described as *rhizomatic awareness*.

**Cartography.** The putative *rhizomatic awareness* required for facilitation and the consequent balancing of the heterogeneous elements of the session cannot be separated from the awareness and agency of the participants. The affective engagement of each participant is what energised the connections and gave the technological/musical/relational environment meaning. This was negotiated on a moment-to-moment basis, with no certain outcome aimed for, though not a matter of chance either. If improvised music is inherently rhizomatic, sending out lines of flight (Deleuze & Guattari, 1988), then improvising, or musicing in passive ways, function as possibilities for connection that are actualised when these lines connect. This required attention and quick action from the musicians to sustain and develop the connections. In this clip, moments of connection are not necessarily preserved or maintained, as my focus shifted, but responsiveness was perceptible throughout. The process of *becoming-musician* was shared by all in the group, including me as facilitator, deterritorialising the expert/non-expert dichotomy that Reason and Heron's notion of hierarchy sought to address (1997).

**Ennis reading 4 – Serendipity.** This cartography maps an event where intentionality and contact were in flux as the participants negotiated their DMI interfaces while musicing. Jonathon’s exploration of a new interface led to a moment of discovery. The participants appeared to have different relationships with the technology interfaces in their musicing. For some musicians, there was from comfort and enthusiasm with trying new interfaces, for others a sense of growing confidence with a preferred interface.

***Background (Data fragments and connections).*** This event was taken from session 4 of Cycle 3. Jonathon chose GarageBand on the iPad and experimented with the app by changing patches (instrument sounds and graphic interfaces) frequently. I played a double bass synth on the Launchpad (64-pad MIDI controller). Paraic and Chime ended up with each other’s usually preferred interface. Paraic had the MIDI keyboard with percussion synth and arpeggiator effect, while Chime had the MIDI keyboard with a synth/MIDI effect rack that had been developed for Paraic the previous week. This involved grouping two identical tuned percussion synths for playing by MIDI keyboard. One of these synths was run through an arpeggiator effect to allow sustained rhythmic melody. The other was run through a velocity effect set to maximum (127). This meant that initial contact with the keyboard would bring a high level of feedback, while the rhythm would continue to play at a lower velocity level (the actual velocity input of the player) if contact was maintained. This had been to maximise gestural transduction and feedback for Paraic. This configuration matched Chime’s gross motor capacities well also.

The final sequence of the improvisation was chosen for rhizomatic reading. I played a repetitive bass pattern to match a two-note bell pattern played by Chime. Gerard played single E notes on his guitar controller. Jonathon used the “smart guitar” function of Garageband (interactive strips on the screen that play individual chords in a key). He began by cycling through the chords in different combinations. This gave colour to the repetitive

ostinatos being played by the other musicians. This seemed to involve the tacit and sometimes serendipitous nature of musicing within the research sessions. Jonathon commented on his efforts as he played and watched me for my response. Jonathan laughed at the end of one progression. Gerard's playing became more arrhythmic as he changed playing position to use the *solo* buttons on his controller. I ended the improvisation by checking in with Gerard about his audibility.



Figure 27. The Smart-Guitar graphical user interface (GUI) on Garageband.

In this event, the musicing of the participants seemed to harmonise in a way that may not have been entirely deliberate. There was a high degree of intentionality in Gerard, Jonathon, Chime and my individual playing, while Paraic was engaged as a listener. While moments of musical harmony may have been serendipitous, the engagement of each musician in their response to the music was genuine. There seemed to be less overt facilitation by me as the group came into contact organically.

The interaction between musician/interface in generating music and connecting to other musicians through musicing had different determinations for the players depending on their type of participation (active or passive), their familiarity and facility with their interface and consequent (or incidental) awareness of the musicing of other participants. These determinations cohered within the chosen event to create an aesthetically pleasing assemblage of musical lines, apparent to the players in the clip, and to me as I selected and

read the event. The configuration of sounds (simulated acoustic instruments – drums, double bass, acoustic guitars and tuned percussion) contributed to this effect and contrasted with the more synthetic electronic sounds that tended to be chosen.

In this event, I appeared more absorbed in the musicing and the development of the bass-line than in monitoring the other musicians' DMIs. This looser, less overt facilitation corresponds with the Dionysian mode of participatory research (Heron & Reason, 2008), emphasising the imaginal, expressive, impromptu and aspects of PAR. In the reflection portion of this session, Jonathon reported that "it felt like we were together", holding his hand to his chest.

***Difference (asignifying rupture).*** The groove established by Chime's 2-note motif and my repetitive bass line was joined by Gerard's single note playing. Jonathon's addition of guitar chords brought colour and harmony to the music, first incidentally (as Jonathon cycled through the available chords as laid out in the Smart Guitar GUI) and then deliberately, as Jonathon chose a sequence to create a progression with, resolving on Em, consistent with the tonality established by my, Gerard's and Chime's playing. This brought a response from all participants, including Paraic, who became more animated, raising his arms and moving to the music. Jonathon's exclamation "Ah-ha!" showed his quick grasp of the new interface. Different processes of *becoming-musician* appeared to have come into phase.

***Cartography.*** The deterritorialisation of music through technology to facilitate *becoming-musician* was expressed during this event in different ways and at different rates for each participant within and between research sessions. This event involved the synchronising of individual processes of *becoming-musician* within a group musicing process (that is, *becoming-musician together*). The affective response showed the participants' awareness of this, explicit or otherwise. My facilitation, it could be suggested, was replaced

by serendipity and tacitness, but also by the growth of trust and reciprocity within the musicing/PAR process.

Each musician was working with the idiosyncratic properties of their DMI interface, with different degrees of familiarity. At the same time, the musicians maintained awareness of the group musicing in general, in order to contribute and respond to the improvisation. Jonathon worked with an entirely new interface for him, yet his exploration connected with the musicing of the group in an interesting and stimulating way. Chime's DMI had properties that were like interfaces he had used (MIDI keyboard with arpeggiator), but with melodic rather than percussion synth. Holding his hand in position to keep the ostinato going for the duration of the event required effort and concentration, allowing him to play a central role in the improvisation. Gerard, using an interface that was very familiar to him, explored different ways creating rhythm and melody by changing hand positions.

The flexibility and modularity of the available DMI resources facilitated idiosyncratic relationships between user/interface – whether motivated by novelty and exploration, pragmatics, or refinement. This allowed for the joint creation a dynamic musical environment connecting the musicians in *becoming-musician-together* in a moment-to-moment community of inquiry.

**Ennis reading 5 – Paraic's voice.** The event at the centre of this cartography concerned the deterritorialisation of fixed relations within the working of the research group itself. A familiar dynamic or groove was established quickly during an improvisation, to be given a new dimension when Paraic joined in with his voice. The group's music was unobtrusive and subdued, letting Paraic take the lead, as he vocalised in key. This event foregrounded the tacit participation of Paraic, whose responses influenced the more active participants' musicing decisions. New musical interfaces were used in this event, in particular Jonathon's touch screen keyboard.

**Background (data fragments and connections).** This event occurred in session 10. Gerard had chosen the wireless guitar with the *French guitar* synth – a guitar sound combined with a synth sound with long after-touch. This meant that Gerard could hold the strum bar of the controller down and get a continuous note after the guitar sound had faded. Chime declined to play, choosing to listen instead. Jonathon chose the iPad app *GarageBand*, selecting the touch keyboard patch. I chose to play the Launchpad MIDI controller and bass synth. Paraic was given the MIDI keyboard/bell synth/arpeggiator interface as in previous weeks.

Gerard's guitar rhythms sounded chaotic at first, but he settled into slower, single note playing quickly. I initially played a bassline and Paraic's synth simultaneously, to demonstrate the sound. Paraic roused from his curled-up posture and vocalised. I acknowledged this with delight ("Paraic likes that sound"). Meanwhile, Jonathon explored GarageBand's *graphical user interface* (GUI) on the keyboard setting. This involved an on-screen keyboard, with a *glissando* option that allowed melodies to be played as a continuous pitch.

Paraic vocalised intently as the musicing continued. I created a pleasant, major-sounding bassline. Gerard's guitar playing settled to a steadier rhythm, sometimes holding a sustained E note. There was a coherence to the music that was pleasant in review, yet I was curious about how deliberate that was in terms of the group's co-creation of that music. Paraic's response was stimulated one way (hearing the arpeggios on the bell synth) but sustained another way (his vocal interactions with me). The event ended when the group heard another service user crying outside the room.

I created a simple bassline around Gerard's single note playing, a familiar dynamic. Jonathon improvised along as he figured out the new aspects of his interface. I reached for Paraic's keyboard to demonstrate the sounds, bringing an immediate reaction from Paraic.

Paraic vocalised, which I matched vocally also. The bassline, guitar sound and Jonathon's synth playing had a pleasant, major tonality matching Paraic's positive affect in facial expression and vocalisation.

The idiosyncratic musical identities of the group members and the interactions that arise therefrom created a harmonious musical whole, with some degree of serendipity. This consistency was based in the tacit musicality, or presentational knowledge of the musicians, including my own, rather than formal knowledge of music. The DMI interfaces offered access to this tacit knowledge at different rates, sometimes within the improvisation itself (e.g. Jonathon's quick grasp of the GarageBand GUI) or over the course of weeks/months (e.g. Gerard's minimalist guitar style).

Paraic's purposeful musicing, through vocal, gross motor and affective modalities, was a response to the musical context and its technological basis. His initial vocalisations were not in tune with the music, but he did bring the pitch up to E, matching the group's tonality. This could indicate the difference between a para-verbal response and a musical response – another expression of tacitness versus explicitness in the research process, and the incorporation multiple knowings to support the generation of knowledge by people of diverse functioning.

*Difference (asignifying rupture)*. The group set to musicing quickly and in a manner consistent with preferences and practices developed over the course of the research. Paraic's initial response to the keyboard sounds, sustained through the event as a vocal interplay with me added a new dimension to the group's interaction. He vocalised in tune with the group's music, contributing as he responded. My attention was focused on maintaining this engagement, while incorporating the musical components of Jonathon and Gerard's playing into his own. Paraic's singing provides the final line of flight that connects those sent out by the other musicians as they negotiated their interfaces.

*Cartography.* The music technology resources offered unique and individualised opportunities for group members to access their own, tacit musical resources and mobilise them in their own way, at their own pace. The group members were comfortable with their DMI interfaces and established a groove quickly in this event. This demonstrated trust and reciprocity through musicing. Paraic, as a more passive participant, responded to the musical environment created by the rest of the group and music technology. His responses to the music affected the group's playing, as his vocalisations were validated and incorporated into the music.

Paraic's vocalisations stood out as the *difference* in this event for their intensity and musical congruence with the rest of the group's playing. His transition from passive participant to active participant created a shift in the established relations of the group sang along with the improvisation, accompanied by me. Paraic's process of *becoming-musician*, in this instance (and perhaps throughout the research), is tied to that of the other musicians. New dimensions in the group musicing dynamic, supported by growing competence with the DMI interfaces (i.e. practical knowing) could be said to bring about becoming-musician *together*.

### **Conclusion**

These readings were selected from a larger group of events for their salience rather than for how they relate to each other. This was to avoid overcoding or repetition. There seems, however, to be a range of intersecting perspectives represented by these readings overall that signify *becoming-musician* or more importantly for a PAR project *becoming-musician together*.

The modular DMI resources offered multiple avenues for the deterritorialisation of music/technology in the *becoming-musician* of the participants, including me as lead researcher. This shared experience of becoming accommodated the idiosyncratic knowings of the participants in a manner that was tracked, though not necessarily directed by me. This

sharing of experience and openness to new possibilities highlights the minoritarian nature of this research.

Individual relationships with DMI interfaces allowed for the authentic adoption of musical identities – Jonathon as *drummer*, Gerard as *guitarist* – and the motivation to engage with musical material as a group. These roles themselves were not concrete, but rather remained open to change and reconfiguration as Jonathon explored new ways to create rhythm and Gerard experimented with audio effects and synth sounds as he refined his playing style. Pragmatic issues of enhancing access to the DMIs without reference to an *ideal* or real-world instrument created new possibilities for participants such as Chime, who could lead an improvisation with very little physical effort.

The degree of responsiveness of the group to each other through musicing (passive and active) was often dependent on the fit of the DMI to the user within a given event, that is, the degree to which tacit musicing was possible. For Paraic, his voice was the most immediate resource for musicing, allowing him to respond to the evolving musical environment and have that response validated and incorporated by the group. Song material interpreted by the group through arrangement and instrumentation offered another form of connection for the group.

These readings present different aspects of the group as *becoming-musician* that cannot be separated, but rather operate at different levels of intensity within a given event. These events are characterised by the deterritorialisation of musical parameters, musical content (improvisation or composed material), the interactive and virtual aspects of the DMI interfaces and the relational/participatory aspects of the research group itself. The rhizoanalysis is necessarily partial and incomplete but provides interesting insights into the group's work focusing less on interpretation than capturing processes and highlights.



## Chapter 7

### Discussion

This research sought to investigate idiosyncratic and collaborative uses of mainstream music technology in person centred music therapy practice. This was done through participatory action research process with collaborative co-researcher engagement between the participants and myself. The research process involved engaging in iterative cycles of planning, action and reflection to address an evolving thematic concern. Implicit in this research question was an interest in supporting tacit musicality, engendering empowerment and relating, and exploring new ways of connection and expression through music.

### Overview

The empowering potentials of music technology in music therapy had been observed in my existing practice with adults with disabilities at Enable Ireland. These potentials were conceptualised as focused around issues of access, agency, aesthetic choice and environmental control. It was perceived that the research process offered the opportunity to achieve further clarification of these potentials. The skills and applications already developed by service users themselves, in collaboration with me or otherwise, deserved to be further articulated and more widely shared. Many of the existing applications were idiosyncratic, multifaceted and tacit. The research process was intended to give clarity to the need for these not to be manualised or otherwise developed as tools or instructions for groups processes. Rather, music based group work with the participants was intended to reveal the opportunities and affordances of musicing with DMIs.

Music therapy literature has provided little reference to mainstream music technology, and less about how practitioners use it. This can be contrasted with the abundance of literature on bespoke or specialised devices. These devices tend to be characterised by technical complexity, and high expense because they are created in small quantities rather

than mass produced. The available literature did not present client or participant perspectives on the potentials or appeals of music technology in therapy.

Participatory action research was chosen due to its focus on undertaking research *with* people to create tangible benefits. Participatory action research is a frequently used, useful, insightful and recognised method. Though it lacks a single clear definition, it has been broadly described as a form of collective, self-reflective inquiry to improve social or educational practices or, more accurately for this research, participants' understanding of practices and the contexts of those practices (Altrichter et al., 2002).

PAR was considered appropriate for its flexibility, contextual sensitivity and its inherent resonances with the person centred planning model used at Enable Ireland, along with its alignment with the theoretical underpinnings of my own music therapy practice. Its potential to engender empowerment for co-researchers, as a research outcome or otherwise, made it appealing. The shared ownership of the research process was another positive consideration in the final choice of PAR as the research method.

Throughout the research it became clear that PAR is an approach in which user voice could be foregrounded in a manner authentic to the host culture – adults with disabilities attending a person centred service. Pre-existing participatory relationships due to my insider status facilitated the development of the research process and of the transition of the groups on each site from communities of practice to communities of inquiry. Using the participatory inquiry paradigm, which acknowledges multiple forms of knowing optimised the inclusiveness of the research and incorporated the knowing of functionally diverse participants.

Two groups, one based in Limerick and one in Ennis, engaged in concurrent and discrete PAR projects over the 3 PAR cycles between April 2013 and June 2014. In Limerick, service users formed a research group outside of their respective music therapy

sessions to explore music technology, improvise as a group, and reflect on their experiences together. In Ennis, the PAR methodology was incorporated into an existing group music therapy programme that involved group improvisation and technology.

Over the course of 3 research cycles for each group, we developed practical music skills with digital musical instruments (DMIs) rooted in the co-researchers' tacit musicality. These skills were shared and disseminated through public performances and public lectures. The Ennis group used video review to reflect and respond to their ongoing learning. Some co-researchers, including myself, learned more about group facilitation skills.

Once initiated, the initial research concern was reframed to reflect the participants' perspectives. Both the Limerick and Ennis groups expressed a desire to share their skills with music technology through performance. These thematic concerns were refined and deepened over the 3 cycles as the groups evolved from communities of practice into communities of inquiry. Each participant in the two groups had the opportunity to contribute to and influence the trajectory of the research – the refinement of the thematic concerns, the actions taken to address those concerns, and the manner in which that action was reflected on

As facilitator, I was committed to prioritising *user voice* (Baines, Edwards, McCaffrey & Noone, 2015) within the research process. There was some tension between the researcher and practitioner elements of my role, particularly in terms of perplexity in interpreting or monitoring the assent and participation of Paraic in the Ennis group. Such issues were less complex with the Limerick group, where the co-researchers' music therapy programmes were separate from the research process, allowing participants to withdraw from research without disrupting their music therapy provision.

There were multiple challenges encountered through the research process. By the end of the research, neither group had settled on a final analytical frame. There was difficulty in representing multiple knowings authentically. Additionally, there was the issue of curating

the final doctoral thesis in a manner that preserves the participatory nature of the action strand of the research.

These challenges were addressed by adopting a rhizomatic perspective on the completed work, in particular the group's weekly improvisations. These were positioned as the essential meaning making process of the group and the main modality of interaction for the co-researchers. This could be described as *action research in the moment* (McKewn, 2008). Rhizoanalysis was used to *read* the group performances and improvisations – to identify *events* that signified *becoming-musician* through contact with music technology. *Becoming* was considered analogous to *flourishing* or practical knowing within the PIP. This approach treated the research data from the group improvisations immanently. The minoritarian nature of this qualitative approach corresponds with the emancipatory, adaptive and postmodern position of the PAR methodology (Colebrook, 2002; Drummond & Themessl-Huber, 2007).

In participant-led research, the voices of the participants/co-researchers must be prioritised at all stages of the research (Aldridge, 2017). For this project this philosophy extended to the application of the rhizomatic analysis method and the curation of the thesis.

The aim of participatory or emancipatory research is to confer control over the *telling* and ownership of the data on to participants, and to give them opportunities to present something of themselves as participants, narrators and researchers (and thus to avoid the risk of misinterpretation or misrepresentation) (Aldridge, 2017, p. 28)

Where the analytical work of the PAR process was partial or incomplete, the steps taken to resolve this after the completion of the action project (Zuber-Skerritt & Perry, 2002) continued to foreground the moment-to-moment interaction, learning and meaning-making of the co-researchers.

Rhizoanalysis offered a unique way to present the group's data immanently. The notion of the participants and their generated data *speaking for themselves* (Aldridge, 2017) was at

the core of the development and application of this approach, for conceptual, ethical and methodological reasons, and primarily because it represented the reflective work of the PAR co-researchers themselves.

Rhizoanalysis was engaged to resolve the research process, at least partially, without needing to resort to tautology. A more taxonomic, or arboreal, approach to describing the use of mainstream music technology could not have captured the minoritarian quality of the research teams' work. The rhizomatic readings conveyed the essence of the broader PAR project through the selective identification of meaningful moments or *events of becoming-musician* achieved through the exploration music technology within a community of inquiry.

Refinement, adaptation and application of music technology expressed a reciprocal dialectic for the deterritorialisation of music technology in the engendering of *becoming-musician* for each player/participant/co-researcher. Each person used very different interfaces to engage in similar patterns of refinement and experimentation.

### **Findings**

While practical knowing, and associated flourishing are considered the main outcomes of a participatory action research process based on the participatory inquiry paradigm (Heron & Reason, 2008) articulating these outcomes can be difficult (Riley & Reason, 2015). In participatory action research “the sense making is in the process of inquiry in the cycles of action and research, in the dialogue of the inquiry group” (Riley & Reason, 2015, p.191). Though there is a temptation to articulate the outcomes in a more crystalline, directional or resolved manner than the data allows, the research process did engender a shared learning experience and meaning-making process in a participant-led manner, with tangible outcomes.

The outcomes of the research can be described in terms of the practical results of the PAR process engaged by the two groups – the development of the thematic concerns and the results of the actions taken to address them as well as the reflections that occurred in the

aftermath of those actions. This cyclical process generated practical knowing and empowerment through co-researchers' control of the research process as broad outcomes of the research process (Riley & Reason, 2015).

For the Limerick group the thematic concern *to show what we can do* was developed and evolved over three cycles. The group's reflections on their work brought nuance to the evolving thematic concern as they determined ways to ensure their performances were of a high standard. This required greater familiarity with the DMI resources as well as greater attention to each other's playing. These skills were then shared through public performances, both musical (presentational) and lecture-based (propositional). These experiences were not always satisfying for the group which stimulated reflection on the role of the audience in the group's work. This frustration did not affect the co-researchers' sense of confidence and pride in their skills with music technology. Their sense of connection and mutual respect developed during the research project was expressed clearly in the exit interviews.

There were iterations of meaning-making processes throughout the 3 cycles that, while partial or incomplete, contributed to the development of the rhizomatic analysis method and the subsequent readings. Through inductive coding of video material, and exploratory arts-based research reflections on recorded improvisations, I was able to present certain aspects of the group's work back to them for discussion and confirmation or rejection as we worked to develop a way to use our documentation to improve our practice and disseminate our learning.

A series of inductive codes were useful reference points throughout the research and had resonances within the major discussion points of the exit interviews. These codes were chaos vs coherence, talk vs action, humour and support, and pride, ownership and agency.

Table 3: The inductive codes developed after Cycle 1 in Limerick.

Inductive Code	Description
Talk vs Action	The tension between propositional and presentational/experiential knowing was often present as some participants preferred to talk and discuss while others preferred to just make music
Chaos vs Coherence	Encountering technical problems or navigating the musical chaos of up to 9 musicians playing at once. The importance of listening was reiterated by participants in terms of working towards a coherent public performance.
Humour and Support	The atmosphere of the group was consistently conducive to reflecting on problems and developing creative solutions.
Pride, Ownership and Agency	Whether through developing individualised applications or by regularly trying different interfaces, there was a strong sense of pride in the agency offered by music technology and a desire to demonstrate this agency to loved ones and the community.

David's idea of using recordings to create a *musical story* of the research group's work led to exploratory work within an Arts-based research paradigm which culminated in the idea to "let the music do the talking". This notion of immanent meaning within the weekly improvisations became a core concept in the adoption of rhizoanalysis as means of representing the group's learning and meaning making through music and music technology.

The rhizomatic analysis, or rhizomatic reading of some of the group's *meaningful moments* allowed a shift in perspective on the Limerick group's process, focusing on the *intermezzo* of the research process. The readings affirmed the person centred, minoritarian nature of the research through the identification of disruption and deterritorialisation of the

relationships within the group, whereby the facilitator/participant dichotomy was consistently challenged and reframed.

For the Ennis group, PAR was incorporated into a weekly session, also with a desire to perform and share skills. This established community of practice explored familiar and newly-introduced DMI interfaces and explored ways of reflecting on and feeding back their experiences. The co-researchers' relationships with music technology developed in idiosyncratic ways, whether based on issues of ergonomics, isomorphism with traditional instruments, potential for exploration or expression or aesthetic preferences. The group shared their work through a public performance which they were active in organising. The group's mixed feelings on the concert led to a deemphasis on public performance as a component of their thematic concern. The commitment of the Ennis co-researchers to developing and reflecting on their skills with music technology was maintained through the curation of a CD of the group's favourite improvisations from in Cycle 3.

The group frequently used audio and video review as part of their reflections. This gave them opportunities to engage and respond to their own work. Videos were often revisited and replayed as an affirmational and empowering experience for some co-researchers. The common practice prior to the research of creating CDs of each week's improvisations was refined to a more critical and selective purpose as the group chose their favourite improvisations for the *Best Of CD*. This selection process was characterised by the notion of *interestingness* within the improvisations, as well as the sense that the group's favourite improvisations were complete without requiring editing or manipulation. This criterion was used to justify the rhizomatic reading of this group's work as an extension of their *protoanalytical* meaning-making process and as a means of curating the PhD thesis.

Events were identified within the group's research recordings and read through rhizoanalysis to determine relevant factors of *becoming-musician*. For the Ennis group, this

led to reflection on isomorphism between DMIs and traditional instruments, the role of affective synchrony in group musicing, rhizomatic awareness in facilitation, the tension or balance between effort and user fit when using technology.

### **Comparing the Groups**

The two groups ran concurrently but were considered separately when undertaking the analysis. This was for a number of reasons. Primarily, there was no guarantee that the two groups would develop similar or compatible thematic concerns, actions or meaning-making processes, or that they would iterate or evolve in comparable ways. The groups were formed differently and with different compositions – Limerick was a specially formed research group while Ennis was an existing music therapy group. Early in the development of the research it was cautioned that two groups might create an unwieldy amount of data. However, there was a need to consider the ethical dimensions of running a research process at one centre and not the other; the centre not included may have experienced a status issue or concern with regards inclusion.

The development of two distinct groups led to differently functioning communities of inquiry. From a PAR perspective, neither group expressed an interest in the other in a manner that would have justified a combined analysis. This made for a large overall cohort, but the commitment to inclusivity took precedence. There may have been a way to treat each group as a connecting multiplicity within the rhizoanalyses, but this would have either been too complex, or risked over coding. Reading each group's data immanently was more effective when the groups' data was taken separately

That said, there were resonances between the two groups that it may be appropriate to outline here. Each group decided independently to base their thematic concerns around sharing their skills with DMIs through performance. This is consistent with the capacity-based and empowerment-focused nature of the research context common to both groups.

Each group experienced some ambivalence about their experiences of performing in public, though for different reasons, it would seem. Each group chose to focus on the experience of musicing together for their final cycles, demonstrating that they were not relying on the audiences to validate their capacities. In the rhizoanalyses, the concept of *becoming-musician* through deterritorialisation was formative in articulating the interactions within the groups – in terms of how DMIs were personalised and how the groups themselves functioned in general.

### **Role of Music Technology**

It was difficult to delineate the exact benefits of music technology resources propositionally across the three cycles and two projects. The flexibility, modularity and intuitiveness/tacitness of the devices and software we accessed stood out. Perhaps this is where the data *should* speak for itself, in terms of the groups' performances and rhizomatic clips, to demonstrate the consistent acquisition of practical knowledge with modular resources, developed and refined over time.

Rhizome theory offered a useful way to consider this flexibility in a way that affirmed the PAR process. The deterritorialisation of facilitator/participant relationships could be presented in terms of the acquisition of practical knowledge and the equalisation of the *participatory hierarchy*. The modularity of the DMI resources we used facilitated deterritorialisation of fixed relationships within an interface that would not be possible with a traditional or acoustic instrument. Thus the most important aspect of music technology was the facility to effectively de/reterritorialize musical parameters, aesthetic/stylistic options and physical features of the interfaces. This allowed a high degree of individualisation to ensure access to music making, ensuring the optimum opportunity to actualise co-researchers' musical intentions and potentials and engender *flourishing* and *becoming* as tangible outcomes of the research process.

### Contribution

This research was conducted with the axiological imperative that the service users' voices were of primary importance in engaging with the research question. The postmodern, Dionysian and minoritarian character of the research was essential in ensuring the research was sensitive and responsive to the co-researchers' preferences, motivations and creativity.

The participatory inquiry paradigm, supplemented by ABR theory optimised the inclusivity of this research by acknowledging and incorporating multiple ways of knowing, of interacting and of influencing the research process. Using musicing as a data generation modality was appropriate given the research question, but also facilitated participation of co-researchers who could not have accessed the research process in a more propositional or verbal manner.

In future research, participatory group musicing could be further explored as a flexible method of democratising the participatory action research process alongside such methods as Photovoice, citizen juries and World Café (Ortiz Aragón & Castillo-Burguette, 2015). Within the field of music therapy research, this work may help to highlight and support the fit between PAR and music therapy practice suggested by Stige (2005) and encourage music therapists to engage in collaborative practitioner research. The *micro-cycle* concept may be particular contribution for the naturalistic incorporation of PAR methodology into music therapy practice.

Deleuzoguattarian concepts and rhizoanalytic methodology offered a further means of foregrounding the co-researchers' capacities and meaning-making processes. This approach has not been used in music therapy research to date, though it resonates with the concept of "hypertextuality" mentioned by Stige (2004, p.107). Rhizoanalysis may offer music therapists a means of engaging with the complexities and nuances of their own work. This method could be applied to single-session case studies as well as larger scale projects like this

one. This may be appealing for music therapists to explore complex or heterogenous aspects of their work, favouring immanence over interpretation.

Within music therapy practice itself, rhizomatic thinking may be a useful reflective modality – as a way manage and articulate complex, nuanced and heterogenous therapeutic scenarios and interactions in terms of *events* and *becomings*. This would be particularly valuable to those working in anti-oppressive contexts, where the identification, disruption and renegotiation of fixed power relationships is crucial (Goodley & Roets, 2008; Smith, 2012).

### **Limitations**

The iterativity, sensitivity and responsiveness that characterised this research should be considered a strength that fostered inclusion, control and empowerment for the participants. As such, it may be inappropriate to frame limitations of the research in terms of what *should* have happened or been done differently. An *ideal* version of the research methodology might be able to be derived in hindsight, but this would not adequately represent the efforts of the communities of inquiry in Limerick and Ennis. However, there is value in reflecting on how a future project might be conducted with the learnings from this process.

A primary consideration in the critical appraisal of limitations of the project is 1. the degree to which the participation of the co-researchers was maximised, and 2. how effectively my expertise was put at their disposal in the generation of indigenous knowledge (Wicks, Reason & Bradbury, 2008) and the development and resolution thematic concerns of each group. In PAR, the co-researchers must have control over every aspect of the research process – deciding the agenda of the research, participating in data collection and analysis and controlling the outcomes of the process (McTaggart, 1997). McTaggart specified that involvement is not necessarily participation (1997). For non-verbal co-researchers in the severe/profound range of functioning, this was difficult to monitor with certainty.

While the research was flexible and responsive to the preferences and capacities of the co-researchers (Stevenson, 2010), there still existed a predominance of the voices of co-researchers who engaged more through propositional and verbal means. For non-verbal participants like Thomas in Limerick and Paraic in Ennis, efforts were made to ensure that their participation was authentic, respected and valued, though it was sometimes difficult to tell if more could or should have been done in this regard. Bigby and Frawley (2010) and Stevenson (2010) have acknowledged the difficulties in ensuring that participants with intellectual disabilities have control over research processes concerning them. It could be argued that a different research methodology would not have been accessible to these people at all.

While the participants could not be involved in the rhizoanalysis or the curation of the thesis, they were involved in dissemination after the PAR projects ended. The Ennis and Limerick groups both presented on our research in the Irish World Academy in November 2014, with a selection of participants from the Limerick group co-presenting with me again in September 2017.

Certain limitations can be ascribed to myself as lead researcher. The research may have benefitted from a clearer or more resolved analytical frame. This is where certain decisions made for ethical reasons or reasons of inclusivity had practical or methodological implications at another point in the research. The groups generated interesting meaning-making processes, the lack of resolution of which was mainly a logistical issue. It was difficult for me as facilitator to manage the pace and scale of the research groups within the available time.

PAR literature often describes experienced action researchers entering an unfamiliar context to access a community or host culture and work together to investigate their concerns (Brydon-Miller, Aranda & Stevens, 2015; Pavlicevic, 2010; White & Suchowierska, 2004).

From an insider, practitioner-researcher perspective I am certainly more of a practitioner than a researcher, meaning that the characterisation of participants in PAR as *lay researchers* (Carlisle & Cropper, 2009; Stige, 2005) applies to me as much as to my co-researchers. However, my status as a novice with participatory action research methodology may have helped with managing expectations or assumptions and maintaining the democratic, bottom-up, person centred and Dionysian character of the research. There are lessons to be learned from these projects in the planning of future research.

### **Future research**

In considering my next steps as a researcher, multiple possibilities occur. This doctoral research had multiple strands, or in Stige's words, was *polyphonic* (2005). Some of these may be deserving of additional attention or more focused application. The most salient ideas are: further PAR projects, more technical research into music technology, and the application of rhizome theory and rhizoanalysis in music therapy.

As mentioned earlier, an *ideal* or streamlined methodology could be abstracted from this research and incorporated into a new project. This would involve running a PAR project with similar parameters, but with a more manageable structure, and more defined analytical frame. It would potentially be interesting to incorporate Deleuzoguattarian concepts and rhizoanalysis into a PAR project from its inception in the manner of Drummond and Themessl-Huber (2007). In this way, the co-researchers could be more involved in the identification and reading of immanent relations within a PAR research process on an ongoing basis. Identifying and recruiting interested co-researchers would determine the focus of such research. As well as service users from disability services I attend, music therapy practitioners may be interested in developing and engaging in an Action Learning project to explore and incorporate music technology into their own approaches.

Focusing on developing a more practical, taxonomic or pedagogical description of the music technology resources used in this resource would be another possible next step. This could involve a data-mining approach (Epstein, 2010; O’Callaghan, Dun, Baron & Barry, 2013) based on the DAW data from this research, or from other recordings created in my practice. This could involve project-based work to synthesise some of the modular aspects of the devices and software we used into new open-source devices and applications. Similarly to the Action Learning suggestion above, a taxonomic perspective on music technology in music therapy could be used to develop CPD resources for music therapists or other practitioners.

A further offshoot of this research would be to apply rhizoanalysis to other areas of music therapy practice. In keeping with Deleuze and Guattari’s assertion that improvised music is inherently rhizomatic (1988), this method may have applications for investigating and articulating nuances of interactions in clinical improvisation, in the case of my practice, Boxill’s Developmental Music Therapy (1985, 1997; see also Boxill & Chase 2007). This could be a useful alternative approach to other qualitative methods such as microanalysis (Ridder, 2007; Wigram & Wosch, 2007) or grounded theory (Baines & Edwards, 2018; Edwards & Kennelly, 2004; O’Callaghan, 2012).

### **Conclusion**

Over a period of 15 months this doctoral research was conducted with two groups of 14 total participants in the locations of Ennis and Limerick Enable Ireland services. The research used PAR, ABR and rhizoanalytic methods to generate, explore and present the research process. The guiding question was “how does music technology help us to make music together?” The results indicate that music therapy within a person centred planning framework can be researched as a legitimate and affirming process for affording musicing and co-creation of new work.

It is a source of pride and gratification to have taken part in this research with my co-researchers from Enable Ireland. Our project was full of challenges and surprises, setbacks and achievements. My high regard for my co-researchers – their skills, insights creativity and commitment has sustained me throughout the research process, and the curation of this thesis. Work continues on our shared learning – we continue to collaborate on our radio station, on community song writing projects, in individual and group music therapy sessions as well as in academic presentations of our work together. As Jonathon from Ennis might say, we are still a team, and to quote him directly, “we get better every day”.

## References

- Abma, T., Nierse, C., & Widdershoven, G. (2009). Patients as partners in responsive research: Methodological notions for collaborations in mixed research teams. *Qualitative Health Research, 19*(3), 401-415. doi: 10.1177/1049732309331869
- Adams, J., & Lajoie, M. (2014). Playing in the band: The story of The Headbangers, a performance ensemble for young people and young adults using assistive devices. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 235-246). London: Jessica Kingsley Publishers.
- Akazawa K., Kawai T., Okuno R., Masuko T., & Nishida H. (2012). Novel electronic musical instrument for persons with cerebral palsy to play and enjoy together. *Proc. 9th Intl Conf. Disabil Virtual Reality & Associ Technol Laval*, pp. 419-422.
- Aldridge, J. (2017). Advancing participatory research. *Relational Social Work, 1*(2), 26-35.
- Altrichter, H., Feldman, A., Somekh, B., & Posch, P. (2008). *Teachers investigate their work*. London: Routledge.
- Altrichter, H., Kemmis, S., McTaggart, R., & Zuber-Skerritt, O. (2002). The concept of action research. *The Learning Organization, 9*(3), 125-131.  
doi:10.1108/09696470210428840
- Alvermann, D. (2002). Researching libraries, literacies, and lives: A rhizoanalysis. In E. St. Pierre & W. Pillow, *Working the ruins: feminist poststructural theory and methods in education* (pp. 114-130). New York: Routledge.
- Amorim, A., & Ryan, C. (2005). Deleuze, action research and rhizomatic growth. *Educational Action Research, 13*(4), 581-594. doi: 10.1080/09650790500200306
- Anderson, T. (2002). Composing and performing with switches, using specialised or adapted music software. Retrieved from  
[www.drakemusicproject.org/download.asp?nmediaid=578](http://www.drakemusicproject.org/download.asp?nmediaid=578)

- Ansdell, G. (2002). Community music therapy & the winds of change. *Voices: A world forum for music therapy*, 2(2). Retrieved from <https://normt.uib.no/index.php/voices/article/view/83/65>
- Ansdell, G. (2004). Rethinking music and community: Theoretical perspectives in support of Community Music Therapy. In M. Pavlicevic & G. Ansdell (Eds.), *Community music therapy* (pp. 65-90). London: Jessica Kingsley.
- Ansdell, G. (2010). Reflection: Belonging through musicing: Explorations of musical community. In B. Stige, G. Ansdell, C. Elefant & M. Pavlicevic (Eds.), *Where music helps* (pp. 41-64). Surrey: Ashgate.
- Altheide, D. L., & Johnson, J. M. (2011). Reflections on interpretive adequacy in qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 581-594). Thousand Oaks, CA: SAGE.
- Arata, T. (1990). *The Dance*. Nashville: Capitol Records
- Baines, S., & Edwards, J. (2018). A constructivist grounded theory research project studying music therapy as an anti-oppressive practice in long-term and psychiatric residential care. *The Arts in Psychotherapy*, 60, 1-8. doi: 10.1016/j.aip.2018.04.003
- Balcazar, F., & Keys, C. (2006). Participatory action research and people with disabilities: principles and challenges. *Canadian Journal of Rehabilitation*, 12.
- Barnes, C. (2001). Emancipatory Disability Research: Project or process. *Public Lecture 24th October 2001, City Chambers, Glasgow, UK*. Retrieved from <http://www.leeds.ac.uk/disabilitystudies/archiveuk/Barnes/Glasgow>
- Barnes, C. (2012). The social model of disability: Valuable or irrelevant? Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.459.1606&rep=rep1&type=pdf>

- Bauer, S., Elsaesser, L.J., Scherer, M., Sax, C., & Arthanat, S. (2014). Promoting a standard for assistive technology service delivery. *Technology and Disability, 26*. 39-48. 10.3233/TAD-140403.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine Books.
- Bateson, G. (1979). *Mind and Nature: A necessary unity*. New York: E.P. Dutton.
- Benveniste, S., Jouvelot, P., Lecourt, E., & Michel, R. (2009). Designing Wiimprovisation for mediation in group music therapy with children suffering from behavioral disorders. *Proceedings of the 8th International Conference On Interaction Design And Children - IDC '09*. doi: 10.1145/1551788.1551793
- Berger, D. (2002). *Music therapy, sensory integration and the autistic child*. London: Jessica Kingsley.
- Beyes, T., & Steyaert, C. (2011). The ontological politics of artistic interventions: Implications for performing action research. *Action Research, 9*(1), 100-115. doi: 10.1177/1476750310396944
- Bigby, C., & Frawley, P. (2010). Reflections on doing inclusive research in the “Making life good in the community” study. *Journal of Intellectual & Developmental Disability, 35*(2), 53-61. doi: 10.3109/13668251003716425
- Blackwell, D., & Lee, E. (1990). *Friends in low places*. Nashville: Nashville Capitol.
- Blake, M. (2007). Formality and friendship: Research ethics review and participatory action research. *ACME: An International Journal for Critical Geographies, 6*(3), 411-421.
- Boog, B. (2003). The emancipatory character of action research, its history and the present state of the art. *Journal of Community & Applied Social Psychology, 13*(6), 426-438. doi: 10.1002/casp.748
- Boxill, E.H. (1985). *Music therapy for the developmentally disabled*. Texas: Pro-Ed Inc.
- Boxill, E.H. (1997). *The miracle of music therapy*. New Hampshire: Barcelona.

- Boxill, E.H., & Chase K.M. (2007). *Music therapy for developmental disabilities (Second Edition)*. Texas: Pro-Ed Inc.
- Bradbury, H. (2015). Introduction: How to situate and define action research. In H. Bradbury (Ed.) *The SAGE handbook of action research* (3<sup>rd</sup> Edition) (pp. 1-10). Thousand Oaks: SAGE
- Breines, E., & Pellerito, J. (2003). Editorial: occupational technology: a vision for occupational therapy. *Occupational Therapy International*, 10(1), iii-vii. doi: 10.1002/oti.173
- Brydon-Miller, M., Kral, M., Maguire, P., Noffke, S., & Sabhlok, A. (2011). Jazz and the Banyan tree: Roots and riffs on participatory action research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (4th ed.) (pp. 387-399). Thousand Oaks: SAGE.
- Bruscia, K. (1998). *Defining music therapy* (2<sup>nd</sup> edition). Gilsum: Barcelona.
- Brydon-Miller, M., Aranda, A.R. & Stevens, D.M. (2015). Widening the circle: Ethical reflection in action research and the practice of structured ethical reflection. In H. Bradbury (Ed.) *The SAGE handbook of action research* (3<sup>rd</sup> Edition) (pp. 596-607). Thousand Oaks: SAGE.
- Burland, K. & Magee, W.L. (2014). Music technology and identity in therapeutic contexts. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 327-348). London: Jessica Kingsley Publishers.
- Bruscia, K. (1998). *Defining music therapy*. Gilsum: Barcelona.
- Carlisle, S., & Cropper, S. (2009). Investing in lay researchers for community-based health action research: implications for research, policy and practice. *Critical Public Health*, 19(1), 59-70. doi: 10.1080/09581590802225712

- Carney, G., Dundon, T., & Léime, Á. (2012). Participatory action research with and within community activist groups: Capturing the collective experience of Ireland's Community and Voluntary Pillar in social partnership. *Action Research*, 10(3), 313-330. doi: 10.1177/1476750312451279
- Cavanaugh, T. (2002). The need for assistive technology in educational technology. Retrieved from <http://www.aace.org/pubs/etr/issue2/cavanaugh.cfm>
- Cevasco, A.M. (2014). Music technology in the neonatal intensive care unit. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 111-132). London: Jessica Kingsley Publishers.
- Cevasco, A.M., & Hong, A. (2011). Utilizing technology in clinical practice: A comparison of board-certified music therapists and music therapy students. *Music Therapy Perspectives*, 29(1), 65-73. doi: 10.1093/mtp/29.1.65
- Challis, B. (2009). Technology, accessibility and creativity in popular music education. *Popular Music*, 28(3), 425. doi: 10.1017/s0261143009990158
- Challis, B. (2011). Octonic: an accessible electronic musical instrument. *Digital Creativity*, 22(1), 1-12. doi: 10.1080/14626268.2011.538703
- Chapman, R. (2014). An exploration of self-advocacy support role through collaborative research: 'There should be never be a them and us'. *Journal of Applied Research in Intellectual disabilities*, 27(1), 44-53. doi: 10.1111/jar.12084
- Clay, W. C. (2001). Coming to Know My Place. In J. Zeni (Ed.), *Ethical issues in practitioner research* (pp. 24-34). New York: Teachers College Press.
- Cobb, E. (1965). Tainted love. Nashville: Champion Records
- Colebrook, C. (2002). *Understanding Deleuze*. St. Leonards, N.S.W.: Allen & Unwin.
- Colman, F. (2010). Rhizome. In A. Parr, *The Deleuze dictionary* (2nd ed., pp. 232-235). Edinburgh: Edinburgh University Press.

- Conrad, D. & Campbell, G. (2008). Participatory research – An empowering methodology with marginalized populations. In P. Liamputtong & J. Rumbold (Eds), *Knowing differently: Arts based and collaborative research methods* (pp. 229-243). New York: Nova.
- Coots, J.F. & Gillespie, H. (1934). *Santa Claus is coming to town*. London: EMI
- Coupal, L. (2018). Practitioner-research and the regulation of research ethics: The challenge of individual, organizational, and social interests. Retrieved from <http://dx.doi.org/10.17169/fqs-6.1.528>
- Craddock, G., & McCormack, L. (2002). Delivering an AT service: a client-focused, social and participatory service delivery model in assistive technology in Ireland. *Disability and Rehabilitation*, 24(1-3), 160-170. doi: 10.1080/09638280110063869
- Crowe, B., & Rio, R. (2004). Implications of technology in music therapy practice and research for music therapy education: A Review of Literature. *Journal of Music Therapy*, 41(4), 282-320. doi: 10.1093/jmt/41.4.282
- D'Adamo-Damery, P. (2015). *Ontological possibilities: Rhizoanalytic explorations of community food work in Central Appalachia* (PhD). Virginia Polytechnic and State University
- Daly, T.G., (2001). Pedagogy and disability: Insights from action research. *Irish Educational Studies*, 2, 107-124.
- Daveson, B.A. (2001). Empowerment: An intrinsic process and consequence of music therapy practice. *The Australian Journal of Music Therapy*, 12, 29-37.
- Davidson, A. (2015). A collaborative action research about making self-advocacy videos with people with intellectual disabilities. *Social Inclusion*, 3(6), 16. doi: 10.17645/si.v3i6.412

- Daykin, N. (2008). Knowing through music: Implications for research. In P. Liamputtong & J. Rumbold (Eds.), *Knowing Differently: Arts-based and collaborative research method* (pp. 229-243) New York: Nova.
- Daykin, N. (2009). The role of music in arts-based qualitative inquiry. In P. Leavy (Ed.), *Method Meets Art* (pp. 123-134 ). New York: Guildford Publications
- de Freitas, E. (2012). The classroom as rhizome. *Qualitative Inquiry*, 18(7), 557-570. doi: 10.1177/1077800412450155
- Deleuze, G. & Guattari, F. (1988). *A thousand plateaus*. London: Continuum.
- DeNora, T. (2005). The pebble in the pond: Musicing, therapy, community. *Nordic Journal of Music Therapy*, 14(1), 57-66. doi: 10.1080/08098130509478126
- Denzin, N.K., & Lincoln, Y.S. (2011). Introduction: The discipline and practice of qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 1-20). Thousand Oaks, CA: SAGE.
- DeSantis, D., Gallagher, I., Haywood K., Knudsen, R., Behles, G.B., Rang, R., Henke, R. & Slama, T. (2016). *Ableton Live 9 manual*. Ableton AG. Retrieved from [https://cdn-resources.ableton.com/80bA26cPQ1hEJDFjpUKntxfqdmG3ZykO/static/manual/pdf/L9Manual\\_EN.0f97a0bd6041.pdf](https://cdn-resources.ableton.com/80bA26cPQ1hEJDFjpUKntxfqdmG3ZykO/static/manual/pdf/L9Manual_EN.0f97a0bd6041.pdf)
- Dewing, J. (2007). Participatory research. *Dementia*, 6(1), 11-25. doi: 10.1177/1471301207075625
- Dick, B., Sankaran, S., Shaw, K., Kelly, J., Soar, J., Davies, A., & Banbury, A. (2015). Value co-creation with stakeholders using action research as a meta-methodology in a funded research project. *Project Management Journal*, 46(2), 36-46. doi: 10.1002/pmj.21483

- Dimitriadis, T., & Smeijsters, H. (2011). Autistic spectrum disorder and music therapy: theory underpinning practice. *Nordic Journal of Music Therapy*, 20(2), 108-122. doi: 10.1080/08098131.2010.487647
- Drummond, J., & Themessl-Huber, M. (2007). The cyclical process of action research. *Action Research*, 5(4), 430-448. doi: 10.1177/1476750307077317
- Dylan, B. (1973). *Knocking on Heaven's Door*. New York: Columbia.
- Edwards, J. (2002). Debating the winds of change in community music therapy - #2. [online] *Voices: A World Forum for Music Therapy*. Retrieved from [http://www.voices.no/discussions/discm4\\_02.html](http://www.voices.no/discussions/discm4_02.html)
- Edwards, J., & Kennelly, J. (2004). Music therapy in paediatric rehabilitation. *Nordic Journal of Music Therapy*, 13(2), 112-126. doi: 10.1080/08098130409478108
- Edwards, J., & Noone, J. (2016). Developmental Music Therapy. In J. Edwards (Ed.) *The Oxford Handbook of Music Therapy* (pp. 577-594). London: Oxford University Press.
- Elefant, C. (2010). Giving voice: Participatory action research with a marginalized group. In B. Stige, G. Ansdell, C. Elefant & M. Pavlicevic (Eds.), *Where music helps* (pp. 199-219). Surrey: Ashgate.
- Emiliani, P. (2006). Assistive technology (AT) versus mainstream technology (MST): The research perspective. *Technology and Disability*, 18(1), 16-29.
- Enable Ireland (n.d.). Enable Ireland adult services. Retrieved from <http://www.enableireland.ie>
- Enable Ireland (2005). Action on disability: Enable Ireland annual report 2005. Retrieved from [http://www.enableireland.ie/docs/enableireland\\_annualreport05.pdf](http://www.enableireland.ie/docs/enableireland_annualreport05.pdf)
- Enable Ireland (2009). Promoting inclusion – Enabling independence: Strategic plan 2009-2011. Retrieved from

<http://www.enableireland.ie/sites/enableireland.ie/files/imce/user6/EnableIreland-StrategicPlan-2009-2011.pdf>

- Enable Ireland. (2015). *Strategic plan 2015-2017*. Dublin: Enable Ireland. Retrieved from <http://www.enableireland.ie/sites/default/files/publication/2014%2011%2026%20Strategic%20Plan%202015%20-%202017%20Final.pdf>
- Enable Ireland & Disability Federation of Ireland (2016). Assistive technology for people with disabilities and older people: A discussion paper. Retrieved from <https://www.enableireland.ie/sites/default/files/publication/AT%20Paper%20final%20version.pdf>
- Epstein, I. (2010). *Clinical data-mining: Integrating practice and research*. New York: Oxford University Press
- Etherington, K. (2007). Ethical research in reflexive relationships. *Qualitative inquiry*, 13, 599-616.
- Farrimond, B., Gillard, D., Bott, D., & Lonie, D. (2011). Engagement with technology in special educational & disabled music settings. Retrieved from <https://network.youthmusic.org.uk/file/5694/download?token=I-1K0qhQ>
- Fawcett, S. (1991). Some values guiding community research and action. *Journal of Applied Behavior Analysis*, 24(4), 621-636. doi: 10.1901/jaba.1991.24-621
- Flippo, K., Inge, K., Barcus, J., & Douglas, R. (1995). *Assistive technology*. Baltimore: P. H. Brookes.
- Future Music (2017). A brief history of Ableton Live. Retrieved from <https://www.musicradar.com/tuition/tech/a-brief-history-of-ableton-live-357837>
- Garbutt, R. & Seymour, J. (1998). 'Do we all get a PhD?' Attempting emancipatory research relating to disability in academic environment. In *British Sociological Association annual conference 1998, Making sense of the body*. Edinburgh: UK.

- Gibbs, P., & Costley, C. (2006). An ethics of community and care for practitioner researchers. *International Journal of Research & Method in Education*, 29(2), 239-249. doi: 10.1080/17437270600891689
- Gilbertson, S. (2015). In visible hands: The matter and making of music therapy. *Journal of Music Therapy* 52(4). doi:10.1093/jmt/thv014
- Goodley, D., & Lawthom, R. (2005). Epistemological journeys in participatory action research: alliances between community psychology and disability studies. *Disability & Society*, 20(2), 135-151. doi: 10.1080/09687590500059077
- Goodley, D., & Roets, G. (2008). The (be)comings and goings of 'developmental disabilities': the cultural politics of 'impairment'. *Discourse: Studies in The Cultural Politics of Education*, 29(2), 239-255. doi: 10.1080/01596300801966971
- Groundwater-Smith, S., & Mockler, N. (2007). Ethics in practitioner research: an issue of quality. *Research Papers in Education*, 22(2), 199-211. doi: 10.1080/02671520701296171
- Guerin, C. (2013). Rhizomatic research cultures, writing groups and academic researcher identities. *International Journal of Doctoral Studies*, 8, 137 - 150. doi: 10.28945/1897
- Hadley, S., Hahna, N., Miller, V., & Bonaventura, M. (2014). Setting the scene: An overview of the use of music technology in practice. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 25-44). London: Jessica Kingsley Publishers.
- Hahna, N., Hadley, S., Miller, V., & Bonaventura, M. (2012). Music technology usage in music therapy: A survey of practice. *Arts in Psychotherapy*, 39, 456-464
- Hammel, J., & Finlayson, M. (2003). Assistive technology access and financing. *Journal of Disability Policy Studies*, 14(2), 66-67. doi: 10.1177/10442073030140020101
- Hammel, J., Finlayson, M., & Lastowski, S. (2003). Using participatory action research to examine outcomes and effect systems change in assistive technology financing.

- Journal of Disability Policy Studies*, 14(2), 98-108. doi:  
10.1177/10442073030140020801
- Hammel, J., Jones, R., Smith, J., Sanford, J., Bodine, C., & Johnson, M. (2008). Environmental barriers and supports to the health, function, and participation of people with developmental and intellectual disabilities: Report from the state of the science in aging with developmental disabilities conference. *Disability and Health Journal*, 1(3), 143-149. doi: 10.1016/j.dhjo.2008.05.001
- Harrison, L., Johnson, K., Hillier, L., & Strong, R. (2001). "Nothing about us without us": The ideals and realities of participatory action research with people with an intellectual disability. *Scandinavian Journal of Disability Research*, 3(2), 56-70. doi: 10.1080/15017410109510776
- Helps, S. (2017). The ethics of researching one's own practice. *Journal of Family Therapy*, 39(3), 348-365. doi: 10.1111/1467-6427.12166
- Henderson, L. (2010). A Deleuzian framework for participatory action research. Presented to the 8<sup>th</sup> World Congress 2010, Participatory Action Research and Action Learning, 6<sup>th</sup>-9<sup>th</sup> September, Melbourne,  
<http://wc2010.alara.net.au/Formatted%20Papers/1.1.2.EDU.1.pdf>
- Heron, J. (1996). *Co-operative inquiry*. London: SAGE.
- Heron, J., & Reason, P. (1997). A participatory inquiry paradigm. *Qualitative Inquiry*, 3(3), 274-294.
- Heron, J., & Reason, P. (2008). Extending epistemology within cooperative inquiry. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 366-380). London: SAGE.
- Honan, E. (2007). Writing a rhizome: an (im)plausible methodology. *International Journal of Qualitative Studies in Education*, 20(5), 531-546. doi: 10.1080/09518390600923735

- Hunt, M. (2005). Action research and music therapy: group music therapy with young refugees in a school community. *Voices: A world forum for music therapy*, 5(2). Retrieved from <https://normt.uib.no/index.php/voices/article/viewArticle/223/167>
- Hunt, A., & Kirk, R. (2003). MidiGrid: Past, present and future. Retrieved from [http://www.music.mcgill.ca/musictech/nime/onlineproceedings/Papers/NIME03\\_Hunt.pdf](http://www.music.mcgill.ca/musictech/nime/onlineproceedings/Papers/NIME03_Hunt.pdf)
- Hunt, A., Kirk, R., & Neighbour, M. (2004). Multiple media interfaces for music therapy. *IEEE MultiMedia*, 11 (3), 50-58.
- Jaiswal, A., & Gupta, S. (2017). Advocacy campaign for the rights of people with disabilities: A participatory action research within a community-based rehabilitation project in Vangani, Maharashtra. *Disability, CBR & Inclusive Development*, 27(4), 76-92.
- Jewell, S., & Atkin, R. (2013). Enabling technology. Retrieved from [https://www.rca.ac.uk/documents/278/EnablingTechnology\\_SCREEN\\_1.pdf](https://www.rca.ac.uk/documents/278/EnablingTechnology_SCREEN_1.pdf)
- Johnson, K. (2009). No longer researching about us without us: A researcher's reflection on rights and inclusive research in Ireland. *British Journal of Learning Disabilities*, 37(4), 250-256. doi: 10.1111/j.1468-3156.2009.00579.x
- Jurkowski, J., & Paul-Ward, A. (2007). Photovoice with vulnerable populations: Addressing disparities in health promotion among people with intellectual disabilities. *Health Promotion Practice*, 8(4), 358-365. doi: 10.1177/1524839906292181
- Kemmis, S., & McTaggart, R. (2000). Participatory action research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research*, (2nd ed., pp. 567-605). Thousand Oaks, CA: SAGE.
- Kennedy, J., Poll, C., & Sanderson, H. (2008). Creating community inclusion. In Thompson, J., Kilbane, J. & Sanderson, H. (Eds.), *Person centred practice for professionals* (pp. 280-304). Maidenhead: McGraw-Hill.

- Kidd, S.A., & Kral, M.J. (2005). Practicing participatory action research. *Journal of Counselling Psychology*, 52 (2), 187-195.
- Kilbane, J., Thompson, J. & Sanderson, H. (2008). Towards person centred practice. In Thompson, J., Kilbane, J. & Sanderson, H. (Eds.), *Person centred practice for professionals* (pp. 26-46). Maidenhead: McGraw-Hill.
- Kitchin, R. (2005). Towards emancipatory and empowering disability research: Reflections on three participatory action research projects. Retrieved from <http://eprints.maynoothuniversity.ie/7243/1/NDA>
- Kowalski, R., Yorks, L., & Jelinek, M. (2008). The workplace stress and aggression project: ways of knowing – Our rosetta stone for practice. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 497-509). London: SAGE.
- Kramer-Roy, D. (2015). Using participatory and creative methods to facilitate emancipatory research with people facing multiple disadvantage: a role for health and care professionals. *Disability & Society*, 30(8), 1207-1224. doi:10.1080/09687599.2015.1090955
- Krout, R. (2014). Music technology used in therapeutic and health settings: Definitions of devices and resources. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 25-44). London: Jessica Kingsley Publishers.
- Kubicek, L. (2014). Creative adaptations of music technology in adult cancer care. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 247-262). London: Jessica Kingsley Publishers.
- Leander, K., & Rowe, D. (2006). Mapping literacy spaces in motion: A rhizomatic analysis of a classroom literacy performance. *Reading Research Quarterly*, 41(4), 428-460. doi: 10.1598/rrq.41.4.2

- Leavy, P. (2009). *Method meets art*. New York: Guilford Publications.
- Ledger, A. (2010). *Am I a founder or a fraud? Music therapists' experiences of developing services in healthcare organizations*. (PhD). University of Limerick, Ireland.
- Ledger, A., & Edwards, J. (2011). Arts-based research practices in music therapy research: Existing and potential developments. *The arts in psychotherapy*, 38, 312-317.
- Ledger, A., & Noone, J. (2011, June). *Reflection on: Am I a founder or a fraud? Music therapists' experiences of developing services in healthcare organizations*. Paper presented at the World Congress of Music Therapy, Seoul, South Korea.
- Lem, A., & Paine, G. (2011). Dynamic sonification as a free music improvisation tool for physically disabled adults. *Music and Medicine*, 3(3), 182-188. doi: 10.1177/1943862111401032
- Lewin, K. (1946). Action research and minority problems. *Journal of Social Issues*, 2(4), 34-46. doi: 10.1111/j.1540-4560.1946.tb02295.x
- Liamputtong, P. & Rumbold, J. (2008). Knowing differently: Setting the scene. In P. Liamputtong & J. Rumbold (Eds.), *Knowing Differently: Arts-based and collaborative research methods* (pp. 1-23). New York: Nova.
- Lindeck, J. (2014). Applications of music technology in a children's hospice setting. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 199-216). London: Jessica Kingsley Publishers.
- Loewe, F., & Lerner, A. (1969). *Wandr'in' Star*. New York: Chappell & Co.
- Lunt, J., Bassett, J., Evans, L., & Jones, L. (2008). People with learning disabilities planning for themselves. In Thompson, J., Kilbane, J. & Sanderson, H. (Eds.), *Person centred practice for professionals* (pp. 213-230). Maidenhead: McGraw-Hill
- MacNaughton, G. (2005). *Doing Foucault in early childhood studies*. New York: Routledge.

- Magee, W.L. (2006). Electronic technologies in clinical music therapy: a survey of practice and attitudes. *Technology and Disability*, 18 (3), 139-146.
- Magee, W.L. (2011). Music technology for health and well-Being: The bridge between the arts and science. *Music and Medicine*, 3(3), 131-133. doi: 10.1177/1943862111411719
- Magee, W.L. (2014). Indications and contraindications for using music technology with clinical populations: When to use and when *not* to use. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 83-110). London: Jessica Kingsley Publishers
- Magee, W.L. (2014). Models for roles and collaborations when using music technology in music therapy. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 361-386). London: Jessica Kingsley Publishers.
- Magee, W., & Burland, K. (2008). An exploratory study of the use of electronic music technologies in clinical music therapy. *Nordic Journal of Music Therapy*, 17(2), 124-141. doi: 10.1080/08098130809478204
- Magic Flute. (2018). Retrieved from <https://touchthefuture.us/product/magic-flute/>
- Marks, J. (1949). Rudolph the red-nosed reindeer. Chicago: Montgomery Ward
- Martino, L., & Bertolami, M. (2014). Using music technology with children and adolescents with visual impairments and multiple disabilities. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp.165-180). London: Jessica Kingsley Publishers.
- Masny, D. (2015). Problematizing qualitative educational research: reading observations and interviews through rhizoanalysis and multiple literacies. *Reconceptualizing Educational Research Methodology*, 6(1). doi: 10.7577/term.1422

- Masny, D., & Waterhouse, M. (2011). Mapping territories and creating nomadic pathways with multiple literacies theory. *Journal of Curriculum Theorizing*, 27(3), 287-207
- Mazzei, L., & McCoy, K. (2010). Thinking with Deleuze in qualitative research. *International Journal of Qualitative Studies in Education*, 23(5), 503-509. doi: 10.1080/09518398.2010.500634
- McCormack, B. (2003). A conceptual framework for person-centred practice with older people. *International Journal of Nursing Practice*, 9(3), 202-209. doi: 10.1046/j.1440-172x.2003.00423.x
- McCormack, B. (2004). Person-centredness in gerontological nursing: an overview of the literature. *Journal of Clinical Nursing*, 13(s1), 31-38. doi: 10.1111/j.1365-2702.2004.00924.x
- McLeod, J. (1999). *Practitioner research in counselling*. London: SAGE
- McNiff, J. (n.d.). Action research, transformational influences: pasts, presents and futures. Retrieved from <http://www.jeanmcniff.com/items.asp?id=11>
- McTaggart, R. (1997). Guiding principles for participatory action research. In R. McTaggart (Ed.), *Participatory action research: international contexts and consequences* (pp.25-43). New York: SUNY.
- Mertens, D. M., Sullivan, M., & Stace, H. (2011). Disability communities: transformative research for social justice. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (4th ed.) (pp. 227-241). Thousand Oaks: SAGE.
- Metell, M. (2014). Dis/Abling musicking: Reflections on a disability studies perspective in music therapy. *Voices: A World Forum for Music Therapy*, 14(3). doi:10.15845/voices.v14i3.786

- McKewn, J. (2008). Facilitation as action research in the moment. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 615-628). London: SAGE.
- Naess, S. (1987). *Quality of life research: Concepts, methods and applications*. Institute of Applied Social Science, Oslo.
- Nagler, J. (2011). Music therapy methods with hand-held music devices in contemporary clinical practice: A commentary. *Music and Medicine*, 3(3), 196-199. doi: 10.1177/1943862111407512
- Nagler, J. (2014). Music aesthetics, music technology, and music therapy. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 349-360). London: Jessica Kingsley Publishers.
- National Disability Authority. (2005). *Person centred planning for people in Ireland who have disabilities: Plain English*.
- Nind, Melanie (2008). *Conducting qualitative research with people with learning, communication and other disabilities: Methodological challenges*. Project Report. National Centre for Research Methods.
- Noone, J. (2008). Developing a music therapy programme within a person-centered planning framework. *Voices: A world forum for music therapy*, 8(3). Retrieved from <https://voices.no/index.php/voices/article/viewArticle/420/344>.
- Nordenfelt, L. (1993). *Quality of life, health and happiness*. Aldershot: Avebury.
- Nordoff, P., & Robbins, C. (1971). *Music therapy in special education*. New York: John Day.
- Numan, G. (1979). *Cars*. London: Marcus Music AB.
- O'Brien, J. (1987). A guide to lifestyle planning. In B. Wilcox & T. Bellamy (Eds.), *A comprehensive guide to the activities catalog*. Baltimore: Paul Brookes.

- O'Brien, J. (1998). A guide to personal futures planning. In J. O'Brien & C.L. O'Brien (Eds.), *A little book about person-centred planning* (pp. 133-150). Toronto: Inclusion Press. (Reprinted from B. Wilcox and T. Bellamy (Eds.), (1987). *A comprehensive guide to the activities catalog*. Baltimore: Paul Brookes.)
- O'Brien, J., & Lovett, H. (1992). Finding a way toward everyday lives: The contribution of person-centered planning. Retrieved from [http://www.inclusion.com/everyday\\_lives.pdf](http://www.inclusion.com/everyday_lives.pdf)
- O'Brien, C. L., & O'Brien, J. (2000). *The origins of person-centered planning: A community of practice perspective*. Responsive Systems Associates, Inc. <http://www.soeweb.syr.edu/thechp/wnew>
- O'Brien, C.L., O'Brien, J., & Mount, B. (1998). Person-centered planning has arrived...or has it? In J. O'Brien & C.L. O'Brien (Eds.), *A little book about person-centred planning* (pp. 19-28). Toronto: Inclusion Press. (Reprinted from *Mental Retardation*, 35, 480-484, 1997).
- O'Callaghan, C. (2012). Grounded theory in music therapy research. *Journal of Music Therapy*, 49(3), 236-277. doi: 10.1093/jmt/49.3.236
- O'Callaghan, C., Dun, B., Baron, A., & Barry, P. (2013). Music's relevance for children with cancer: Music therapists' qualitative clinical data-mining research. *Social Work in Health Care*, 52(2-3), 125-143. doi: 10.1080/00981389.2012.737904
- Oliver, M. (1992). Changing the social relations of research production? *Disability, Handicap & Society*, 7(2), 101-114. doi: 10.1080/02674649266780141
- Oliveros, P., Miller, P., Heyen, J., Siddall, G., & Hazard, S. (2011). A musical improvisation interface for people with severe physical disabilities. *Music and Medicine*, 3(3), 172-181.

- Pavlicevic, M. (2003). *Groups in music: Strategies from music therapy*. London: Jessica Kingsley.
- Pavlicevic, M., & Ansdell, G. (2004). Introduction: 'The ripple effect'. In M. Pavlicevic & G. Ansdell (Eds.), *Community music therapy* (pp. 15-34). London: Jessica Kingsley Publishers.
- Pearpoint, J., & Forest, M. (1998). The ethics of MAPs and PATH. In J. O'Brien & C. O. O'Brien (Eds.), *A Little Book about Person Centered Planning* (pp. 99-103). Toronto: Inclusion Press.
- Pedler., M., & Burgoyne, J.G. (2008). Action learning. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 319-332). London: SAGE.
- Priestley, M. (1997). Whose research? A personal audit. In C. Barnes & G. Mercer (Eds.) *Doing Disability Research* (pp. 88-107). Leeds: The Disability Press.
- Prilleltensky, I. (2005). Promoting well-being: Time for a paradigm shift in health and human services. *Scandinavian Journal of Public Health*, 33(66\_suppl), 53-60. doi: 10.1080/14034950510033381
- Prilleltensky, I., & Prilleltensky, O. (2006). *Promoting well-being: Linking personal, organizational, and community change*. Hoboken: Wiley & Sons.
- Procter, S. (2001). Empowering and enabling. *Voices: A World Forum for Music Therapy*, 1(2). doi:10.15845/voices.v1i2.58
- Procter, S. (2011). Reparative musicing: thinking on the usefulness of social capital theory within music therapy. *Nordic Journal of Music Therapy*, 20(3), 242-262. doi: 10.1080/08098131.2010.489998
- Reason, P. (2006). Choice and quality in action research practice. *Journal of Management Inquiry*, 15(2), 187-203. doi: 10.1177/1056492606288074

- Reason, P., & Bradbury, H. (2001). Inquiry and participation in search of a world worthy of human aspiration. In P. Reason and H. Bradbury (Eds.), *Handbook of action research*. (pp. 1-14). London: SAGE.
- Reason, P., & Bradbury, H. (2008). Introduction. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 5–10). London: SAGE.
- Reason, P., & Heron, J. (2001). The practice of co-operative inquiry: Research with rather than on people. In P. Reason & H. Bradbury (Eds.) *Handbook of action research: Participative inquiry and practice* (pp. 179-188). London: SAGE.
- Reason, P., & Riley, S. (2015). Cooperative Inquiry: An action research Practice (with Sarah Riley). In J. Smith (Ed.) *Qualitative Psychology: A practical guide to research methods* (pp. 168-198). London: SAGE
- Ridder, H.M. (2007). Microanalysis on selected video clips with focus on communicative response in music therapy. In T. Wosch & T. Wigram (Eds.) *Microanalysis in music therapy: methods, techniques and applications for clinicians, researchers, educators and students* (pp. 54-66). London: Jessica Kingsley.
- Riddle, S. (2013). Looking for madness in the method: rhizo-becoming in educational research. In: W. Midgley, K. Trimmer & A. Davies (Eds.), *Metaphors for, in and of education research* (pp. 131-144). Newcastle upon Tyne: Cambridge.
- Ringrose, J., & Coleman, R. (2013). *Deleuze and research methodologies (Deleuze connections)*. Edinburgh: Edinburgh University Press.
- Ripat, J., & Woodgate, R. (2010). The intersection of culture, disability and assistive technology. *Disability and Rehabilitation: Assistive Technology*, 6(2), 87-96. doi: 10.3109/17483107.2010.507859

- Ripat, J., & Woodgate, R. (2011). Locating assistive technology within an emancipatory disability research framework. *Technology and Disability*, 23(2), 87-92.
- Robson, C., & McCartan, K. (2016). *Real world research, 4th Edition*. John Wiley & Sons.
- Rogers, C.R. (1961). *On becoming a person: A therapist's view of psychotherapy*. London: Constable.
- Rolvjord, R. (2006). Therapy as empowerment: Clinical and political implications of empowerment philosophy in mental health practices of music therapy. *Voices: A world forum for music therapy*, 6(3). Retrieved from <https://voices.no/index.php/voices/article/view/283/208>
- Rolvjord, R., Gold, C., & Stige, B. (2005). Therapeutic principles for resource-oriented music therapy: A contextual approach to the field of mental health. *Nordic Journal of Music Therapy*, 14(1). Retrieved from <http://njmt.b.uib.no/2005/06>
- Rowan, J. (2006). The humanistic approach to action research. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice* (concise ed. Pp. 106-116). Thousand Oaks, CA: SAGE.
- Ruud, E. (1998). *Improvisation, communication and culture*. Gilsum, NH: Barcelona.
- Ruud, E. (2002). Debating the winds of change in community music therapy - #3. [online] *Voices: A World Forum for Music Therapy*. Retrieved from [http://www.voices.no/discussions/discm4\\_03.html](http://www.voices.no/discussions/discm4_03.html)
- Ruud, E. (2004). Defining community music therapy. *Voices: A World Forum for Music Therapy*. Retrieved from [http://www.voices.no/discussions/discm4\\_04.html](http://www.voices.no/discussions/discm4_04.html)
- Sadovnik, N. (2014). The birth of a therapeutic recording studio: Addressing the needs of the hip-hop generation on an adult inpatient psychiatric unit. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 247-262). London: Jessica Kingsley.

- Sample, P. (1996). Beginnings: Participatory action research and adults with developmental disabilities. *Disability & Society, 11*(3), 317-332. doi: 10.1080/09687599627633
- Samuels, K. (2014). Enabling creativity: Inclusive music interfaces and practices. Retrieved from <http://users.fba.up.pt/~mc/ICLI/samuels.pdf>
- Sanderson, H. (2000). Person centered planning: Key features and approaches. Retrieved from: <http://www.nwtdt.u-net.com/pcp/docs/HELENSAN.PDF> .
- Schwantes, M., & Rivera, E. (2017). “A team working together to make a big, nice, sound”: An action research pilot study in an inclusive college setting. *The Arts in Psychotherapy, 55*, 1-10. doi: 10.1016/j.aip.2017.01.011
- Seeley, C., & Reason, P. (2008). Expressions of energy: An epistemology of presentational knowing. In P. Liamputtong & J. Rumbold (Eds.), *Knowing Differently: Arts-based and collaborative research methods* (pp. 25-46). New York: Nova Science.
- Sellers, M. (2015). ‘Working with (a) rhizoanalysis’ and working (with) a rhizoanalysis. *Complicity: An international journal of complexity and education, 12*(1), 6-31.
- Shakespeare, T. (2010). The social model of disability. Retrieved from [http://thedigitalcommons.org/docs/shakespeare\\_social-model-of-disability.pdf](http://thedigitalcommons.org/docs/shakespeare_social-model-of-disability.pdf)
- Shaw, I. (2003). Ethics in qualitative research and evaluation. *Journal of Social Work, 3*(1), 9-29. doi: 10.1177/1468017303003001002
- Small, Christopher (1998). *Musicking: The meanings of performing and listening*. Hanover: University Press of New England.
- Smith, R. (2015). Encountering methodology through art: A Deleuzoguattarian territory of action research. *Action Research, 14*(1), 36-53. doi: 10.1177/1476750315573588
- Smull, M.W. (1998). Revisiting choice. In J. O’Brien & C.L. O’Brien (Eds.), *A little book about person-centred planning* (pp. 37-49). Toronto: Inclusion Press.

- St. Pierre, E.A. (2011). Post qualitative research: The critique and the coming after. In N.K. Denzin & Y.S. Lincoln (Eds.), *SAGE handbook of qualitative inquiry* (4th ed.) (pp. 611- 635). Los Angeles: SAGE.
- Steele, N. (2011). Beat it: The effects of rap music on adolescents in the pediatric medical setting. In S. Hadley, & G. Yancy (Eds.), *Therapeutic uses of rap and hip-hop* (pp. 307–319). New York, NY: Routledge.
- Stern, D. (2000). *The interpersonal world of the infant: A view from psychoanalysis and developmental psychology*. New York: Basic Books
- Stevenson, M. (2010). Flexible and responsive research: Developing rights-based emancipatory disability research methodology in collaboration with young adults with Down syndrome. *Australian Social Work*, 63(1), 35-50.
- Stige, B. (2002). The relentless roots of community music therapy. *Voices: A world forum for music therapy*, 2(3). Retrieved from <https://voices.no/index.php/voices/article/view/98/75>
- Stige, B. (2004). Community music therapy: Culture, care and welfare. In M. Pavlicevic & G. Ansdell (Eds.), *Community music therapy* (pp. 91-113). London: Jessica Kingsley.
- Stige, B. (2005). Participatory action research. In B. Wheeler (Ed.) *Music therapy research: Second edition* (pp. 404-415). Gilsum: Barcelona.
- Street, A. (2014). Applications of music technology in a children’s hospice setting. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 217-234). London: Jessica Kingsley.
- Stringer, E. (1999). *Action research*. Thousand Oaks, California: SAGE.
- Sultana, F. (2007). Reflexivity, positionality and participatory ethics: Negotiating fieldwork dilemmas in international research. *ACME: An International Journal for Critical Geographies* 6 (3), 374-85

- Sullivan, F., & Petrik, J. (1982). *Eye of the tiger*. [Recorded by Survivor]. London: EMI
- Trevarthen, C., & Malloch, S. (2000). The dance of wellbeing: Defining the musical therapeutic effect. *Nordic Journal of Music Therapy*, 9(2), 3-17. doi: 10.1080/08098130009477996
- Tsiris, G., Pavlicevic, M., & Farrant, C. (2011). *Towards ethical research*. London: Nordoff Robbins.
- Tuastad, L., & Stige, B. (2018). Music as a way out: How musicking helped a collaborative rock band of ex-inmates. *British Journal of Music Therapy*, 32(1), 27-37. doi: 10.1177/1359457518759961
- UN General Assembly (1989). Convention on the rights of the child. *United Nations, Treaty Series, vol. 1577*, p. 3, Retrieved from: <http://www.refworld.org/docid/3ae6b38f0.html>
- UN General Assembly (2007), *Convention on the rights of persons with disabilities: resolution / adopted by the General Assembly*, Retrieved from: <http://www.refworld.org/docid/45f973632.html>
- Vaillancourt, G. (2009). *Mentoring apprentice music therapists for peace and social justice through community music therapy: an arts-based study* (PhD). Antioch University.
- Van Woerden, K. (2006). Mainstream developments in ICT: Why are they important for assistive technology? *Technology and Disability*, 18(1), 15-18.
- Vernon, A. (1997). Reflexivity: The dilemmas of working on the inside. In C. Barnes & G. Mercer (Eds.) *Doing Disability Research* (pp. 158-176). Leeds: The Disability Press
- Watson, T. (2007). *Music therapy with adults with learning disabilities*. New York: Taylor & Francis.

- White, G. W. (2002). Consumer participation in disability research: The golden rule as a guide for ethical practice. *Rehabilitation Psychology, 47*(4), 438-446. doi: 10.1037//0090-5550.47.4.438
- White, G.W., Suchowierska, M., & Campbell, M. (2004). Developing and systematically implementing participatory action research. *Archives of physical medicine and rehabilitation, 85* (2), 3-12.
- Whitehead-Pleaux, A., & Spall, L. (2014). Innovations in medical music therapy: The use of electronic music technologies in a pediatric burn ward. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 133-148). London: Jessica Kingsley.
- Wicks, G.W., Reason, P., & Bradbury, H. (2008). Living inquiry: Personal, political and philosophical groundings for action research practice. In P. Reason and H. Bradbury (Eds.), *The SAGE handbook of action research: Participative inquiry and practice* (2<sup>nd</sup> ed) (pp. 15-30). London: SAGE.
- Wolfe, B. (2012). Healing the research–practice split: Let's start with me. *Psychotherapy, 49*(2), 101-108. doi: 10.1037/a0027114
- Wood, M., & Ferlie, E. (2003). Journeying from Hippocrates with Bergson and Deleuze. *Organization Studies, 24*(1), 47-68. doi: 10.1177/0170840603024001680
- World Health Organisation. (2002). *Towards a common language for functioning, disability and health ICF* [Ebook]. Retrieved from <http://www.who.int/classifications/icf/icfbeginnersguide.pdf>
- World Health Organisation & World Bank (2011). *World Report on Disability*. Geneva: WHO.
- Wosch, T., & Wigram, T. (2007). Microanalysis in music therapy: Introduction and theoretical basis. In T. Wosch & T. Wigram (Eds.) *Microanalysis in music therapy:*

- methods, techniques and applications for clinicians, researchers, educators and students* (pp. 13-28). London: Jessica Kingsley.
- Yu, J. (2015). Approaching minoritarian ethics from Deleuze's Theory of Assemblage: A proposed framework. *International Journal of Philosophy Study*, 3(0), 1. doi: 10.14355/ijps.2015.03.001
- Zeni, Jane (Ed.) (2001). *Ethical issues in practitioner research*. New York: Teachers College Press.
- Zigo, J. (2014). Access to music making through switch and voice output technology for young people with multiple and complex needs in a school setting. In W. Magee (Ed.), *Music technology in therapeutic and health settings* (pp. 149-164). London: Jessica Kingsley.
- Zuber-Skerritt, O. (2001). Action learning and action research: Paradigm, praxis and program. In S. Sankaran, B. Dick, R. Passfield & P. Swepson (Eds.), *Effective change management using action research and action learning: Concepts, frameworks, processes and applications*. Lismore: Southern Cross.
- Zuber-Skerritt, O. (2002). A model for designing action learning and action research programs. *The Learning Organization*, 9(4), 143-149. doi: 10.1108/09696470210428868
- Zuber-Skerritt, O. (2015). Participatory action learning and action research (PALAR) for community engagement: A theoretical framework. *Educational Research for Social Change*, 4(1), 5-25.
- Zuber-Skerritt, O., & Perry, C. (2002). Action research within organisations and university thesis writing. *The Learning Organization*, 9(4), 171-179. doi: 10.1108/09696470210428895

## APPENDIX A: PARTICIPANT INFORMATION SHEET



### FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE INFORMATION SHEET

Study Title: The applications of mainstream music technologies to facilitate access to creative musical experiences for people with disabilities.

What is this project about?

I am interested in learning more about how people who come to music therapy at (facility) use keyboards, drum pads, switches and computers to create music. I would like to find out what you like or don't like, and to find out what makes the technology easy or hard to use.

What will happen in this research?

Everyone who is interested in this project will work together as a team. Each person's ideas, interests and preferences will decide how we do the research.

The people who take part in the project will be able to:

- Decide what questions are important.
- Decide how we go about exploring those questions.
- Decide how we tell people about what we find out.

If I say I want to participate what will be expected of me?

The project will mainly take place here at the centre. The research will have different stages where we meet together to:

- Plan what we want to do.
- Put the plan into action.

- Think about what worked or did not work, what we liked or didn't like.
- Use the ideas we come up with to plan our next action.

This is called "participatory action research".

During the research we might decide to any of these things together -

- Video recording - we will look at videos of ourselves working and describe what we are doing.
- Interviews and focus groups – we will talk about our ideas about music technology.
- Arts-based research – where we make a piece of art or music to show our work.

There may be other ways to do the research that we find out and decide together. While we are working on this project, I will also be writing about the work for my PhD. This project should last for 18 months or so, but you may decide you do not want to be involved any time during the project.

#### Are there any risks?

There are no risks in taking part in this project. There may be benefits to taking part, like learning new skills, taking part in creative activities or sharing your experiences with other people. These benefits will be different for each person who takes part. You will still be able to have music therapy if you don't want to take part in the research.

#### Anonymity

You can decide if you want your name or image to be used in the written or video parts of the research. If you prefer, a different name will be used in the written parts and your face can be blocked in videos. Any recordings or documents with personal information will be safely stored so that only I or my research supervisor, Jane, can see it.

#### Right to refuse to participate

You do not have to answer any questions or take part in any discussion if you do not want to. You can decide at any time to stop participating in the project. You can contact the UL Research Ethics Governance (ULREG) committee if you have any concerns about participating in the research.

## Contact Details

Researcher: Jason Noone

Email: [Jason.noone@ul.ie](mailto:Jason.noone@ul.ie)

Phone: 0879376848

Supervisor: Professor Jane Edwards

Email: [jane.edwards@ul.ie](mailto:jane.edwards@ul.ie)

ULREG Chair: c/o Dr. Maria Connolly, Corporate Secretary's Office, University of Limerick, Castletroy, Limerick, Republic of Ireland or phone at 061 23 4393.

## APPENDIX B: PARENT/GUARDIAN INFORMATION SHEET



### FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE INFORMATION SHEET FOR PARENTS AND GUARDIANS

Study Title: The applications of mainstream music technologies to facilitate access to creative musical experiences for people with disabilities

What is this project about?

As part of my PhD research, I am interested in learning more about how people who come to music therapy at (facility) use music technology such as keyboards, drumpads, switches and computers to create music. I would like to understand more about what service users like or don't like, and to find out what makes the technology easy or difficult to use from their own perspective, on their own terms. I would like to seek your consent on behalf of your son/daughter for their participation in this research. If consent is granted, I will seek assent from your son/daughter to ensure they are comfortable participating.

How will the research be conducted?

The project will involve everyone who is interested working together as a "research team" to explore relevant issues. Each participant will be able to participate according to their own preferences and motivations. The people who take part in the project will be able to:

- Decide what questions are important
- Decide how we go about exploring those questions
- Decide how we tell people about what we find out

If I say I want my son/daughter to participate what will be expected of him/her?

The project will mainly take place here at the centre. As part of a method called "participatory action research" the research will have different stages where the research team meets to:

- Plan what we want to do
- Put the plan into action
- Think about what worked or did not work, what we liked or didn't like.
- Use the ideas we come up with to plan our next action.

The team will also decide the method of research, which may include video recording sessions, conducting interviews and focus groups or arts-based research, where we make a piece of art or music to show our work.

There may be other ways to do the research that we find out and decide together. While we are working on this project, I will also be writing about the work for my PhD. This project is intended to last for 18 months or so, but anyone may decide they do not want to be involved any time during the project.

#### Are there any risks?

There are no risks in taking part in this project. There may be benefits to taking part, such as learning new skills, taking part in creative experiences or sharing experiences with the broader community but these will be different for each person who takes part. If you do not want your son/daughter to take part in the research project he or she will still have access to music therapy.

#### Anonymity

You can decide if you want your son or daughter's name or image to be used in the written or video parts of the research. If you prefer, a different name will be used in the written parts and your son or daughter's face can be blocked in videos. Any recordings or documents with personal information will be safely stored so that only I or my research supervisor, Jane, can see it.

#### Right to refuse to participate

Your son or daughter does not have to answer any questions or take part in any discussion if he/she does not want to. You may choose to withdraw your son or daughter at any time during the research. Your son/daughter will be regularly monitored by sensitive attention to any signs, verbal or non-verbal, that they are not wholly willing to continue with the research. You can contact the UL

Research Ethics Governance (ULREG) committee if you have any concerns about participating in the research.

Researcher: Jason Noone

Email: [Jason.noone@ul.ie](mailto:Jason.noone@ul.ie)

Phone: 0879376848

Supervisor: Professor Jane Edwards

Email: [jane.edwards@ul.ie](mailto:jane.edwards@ul.ie)

ULREG Chair: c/o Dr. Maria Connolly, Corporate Secretary's Office, University of Limerick, Castletroy, Limerick, Republic of Ireland or phone at 061 23 4393.

## APPENDIX C: CONSENT FORM



### FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE APPENDIX B – CONSENT FORM

#### **Consent Section:**

I, the undersigned, declare that I am willing to take part in research for the project entitled “The applications of mainstream music technologies to facilitate access to creative musical experiences for people with disabilities”.

- I declare that I have been fully briefed on the nature of this study and my role in it and have been given the opportunity to ask questions before agreeing to participate.
- The nature of my participation has been explained to me and I have full knowledge of how the information collected will be used.
- I am also aware that my participation in this study may be recorded (video/audio) and I agree to this. However, should I feel uncomfortable at any time I can request that the recording equipment be switched off. I am entitled to copies of all recordings made and am fully informed as to what will happen to these recordings once the study is completed.
- I fully understand that there is no obligation on me to participate in this study.
- I fully understand that I am free to withdraw my participation at any time without having to explain or give a reason.
- I am also entitled to full confidentiality in terms of my participation and personal details.

---

Signature of participant

---

Date

## APPENDIX D – ASSENT PROTOCOL

### Assent Protocol –

#### This will involve

- A meeting between potential participant and researcher with the service user's keyworker or family member present to ensure transparency.
- Physical props (music technology devices, video recorders, laptops etc) will be used to explain the research.
- Simple statements will be used to explain and contextualise the research.
- The meeting will be video recorded so that verbal or paraverbal signals can be recorded as evidence of assent, with the input of the key worker or family member.
- Assent will be “regularly monitored by sensitive attention to any signs, verbal or non-verbal, that they are not wholly willing to continue with the data collection” (British Psychological Society, 2010).

British Psychological Society (2010). Code of human research ethics. Retrieved 27<sup>th</sup> September 2012 from

[http://www.bps.org.uk/sites/default/files/documents/code\\_of\\_human\\_research\\_ethics.pdf](http://www.bps.org.uk/sites/default/files/documents/code_of_human_research_ethics.pdf)

## Appendix E: Digital Appendices Outline

See memory stick accompanying thesis

## Appendix A: Limerick Video and Audio

- Cycle 1
  - David's ABR idea – a clip of David describing his ideas for the group's recordings – see thesis p. 99
  - The On-Site Concert – an audio recording of the PAR group's first performance at their facility's summer concert. Audio only for reasons of confidentiality. See thesis, p.99
- Cycle 2
  - Limerick PAR group Research Lecture Oct 13 – a video recording of the Limerick group's presentation to the MA music therapy students. See thesis, p.100
  - Limerick PAR group Public Concert Dec 13 – a video recording of the group's end of cycle concert at the Irish World Academy. See thesis p.
- Cycle 3
  - Limerick PAR group Interactive Workshop – a video recording of the group's full presentation to MA Music therapy students, March 2014. See thesis p. 139
  - Limerick PAR group Exit interviews – video recorded interview with PAR group June 2014. p. 158

---

## Appendix B: Ennis Video and Audio

- Cycle 1
  - Ennis PAR Group On-Site Concert – video recording of some of the Ennis group performing in their day facility. p. 184
- Cycle 2
  - The Embrace Concert – video recording of the group performing at an Arts & Disability event in Cois Na hAbhna in December 2013. p.199
- Cycle 3
  - The Best of Cycle 3 – Improvisations from Cycle 3, edited by the facilitator and selected by the group. MP3 format. p. 221

---

## Appendix C: Limerick Rhizomatic Events

p. 251

- 1. Establishing the rhizome.

This cartography maps an event early in the research where a group of co-researchers played together, adapting their DMI interfaces throughout the improvisation. Each musician was using a music technology interface they were unfamiliar with to varying degrees. The players alternated between refining their DMIs in conjunction with me and concentrating on improvising with each other. This dynamic established in this early process by collaboration between the co-researchers came to be a common feature of the weekly sessions

Notes:

- \* used in first progression meeting to show “improvisation and adaptation”
- \* technology is an asset for the first time (in the group), rather than a source of frustration
- \* Garageband GUI represents real instrument
- \* Sharing iPads to access different resources/apps
- \* Launchpad app – loop ties music together
- \* David blends techno and orchestral percussion in instrument rack
- \* Demonstrates some of the inductive codes
  - 2. Locking In

The cartography presents the group’s effort to lock in with each other during an improvisation, without my musical input as facilitator. This appears to depend on the consistency of Ricky and Darren’s rhythm, the clarity of the overall sound, and their familiarity with their DMI interfaces. The shift in roles offered new possibilities for the group to interact musically.

Notes:

- \* Collaboration between Darren and Ricky
- \* Sense of connection to the music
- \* Jason told not to play – just facilitate
- \* Darren asks about controller layout leading to new DMI configuration
  - 3. The UL Concert

This event concerned the group improvisation segment of a public concert performed by the Limerick PAR group. Each musician contributed to the performance, with the interconnection of their DMIs facilitating the connection between the musicians and the cohesion of the improvised music. This event highlights the collaborative nature of the co-researchers’ 'becoming-musician'.

Notes:

- \* Culmination of work on thematic concern
- \* Ownership of idiosyncratic DMIs
- \* Connection between DMIs

- \* Countdown, last word
- \* Balance of DMIs, on-the-fly facilitation,
- \* Thomas engaged by not playing
  - 4. Chatting and Musicing

A group improvisation characterized by dynamic musical and verbal interactions. Multimodal references were made to musical tastes and influences. In contrast with the dichotomous *talk vs action* theme that had pervaded the research to date, the group, appeared quite comfortable doing both at the same time

Notes:

- \* Each musician takes prominence in the improvisation at some point
- \* Ricky incorporates own composition.
- \* David talks about his influences and his father as he plays
  - 5. Ricky in Charge

Ricky facilitates a research session. This was a first for the group and signified a further deterritorialisation and reorganization of the relations within the group. Ricky showed aptitude with Ableton as he comfortably managed the group's DMIs, while I was able to fully concentrate on musicing with Trevor R. and Darren.

Notes:

- \* Rhizome is broken and reformed, new possibilities emerge
- \* Ricky led the session, connected DMIs and determined VST choices - followed standard structure well while I was out of room
- \* I engaged solely as musician, and appeared to have fun
- \* Available to help Ricky, though also freed to give more attention to own musicing and other co-researchers.

## Appendix D: Ennis Rhizomatic Events

p. 268

- 1. Tainted Love

Relevant features

Deterritorialisation:

- Isomorphism – Drum kit controller resembles real drum kit more than any device Jonathon has previously used to play percussion sounds.

- Adaptation – the buddy button and the cushion allow Jonathon to play a bass drum by leaning forward
- Connections – Literal mappings of controller functions to DAW functions, (VST's).
- Line of flight – moments of musical prowess from Jonathon catch Jason by surprise. Jonathon surprises himself and stops playing after big fills.
- Other multiplicities: song lyrics “that’s not nearly ALL!” at high point of musicing
- Witnessing as participation (Chime and Paraic)

- 2. Knocking on Heaven’s Door

Relevant features:

Interfaces:

- Gerard’s new effect (rhythmic stability/control)

Line of flight

- Song leads to improvisation
- Ger adapts style to new FX
- “One more time” (Jonathon)

Deterritorialisation –

- Isomorphism (guitar)

Mapping:

- Affective synchrony. Lyrical/Musical

Effort and commitment

- 3. Coming together

Relevant features

Deterritorialisation

- On the fly reassignment of sounds and effects
  - Within user interface (adding FX)
  - Between interfaces (Jason reassigns own VST to Chime)
- Effort and user fit
  - Triggering options+ sounds (momentary, sustained, rhythmic)
- Isomorphism (guitar)::Rhodes piano (adding guitar FX later)

## Lines of flight

- Novelty/Firsts – Chime (percussion and arpeggiator), Jonathon plays melody
- Chime's snare beat leads to a reconfiguration of sounds/FX
- Paraic reaches for keyboard
  - 4. Serendipity

## Relevant features

- Intentionality and contact

## Deterritorialisation

- Smart guitar GUI and chord strips
- Changing interfaces/patches
- Isomorphism
  - Garageband smart guitar vs wireless controller (guitar)
- Degrees of interaction: player/interface

## Line of flight:

- Serendipitous harmony between Jonathon and rest of group
- Jonathon's "A-ha" moment
- Loose facilitation

## Other Multiplicities

- End of session reflection "it felt like we were together"

## Map – synchronising of different processes of becoming and affective response

- 5. Paraic's voice

## Relevant features:

-- Described as a "familiar dynamic" in notes (territorialisation – establishment of fixed relations)

## Deterritorialisation

- Ger's developing minimal style and the new synth (momentary and sustained sounds)
- Touchscreen glissandi on Jonathon's Garageband patch (contrast chord strips in previous reading)

## Line of flight

– As music coheres, Paraic responds. Sensitive responses sustain the interaction. Paraic seems to sing in tune.

Map: tacit knowledge mobilised in individual ways. Grooving (CMT) as musical becoming.

---

#### Appendix E: Rhizomatic Matrices

- Limerick Rhizomatic Matrix – a breakdown of the heterogenous elements of the Limerick research sessions from Cycle 1-3. Elements include DMI interface (input, processing, output), session description, PAR elements, musicing elements and rhizomatic elements.
- Ennis Rhizomatic Matrix - a breakdown of the heterogenous elements of the Ennis research sessions from Cycle 1-3. Elements include DMI interface (input, processing, output), session description, PAR elements, musicing elements and rhizomatic elements.