

Inclusive participatory design of bespoke music
instruments and auxiliary access equipment, as
emancipatory arts interventions advocating for equality
and wellbeing

William Edward Longden

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London Metropolitan University

Lead Supervisor: Lewis Jones
Second supervisor: Chris Smith

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Abstract

This practice-based research aims to increase participation in community music making, by exploring the production and use of bespoke instruments and associated access equipment designed to meet the personal needs and preferences of disabled people, who participate as co-designers and players.

Grounded in the tradition of participatory community arts, and using emancipatory approaches, the research challenges disabling attitudes and practices that inhibit social inclusion.

Three case studies demonstrate inclusive approaches to instrument design and making, contributing to the medical humanities and social sciences, and to the fields of community music, organology, inclusive design research and disability studies.

Bespoke music instruments are significant to Arts for Wellbeing practices and to the emerging Social Prescribing agenda; the possibility of Music Instruments on Prescription is proposed.

The inclusive methods used offer therapeutic benefit to individuals and society; by facilitating pathways for participation in product design and innovation, knowledge creation and transfer, and community music making.

Bespoke Music Instruments embody social, cultural and material qualities. As agents of personal and social development they are revealed as potent material for use in object-based learning as rich containers of stories about their designers, makers and players, and about the social environments in which they are created.

Demonstrating benefits that arise through inclusive participation, the research facilitates expression of voice by disabled, non-verbal and marginalised participants whose contribution works to increase social awareness and equal rights; and toward their self-emancipation as designers and musicians.

As experts by experience, disabled participants advocate for participatory community music by demonstrating the broader personal, social, and cultural advantages that can be gained through inclusive society.

Key Words

Community music and arts, participatory society, social inclusion, inclusive design, disability studies, organology, music instruments, emancipatory research, social prescribing, arts on prescription, arts for health and wellbeing, Object Based Learning, Bespoke Music Instruments.

Partner organisations

Joy of Sound

Registered charity Number: 1126361

www.joyofsound.org

London Borough of Kensington & Chelsea Learning Disability Resource Centre

MERU, a member of the QEF family of charities

Registered Charity Number: 269804

www.qef.org.uk

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Abbreviated terms

AIPS	Adjustable Instrument Presentation Stand
BMI	Bespoke Music Instrument
CAD	Computer Aided Design
C-D	Co-Designer
DCMS	Department of Culture, Media and Sport
IAD	Instruments Access Device
JOS	Joy of Sound
LA	Local Authority
LDRC	Learning Disability Resource Centre
London Met	London Metropolitan University
LSO	London Symphony Orchestra
NMT	Neurologic Music Therapy
OBL	Object Based Learning
OED	Oxford English Dictionary
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPIAS	Union of Physically Impaired Against Segregation
OT	Occupational Therapist
PMLD	Profound and Multiple Learning Difficulties
PP	Personal Profile
RBKC	Royal Borough of Kensington and Chelsea
TDM	Transformational Design Model
WHO	World Health Organisation
WIPP	Wind Instrument Presentation Platform

Abbreviated names

The following are abbreviations of names used in this thesis, particularly in the case studies.

AG	Alrick Guyler
BL	Ben Lynam
CL	Chris Leeds
DG	Dmitri Gour
GM	Godefroy Maruejouis
HL	Hannah Lewis
IB	Ian Burrow
JB	Jon Blend
JH	John Hendry
JS	Jason Suckling
KH	Katia Hadaschik
LJ	Lewis Jones
ME	Minna Eyles
MH	Merrin Hurse
NG	Nigel Gilderstone
NR	Nathan Reeves
SB	Sonia Barrufet
SO	Steve O'Sullivan
SP	Simon Powell
SR	Susannah Rigby
ShP	Sheryll Proctor
TR	Tadeusz Rytwinski
VC	Vicky Cable
WL	William Longden

Language and terminology

I am a practitioner before being an academic. Central to this research is my humanistic stance regarding the equality of every human being in any context. Whilst attempting to be objective I have struggled throughout in trying to find viable and comfortable forms of expression that are social, informal, natural and spontaneous. I have aimed for a plain English that might be easily read, understood and translated to allow best opportunity for sharing at grass roots level where the work is situated and intended to find its most pertinent mark, whilst being correct and sufficiently rigorous to meet academic requirement. My priority is that the emancipatory nature of this work might be easily grasped across the broadest possible spectrum of reader, and otherwise by experience of the Bespoke Music Instruments produced towards the research, in use by their players, and as objects rich in narrative associations.

My intended use of language is that of a social equity where all are treated and referred to as equals. This work is not grounded in any medical purpose, but rather in furtherance of a social model that veers away from the use of deficit and disabling terms. Whilst there is no fixed dictum regarding the use of language regarding disabled people, there are precedents, models, multi-cultural attitudes and ideologies that are uniquely derived and situated and constantly readjusting to fit into current social and political arenas that are themselves in a constant state of flux. As William (2013, p.13) puts it, "Experience cannot be standardised." This being the case, the language of experience must be open and inclusive of difference in modes of expression and in modes of reception.

I have referred to people by their real names as I intend to reiterate at every opportunity the importance of their co-creative participation in BMI production processes as real people and as Co-Designers who shared the journey of this research and must be acknowledged for the outcomes and success of the work. During the course of the research much has changed. I have needed to backtrack and readjust frequently to keep pace with current terminological

usage. I do not apologise for any lack of consistency but rather insist that any such variance is reflective of the real-life, lived circumstance of disabled and impaired people and those with whom they live, work and socialise, who must struggle constantly to find anchorage in a genuinely humanistic language where people are regarded and treated as unique and equal in every context.

Design Recipient vs Co-Designer

At the start of this research, the term *Design Recipient (DR)* was used to refer to participants such as Nicole, Karim and Ricky. Although this is retained here in the Design Logs, which were compiled at an early stage), I later adopted the term *Co-Designer (C-D)*, to reflect the active role they have taken. However, *Design Recipient* or *DR* still arises in quotes drawn from the Design Logs.

Notes on formatting

Use of “I” and “WL”

Throughout the thesis, refer to myself as “I”, except where I am identified as “WL” in the Design Logs, which were kept by the project administrator.

Use of bullet points

The reliability of the case studies rests on a wealth of qualitative feedback gained from a number of people engaged in the studies. Because presenting feedback responses to the BMI prototypes in narrative and paragraph form would be complex and potentially confusing to the reader, I elected to present much of what has been fed back by using bullet points. This approach is intended to isolate relevant qualitative evidence that informed the development of the BMIs, and to make clear my subsequent reflections on BMI design process.

LDRC and SCOPE

The Learning Disabilities Resource Centre (LDRC) who partnered JOS in this project was based in a building that was at one point occupied by the SCOPE charity. Although the LDRC is not affiliated with SCOPE charity, the participants and support workers often referred to themselves as being from “the SCOPE centre.” For the purpose of clarity, I have used LDRC in this thesis. However, as the name “SCOPE” was used during the course of the research, it will be found in some of the case studies and Appendices. Unless I make specific reference to SCOPE charity, therefore, the reader should understand mentions of SCOPE to refer to the LDRC.

Design Logs

Due to their size, the General Design Log, Nicole Design Log, Karim Design Log and Ricky Design Log have been included in a separate file as auxiliary material.

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Joy of Sound volunteers involved as co-facilitators enabling research workshops and meetings, and keeping the JOS project alive and focussed

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1. Introduction and Literature Review

In Chapter 1, I introduce each chapter of the thesis. I locate the research within the context of the Joy of Sound (JOS) inclusive participatory community music project, and describe how the need arose for the production of accessible music instruments and associated presentation devices that make instruments playable; and community music making accessible, to the broadest possible range of participants inclusively. I state my principal research questions and proceed to review the literature contextualising the research as intersecting the fields of musicology and organology (a subset of musicology), Music and Arts for Wellbeing, social inclusion, critical disability studies and Object Based Learning. I conclude by reiterating the rationale by which personalised music instruments, associated access devices and the music making that they facilitate are of significance in advancing the scope of organology, to the achievement of personal and social change, and toward equal access to all areas of society, as a human right.

This research is set within the context of JOS, an emancipatory music and arts project that advocates through practice for inclusive society using the medium of music and arts. JOS was founded in 2000 and has established its practices through experience of using improvised approaches to music making as a means of engaging players of all abilities as co-creative participants. Toward this aim, JOS workshops have from the outset used open tunings with the tonal centre E-flat (at $a' = 440$ Hz). Over time this approach has proved to be inclusively comfortable, accommodating of various instrumental tunings, vocal ranges and shared experience. The attitude and approaches used in facilitating such participation demonstrate potentials that can be applicable towards the realisation of a broader reaching inclusive society. Through facilitating the development of a participant-led community music, need arose for accessible music instruments and associated presentation devices that make instruments playable by the broadest possible range of participants. As such instruments and equipment were not available on the open market, I decided to produce them through the JOS project by working with disabled

participants as Co-Designer (C-D) experts by experience, and with JOS volunteers and associates as facilitating agents.

This thesis focuses on three case studies drawn from a number of achieved Bespoke Music Instruments (BMIs) that have been designed in collaboration with disabled C-Ds, their care and support networks, instrument makers, designers, organologists, JOS volunteers, project participants and associates. By situating its undertakings within the remit of academic research, I demonstrate how the project has generated new knowledge, and stimulated fresh insight and interest about processes and benefits associated with inclusive community music and related BMIs. My aim is to contribute to a knowledge base grounded in experience concerning emancipatory practices in the arts, and to challenge and change disabling attitudes, cultural norms and expectations around music and the people who express it.

Despite an extensive and growing body of research into the personal and social benefits and therapeutic advantages to be gained through involvement with music across its global range of manifestations, I contend that prevalent musical practices in the Western world have resulted in a culture that perceives musicality as the gift of a talented few. By contrasting this culture with participatory music in non-Western societies and music as a medium for improvisation, as play, and by situating my discourse within the social confluence model of disability, I suggest an alternative mode through which participation in music making can be accessible to everybody, with the potential to transform personal lives and society by example of benefits arising through the use of inclusive approaches. Given the recent rapid momentum towards Social Prescribing in the UK, I consider BMIs as potential therapeutic tools that might be used as Arts on Prescription.

As long as music instruments continue to be seen as mere producers of sound, there is little scope for them to be agents of personal and social change. I therefore look at BMIs from the perspective of Object Based Learning, which seeks to understand objects' meanings within their socio-cultural and historical contexts. Investigating the meaning and learning that BMIs can embody

reveals their creative, therapeutic and emancipatory potentialities as object agents towards personal and social change.

Conducting my research within the emancipatory framework, I work in an inclusive and person-centred way. Each case study presents the process of design and production of a music instrument made specifically to encourage and facilitate its disabled C-D to increased participation in community music making sessions. Disabled participant C-Ds provide leading creative input throughout the project by determining core design factors, testing and providing feedback about their BMIs, and by using them at JOS. Design Logs record the process of design, production and working prototypes testing of each BMI case study (Appendix 3-6). Qualitative data has been collected through meetings, questionnaires, photographs and film, and by logging regular feedback. A focus group produced further data towards evaluation of the project. Produced BMIs and associated auxiliary access devices provide material data as evidence of outcomes.

In achieving my broader goal of situating the inclusive design processes and the therapeutic and social benefits of BMIs within discourses that intersect organology, disability studies, emancipatory arts and arts for health and wellbeing, I answer the following questions:

Principal research questions

- How do BMIs function as material towards Object Based Learning (OBL)?
- How can disabled and impaired BMI Co-Designers influence design process and outcomes towards new knowledge creation through design innovation significant to the field of organology, and the achievement of personal and social change?
- In what ways can BMIs serve as therapeutic tools in relation to Arts on Prescription and Social Prescribing?

- What are the potentials for continuing BMI project development?

This thesis is divided into eight chapters, which develop and explore these research questions.

My Literature Review contextualises the research as intersecting the fields of musicology, organology, Music and Arts for Wellbeing, social inclusion, critical disability studies and Object Based Learning. Looking at examples of music instruments from early human history, and research into entrainment or embodied responses to music, I seek to establish that musicality is inherent in every human being and is connected to physical experiences. From this statement of universal intrinsic human musicality that gives foundation to JOS inclusive approaches, I explore improvisation as the facilitating mode of musical interplay used by JOS. I examine the significance of improvisation to human interaction, embodiment, participation, play and subversion. Additionally, I begin to examine the therapeutic potentials of improvisatory play with a view toward ongoing research. In section 1.2, I look at music playing, music improvisation and community music from the perspective of arts for health and wellbeing and establish the context within current policy making for the development of Social Prescribing and Arts on Prescription programmes. Finally, I present the case for inclusive access to wellbeing benefits derived through participation in music making. In section 1.3, I examine factors that contribute to the current situation in which a comparatively small percentage of the UK population are regularly engaged in playing a music instrument. I look at the idea that musicians are commonly regarded as having exceptional talent, and at aesthetics that privilege dominant Western European styles. I note the funding streams that perpetuate this privilege and underscore the prevailing system in which the vast majority of population participate in music as audience rather than as participating musicians and players. Finally, I look critically at global markets for standardised music and music instruments, which commodify music making such that many people with specific access requirements are excluded from playing, as commonly available instruments and modes of music making do not acknowledge or facilitate their personal

choice and specific need. In section 1.4, I reference the social model of disability, which states that people are disabled not only by impairment, but by environments and attitudes that deny them equal access to everyday activities. Within the realm of music making, I explore ways in which disabled people who are inherently musical may be either denied access to, or enabled to participate in music making activities depending on the confluence of social factors in their environment, in keeping with the social confluence model of disability. In section 1.5, I consider the growing field of organology which in response to expanding definitions of music and approaches to music making, embraces an increasing range of music instruments and instrument making practices. In particular, the field of Object Based Learning (OBL) is broadening awareness of characteristics that music instruments can embody, and how they can be meaningful agents of personal and social change.

Chapter 2 (Methodology, Methods and Research Design) sets out the theoretical frameworks that underpin the research, my rationale for the inclusive methods used in producing BMIs and in collecting and evaluating data. Given the aim of personal and social change that motivates this project, I set it within the historical framework of emancipatory research and establish a context within the field of emancipatory design. I connect the emancipatory goals to a contextualist view of knowledge, and present ways in which JOS seeks to create contexts where disabled people are seen as being uniquely knowledgeable about their personal experience, and able to communicate their expertise. I present criteria from the literature by which emancipatory research projects have been evaluated, and discuss how I aim to fulfil such criteria within this project. In section 2.2 I look at additional principles that influenced my viewpoint towards this research, including integral theory and integral design, a holistic intersection of aesthetics, ethics and practicality. I also present the principles around inclusive design, and the JOS-adapted Transformational Design Model, both of which impacted the processes by which the Bespoke Music Instruments (BMIs) were developed.

Given the emancipatory goals of the research, it has been necessary to work in a person-centred way by which disabled C-Ds instigate and guide design

process. I outline my methods for achieving this, and discuss how BMI prototypes have been used throughout the design process as Object Based Learning repositories for informational narrative about their C-Ds' personal preferences, needs and experiences. Finally, I put forward my rationale for the use of case studies to present the results of the BMI production process. In section 2.2 I present the overall project design, and in section 2.3, I outline my methods for data collection and analysis.

In Chapter 3 (Introduction to Case Studies), I present JOS as the context in which the three case studies take place. I present previously achieved BMIs that led to the development of this research, and discuss lessons learned from the initial BMIs that have informed the way the research has been undertaken. I then provide an introduction to LDRC and MERU, organisations that partnered JOS in realising aspects of the project. Finally, I set out the initial stages of BMI project development as it was introduced to personnel at LDRC, prior to the appointment of the disabled C-Ds. Within this section, I present the Aims and Objectives of the project as benchmarks for evaluating the success of the produced BMIs.

Chapters 4 – 6 (Nicole's, Karim's and Ricky's case studies) each pick up where the Introduction to Case Studies leaves off, by presenting a detailed illustrated Design Journey that maps the production process of each BMI or Instruments Access Device in relation to its disabled C-D. The case studies narrate each design process from inception of initial design concepts, sketches, design development and finalised hand drawn and CAD drawings, through to model and working prototype stages that are designed, tested and refined in accordance with direct feedback from disabled C-Ds, and auxiliary sources. Each case study presents multiple diagrams and images recorded throughout production process with accompanying statements noting the viewpoints of disabled C-Ds, their familial and professional care and support networks, instrument makers, designers and other JOS participants, volunteers and associates, in order to achieve broad-reaching and comprehensive narrative about the BMIs and their viability as music instruments, therapeutic devices and emancipatory objects.

Chapter 7 (Reflecting on the BMIs) presents firstly the results of an informal focus group in which those who had been involved in the BMI design project as care and support workers at LDRC were invited to examine and consider the design and function of the produced BMIs in relation to the criteria as determined by the choice and need of their disabled C-D players, and to give their feedback. Section 7.2 draws on the results of the focus group and on the case studies themselves to evaluate the BMI design process from the perspective of the project's Aims and Objectives.

Chapter 8 (Discussion and Conclusions) examines the project from the perspective of the research questions. In each section I align evidence from the case studies with discourses from the Literature Review to suggest ways in which the research questions may be answered, and to present possibilities for further development of the research in relation to organology, Object Based Learning, emancipatory research, arts for health and wellbeing and BMIs in general. I discuss factors that have impacted the practical success of the research, and ways in which the validity of its claims might be limited by my personal experience and viewpoints due to the emancipatory nature of my undertaking, and my relational proximity to research participants. Finally, I present my conclusions making clear this thesis' contribution to knowledge and understanding within its fields of remit.

Literature Review

In this section I provide a rationale for research into Bespoke Music Instruments by intersecting elements from the fields of musicology, organology, arts for health and wellbeing, social inclusion, critical disability theory and Object Based Learning (OBL). Juxtaposing views about music making currently prevalent in Western society with those found in other parts of the world, in Music Therapy, in community music environments including JOS, and within the wider movements of arts for health and wellbeing and social inclusion, I situate my discourse within the social model of disability. I suggest alternative musical idioms as an antidote to a lack of access and participatory involvement in music making as experienced by disabled people and others, and propose BMIs as facilitating agents of change. Finally, I discuss music instruments within the realm of OBL, as repositories of information about their designers, makers, players and the social contexts in which they are produced and used. I suggest BMIs as potent agents of OBL, towards acknowledgement, appreciation, and subsequent increased social inclusion of disabled and marginalised people who co-produce and play their BMIs as self-emancipatory tools.

Undoubtedly my personal experience of growing up in a large family that shared music spontaneously (most memorably singing together with brothers and sisters in multi-layered harmony at the kitchen sink) has been deeply significant in inspiring and guiding my involvements and development in personal and community music making. Nevertheless, it was my experience of African tribal music that led to the founding of JOS and to the development of the inclusive approaches to music making that underpin its core values and practices. As a pupil of Thebe Lipere, a Soweto-born master drummer and internationally celebrated improviser, I became practically aware of African drum culture, and of the nature and function of drum-circle play as a community music making activity.

My hands-on experience achieved over a period of six years regular group tuition that included playing with other African master musicians opened the door to my increased awareness and appreciation of the universal capacity and potential of music as a means of community engagement, and as a real time indicator of flow – by which I mean the visual, auditory and energetic interconnectedness and self-evident changing interpersonal dynamics and relationships that occur continually between participating players, and of the emergent feelings of joy, enhanced community, shared interest and personal development that arise as result of such music making.

Through reading the works of John Blacking (1973), a European ethnomusicologist who spent years making music with the indigenous Venda people in South Africa, my personal experience became clarified as being situated within the context of practical and academic musicology. It was by my practical clarification of the creative continuum that binds ancient tribal music traditions to modern community music that JOS was founded, and has subsequently developed as an inclusive, participatory community music facilitating and research organisation.

1.1. Improvisation as intrinsic

This section recognises musicianship as an intrinsic element of human society, with roots in community life and improvisation. Examining the literature on embodiment and entrainment, I discuss ways in which human beings' inherent musicality is grounded in physical response – something that is particularly important when considering music in inclusive settings. Finally, I explore improvised music's relationship to entrainment, play, and subversion.

1.1.1. Indigenous music and the process of 'becoming'

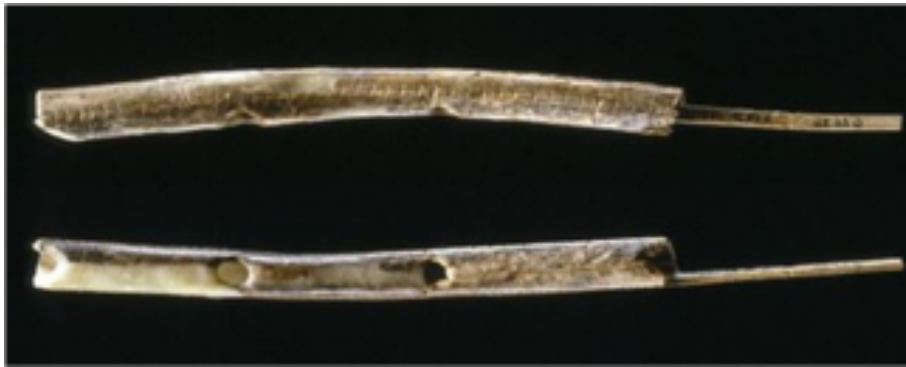


Figure 1.1.a: 42-43,000 year old Flutes found at Hohle Fels cave in southern Germany. Image from <http://www.bbc.co.uk/news/science-environment-18196349>

Research into human history is increasingly uncovering evidence that the earliest human societies made music. Higham, et.al. (2012) describe the finding and carbon dating of flutes made from bird bone and mammoth ivory between 42,000 and 43,000 years old, and suggest that music may have helped establish and nurture social relations.

Within traditional cultures, music is still primarily played within community contexts. Bebey (1969, p. vi), discussing the role of music in African societies, writes that it “is fundamentally a collective art... whose spiritual qualities are shared and experienced by all.” While there are some ceremonial situations in which music making is restricted to particular roles, the societies in which music is a “dynamic and driving force that animates the life of the entire community” (Bebey, 1969, p. 17) serve as grounding inspiration for this

research. Similarly, in reference to his field research with the Venda tribe, Blacking (1973, p. 28) writes, “Venda music... is an experience of becoming, in which individual consciousness is nurtured within the collective consciousness of the community and hence becomes the source of richer cultural forms.”

The collective and largely improvisatory nature of music can also be found within the tradition of the Balinese Gamelan, where there is no differentiation between professional and amateur musicians (Small, 1980). Rehearsals are held in public, to be enjoyed and commented upon, and “the pieces are constantly evolving. The players revel in the process of creation and care less about the finished product, which may well disappear, unmourned, when the musicians become tired of it” (Small, 1980, p. 45).

The inclusive nature of JOS music making brings people of all ages and abilities together as co-creators to make music as a community of shared experience. Intensive music based interaction as encouraged and facilitated at JOS sessions can involve anything that happens within the context of the session as a component part of a music improvisation. It is this openness and facility to embrace and include any new emergent factors into the creative flow of the music making process that connects JOS approaches to Blacking’s notion of music as “an experience of becoming.”

1.1.2. Music improvisation as embodiment and play with subversion

Within literature on non-Western music, the importance given to physical movement suggests embodiment to be a key factor in music making. Wilson and Golonka (2013, p. 1) define embodiment as the idea that “our bodies and their perceptually guided motions through the world do much of the work required to achieve our goals, replacing the need for complex internal mental representations.” Mathers (2016, p. 13) writes that our experience of embodiment is “shaped by cultural values... and manifest as a feeling, or

knowing, of culture within ourselves.”

DeNora (2004) discusses embodied musicality from a developmental perspective, pointing out that our earliest experience of the elements of music occurs in the womb, through perceiving our mother’s rhythmic breathing. She presents entrainment as “the alignment or integration of bodily features with some recurrent features in the environment,” from the way the pulse regulates the body, to the way toes tap to music (pp. 77-78).

In the realm of Neurologic Music Therapy (NMT), Thaut (2008) traces rhythmic entrainment in everyday life to the songs of factory workers, who use commonly shared music to enhance performance and ease stress. Other examples could include slave songs, sea shanties and farm worker songs. Considering evidence of flint chips around Neolithic fire pits (O’Brien et.al., 2009), it is possible to imagine the entrainment of people 6,000 years ago, as they worked together chipping their stone tools into shape.

There exist multiple accounts of the way musical embodiment can enter the mystical realm. Schneider (1960) highlights the mystical role music plays in totemic cultures, in which every person has and *is* his or her own personal song and sound. From the modern perspective, renowned improviser, Derek Bailey speaks of “a complete personal identification with the music [improvisers] play. They... are the embodiment of the music” (Bailey, 1992, p. 11). Improviser and academic Ellen Waterman elaborates this experience as a “loss of subjectivity... where she is no longer aware of her own body’s pain or limitations in the experience of continuity with the music” (Waterman, 2008, pp. 5-6).

Seddon (2005) connects the improviser’s experience of embodiment to the social awareness of people playing together, with his concept of *empathetic attunement* – a kind of nonverbal communication by which jazz musicians take risks, try new things and respond to each other musically.

Theories of embodiment find practical realisation at JOS sessions, where any

participant might express a movement or gesture ranging from a breath or a blink, to a series of head or bodily movements, which might then be used as a prompt that other participants can respond to with voice or with instruments, as a basis from which to develop a group improvisation. As the group reiterates and repeats any such prompts, they become recurrent themes in the context of the improvisation, and thus encourage group entrainment through shared embodiment. It is this commonly shared experience of inherent musicality that allows groups of diverse players of different ability to co-produce music together as equals and to experience wellbeing factors that can arise out of such shared experience.

Simon Procter, Director of Music Services at Nordoff Robbins, highlights the creative and therapeutic potential of responding to everything that happens as improvisation. “On such a scale, improvisation becomes part of life itself... the dynamic creation of our social selves in the context of others. It is living itself” (Procter, 2016, pp. 65-66). Fischer (2007, p. 11) views our constant re-evaluation of circumstances as a natural readjustment, and a form of play.

When the situation does not match our expectations then there is some kind of breakdown. In such situations an activity best described in terms of play or dialogue occurs [...]. Our effective historical consciousness is always being renewed.

Playfulness is inherent within such improvised “dynamic creation.” This calls to mind the homonymic relationship between the different meanings of the word *play*. Huizinga (1949) points out in his work *Homo Ludens* that the concept of play is built into the linguistic terminology by which music is known, both in English (to *play* an instrument) and in Arabic (*la'iba* means playing an instrument, as well as laughing / mocking).

Since this semantic understanding between East and West can hardly be ascribed to borrowing or coincidence, we may assume some deep-rooted psychological reason for so remarkable a symbol of the affinity between music and play.

The aspects of play and playfulness that arise within improvisation have the potential to challenge and undermine established ideas, leading to a discourse that implies improvisation is “too illusive for analysis and... contradicts the idea of documentation” (Bailey, 1992, p. ix). In *The Consuming Image*, Rumney (1989, p. 4) states, “an artist is not an artist if he is not subversive; there is the ludic element... and play is not play if it is not subversive.” Within the illusive, subversive nature of improvisatory play lies an element of danger or even immorality which allows players to “[explore] violence or absence, tenderness or impermeability, without censure” (Toop, 2016, p. 3). When Waterman (2008, p. 4), writes about the way music improvisers, through a complete, embodied engagement with the sonic environment, seek “to risk all in the search for ecstatic experience,” she implies both danger and a quality of transcendence in improvisation. However, Bailey (2012, p. 9) argues that “a practice that feeds on dismantling established codes will eventually devour the context of its birth,” implying that within the “danger” of improvisation lies a potential for the music - and its players - to undergo a complete transformation, marking it as a potentially therapeutic practice.

In relation to Music Therapy, Wigram (2012, p. 432) states that “improvisation is a much freer and more flexible way of creating music than either playing by ear or playing ‘in the style of...’ It can be more simple, but also more complex, as well as essentially original and idiosyncratic.” Procter discusses the way in which improvisation in particular provides opportunity for aesthetic self-expression, particularly when mentally ill people do not have easy access to the arts. “Indeed it might even be argued that improvisation has the potential to appropriate certain aspects of mental illness in the service of a person’s experience of wellness” (Procter, 2009, p. 63).

Whilst the prime focus of JOS is to facilitate access and creative engagement of participants of all abilities as co-creators in improvisational flow, I propose that the musical outputs achieved by such inclusive processes can be included under Bailey’s (1992) umbrella term of “idiomatic improvisation... [which] takes its identity and motivation from that idiom” (JOS idiomatic), and is aesthetically equal and significant as any other such idioms referred to by Bailey as “jazz,

flamenco or baroque” (p. xi). As such, I propose that the improvisational music co-produced by JOS participants is worthy of equal consideration, resource and appreciation as any other music, and an integral aspect of our social and cultural heritage¹.

1.2. Arts for health and wellbeing

This section marks the rise of arts for health and wellbeing movement, which has done much in recent years to highlight the benefits of participation in community music activities and the playing of music instruments. I proceed to discuss Arts on Prescription as an element of the broader Social Prescribing agenda, which seeks to extend the benefits of participation in the arts to people on health and wellbeing pathways as preventative and therapeutic measures. Finally, I discuss social inclusion as a determinant of personal and social health and wellbeing, and argue that for many people, the right of access to participation in music making activities has not yet been realised.

JOS locates itself within the arts for health and wellbeing movement, and its interventions draw on certain practices that can be found in Music Therapy² and Occupational Therapy.³ A number of contrasts exist, however. Whilst practitioners of both Music Therapy and Occupational Therapy are required to

¹ An example of music produced in JOS idiomatic can be found on the BMI Film, produced as auxiliary material towards this research (Appendix 14, 05:33).

² Music Therapy is “an established psychological clinical intervention, which is delivered by HCPC registered music therapists to help people whose lives have been affected by injury, illness or disability through supporting their psychological, emotional, cognitive, physical, communicative and social needs.”

British Association for Music Therapy (2017) *What is music therapy?* [Online]. Available at <https://www.bamt.org/music-therapy/what-is-music-therapy.html>. (Accessed 25th August 2017).

³ Occupational Therapy “is a science degree-based, health and social care profession [that] provides practical support to empower people to facilitate recovery and overcome barriers preventing them from doing the activities... that matter to them.”

Royal College of Occupational Therapists (2017) *What is occupational therapy?* [Online]. Available at <https://www.rcot.co.uk/about-occupational-therapy/what-is-occupational-therapy>. (Accessed 8th October 2017).

be academically qualified and most frequently operate in clinical environments, JOS functions primarily in an informal social context, involving members of the community as participating self-advocates in achieving its wellbeing interventions. All three systems draw on well documented improvisational approaches towards the achievement of outcomes towards the wellbeing of participants.

In 2010, the UK's regulating body for public health stated a causal link between mental wellbeing and physical health. "Mental wellbeing protects against mental and physical health problems by increasing resilience to common emotional, social and financial stressors" (Faculty of Public Health, 2010). This links to the UK Government's current wellbeing agenda that aims to prevent mental and physical illness, by promoting mental wellbeing at population level. On a global level, the World Health Organisation (WHO) has highlighted the importance of mental health, towards preventing noncommunicable diseases such as cancer, heart disease, diabetes and respiratory illness. "We now know that addressing mental illnesses in primary care settings will delay progression, improve survival outcomes, and reduce the health care costs of... noncommunicable diseases" (Kolappa, Henderson and Kishore, 2013, p. 3). The *2030 Agenda for Sustainable Development*, adopted by United Nations Member States in 2015, states that "Rich and poor countries alike can benefit from policies promoting equality and inclusivity."⁴

Evidence of links between physical and mental health are of particular importance to the care and support networks who work with disabled and impaired people. This group are at higher than average risk for developing mental health problems (Mental Health Foundation, 2016). In a 2015 report by Carers UK that interviewed 4,500 carers, 84% reported feeling more stressed than in the previous year, 78% reported feeling more anxious, and 55% reported suffering from depression as a result of their caring role (Carers UK, 2015). As a high percentage of participants at JOS are care and support workers who work with disabled participants, it is important to acknowledge

⁴ <https://sustainabledevelopment.un.org/?menu=1300>

their associated needs and to build consideration of such into the participatory frameworks that JOS uses.

In July 2017, the All Party Parliamentary Group on Arts, Health and Wellbeing published an inquiry report outlining the extensive potentials of engagement in the arts to aid the mental and physical wellbeing of people in all walks of life, and advocating for the further development of Social Prescribing programmes in the UK as a means of reducing pressure on healthcare systems by early intervention of preventative and reductive measure at a social level.

1.2.1. Community music and wellbeing

Community music, a common wellbeing activity, is defined by the International Society for Music Education (ISME) as:

Music in community centres, prisons and retirement homes; extra-curricular projects for school children and youth; public music schools; community bands, orchestras and choirs; musical projects with asylum seekers; marching bands for street children. All this – and more – comes under the heading of community music [...]. But a single definition of community music is yet to be found.

cited in Brown, Higham and Rimmer, 2014, p. 12

While this definition is relatively apolitical, the ISME website links community music activities to the arts for health and wellbeing agenda, stating that they “provide opportunities to construct personal and communal expressions of artistic, social, political, and cultural concerns... enhance the quality of life for communities and contribute to economic regeneration” (International Society for Music Education, 2016). A 2014 report for the Arts and Humanities Research Council on the effects of community music in community engagement emphasises its capacity to develop “self-awareness and confidence, the ability to communicate and collaborate, and enhanced ability to think and act creatively” (Brown, Higham and Rimmer, 2014, p. 44). Of particular importance towards the wellbeing agenda is the report’s finding that

“participants in CM activities are often untypically lacking in... confidence and / or the inclination to engage in collaboration... have been denied – or have rejected – the opportunity to engage in more formal learning environments.”

Whilst the therapeutic benefits of music have been acknowledged for a long time, the field of music therapy is currently used to treat disorders of thought, mood, personality and anxiety (Hurt-Thaut, 2009), and can provide “an outlet for negative feeling processes, providing feedback and support for movement, control, pairing physical exercise with relaxation, increasing frustration tolerance, promoting coping skills and focusing attention in a structured and calming environment” (Hurt-Thaut, 2009, p. 506).

In meeting criteria implicit within the above mentioned definitions of Music Therapy Occupational Therapy and Community Music, JOS combines facets of all three into an integral form of *inclusive community music*, at the heart of which arises improvisation as a core element of inclusive practices that give therapeutic potential to the broadest achievable range of beneficiaries, through their participation in socially inclusive music making activities.

1.2.2. Music instruments as objects towards wellbeing

In *Rhythm, music and the brain*, Neurologic Music Therapy (NMT) pioneer Michael Thaut (2008, p. 113) speaks of the therapeutic value of music in therapy and medicine. “The therapeutic value of music is derived from the various emotional and social roles it plays in a person’s life and a society’s culture, based on the accepted uses, norms, and functions for the arts.” The training manual for NMT indicates the breadth of ways in which music can be used to address sensorimotor, speech and language and cognitive impairments and disabilities (Thaut, 1999).

Historic reference to playing a music instrument for the purpose of personal and social wellbeing go back at least 3,000 years with the *guqin*, a Chinese lute associated with “self-cultivation, meditation, mind purification and spiritual

elevation, union with nature, identification with the values of past sages, and communication with divine beings or with friends and lovers” (Fang, 2009).

Robert van Gulik was an orientalist, diplomat, guqin player and writer, who is widely regarded as a leading authority on all matters relating to the guqin. Amongst the personal and social wellbeing factors associated with the guqin as an object, and with the sounds produced by its playing, in referring to broad ranging Chinese historical sources van Gulik (1941) includes that it disperses darkness of the mind; calms the passions; is a means of reaching enlightenment; conveys heavenly and earthly harmony; improves the heart; ameliorates morals; brings serenity; balances body and mind, likes and dislikes; establishes the right order of all things; regulates the State and perfects the individual.

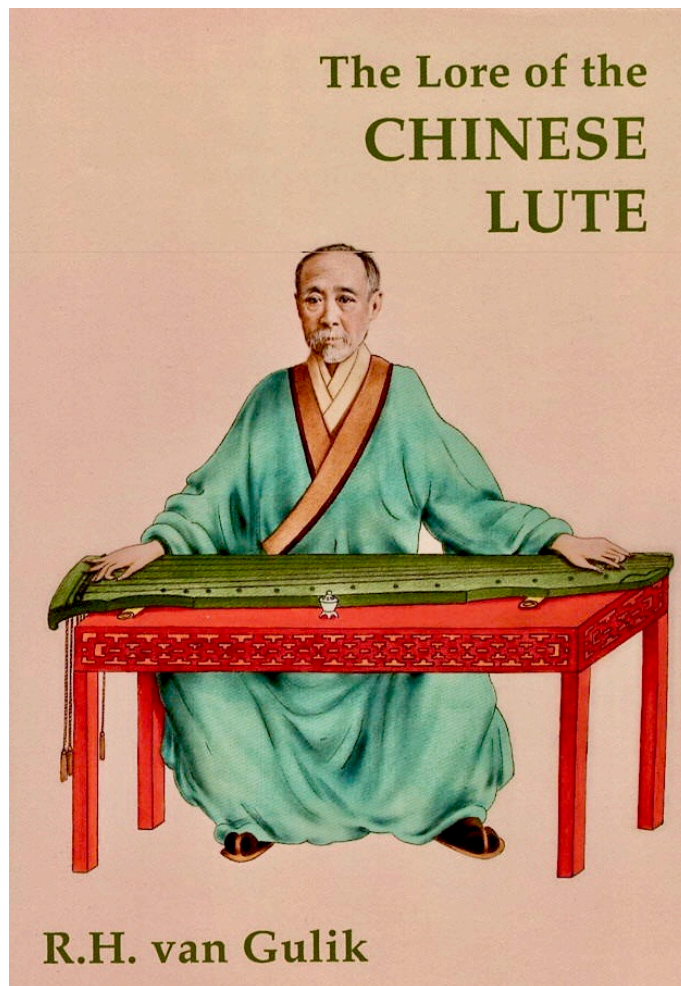


Figure 1.2.a: Front cover of *The Lore of the Chinese Lute* by R.H. van Gulik (1941) showing a Guqin (Chinese zither) player.

Spirituality, as a factor influencing wellbeing was first acknowledged by the World Health Organisation in 1984, when a draft proposal stated that “The spiritual dimension plays a great role in motivating people’s achievement in all aspects of life.” Since then, there has been growing interest in the connection between the spiritual domain and mental wellbeing. A report by the Mental Health Foundation (Cornah, 2006, p. 32) finds that “expressions of spirituality that encourage personal empowerment, that affirm and embrace diversity and that promote the importance of emotions such as hope, forgiveness and purpose” have a positive impact on mental health.” Relating music to creativity, Huizinga (1949, pp. 158-159) writes, “in feeling music we feel ritual. In the enjoyment of music, whether it is meant to express religious ideas or not, the perception of the beautiful and the sensation of holiness merge.”

Music instruments, as tools for self-exploration, expression and shared creative experience, have the potential to facilitate players of all faiths and of none, to access and affirm their personal and communal identity, spirituality and wellbeing.

1.2.3. Social Prescribing and Arts on Prescription

Reports linking participation in the arts to wellbeing (Secker, et.al., 2007; Fenton, 2013; All Party Parliamentary Group on Arts, Health and Wellbeing, 2017) highlight the potential of participation in the arts as an aid to recovery as well as a factor in building personal and social resilience as preventative measures that “offer a more holistic approach to tackle complex health problems” (Chatterjee, et.al., 2017). This has led to the incidence and growth of Social Prescribing programmes around the UK, which encourage GPs and other healthcare practitioners to refer patients to available “sources of support within the community to help improve their health and well-being” including ecotherapy, bibliotherapy, volunteering, exercise on prescription and arts on prescription such as poetry, theatre, dance, music and singing activities (Bickerdike, et al., 2017, p. 1). Recent reports on Social Prescribing programmes (Jackson, 2016; Polley, et al., 2017) have found that stakeholders commonly value patient autonomy, an emphasis on wellness rather than illness, and a comprehensive, patient-centred assessment process.

Studies evaluating Arts on Prescription (White and Salamon, 2010; Bickerdike, et al., 2017) highlight the difficulty of measuring outcomes, and emphasise the need for more evidence on good practice in community-based interventions. Additionally, Jackson (2016) points out the danger of existing organisations simply calling their services ‘wellness activities,’ without developing a wellness-supporting ethos. Such organisations, he says, “are therefore both doomed to fail and skew any evaluation of impact... as Social Prescribing gains political parlance without real cultural change it simply risks becoming a ‘buzz word’ lacking any real substance” (Jackson, 2016, p. 15). This indicates the need for examples of practices which lead to gains in wellbeing that can

be more widely communicated and dispersed across and beyond the Social Prescribing sector.

In his published address to the Culture, Health and Wellbeing International Conference, Lord Howarth of Newport calls for diffusing leadership amongst

artists, clinicians, carers, service users engaging together, in dialogue, debate, collaboration and co-production, across conventional boundaries [to challenge the] dominant medico-technical culture [...] humanise it and open it to the possibilities of imagination, creativity and the spirit.

Lord Howarth, 2017, p. 11

Such a dialogue could not only add to the evidence base on good practice, but also enable a greater degree of personalised care for disabled, impaired and disadvantaged people. To this end, the All Party Parliamentary Group on Arts, Health and Wellbeing recommends that

NHS England and the Social Prescribing Network support clinical commissioning groups, NHS provider trusts and local authorities to incorporate arts on prescription into their commissioning plans and to redesign care pathways where appropriate.

All Parliamentary Group on Arts, Health and Wellbeing, 2017, p. 155

This governmental acknowledgment implies that whilst the development of Social Prescribing that incorporates Arts on Prescription and by association potential for music instruments on prescription is desirable, it requires inter-agency collaboration to be successful.

With the WHO, UK governmental, medical and community based bodies acknowledging the importance and encouraging the increased use of participatory creative arts towards public health, this may be a crucial point for grass roots volunteer led projects such as JOS to contribute to the dialogue in demonstrating the benefits of personal and socially inclusive engagement in arts, music and design towards health and wellbeing.

It is intended that this research contributes towards the gathering momentum for arts, including music, on prescription, and particularly by demonstrating how the production of music instruments and associated access equipment can be undertaken as therapeutic and new knowledge creation interventions in the context of inclusive community music; and how such initiatives might offer effective means to demonstrate and advocate for the further advance of authentic and meaningful Social Prescribing initiatives.

1.2.4. Inclusion: rights of access to participation

Given the common acknowledgement of wellbeing factors that can arise as a result of participation in music making activities, access to any such activities in a personal or social context cannot be intended merely for a privileged few, but by equal right of access and opportunity must be made available and accessible to all members of society. The WHO's report on Tackling Social Exclusion emphasises the need for social advocacy towards this goal, as it reveals a "continuum of inclusion / exclusion characterised by unequal access to resources, capabilities and rights which leads to health inequalities" (Popay, 2008 p. 2). In UK legislation the Equality Act 2010 (Great Britain) emphasises the illegality of discriminating against people, based on disability. However, the UN Committee on the Rights of Persons with Disabilities (2017, p. 6) has criticised implementation of this act, citing "grave and systemic violations of the rights of persons with disabilities." Whilst the UN report indicates that the take-up of the Equalities Act 2010 has been slow, momentum of the Health and Wellbeing agenda indicates that it is essential for socially excluded people to have access to all areas of society. This includes access to benefits that can be gained through participation in music making.

JOS interventions advocate for greater social awareness and the realisation of social equity in accord with the above stated global initiatives, and in agreement with standards as forwarded by Inclusion Press that draw together a broad range of definitions to build the following set of inclusive principles:

Inclusion is about ALL of us
Inclusion is about living full lives – about learning to live together.
Inclusion makes the world our classroom for a full life.
Inclusion treasures diversity and builds community.
Inclusion is about our ‘abilities’ – our gifts and how to share them.
Inclusion is NOT just a ‘disability’ issue.

O’Brien et al., 1996.

This definition makes clear the fact that inclusion is not simply about how people who are disabled, ‘different’ or ‘outsiders’ are regarded and treated, but is rather “an all-embracing societal ideology” (Special Education Guide, 2017) that perceives working inclusively as a practice through which all of those involved have potential to develop and “become new people capable of building new and more human communities” (O’Brien et.al., 1996). Studies in inclusive settings demonstrate that while a commitment to inclusion can challenge established systems and hierarchies, it also offers opportunity to unlock potentials for greater social democracy, creativity, understanding and empathy.

The development of inclusive practices employed in the achievement of this research have been determined by the personal preferences, needs and access requirements of participants. According to feedback from the Community Development Foundation, at JOS “people gain through meeting on an equal basis, and in sharing their experiential knowledge” (Evison & Roe, 2009, p. 132).

Potential for inclusive approaches to transform society are articulated by Marc Jeffery, a humanist and scholar who at the time of our meeting was confined to a wheelchair. After visiting a JOS session, Marc wrote the following text in which he articulates the ethos of inclusive society (full version in Appendix 12). Marc died a few days after the delivery of his text. I subsequently learnt that he had been seriously ill for some years and that he was a known disability rights advocate and activist.

If ...
you get it right for the disabled you get it right for all. Irrespective of gender,

age or perceived sagacity. This tenet underpins the very principals of Universal law.

Equality is the basis for human life. We learn that they who are able bodied are the needful learners, as opposed to the misconception of disability that decrees that those who are labelled the disabled, are learning challenged; for true learning lies within those who are hardest to reach...

Diversity affects us all, and from it, we benefit. Yet, learn we can and should. Interact with disability and learn from it, for it knows no boundaries, it goes beyond imagination and makes the impossible possible...

Each individual adds to the layers of our knowledge and from their capabilities we fashion the capability of all to communicate, and from that communication reap the benefits of communal ability...

We do not deny, we do not manage medically or socially, we do not patronise. Instead we learn from these, our co-teachers and co-creators. Through collective capability, collective trust, and collective thought, a microcosm that can inspire all to learn...

Jeffery, 2012, p. 1.

Marc Jeffery (2012, p. 1) proposes that “We take each person as a Rosetta stone,” a tool to unlock the realisation of “collective capability.” In relation to JOS inclusive community music practices “we learn about ourselves,” and through participation, observation and awareness of inclusive community music “we allow our collective imaginations a never ending access to the global village that can enable life to imitate art and inspire a collective capability that goes far beyond the playing of the first note on a global map of harmony” (Jeffery, 2012, p. 1).

1.3. Exclusion in music

Whereas music is experienced socially in indigenous cultures, Waterman (2008, p. 6) points out that “Western audiences are physically and symbolically separated from performers, they are situated as voyeurs.” Despite mounting evidence of wellbeing associated with playing music and examples of societies and environments where participation in music is seen as the norm, music participation in the UK is far from inclusive. The Department of Culture, Media and Sport’s (DCMS) England-wide survey of participation in voluntary and amateur arts reveals that in 2007, out of over 51 million people (Office of National Statistics, quoted by Barrow, 2014), only 1,642,000 (just over 3%) participated in music groups, only 2% of whom considered themselves disabled (Department for Culture, Media and Sport, 2008). The general population’s lack of experience of participating in music is reflected in JOS sessions, where it is common for new support workers to express reluctance to join in, due to not seeing themselves as musical. In this section, I begin to unpick some of the reasons for the current state of exclusion in music.

1.3.1. Music as fixed, musicians as exceptional

Blacking sums up the perspective from which he first encountered indigenous Venda music, thus:

I had been brought up to understand music as a system of ordering sound, in which a cumulative set of rules and an increasing range of permissible sound patterns had been invented and developed by Europeans who were considered to have had exceptional musical ability.

Blacking, 1973, p. x.

The Western canon of music, through its emphasis on fixed, notated forms, has given rise to a perception of musicians as a breed apart, which has ultimately led to an exclusive attitude that restricts notions of who can participate actively in music making activities, and how. In *The Anthropology of Music*, Merriam (1964) highlights the difference between the Western perception of music as being a question of special talent, and indigenous

cultures where it is seen as a universal ability accessible to the entire community.

Bailey (1992) believes that this attitude is in large part due to the reification of composers by orchestral conductors, during the Baroque era, who restricted musicians' improvisation to codified and predictable cadenzas. Currently, Bailey suggests that the attitude towards classical music implies that "Music is precious and performance constitutes a threat to its existence... Somebody, somewhere, has gone through a lot of trouble to create this thing... and the performer's primary responsibility is to preserve it from damage" (1992, pp. 66-67). In contrast to indigenous treatment of a piece of music as transient and disposable, Bohlman (2001) points out that Western culture – and notation in particular – has objectified music, codifying it as something which has a fixed and unchanging identity, independent of the performer. Musician Lionel Salter, in an interview with Bailey, implicates the recording industry in the perpetuation of music as a fixed entity. "We've all become so conditioned by modern recording techniques and by broadcasting... everybody's afraid to put a foot wrong," Because the recording will be subjected to countless hearings, there is a pressure to play something "set and perfect" (1992, p. 26).

The relatively fixed nature of music makes it challenging for those who do not have support and encouragement of family and / or music education that allows them to enter the sphere of music. For profoundly disabled people and many others, the chance of becoming a musician in the Western idiom is extremely remote. The general lack of confidence that arises from such remoteness, means that music is frequently absent in situations where it could be of therapeutic value. This notion of remoteness extends to healthcare professionals. Purtell points out that while many Occupational Therapists are happy to facilitate "art, creative writing, gardening and cooking sessions... without thinking themselves an expert," that confidence stops short at music (Purtell, 2013, p. 34).

Improviser Alex Lubet (2011, p. 99) writes, "An expectation of universal musicality requires not only egalitarian sentiment but also a musical praxis that

makes possible, and may even require, such broad participation.” It is in advocating for such a musical praxis that JOS’ style of inclusive community music improvisation, and by extension the production of associated BMIs that aim to facilitate broader social participation in music has arisen.

1.3.2. Comparative aesthetics

In *The Social Life of Things* (1986) Arjun Appadurai illustrates rich narratives, stories, values and meanings that can be attributed to objects, and argues that “complex, but specific social and political mechanisms... regulate taste, trade, and desire” (Appadurai, 1986, outside back cover). Music instruments currently produced as standardised objects reflect the curricula values of music education, commercially recorded music played to meet the demands of popular cultural traditions, and tastes largely determined by Western values and associated aesthetics.

Bohlman (2001, p. 30) credits Romanticism in 19th century Western culture with the objectification of music, through a preoccupation with beauty. He states that as music was seen as an object in which “beauty could lodge... beauty’s objectified status had come to permeate aesthetic thought so pervasively that composers were forced to succumb to it or openly to reject it” in the content and style of their works. Despite the “beauty” of music, Huizinga (1949, p. 164) cautions that “Romanticism, which has stimulated our aesthetic consciousness in so many respects, has... not ousted any of music’s more ancient functions.” As a contrast to Western notions of beauty, Bebey (1969, p. 115) reminds us that “the objective of African music is not necessarily to produce sounds agreeable to the ear, but to translate everyday experiences into living sound.” This implies that musicians and music practices that endeavour to produce music that is beautiful in accord with a governing aesthetic, may well be missing out on much else of what music and music making processes have to offer, particularly in relation to its social, therapeutic and emancipatory potentials.

By the projection of Western cultural values onto non-Western music, mass consumer markets for such music have been created and developed. Western attitudes towards beauty have, first through process of colonisation and then through globalisation and the emergence of the recording industry, led to changes in the way that non-Western musicians are exposed to, appreciate and play music. Some of these cultures are not so concerned with beauty as defined in the Western tradition. “For Indian classical music and Javanese gamelan repertoires to achieve popularity as music in the West... it has been necessary to replace function with beauty” (Bohlman, 2001, p. 30). Hutnyk (2000) critiques the World Music genre as post-colonial exoticism which decontextualises indigenous music and subjects it to the forces of market capitalism, whereby it must adapt to Western tastes, before it is considered successful. Whereas most Western Art music can be experienced as entertainment, Bebey writes that African music “is nearly always coupled with some other art, such as poetry or dance” (1969, p. 16). Therefore, “this type of listening fails to give us access to what may be the most important aspect of the music – the social aspect” (Small, 1980, p. 35). Recognising and acknowledging the forces that underpin the development of popular Western musical idioms, and the ways in which such idioms have been projected onto non-Western cultural forms, suggests a need to re-examine how and why music is assigned value, and how any such assigned value might serve to restrict people from participating in music making.

1.3.3. Funding streams that privilege ‘excellence’

The DCMS statistics mentioned above found that just over 3% of the population in England participate in amateur and voluntary music. This figure stands in contrast to 2014 research by Deloitte, which found that 70% of adults said music was important to their lives (Deloitte, 2014).

This would suggest that in contemporary Western society the vast majority of people’s experience of music is through passive listening, rather than by active playing. The Arts Council England’s current funding strategy is implicated by

this, in that out of its nine stated strategic priorities, only two are aimed at the encouragement of amateur participation (as opposed to attendance) focussing on children and older people (Arts Council England, n.d. d). The *Celebrating Age* fund, which “[supports] cultural spaces and other organisations to be open, positive and welcoming places for older people; and taking high quality arts and culture into places where older people will find it easier to engage” (Arts Council England, n.d. a) makes no mention of participation. Similarly, their strategic priority of *Engaging people everywhere* makes clear that to engage is to be an audience member, rather than a creator: “We want everyone, everywhere to experience and be inspired by great art, museums and libraries” (Arts Council England, n.d. b). Finally, their priority of *Excellence in arts and culture*, directs funding towards organisations that “demonstrate England’s status as a world centre for cultural excellence” (Arts Council England, n.d. c). The funding priorities here stated do much to promote the creation of art by professionals within established idioms for the appreciation of diverse audiences, and do little to promote the creation of art by diverse peoples within non-standard idioms.

1.3.4. Industrialisation, globalisation and standardisation of music instruments

In traditional societies where music has a purely social, improvisatory function, it is not exchanged as a commodity (Bohlman, 2001). Music in the West, and increasingly in non-Western domains has been commodified, resulting in international commerce that feeds globally standardised markets for instruments and recordings. The trend towards global standardisation might be defined as the collective effort of interested stakeholders (investors, producers and marketers) to achieve mutually agreeable and enforceable sets of global standards by which they can define and control the production and marketing of products and services in answer to shared recurrent problems that inhibit the interflow and development of global commerce (Tassey, 2000). Standardised industries are designed to provide consumers with readily available, accessible and affordable off-the-shelf goods. This trend includes

popular music instruments which are produced for mass consumer markets by leading manufacturers such as Yamaha, Steinway, Gibson and Fender (Hoover's, 2017). This trend towards market-driven standardisation might also be reflected in the re-focussing of music instruments making courses that have until recently offered a broad variety of opportunities for aspiring instruments makers and researchers, and have now been restructured to serve a predominant culture of guitar and violin making (Lincoln College, 2017; London Metropolitan University, 2017; South Thames College, 2017). By such changes, it would seem that the field of organology is increasingly in danger of being reduced, in relation to instruments making, to the study of museum displays, rather than the development of living cultural industries.

The standardised technologies that support the production of music instruments determine the types of materials and manufacturing processes that are used in producing the component parts that combine to make an instrument. These component parts might include wood, metal, natural and synthetic materials used to fashion, join and finish instruments bodies, finger boards, internal bracings, strings, pegs, metal tuners, bridges, keys, necks, etc. (Von Busch, 2012). The general quality and playability of any mass-produced music instrument reflects the efficiency and effectiveness of the industrialised production processes that are geared to meet the tastes and needs of popular mass market demand. Whilst such instruments can be seen to answer the tastes and needs of the majority of consumers, in the context of any such dominant cultural trend, there will inevitably be a market for those whose tastes and needs are different by personal choice or by unavoidable circumstance. This problem is not a new one. In 1946, composer Harry Partch stated that both artists and instrument builders have been "reluctant to undertake the thankless groundwork essential to the improvement of music instruments except where commercial exploitation looms in the background" (Partch, 1946, p. 198).

There is evidence of new and expanding markets for unique and traditional music instruments via established and emergent makers and web-based suppliers (Pölkki, 2005; Zappas, 2007; Oddmusic, 2008). Additionally, large

scale public musical sculptures such as architecture firm Tonkin Liu's (2008) *Singing, Ringing Tree* in Lancashire and Nikola Bašič's (2005) *Sea Organ* in Zadar, Croatia have proliferated in recent years, raising awareness of broader and alternative definitions of music. New organologists are also developing experimental instruments, including those played by acoustic (Kolaitis, 2014), electronic (Foulon and Jedrzejewski, 2009; Nilsson, 2011) and even biological means (Arslan, et al., 2005). This is perhaps in reaction to dominant mass consumer markets, but also as an indicator of increasing interest and diversification in the arts and within the general population, in the creative potentialities of sound as sonic art (Licht, 2009).

1.4. The social model of disability

In this section, I present the social model of disability which underpins JOS' approach to inclusive society. I then discuss how this model relates to the experience of disabled people's access to music and music making.

The Union of Physically Impaired Against Segregation (UPIAS) initiated the social model of disability in the 1970s, drawing attention to the difference between physical impairment and the social constructs that can be disabling to impaired people (UPIAS, 1976). Their policy statement challenges the dominant academic discourse of the time as produced by predominantly non-disabled people, and calls for research to actively remove social barriers.

We reject also the whole idea of "experts" and professionals holding forth on how we should accept our disabilities, or giving learned lectures about the "psychology" of disablement. We already know what it feels like to be poor, isolated, segregated, done good to, stared at, and talked down to – far better than any able-bodied expert. We as a Union are not interested in descriptions of how awful it is to be disabled. What we are interested in, are ways of changing our conditions of life, and thus overcoming the disabilities which are imposed on top our physical impairments by the way this society is organised to exclude us. In our view, it is only the actual impairment which we must accept; the additional and totally unnecessary problems caused by the way we are treated are essentially to be overcome and not accepted.

UPIAS, 1976, p. 5

The social model of disability is often presented in juxtaposition to the medical model which says that “a person is disabled if she / he has a physical or mental impairment, which has a substantial and long-term adverse effect on her / his ability to carry out normal day to day activities” (Great Britain, Disability Discrimination Act, 1995). Through its emphasis on managing and curing disability, the medical model frames disability as the individual’s problem, rather than society’s problem (Oliver, 1992). Hosking (2008) however, in favour of the social model, points out that a person-centred, holistic approach must take into account both the disabling social environment and the individual’s experience of illness and impairment.

The social model of disability as explained in the Disability Discrimination Act 2005 (Great Britain, Disability Discrimination Act, 2005) issued by the Disability Rights Commission explains that “poverty, disadvantage and social exclusion experienced by many disabled people are not the inevitable result of their impairments or medical conditions, but rather stem from attitudinal and environmental barriers.” Many disabled and non-disabled people alike believe that it is these socially constructed attitudinal barriers that frequently disable the person, rather than the person’s impairment. Today, the social model of disability is incorporated into the policy statements of leading organisations working for the acknowledgement of disabled people’s rights such as SCOPE (2017a), whose vision statement says “Every disabled person has the right to live their life and work towards their goals without being limited by other people’s expectations or prejudices”; and MENCAP (2016, p. 2), whose mission statement says “We want to see a world where society welcomes everyone in and we can learn to look beyond the easy, damaging labels,” as well as the Equality Act 2010 that “legally protects people from discrimination in the workplace and in wider society,” and underpins every Local Authority’s policy guidelines for the rights of disabled people to participate in all aspects of society as equals (Government Equalities Office and Human Rights Commission, 2013).

Despite UK-wide dissemination of such institutional policy statements and recommendations, my personal experience and that expressed by many JOS

participating support and care staff, volunteers and associates, indicates that the understanding and application of the social model is often superficial, at best. This research therefore aims to make clear by practical demonstration how arts and design interventions when co-produced by disabled participants can offer a viable inclusively accessible model to overcome socially constructed barriers that prevent or inhibit impaired people's access to equal participation. By transfer of my emancipatory approaches and their outcomes into other social, academic, professional, political and economic domains, I propose that people disabled by socially constructed attitudes and environments can, if afforded equal rights of access and opportunity, become self-advocating leaders towards societal equity and change.

1.4.1. Current attitudes to music making with impaired people

A broad variety of approaches to music making exist that engage with people of difference including disabled and impaired people in a variety of ways, all of which can be seen as being inclusive in that they seek to engage groups of participants as creative co-producers. Such activities include:

- Music with mentally disabled people, including autism (Rickson, 2014; Mencap, 2009; Pinder, 2015)
- Inclusive music education in schools (Burnard, et.al., 2008; Pinder, 2015)
- Music with elder, including dementia and stroke patients (Aldridge, 2000; Särkämö, 2008)
- Music for mental health (Ansdell, 2002; Siedliecki and Good, 2006; Creative Alternatives, 2009)
- Music with prison offenders (Cox and Gelsthorp, 2008; Caulfield, 2015)
- Music with refugees and displaced people (Marsh, 2015)
- Music with people disabled by injury (Lubet, 2011)

However, Purtell's (2013) survey of a group of disabled people about their access to music finds that disabling attitudes and social structures continue to

limit their access to music activities many people take for granted, such as buying recordings, staying out late enough to go to public places where music is played, visiting pubs, learning to play an instrument and giving a performance. Citing examples of disabled people being given toy instruments and broken instruments, she claims “there is no expectation that they have the ability to learn to play” (Purtell, 2013, p. 32).

Whilst looking at the ways in which disabled people are “denied the opportunity to participate in music,” Lubet, a disabled musician, proposes a social confluence model (2011). According to this model, it is the attitude of people that is of paramount importance in relation to inclusive social participation, and that it is the *confluence* of attitudes that most commonly determines if and how any social meeting, engagement or participation in a shared activity might happen. It is a matter of who an impaired person is with that is the most important factor in determining if and how they might become engaged in music making activities. This is of particular relevance in relation to disabled people who are deemed as being unable to make decisions or who are legally denied such privilege by reason of their “assumed sagacity” (Jeffrey, 2012, p. 1).

As an example of enabling social confluence, Django Reinhardt’s impaired use of his left ring and little fingers led to a style of playing that was treated as unique and became a valued aspect of musicality, rather than being denied as inadequate. Lubet argues that that within improvisatory idioms, by acknowledging the particular approach and style of individual players as being unique, inclusive music making becomes a musical art form in its own right. It is upon such foundational attitudes that JOS inclusive community music making is based. JOS challenges and subverts cultures of normalcy by inviting and facilitating people of difference to participate as co-creators in making music that acknowledges and embraces the creative input of participants of all abilities into an integral social aesthetic. JOS players produce a music that proclaims its own idiomatic style as being equal to any amongst the entire span of historic and contemporary music of any culture or genre (Bailey, 1992); and reclaims the notion of an inclusive community music grounded in traditions of

shared responsibility, mutual respect and playful exploration where the purpose and process of participation in activities that involve music making defines creative outcomes particular to communities of shared values and interests.

It is evident that participants of all abilities are able to respond to and participate in some way, in music making activities (Thaut, 2008). There can be no question about the fact that disabled people have common right of access and choice (Jermyn, 2001; United Nations, 2006). I propose that any question concerning the type of musical engagements and initiatives that are available for impaired people is largely determined in keeping with Lubet's model of social confluence (2011), and that the broad diversity of models and approaches that are currently in use suggests a healthy environment of differences in style, function and appreciation that can be regarded as fertile grounding from which a global synthesis of musicological interests and disciplines, rooted in inclusive humanistic principals, can emerge as an integral musicology.

Music that upholds the principals of the social model through applied practices of inclusive music making is by nature political. Though the aim of such music making may be no more than to encourage and facilitate the engagement of all participants in shared creative process, an inevitable auxiliary outcome is to "support the transformation of society so that disabled people in all their diversity are equal participants and fully integrated into their communities" (Hosking, 2008, p. 17). JOS approaches and the various BMIs and associated equipment that has been produced in their support, provide a practical framework for facilitating access to music making. By providing opportunity for participants to experience and appreciate the relationship between impairment, disability and society, and to carry forward their experience as a human resource of increased potential to appreciate and "inject disability interests into all policy arenas" (Hosking, 2008, p. 17), disabled participants at JOS become self-advocates towards social change, and the BMIs that they co-design and play become object advocates towards the same. The approaches to inclusive community music making that underpin this research

and that give rise to the BMIs that it has produced are grounded in Critical Disability Theory. This is a social model that states disability as being a “social construct” and “not the inevitable consequence of impairment,” that “disability is best characterised as a complex interrelationship between impairment, individual response to impairment, and the social environment”, and that “the social disadvantage experienced by disabled people is caused by the physical, institutional and attitudinal... environment which fails to meet the needs of people who do not match the social expectation of ‘normalcy’” (Lubet, 2011, p. 7).

1.5. Musicology and organology as expanding fields

This section outlines ways in which the field of musicology and organology as a subset of musicology are expanding to include multiple definitions of music, and to embrace the developing appreciation and understanding of the potentials of music instruments, particularly as material agents for use in Object Based Learning.

1.5.1. Developing definitions

Musicology is described in Groves Dictionary of Music and Musicians (2001) as being “the scholarly study of music” in its broadest context. As the prime focus of my research is on the design, production and use of music instruments and associated equipment, it is situated in the domain of organology⁵ that centres on the study of musical instruments, their historical perspectives, use in different cultures, technical aspects of design and making, sound production, classification and general appreciation. Debate about the origin of music includes that it came from birdsong, babies babbling, pre-verbal mating calls, and early human language (Storr, 1992). However diverse the theories may be about the origin of music, common attitudes towards what music is *now* seem to be narrower, and reflective of the definer’s position.

⁵ From Greek: ὄργανον – organon, “instrument” and λόγος – logos, “study” (Wikipedia, 2017).

The first definition in the Oxford English Dictionary (OED) exemplifies Bohlman's (2001) critique that Western music is preoccupied with beauty: "Vocal or instrumental sounds (or both) combined in such a way as to produce beauty of form, harmony, and expression of emotion" (Oxford English Dictionary, 2017). Nercessian (2002, p. 132), writing about the epistemology of ethnomusicology from a post-modernist standpoint, sees music as an object in and of itself. "There are limits to what may pass as music... as an entity that interacts with perceivers, but which is an entity of its own all the same." Electronic composition pioneer Edgard Varèse said, "What is music, but organised noises?" (Varèse, 1966, p.18). Surveying participation in Community Music, Anthony Everitt wrote, "Music is a social art and should be returned to the people at large" (Everitt, 1997, p. 13). Unlike the OED's and Nercessian's definitions – and to some extent, Varèse's – Everitt sees music as being situated entirely within the social context in which it takes place.

As the founders of modern organology, Curt Sachs and Erich von Hornbostel created the method of classification for musical instruments that became a common though not universal guide. In classifying the music instruments presented in this research I have used the MIMO Consortium's revised Hornbostel-Sachs Classification of Musical Instruments (Musical Instruments Museums Online, 2011). Given that the definition of music is under constant challenge and review, I contend that this applies equally to the definition of instruments by which music is expressed, to the music produced by their use, and to those who might be regarded as musicians, who play them.

The Musical Instruments Resource Network UK (n.d.) states that:

a vast number of objects qualify as musical instruments. Peoples throughout the world have their own varieties of instruments and these can differ, even from village to village. Musical instruments reach back into pre-history and have developed over the centuries in myriad ways. Understandably, identifying them can be a challenge. Nevertheless, all have one thing in common: their primary function is to produce a sound.

This research seeks to add to this definition and to extend the spectrum of organology by demonstrating that a musical instrument can have further and multiple functions other than to produce a sound. By referring to music instruments as foci for Object Based Learning, I give substance to the development and production of the BMIs produced toward this research, as rich sources of information, other than that commonly associated with them as sound producing objects.

1.5.2. Object Based Learning

Object Based Learning (OBL) has evolved out of the museum sector, where it is “a mode of education which involves the active integration of objects into the learning environment” (Chatterjee, Hannan and Thomson, 2008, p.1). Drawing on theories of experiential education (Dewey, 1899; Piaget, 1929; Vygotsky, 1978), museum curators and museum-based educators investigate the socio-cultural contexts which affect the way objects acquire meaning through *material culture* (Appadurai, 1986; Hodder, 1994; Hein, 1998).

OBL also engages Latour’s Actor-Network Theory (ANT), which explores “the ingredients of society... how these features are achieved and which stuff they are made of,” offering perspectives that have been applied to music instruments and their making (Latour, 1996, pp.5-6). Bates (2018, p.42) argues that “Since organology is at its core concerned about the interface between material objects and people... it is an ideal candidate for actor-network type analyses.”

Systems Theory (Heylighten & Joslyn, 1992) and Emergence (Mader, 2010) explore the relationships between phenomena and their environment, in which new properties are constantly emerging as a continual evolution. Mader (2010, p.3) states that “In the living world, the whole is indeed more than the sum of its parts. The emergent properties created by the interactions between levels of biological organization are new, unique characteristics.” The same can be said for OBL, in which music instruments acquire a constantly evolving

significance beyond their physical components, and arising from the extensive networks of personal, social and cultural relationships, and the contexts in which they are used.

OBL tables and in some cases whole rooms have been set aside, as at the Horniman Museum, British Museum, Victoria and Albert Museum and commonly at other museums and galleries where visitors are increasingly encouraged to handle objects from the collections as evocative primary source material for creative exploration and learning. All of this draws attention to the rich potential of objects as agents and actors in building dialogues and stimulating narratives that can enrich understanding and encourage further investigation into interdisciplinary perspectives including viewpoints from social history, cultural anthropology, and economics. Together these perspectives suggest a multiplicity of qualities and attributes that can be drawn from objects as knowledge.

On visiting collections and exhibitions at various museums and galleries I have listed qualities and properties attributed to a variety of exhibited objects on curatorial labels, in exhibition catalogues and books, and by visitors' comments. Adding to this list from other sources (Appadurai, 1986; *History of the World in 100 Objects*, 2012) I have developed a broad but by no means complete scoping of potential attributes that might be associated with an object (Appendix 10). The list is shown here as a word cloud (Figure 1.5.a). In exploring these attributes, OBL also offers a broad array of potentials for transferrable learning opportunity. Its experiential, hands-on approach can generate fresh interest and dialogue, and stimulate narratives that illustrate and demonstrate that objects can embody characteristics of broad reaching social significance.



Figure 1.5.a: Word Cloud: Words associated with Object Based Learning

The UNESCO Representative List of the Intangible Cultural Heritage of Humanity that catalogues “oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts” (UNESCO, 2003) contains more than twenty items that involve traditional and ritual music making activities and associated music instruments, including the Chinese *guqin*, discussed above. Dawe’s (2001) review of musical instrument collections refers to musical instruments as “objects existing at the intersection of material, social and cultural worlds, as socially and culturally constructed, in metaphor and meaning, industry and commerce, and as active in the shaping of social and cultural life” (Dawe, 2001, p. 221).

Accounts of the relationships between music instruments and the cultures in which they are found (Dawe, 2007; Bailey, 2012; Bates, 2012), demonstrate music instruments’ capacity to absorb, embody and transmit information and to inspire imagination as objects of personal and social knowledge creation, transmission and exchange. Dawe’s (2007) Cretan research focuses on the indigenous *lyra*, a small fiddle, describing it as a “body politic” (p. 111), “imbued with social meanings, norms, values and beliefs” (p. 128). He suggests that music instruments “exist in webs of culture, entangled in a range of discourses and political intrigues, and they occupy engendered and status-defining positions. Musical instruments are seen as material and social constructions”

(p. 114).

Bates reflects Dawe's position in his article on the *Social Life of Musical Instruments*, proposing that the

power, mystique, and allure of musical instruments [...] is inextricable from the myriad situations where instruments are entangled in webs of complex relationships between humans and objects, between humans and humans, and between objects and other objects

Bates, 2012, p. 364.

The relationship between a music instrument and its player has particular significance in relation to improvisation. Sam Bailey (2012) suggests that "an improviser's instrument comes to contain, shape and articulate the personal history of the player. The instrument is both the means and the end of an improviser's physical, aesthetic and spiritual development" (p. 6). The capacity of BMIs to act as repositories that embody, store and transmit meanings, qualities and transferable attributes is particularly important towards their capacity for facilitating the voice and reinforcing the identity of impaired C-Ds.

1.5.3. Creating personalised music instruments

Of the many types of music currently produced, the players are commonly people who have been trained to play, or who are otherwise learning to play in particular fixed idioms. It is frequently the case that these types of music are not accessible to many people who are thereby excluded from participating in such music making activity other than as a listener. It is for this reason that alternative and more broadly accessible types of music are needed, and the production of instruments and Instruments Access Devices that can facilitate participation in the production of such music is required.

Authentic inclusive community music must strive to use universally accessible systems of music production that encourage and facilitate the co-creative participation of all-comers in music making process. To achieve such a music, equal consideration must also be given to the types of music instruments used,

and to the manner in which such instruments are made accessible for use by players of all abilities. Any such inclusive approaches to music making must work to acknowledge and accommodate the personal needs and preferences of every individual player involved as an equal co-producer of musical outcomes. The BMI case studies referred to in this research are drawn from a series of music instruments produced specifically as bespoke designs to meet the individual tastes, ability and access requirements of players who participate in their production as C-Ds. Each instrument is uniquely personalised for a particular person.

Through the creation of BMIs, questions arise in reference to their qualities and potentials. If BMIs can be said to embody potential OBL, I propose that this opens up new research potentials within museums and instruments collections, within which a deeper understanding of their contexts may be developed. Additionally, by exploring how instruments arise as products of their social contexts, we may begin to deconstruct how personal social context has influenced and continues to influence the persistence and dominance of particular music forms, and the instruments of their expression. This research therefore asks initially, how music instruments function as material towards OBL.

Secondly, in acknowledging impaired BMI C-Ds' abilities as personal and social advocates to encourage instruments designers, makers and organologists to extend traditional ways of perceiving, making and using music instruments, this research asks how can disabled people when engaged as BMI C-Ds influence design process and outcomes towards new knowledge creation through design innovation significant to the field of organology, and to the achievement of personal and social change.

Thirdly, given the wellbeing benefits associated with participatory community music making, and the capacity of BMIs to facilitate self-agency and enhance access to music making, this research asks in what ways BMIs can serve as therapeutic tools in relation to Arts on Prescription and Social Prescribing Networks.

Finally, in recognising the significance that BMIs can have for their C-D players, the research asks, what are the potentials for BMI project continuum and development.

In this chapter, I have outlined the thesis, and located it within the context of Joy of Sound. I have stated my principal research questions, and reviewed literature within which this research is situated, namely the fields of musicology and organology, Music and Arts for Wellbeing, social inclusion, critical disability studies and Object Based Learning. In the next chapter, I introduce the methodological frameworks underpinning this research, and outline the research methods by which it was realised.

2. Research Methodology and Methods

In this chapter I define the theoretical frameworks which underpin my research design, drawing attention to my design approaches, processes and outcomes. I introduce the emancipatory design principals and related ideas employed to bring into focus the personal voice of disabled C-Ds such as co-design, emergent design, inclusive design, human centred and interactive design, design for social wellbeing, and design activism. Stating the methods used toward my case studies I refer to the BMI project design and the people involved, ethical considerations, resources used and projected timeline. Finally, I explain my methods of data collection, use of stills photography and film, and the function of BMIs as subjects for OBL.

2.1. Emancipatory research

Brazilian educationalist Paulo Freire (1970) pioneered emancipatory and participatory principles as means by which oppressed groups could self-liberate through dialogue, authentic participation and mutual acknowledgement. As awareness has developed of the “unconscious dominance of racial, ethnic, gender, and Western-focused biases in the vast majority of research” (Groat and Wang, 2013, p. 92) the emancipatory paradigm has spread to include disability studies, as well as feminist, race and gender theory (Noel, 2016).

As a methodology, emancipatory research puts the researcher at the disposal of historically disadvantaged groups. It is not exploring “how to empower people, but once people have decided to empower themselves, precisely what research can do to facilitate this process” (Oliver, 1992, p. 111). In their survey of inclusive research methods, *Doing research inclusively, doing research well?* Nind and Vinha (2012) advocate for emancipatory theory as a means by which disabled people can self-advocate towards social change. As a participant researcher on this study my experience has reinforced my determination to continue to strive to explore and develop inclusive approaches by which disabled people and particularly non-verbal disabled

people might be more widely acknowledged and appreciated as able self-advocates and co-creative partners towards social change and inclusive society. Mertens (2015, p. 27) locates the roots of emancipatory disability research within the “‘nothing about us without us’ political activism movement that arose during the 1990s and that was aimed at moving control of research from predominantly non-disabled researchers into the hands of persons with disabilities.”

2.1.1. Emancipatory design

As increased knowledge and awareness of social discrimination has developed, so have design studies located within the emancipatory paradigm “that investigate the extent to which individuals and groups experience equitable access to various settings” (Groat and Wang, 2013, p. 92). In her examination of emancipatory design research, Noel (2016, pp. 13-14) notes that “an emancipatory research framework allows designers to be more [cognisant] of the impact of their power and privilege and to re-structure their research in a way that... really [empowers] collaborators.” Douglas and Gulari (2015) explore the potentials of improvisation as viable experimentation within arts research, and conclude that whilst certain boundaries and conditions are set out, “questions arise out of experience and require the researcher to draw out the social, political and aesthetic circumstances that render such questions important.” Their suggestion of an improvisatory model that allows research participants to co-create the research points towards an emancipatory research framework.

By exploring the processes involved in the production and subsequent use of BMIs, this research seeks to invite, facilitate and acknowledge the ability and voice of disabled participants as equal co-creative actors towards self-empowerment. In doing so the research aims to increase the profile of disabled participant C-Ds as self-advocates. The UK is currently a member of the European Research Agendas for Disability Equality (EuRADE). This project built upon the principles of emancipatory research, “seeks to increase and

enhance the full participation of disabled people's organisations as equal and active partners in future research initiatives that will support the equality of disabled people in Europe" (EuRADE, n.d.).

2.1.2. Contextualism and the emancipatory view of knowledge

Contextualism is an epistemological framework that regards knowledge and knowledge attribution as context specific. In other words, whether somebody is regarded as knowing something depends on the context in which they are placed. "In epistemology, 'contextualism' denotes a wide variety of more-or-less closely related positions according to which the issues of knowledge or justification are somehow relative to context" (DeRose, 1999, p. 187). This type of framework is key to voicing the experiences of disabled people, who regardless of their actual knowledge and experience, are often "dismissed on the basis of their perceived incapacity... and those of people with learning difficulties of the basis of their perceived intellectual deficiencies" (Mercer, 2004).

When working with disabled and non-verbal people as co-producers it is necessary to identify means by which mutual experience might be communicated and shared with the least possible ambiguity. This research uses approaches drawn from Intensive Interaction, a practical approach designed for use with people with learning disabilities and people with multi-sensory impairments. Central to Intensive Interaction is that the "teacher person builds the content and flow of activity by allowing the learner basically to lead and direct, with the teacher responding to and joining in with the behaviour of the learner" (Intensive Interaction Institute, 2017). Over the course of this research disabled C-Ds were regularly consulted as primary sources of feedback about the design process, progress and viability of their BMIs. At each stage of design, verbally and gesturally related ideas, drawings and models were shared with C-Ds who were asked to state their likes and dislikes, and to indicate their personal preferences towards design

development. These consultations were undertaken in the presence of familial and/or professional primary care and support givers. By working closely with C-Ds over time in this manner, and by further regular communication and creative interaction with C-Ds at JOS music sessions, relationships of mutual trust, understanding and appreciation developed. A shared language of non-verbal expression and signage developed by process of interpersonal experience.

Where ambiguity about the expressed meaning of non-verbal participants arose for any reason, or in cases of disagreement between participants about assumed meaning, then C-Ds were centrally involved in discussions and contributed towards resolve. In instances where additional clarifications were required, C-Ds' familial or key care workers, or JOS appointed BMI project liaisons were consulted for second opinion. During process when no clear and mutually agreeable sign of affirmation was given by non-verbal C-Ds questions were reframed or approaches modified. As all participating C-Ds were able to express discernible facial and bodily gestural signs, their co-creative input into the design process was assured.

An ongoing process of increasing familiarisation, mutual awareness and confidence building by association of shared intent and purpose produced a language based in shared experience between all members of the C-D team. This process applied to relationships and interactions between disabled and non-disabled project participants alike. Whist the prime focus of the research centred on intensive interactions with the disabled BMI C-Ds, communications with non-disabled participants were often non the less complex and difficult to determine. To maximise potentials for accuracy of interpretation and understanding I have used multiple data sets gathered in a variety of contexts in order to minimise ambiguity and corroborate agreement by providing means for triangulation. The production of each BMI included input from an interdisciplinary design team centred on each BMI C-D. Each team was unique though with some overlaps. Team members were invited and recruited from a variety of social, academic, professional and creative contexts that enabled a broad scoping of information and viewpoints to be revealed and recorded.

2.1.3. Evaluating an emancipatory research project

Noel's (2016) evaluation of supposedly emancipatory design initiatives reveals that projects which purport to benefit the socially disadvantaged are not always emancipatory. This makes the case for developing criteria against which a project claiming to be emancipatory can be evaluated. I have isolated two such sets of criteria drawn from the different fields of disability, and design research, and have amalgamated them into a list of criteria that provides a thorough and rigorous aid to the evaluation of this research. Stone and Priestly's (1996, pp. 10-11) criteria focus on emancipatory research in the disability sector. Noel's (2016, p. 4) criteria are specific to design research, and linked to emancipatory theory's ontological, epistemological, and methodological assumptions. I have amalgamated and adapted Stone and Priestly's and Noel's criteria here into the following set of principles, which have informed my research design.

- I have undertaken this research in the belief that it will be of practical benefit to the self-empowerment of disabled participants, and towards the removal of disabling barriers for individual participants and disabled people generally (Stone & Priestly, 1996).
- The research aims to facilitate the voice of individual disabled participants, whilst giving focus to the collective political commonality of individual disabled people's experiences (Stone & Priestly, 1996).
- The research is accountable primarily to disabled participants, and to their familial and professional care and support networks and organisations (Stone & Priestly, 1996).
- I have used the social model of disability as the knowledge basis for research production (Stone & Priestly, 1996).
- The research uses multiple methods of data collection and analysis in response to the needs of disabled participants (Stone & Priestly, 1996).
- The language of the research seeks to be grounded in shared experiences of participants (Noel, 2006).
- Disabled participants and researchers interact as co-designers. People at the periphery of the research are invited, encouraged and facilitated

to play an active and equal co-productive role in the creation of knowledge (Noel, 2006).

- The research makes no claim to objectivity, in being committed to the struggles of disabled participants towards their self-emancipation (Stone & Priestly, 1996).
- As researcher I have considered and accepted how my knowledge and personal viewpoint may be construed as representing a dominant group of non-disabled people. I have therefore devised my research methods to facilitate, acknowledge and include the voice of disabled participants as being equal to any other and central to their BMI design (Noel, 2006).
- I have attempted to be aware of and sensitive to the personal, social and historical contexts of the environments in which my research is grounded, and to approach my research interventions in manner sensitive to issues which may potentially arise within these contexts (Noel, 2006).

2.2. Design principles

Whilst the emancipatory research paradigm has underpinned this research, a number of related design principles have influenced my approaches to the production of the Bespoke Music Instruments. In this section, I give an overview of those design principles, and state how they have influenced the direction of the work.

2.2.1. Integral design

Integral design is an offshoot of integral theory, which was pioneered by the Indian philosopher Sri Aurobindo (1948) and has since been popularised in Western society by Ken Wilber (2000). While Wilber seeks to “to make sense of the often contradictory ways that human beings have evolved, physically, emotionally, intellectually, morally, spiritually” (2000, p. xi), integral design theorist Mark DeKay (2012) explores the way design can unite aesthetics, ethics and scientific practicality. He identifies four dimensions of design that must be taken into account:

1. Systems perspective: patterns of form that order ecological and social relationships;
2. Behaviours perspective: individual parts or members with their performance, activities, and functions;
3. Experiences perspective: systemic members (human and non-human) with various forms of perception, sentience, and awareness;
4. Cultures perspective: shared meaning and understanding at various levels of complexity arising from individual members interacting with each other.

DeKay 2012, p. xxxi.

The term *integral design* is fitting in the context of my research in that it embraces the emergence of new experience and knowledge from a multiplicity of sources and contexts that accept the unknown as a potential space for discovery, as a liminal interface of yet unrealised but none the less felt potentials. An integral design process is practiced by incorporating potentials as and when they materialise into the flow of design process as planned or incidental, contrived or improvised events. When working in situations and

circumstances that involve unknown and unknowable factors such as this research does, an awareness of and ability to apply integral, open systems approaches can only add to the potential success of the research.

2.2.2. From universal design to inclusive design

Universal design developed in the mid-20th century as the percentage of disabled and impaired people grew, due to increases in the elder population, disabled war veterans and medical care which increased disabled people's lifespans (Universal Design Institute, 2017). The term comes from architect Ron Mace, and describes design that is "aesthetic and usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life" (North Carolina State University, 2008). At the Royal College of Art's Helen Hamlyn Centre, this is known as *inclusive design* (Coleman, 2006). The principles of universal design and inclusive design are based on the belief that good design works for everybody.

Person-centred design refers to an approach that puts the user at the centre of the design process and as the name suggests, is a personalised approach to creating bespoke design interventions. Also called human-centred design, the Helen Hamlyn Centre at the Royal College of Art (2016) emphasises "[engaging] people in a respectful and equitable way throughout the design process," and includes methods such as "spending time with the intended user in their own environment... using prototypes with the intended user, to test viability... [and] involving users as co-creators, through forming collaborative, interdisciplinary teams" (pp. 10-11).

This research has adopted the principles of universal / inclusive and person-centred design by making disabled BMI C-Ds central to design process; by undertaking as many aspects of design development process as possible in environments, and with care and support staff familiar to C-Ds; by producing and presenting ideas, sketches, models and prototypes for approval and testing by C-Ds, in acknowledgement and facilitation of their personal needs and preference; by forming collaborative, co-creative, interdisciplinary design

teams around each disabled C-D, and ensuring that they are at all times central to design process.

2.2.3. Transformational Design Model (TDM)

I became aware of the TDM and witnessed its effective use in recorded clinical interventions during an introductory training in Neurologic Music Therapy that I attended to extend my knowledge base for my research in 2009. The Transformational Design Model (TDM), developed by the Academy of Neurologic Music Therapy, is grounded in Transformational Design, a person-centred process that uses design solutions to inspire sustainable changes for individuals as well as organisations. The TDM aims specifically to help trained music therapists to “design interventions with outcomes that are directly related to users’ functional goals” (Thaut, 2008). There are five steps to the model which I have adapted towards my research applications by modifying the language of the model from a medical to a social context. In doing so I offer practical guidelines towards the development of BMIs (Figure 2.2.a) and further criteria by which the purpose and function of BMIs as objects might be assessed.

Transformational Design Model	TDM as adapted by Joy of Sound
<ol style="list-style-type: none"> 1. <i>Diagnostic and functional assessment of the patient.</i> 2. <i>Development of therapeutic goals/objectives.</i> 3. <i>Design of functional, nonmusical therapeutic exercises and stimuli.</i> 4. <i>Translation of step 3 into functional therapeutic music experiences.</i> 5. <i>Transfer of therapeutic learning to functional, nonmusical real-world applications.</i> <p style="text-align: right;"><i>Thaut, 2008, p. 131</i></p>	<ol style="list-style-type: none"> 1. <i>Determining features and functional abilities of the player.</i> 2. <i>Determining means of attending to the needs, preferences and potentials of the player.</i> 3. <i>Devising a program of exercises and stimuli to meet the needs, preferences and potentials of the player.</i> 4. <i>Building an instrument and devising environment/s for its use in personal and/or social play.</i> 5. <i>Using knowledge gained from the therapeutic design journey (intervention) to encourage and enhance lifelong living experience.</i>

Figure 2.2.a: Transformational Design Model (Thaut, 2008) and the adapted JOS Model

My research methods that follow have been determined by criteria as cited, developed, adapted and synthesised to meet the needs and choices of my research C-D participants towards the achievement of our shared goals and in keeping with an emancipatory research paradigm.

In Currans, Heit and Kuppers' *Arts-based research sharing and disability culture methods: different ways of knowing*, the researchers speak of "[sharing] the heart of our work through workshops, using experiential methods to experience the excitement and passion of our research" (2015, p. 372). Aside from my adherence to required research protocols, the aspect of this research that has absorbed my focus, emotions and determinations more than any other as an inspiring motivation force, has been not on the achievement of my stated aims and objectives, but as with Currans, Heit & Kuppers (2015, p. 372), it has been in working with people who have brought me to "poetic insight, echoes, layerings, assemblages... in friendship with one another, meditating on what became important to us, in our respective complex places in art, academia, and community activism."

Methods and Research Design

2.3. Methods

My methods for this research include gathering and reflecting upon data from a variety of sources. The research has been achieved working with disabled and non-verbal participants as C-Ds. The types of evidence that I have used and the manner in which it has been collected incorporates approaches specifically intended to invite, facilitate and acknowledge the ability and voice of disabled participants as co-productive actors towards their self-emancipation, and to demonstrate the significance of their contribution in generating new knowledge and product innovation through the process of producing their BMIs of which they were C-Ds and players.

In determining my methods, it has been necessary to identify means by which mutual experience might be communicated and shared between participants, and recorded towards the research. The methods I have used were necessary for the production of evidence in the specific person-centred context of the research. The practical approaches I have used combine my personal experience of working inclusively with disabled people in my capacity as founder, co-director and lead facilitator of JOS Inclusive community music workshops since 2000; with specific approaches developed for working with people with learning disabilities and people with multi-sensory-impairments. *Intensive Interaction* is a term often used in describing such approaches. In keeping with, and central to Intensive Interaction (Intensive Interaction Institute, 2017), my methods have been devised specifically to engage, give voice to, and facilitate the self-generated intent and action of disabled participants on their own terms. The achievement of unique BMIs and associated assistive devices has involved a large number of participants of different abilities, ages and needs. Ten BMIs and auxiliary designs have been undertaken and successfully completed, from which three have been drawn as my research case studies. Locations ranging from central to outer London and beyond have accommodated various aspects of the research, including

day care centres for disabled people, locations for regular weekly JOS workshops, instruments makers' workshops, the homes of participants, London Met University, and an industrial factory unit where the production of various items towards the research has taken place. This is not to mention the many other locations where research related activity such as one to one and group meetings, materials sourcing, consultations, research, conference attendances and research presentations have occurred. Over the period of the research, cancellation, delay and changes to schedule has been a common occurrence. These changes and challenges to process have been unavoidable and largely due to reasons connected to health and wellbeing and personal care issues that arose regularly across the full range of participants, including myself. Due to the subsequently fractured, changed and frequently extended timelines involved in completing the research, the proliferation of data has thus become far more extensive than was initially envisaged as did the timeframe initially given to the research.

Whilst at the start of the research process a composite timeline was envisaged for the production of all BMIs, due to the paramount consideration of essential personal care requirements for participants, readjustments have been necessary, and each BMI timeline has ended up as distinctly separate. Delays have been common and often exacerbated by the inability of some participants to re-align their personal or work schedules to fit with the availability of disabled participants for whom unpredictable and unavoidable change is a common feature of their lives due to the often complex needs of personal care, and frequent barriers to their rights of equal access and adequate resource. Availability and regularity of accessible transportation for disabled participants, changes to and availability of care and support staff has been a regular issue.

In accommodating such complexity my research methods have needed to remain elastic whilst being able to sustain process. The research is novel in mapping previously uncharted territory across a broad range of personal, social and institutional domains. I have therefore chosen to build multiple data sets, my intent being that these various sets interweave as mixed threads to create a composite research tapestry that clearly illustrates the process of BMI

production, to reveal the outcomes of the research as emergent factors in a manner of “cross-fertilization” (Cook, 2008). My inclusive approaches have required that disabled participants instigate and direct process by their personal choice and ability, whilst I as a facilitating agent respond to and join in with their preferred actions as a facilitating co-producer.

This kind of person-centred interaction is typical of a co-learning experience, whereby the role of participants become liquid and interchangeable. “Co-learning aims at the collaborative construction of knowledge, in which co-learners are able to expand their social networks, integrate open learning with collective research and co-author collaborative productions” (IGI Global, 2017). In this context I use the terms co-learner, co-creator, co-producer, co-author and co-designer to signify and reinforce my core intent to work in joint, mutual, common and coequal effort towards the achievement of shared goals working together with others inclusively. My approaches are practically and experientially driven and grounded in a personally felt humanitarianism as an active belief in the equal value of all human life. This belief is substantiated by the UN Convention on the Rights of Persons with Disabilities that works to stop discrimination on the basis of disability by ending any

distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field.

United Nations, 2006, p. 5

My methods particularly emphasise a participatory process, and locates the research firmly within the emancipatory paradigm in being inspired and led by disabled participant C-Ds. The motto “nothing about us, without us,” which characterises my approach, is a political belief and ideal that aims to “move the control of the research into the hands of the community being researched.” (Mertens, 2015, p. 27). Amongst the core principles of this research paradigm are openness, participation, accountability and empowerment all of which I have endeavoured to achieve in the process of realising this work.

Methods used:

- Production of BMIs and associated access devices: as person specific design objects and for user / player testing
- Case studies: compiled as person-centred Design Journeys that tell illustrated stories about the production of individual BMIs
- Design Journey Logs: recorded as digitised chronological lists that record all aspects of BMI production
- Audio-visual recordings: Photographic, video and audio recordings that illustrate and detail particular aspects of design, production and testing of BMIs
- Focus Group Meeting: for the gathering of participant feedback
- Workshops: JOS Inclusive Community Music workshops at which disabled participants and their care and support networks were introduced to the project, invited to participate as BMI C-Ds, and used as an environment to test BMI working prototype designs.

2.3.1. BMIs and associated access devices as objects towards Object Based Learning (OBL)

BMIs and their associated access devices have been used as working prototypes to generate opportunities for Object Based Learning. Prototypes have ranged from quickly made mock-ups in card and wood, to developed models that enable participants to test initial design concepts before progressing to more highly resolved artefacts.

Prototypes provided physical aids to illustrate abstract ideas generated during the design process, as simple sketches, diagrams and notes, making them real as physical items that can be touched, used, shared and communicated with less ambiguity. Participants had direct interaction with prototypes, allowing important and useful lessons to be learned by C-Ds and makers. Reflecting on Bates' argument that musical instruments hold and transmit "power, mystique and allure" in their connection to the countless relationships

“between humans and objects, between humans and humans, and between objects and other objects” (2012, p. 364), BMIs can act as powerful emancipatory tools. It is by such qualities and attributes identified as being embodied and transmitted through and by the bodies of musical instruments, that the BMIs produced towards this research have been used and are tested as therapeutic tools.

2.3.2. Case studies

The folk-lore of case study methods suggests that these designs emerged from the practice of experimental psychology and psychoanalysis. Such a myth ignores the simple fact that human ideas have been conveyed in story for centuries.

Aldridge, 2005, p. 12

My case studies narrate the production of three individual BMIs. The stories are narrated as chronological Design Journeys, built from and illustrated by a rich composite of data drawn from the BMI Design Logs, and narrated as linear stories that map the production process of each BMI from start to conclusion. The start of the BMI project is recorded in the Introduction to Case Studies. Each case study commences with an introduction to specific BMI C-Ds and proceeds to map the process of the design development, physical production and testing of each BMI, up to the point of formal presentation of each BMI to their C-D owners. Reflections on the BMIs are given in Chapter 7 (Reflecting on the BMIs) and an analysis of the process from the perspective of my research questions is given in Chapter 8 (Discussion and Conclusions).

I have used this method of narration because my main interest is how this research was co-produced and inspired by the real-life experiences of disabled people. By mapping such real-life events with stories told with, by and about disabled participants in relationship with their extended BMI co-production networks, my purpose is to present the research in a manner that is broadly accessible and may therefore gain increased readership that might serve to heighten awareness about the challenges and barriers faced by disabled participants. By highlighting the achievements, challenges and uncertainties

faced by disabled participants, I draw attention to common issues faced by non-disabled people when working inclusively with disabled co-producers. By revealing evidence of mutual benefit that can arise out of inclusive co-creative interactions I demonstrate the power and effectiveness of disabled people as C-Ds, and as advocates for social change. By doing so I advocate personally and collectively for inclusive society by movement towards co-produced cultural development.

2.4. Project design

2.4.1. Personnel involved in this study

Project lead:

William Longden: Founder and Co-Director JOS; PhD research student at London Metropolitan University.

Project administrator:

Chris Leeds: JOS volunteer and Co-Director

CL's function was to log in chronological order any data forward by WL or by others instructed by WL.

Supervisory management at LDRC:

Steve O'Sullivan: Day services modernisation manager.

John Hendry: Day Services coordinator.

Simon Powell: Day Centre Support Worker (JOS liaison)

Jason Suckling: Day Centre Support Worker (JOS liaison)

LDRC Key Support workers:

These roles changed several times during the course of the project.

Susannah Rigby (Ricky)

Antonella Cosattini (Nicole)

Charles Kalu (Karim)

JOS volunteer advisory team:

Chris Leeds

Ricky Edwards

Alrick Guyler

Mhairi McGhee

Maggie Tolmie

Karen Morgan

Sonia Barrufet

Tatiana Kukova

Co-Designers (C-Ds)

Nicole Brammer

Ricky Clarke

Karim Karim

Instrument co-designers and makers:

Katia Hadaschik – Mojojo

Nathan Reeves – Mojojo

John Reeves – Mojojo

Godefroy Maruejous – Derek's Guitar, Karim's Karimbek and other BMIs

Ian Burrow – Karimbek, Ricky's zither and other BMIs

Ben Lynam – Ricky's BMIs

Mike Cooper – Ricky's BMIs

MERU Design Club volunteers supervised by Graham Race – Ricky's BMIs and other BMIs

Academic supervisors at London Metropolitan University:

Lewis Jones: Director of Music Research. London Metropolitan University.

Chris Smith: Principal Lecturer. London Metropolitan University.

External supervisor at Roehampton University:

Adam Ockelford: Professor of Music. Roehampton University. London.

Expert advisors and associates:

Alan Spindler: Head of Department. Design Research for Disability. London Met. (Retired)

Merrin Hurse: Speech Therapist – RBKC Learning Disability Team

Sheryl Proctor: Physiotherapist – RBKC Learning Disability Team

Vicky Cable, Hayley Smith, Graham Race: MERU Inclusive Designers

Dale Mathers: JOS Associate, advisor

Paul Crawford: Music technologist. Disability access specialist

Mike Cameron: Music instruments maker and repair specialist

Tadeusz Rytwinski: Music Instruments player, maker, designer and repairer.

Design advisor

Godefroy Maruejouis: Guitar maker and player. Design advisor

Horniman Museum: Organology collection keepers

RCA Hamlin Centre: Inclusive Design specialist

2.4.2. Resources

The funding from Royal Borough of Kensington and Chelsea (RBKC) via Learning Disability Resource Centre (LDRC) has allowed a working budget of £1,800 per BMI (Appendix 1).

JOS volunteers input included workshop support and co-facilitation, reflective feedback, specialist input regarding disability access and music technology, general advice and material support. JOS volunteer management team and trustees have provided support throughout, ensuring the day to day working and continuum of JOS throughout the period of the BMI research.

RBKC Learning Disability Services has provided location/s for workshops and presentations, focus group feedback, management and co-ordination of Nicole, Ricky's and Karim's support teams, including in house therapists and specialist health-care workers; and has provided interface with C-Ds' familial carers and other key workers as required.

MERU (Queen Elizabeth Trust) design and manufacture team and volunteer Design Club members have acted as BMI and access device C-Ds, by providing design input, technical advice and support, manufacturing of components and building of BMIs and access equipment. They have also provided material sponsorship to the project.

St Peters Heritage Centre at Vauxhall has provided location of workshops and events and storage.

2.4.3. Projected process

After the initial introductory JOS workshops at LDRC, and the choice of BMI participant C-Ds, a working timeline was projected including a minimum of five music workshops: two to test BMIs during design development, and three after working BMI prototypes were produced, for purposes of disabled C-Ds' familiarisation with their new instruments, and towards evaluation of BMIs in meeting the criteria of the design briefs. Workshops were to be devised by myself as lead facilitator with assistance from JOS volunteers, support from the LDRC team and where possible attended by BMI C-Ds and makers. When the BMIs were completed, a presentation event would be staged, and a project evaluation undertaken. The initial projected time scale for the project was six to eight months.

2.4.4. Ethical considerations and safeguarding

As lead researcher my role has been to instigate the research and to ensure and oversee its integrity and completion by providing a safe and sustainable environment in which BMI design journeys might be achieved, according to the values of the emancipatory research paradigm. In being aware of my privileged position as researcher, I have considered and accept how my knowledge and personal viewpoint may be construed as part of a dominant group of non-disabled people. Having myself been disabled and impaired by various means and to various ongoing degrees during the process of this research, I claim insight by personal experience into the socially and institutionally constructed barriers that disabled and impaired people commonly face, and the challenges that they must overcome in striving for equal rights of access and opportunity. My personal experience has contributed towards my research methodology, and to my chosen and emergent research methods accordingly. I have incorporated flexible and adaptable approaches in attempting to ensure that the voice of disabled participants is fully acknowledged, facilitated, and included as being equal to any other involved in the BMIs design processes that are central to this research.

As founder and co-director of JOS my function has been to establish the JOS project as a registered UK Charity working as a member of an inclusive team of volunteers of mixed ability, age, gender and culture. In upholding the governing aims and objectives of JOS, I have co-directed and facilitated the development and delivery of a year round program of regular weekly inclusive music and arts workshops, outreach, trainings, research, public events and the development of JOS inclusive and bespoke instruments and auxiliary equipment design projects in advocating for the achievement of authentic inclusive society.

Disabled BMI C-Ds' participation has been approved by personal consent, and with familial and/or prime carer support and approval (Appendix 2). All aspects of the design process in working with disabled C-Ds have been undertaken in accord with their personal choice, needs and preferences, and in keeping with protocols and practices agreed with the LDRC management team and under their supervision. Formal permissions have been requested and gained in writing for all data collected towards the research (Appendix 2). Data has been stored on my personal computer accessible by protected password. Regular backup of data has been stored on external drives, accessible by password. The Project Administrator has stored BMI logs on his personal computer protected by password. All design and conceptual copyrights are held by JOS as Creative Commons, freely available to all with due acknowledgements given, unless otherwise determined by participants whose personal copyrighting of any unique components have been deemed by them to be appropriate and in which case it has been their personal responsibility to do so.

2.5. Methods of data collection

2.5.1. Design Journey Logs

Digital logs have been recorded for each individual BMI design journey as chronological listings. E-mails, notes, sketches, drawings, audio-visual and photographic data pertinent to each BMI design process and outcomes have been filed and stored on my password protected personal computer with external backup.

Source data has been generated and gathered by myself and forwarded on by email or by external hard-drive to Chris Leeds who was commissioned as Project Administrator to keep the logs by order of date entry, to build an index for the logs and to ensure safe keep as backup to original data files. Data collected during all aspects of BMI Design Journeys has been entered into the relevant log as soon as possible after its recording.

Additionally, a JOS Generic Inclusive Instruments and Auxiliary Equipment Design Log has recorded the design journeys of music instruments and instruments access devices intended for general inclusive use with JOS participants, rather than those designed as bespoke for specific individuals.

These Design Journey Logs were devised for data collection and storage, and as an “open and accessible process guide for those who might be interested in inclusive approaches” (General Design Log, p. 11).

I intend to illustrate my approaches as a project manager / supervisor in working with and relating to all other project participants in an inclusive manner, and in achieving agreed goals... I will attempt to show as much of working process as is possible in achieving this end, and in allowing ongoing open and reflective critique of practice in process [...] Obviously this is a huge undertaking and [...] I do not expect to be able to cover all areas of concern, nor to hone in all areas of practice to any concluding definitive form however, I do intend to reveal as much as is achievable within the parameters of my research, in sharing inclusive creative process, that others might further refine and improve my own methodology towards an optimum of inclusive proficiency in advancing the art, science and aesthetic of inclusion.

Working inclusively with an interdisciplinary group of C-Ds, care and support networks, family members, volunteers, instrument designers, makers and associates with diverse personalities, temperaments, cultural and linguistic backgrounds and individual communication styles and skills has necessitated an approach to data generation and collection that is flexible and that accepts all forms of communication as valuable and valid feedback towards the achievement and holistic appraisal of the research.

Data collected towards the BMI Design Journey logs has included:

- Personal Profiles of disabled BMI C-Ds
- Personal notes
- Feedback including individual and group, formal and informal debriefings and discussions, non-verbal communication, drawings.
- E-mails
- Hand written and digital documents and letters
- Design sketches, hand produced drawings and CAD
- Mock-ups and models
- Focus group meetings
- Photographic and audio-visual recordings

2.5.2. Personal Profiles (PPs)

Personal Profiles are otherwise known as Personal Care Plans. They are compiled and maintained with and for individual disabled people working closely with their familial and/or professional, personal and extended care and support networks. The information they contain is reviewed and updated at periodic review meetings that encourage input from extended social networks.

PPs include information, illustration, instruction and guidance about a person's:

- identity and character
- appropriate care and support requirements
- suggestions towards the encouragement of independence
- listing of known personal preferences such as, clothing, food, exercise, and preferred ways of doing things
- acknowledgment of human rights, privacy and confidentiality, dignity and respect
- observance and reportage of any changes

The main function of PPs is to ensure best practice and appropriate working relationships with the disabled people that they refer to. They are also in some instances the main focus of information about the identity, character, physical characteristics and personal preferences of a disabled person by which they might be known to others, other than by personal contact. Contact with disabled people who are regarded as vulnerable is often strictly controlled and managed by familial and/or professional care and support networks. PPs often become the sole voice of identity by which disabled people might be known, other than through personal interaction. They are often used as a means of introducing a disabled person. In relation to this research I did not request to view PPs until 14.11.2009.

My permissions to view the PPs of individual BMI C-Ds was sought directly from participating C-Ds. If C-Ds expressed their consent, then approvals were given formally in writing by familial and/or prime carers and accessed under the supervision of care and support managers. Throughout the BMI design process, PPs have provided detailed insight and opinion about the personal needs and preferences of C-Ds towards the personalisation of their BMIs. Any information gained through PPs was referred back to C-Ds for their corroboration and approval before being applied towards the BMI design development.

2.5.3. Focus group at LDRC

For the purpose of gaining additional data about the BMIs in relation to their use by and with their users, a focus group was facilitated at LDRC on 13.08.12. LDRC BMI project liaisons, day care staff and management working regularly and closely with C-Ds were invited. The meeting was scheduled to coincide with a regular staff training session at the end of a working day. Staff attended voluntarily. Disabled C-Ds were invited to attend though none were available to do so due to personal care requirements. The meeting was coordinated with support from management and staff at LDRC. All who attended had been involved in one way or another with the BMI design project, by attending JOS sessions, supporting participants at familiarisation and observation workshops, as key support workers for participant C-Ds, as appointed JOS liaisons, or as day care management. JOS volunteers attended to facilitate the group by helping to set up the space and BMI displays, and by providing refreshments and resources when requested by participants. The largest room at LDRC was given over for use by the group. This session was informal and encouraged spontaneous input from participants at any time. The meeting was scheduled to last for one and a half hours.

Round tables were used to facilitate communication and information flow, and to allow easy access for 360 degree viewing and handling of the BMIs and supporting materials. Each table was provided with seating for up to four participants. On each table individual BMIs were presented as working prototypes with associated models, illustrations, references and photographs of BMIs in use by their players. Printed copies of questionnaires, pens, markers and spare paper were provided.

BMIs included in presentation:

- Nicole's Mojojo and composite adjustable wheelchair presentation stand
- Karim's Karimbek
- Ricky's wind instruments presentation platform, zither, wristband

plectrum holder and melodica with removable cover

- Daniel's wheelchair mountable harp with composite *berimbau* and scraper board
- Musical mattress

In response to the diversity of language and communication skills, cultural backgrounds and personal characteristics of the LDRC care and support staff, the feedback form (Appendix 8) was co-devised with input from the LDRC project liaisons, management and JOS volunteers. The questionnaire was presented as hard copy for completing in situ with opportunity for group discussion, co-assistance and clarifications from myself where required. After introductions, reiteration of the purpose of the session and thanks to participants for their support for the project, each BMI was briefly described verbally and demonstrated. The twelve LDRC participants were invited to divide into sub-groups of three or four people which they did readily. The groups were asked to rotate around the five tables allowing ten minutes at each table to consider and write their feedback about each BMI on the provided questionnaires. A JOS volunteer acted as timekeeper. Participants were encouraged to handle and play the instruments and to explore the associated presentation devices. Each group was encouraged to work together, ask questions, discuss and share opinions. Space was provided on the questionnaire to offer additional comment or suggestion towards the research. Time remaining was used for questions and answers in clarification of any outstanding queries, to give contact details for any additional feedback, and to thank participants for their contribution.

The written feedback has been digitalised, compiled into a workable framework and coded using thematic coding techniques as suggested by Walliman (2005). Various themes have been drawn out relative to each BMI C-D. The codes have then been cross-referenced and common themes identified, towards analysing the extent to which the BMIs achieved the project's Aims and Objectives (Appendix 9).

2.5.4. Stills photography and the BMI film

Stills photography has been used to record process throughout all stages of BMI design development, production, testing and continued use. Where I have personally not been able to record process, various other participants have collected data under my instruction. The same applies to video recordings. Permissions for filming and use of media, other than those previously granted for the three case study participants, have been requested in each particular situation. This approach has been considered as the most appropriate in view of the uncertainty of who would attend, and in keeping with JOS general safeguarding policy. Wherever individuals preferred not to be filmed, they are not included. In all other cases permission was granted.

To demonstrate the specific contributions made by individual participants towards the research, and to present locations and workshop environments in which the research was achieved, I have produced the film attached to this thesis as supplementary material in the form of a DVD, and will refer to its contents in the text. The film has been produced in the context of Joy of Sound that has previously made various films as a means of recording specific workshops, public events and themed projects.⁶

The purpose of the film is to stimulate discussion, aiding my own and others' understanding of what actually happened during process, towards answering my research questions. In producing the film, I have taken an ethnographic approach, intending to share some of the rich array of atmospheres and feelings that arose as aspects of BMI design journeys. To this end, I have compiled a time log of salient moments that show the produced BMIs and the C-D players and extended co-design teams who produced them, and the environments in which the research was undertaken, giving proof by demonstration of the personal actions of individuals and of the shared experience of group meetings, workshops, presentations (Appendix 14). This

⁶ Further films produced within JOS can be found on the Joy of Sound website at <https://joyofsound.org/videos/>.

time log has served as a focal point for my reflections on process, towards exploring my research questions.

However, video recording can be problematic, with the very presence of a camera sometimes changing how people behave (Jewitt, 2012). Additionally, a film made from selected footage inevitably contains some curatorial bias. Therefore, the BMI film cannot be read as a pure data set, but must be seen rather as a means to “stimulate critical reflection” (Jewitt, 2012, p. 3). I have used the film not as a data set, but as a creative process, intended to bring to attention the people involved in the work of producing BMIs as real, living and feeling people, able and creative individuals with unique characters who play a vital role in the generation and production of the BMIs, of the design process and product innovation that BMIs embody, and in their ability and capacity to act as self-advocates for social change and equal rights. By directing the process of producing this video and examining what the footage revealed, I have deepened my understanding of the BMIs, their C-Ds and design teams, the confluence of factors affecting the project and the broader implications of BMIs in terms of OBL, personal and social wellbeing and advocacy for equal society.

2.5.5. Exploring BMIs as OBL

In exploring BMIs as agents for OBL, I constructed the following diagram based on a diagram developed by the DfES Museums and Galleries Education Programme (Clarke, Dodd and Hooper-Greenhill, 2002). The diagram was produced as a means of increasing my awareness of the multiple potentials that music instruments embody as OBL. I used the diagram in presentations as a guide to stimulate consideration, ideas and discussion about the properties and qualities that music instruments might embody. Additionally, the diagram provided guidance towards the Discussion chapter in answering research questions.

WHAT CAN BE LEARNT FROM THE MOJOJO?

DIAGRAM ADAPTED FROM 'LEARNING FROM OBJECTS' DIAGRAM, DFES PUBLICATION DFES/0159/2002, PAGE 11, PUBLISHED BY RCMG, FEB 2002



Figure 2.5.a: What can be learnt from the Mojojo, as Object Based Learning?

In this chapter I have defined the theoretical frameworks underpinning my research, with an emphasis on emancipatory design and related design principles. In presenting my research design I have stated my methods of project design and data collection. In the next chapter I contextualise the three case studies that build this research within the JOS project, and present key events in the case studies' initial development.

3. Introduction to Case Studies

This chapter grounds the research in the JOS project and contextualises events that led to the three case studies. I explain the music instruments design initiatives that led to this research, stating key lessons learned through their production and use. Project funding, budgeting considerations and ethical reflections are discussed, partner organisations are introduced and the aims and objectives of the BMI projects are given with a projected timeline. After recounting the BMI project set-up meetings with LDRC management, I refer to the introductory BMI development workshop at LDRC and feedback from that workshop that helped to determine the kinds of instruments to be produced. Finally, I note progress meetings at LDRC that resulted in the agreement of potential participant C-Ds.

3.1. Joy of Sound

The BMI design development research presented in this thesis has been undertaken in the context of the JOS project that runs inclusive music improvisation workshops on a regular weekly basis throughout the year at locations around London and elsewhere. The workshops generally last for one hour. The length of workshops is suited to the frequent personal care and support needs of participants and the strict scheduling of day care services. Workshops are facilitated by me or otherwise by trained and experienced JOS facilitators, and co-facilitated by JOS volunteers. All JOS workshop participants are encouraged to participate as co-creators. As much of the ethos and techniques employed by JOS have been discussed in the preceding chapters, I here focus on aspects of Joy of Sound that relate directly to the development of the BMI design project.

The decision to focus this research on the development of acoustic rather than electronic music instruments, whilst remaining aware of and open to the potentials of any approaches, is based on personal preferences and shared experience gained whilst working in the field of inclusive community music since January 2000. JOS has undertaken hands-on explorations with

Soundbeam (2017), Skoogmusic (2017) and similar technological approaches. Although computer generated technological music making devices are increasingly used and have gained considerable success particularly in working with some of the most difficult to access and disabled people, several issues arise in considering the use of such devices including:

- Time-consuming set-up
- Essential equipment needs (speakers, leads, power source, etc.)
- Training staff in set-up, use and troubleshooting
- Technology becoming obsolete
- Specialist repair costs
- Acoustics – preference for natural timbre and vibrations

Therefore, whilst acknowledging that there is indeed a place for technological music instruments, and that the quality of their potential application is constantly advancing, JOS has evolved a strong practice-based preference for the inherent qualities of direct human contact and interaction, and the tactile and sonic qualities of acoustic music instruments.

In keeping with JOS' idiomatic soundscape, BMIs were designed to be tuneable to an E-flat pitch standard, and related scales. At JOS, the use of E-flat was arrived at purely by chance. The flute I used when first improvising with Derek – the disabled person who catalysed the JOS project (Acknowledgements, p.17) – was an Indian bamboo flute tuned to E-flat. As the project developed, participants demonstrated the viability of E-flat for facilitating comfortable vocal improvisation across a number of related modes / scales, towards the creation of inclusive soundscapes.

3.2. BMI precedents: 2001-2007

During early development of the JOS project between 2000 and 2003, a working relationship developed between myself as founder and director of JOS, and the London Met departments of Design Research for Disability, and Music Instruments Technology. This relationship initially centred around the production of five personalised instruments for JOS participants, in fulfilment of a Millennium Champions Award project that aimed “to evolve ways of enabling students with PMLD to create and enjoy interactive music, to express feelings through sound and to extend possibilities for learning” (Longden, 2003).

The produced BMIs “evolved in accord with the personality, dexterity and spirit” (Longden, 2003, p. 1) of each participant. On completion of the BMIs, participants were each recorded separately playing their BMIs and involved along with members of their care and support team in the various stages of production, towards a *Joy of Sound* CD. 1000 copies of the *Joy of Sound* CD were produced and distributed to participants and extended networks, and the CD was made available online at the JOS website (for an image of the CD cover and liner notes, see Appendix 13). Individual tracks were dedicated to each of the players who were featured playing their instruments that were formally presented to them as their personal property. As a result of my interactions with students, staff and alumni at London Met, several unique music instruments were produced. In some cases, participating students used their project as core material towards their course work.

The success of the first BMI project led directly into my London Met MA Research Design for Disability studies 2003-2004 (Longden, 2004). This work was primarily focussed on the development of an inclusive methodology for music-based sessions, however it overlapped with the development of three further BMIs and ongoing JOS participant led initiatives to develop assistive devices to enable disabled and impaired people access to participatory community music making as co-creative players.

The next sections briefly outline the BMIs which preceded those presented in this thesis. For further information on the instrument builders and the BMI process, see Appendix 15. For most of the BMIs, I have presented a reference to the BMI Film in Appendix 14, where the instrument can be seen and heard.

3.2.1. Mark's marimba



Figure 3.2.a: Mark's wheelchair presentable marimba, co-designed and made by Jamie Linwood working with Mark and JOS volunteers. Design modifications and repairs by Dan Knight and JOS.

Mark's marimba was designed with a narrow spread of six keys that fitted his specific range of single armed movement. Individual keys were made long and broad enough to comfortably facilitate his play. The instrument expressed a deep and resonant voice in the key of E-flat. The freestanding composite stand proved the perfect fit for Mark's wheelchair access, and allowed Marks support team to offer co-creative assistance when required (Appendix 14, 31:40).

3.2.2. Derek's guitar



Figure 3.2.b: Derek's personalised guitar with front and rear resonator panels, strengthened neck and grip-bar, co-designed and made by Godefroy Maruejouis and Juliane Bozzolini working with Derek and JOS.

Derek's Bespoke Guitar was designed to cope with his physical strength, his particular access approaches and needs, and his personal techniques and manner of playing. It featured metal resonator panels that transmitted sounds in a manner that allowed Derek to hear and feel his instrument through his body, a locking safety strap to ensure safe handling, a reinforced neck to accommodate Derek's considerable strength, a strum-guard-plate that prevented the strings from being accidentally blocked, and a grip bar at the back of the neck that allowed Derek to hold and support the instrument next to his body without blocking the strings. The solid guitar body was made from poplar, a wood selected for its strength and fragrance. Derek's name was inlaid into the body of the instrument. The instrument was strung with thick gauge metal strings that expressed a clear, bright and warm spectrum of sound when Derek played it (Appendix 14, 30:37).

3.2.3. Anne-Marie's Ladybird lap harp



Figure 3.2.c: Anne-Marie's personalised Ladybird lap harp was co-designed and made by Ina de Smet working with Anna and JOS. The instrument is moulded from carbon fibre as used in racing car bodies.

Anne-Marie had learning disabilities and experienced seizures that made her prone to dropping or throwing anything that she was holding during seizure. Growing directly out of Anne-Marie's preferences and access requirements, the lap harp took the form of her favourite creature, a ladybird, and preferred colour, red. Ina de Smet, the instrument's designer, gained sponsorship from a car manufacturer for the body of the lap harp to be moulded from carbon fibre as used in building lightweight racing cars, making it safe, light and resilient for Anne-Marie's use. The harp was strung with natural and coloured nylon harp strings that expressed a mellow high-pitched range of sounds (Appendix 14, 32:34).

3.2.4. Johnny B's tuneable peg drums



Figure 3.2.d: Johnny B's tuneable peg drums based on traditional African drums, made by Richard Huxley, with adjustable stands fitted by JOS.

Johnny B was an enthusiastic, energetic and popular participant at music sessions. He was non-verbal with learning disabilities. His drums were made and presented specifically to fit his repetitive range of movement and liking of rhythm.

3.2.5. Joanne's wheelchair presentable tuned percussion frame



Figure 3.2.e: Joanne's wheelchair presentable tuned percussion frame made by Jamie Linwood working with Joanne and JOS. Design modifications by Dan Knight and Dmitri Gour. The instrument's mechanism is based on a traditional pole-lathe and is played by Joanne with her foot.

Joanne's wheelchair presentable tuned percussion frame was a composite instrument's design built to fit Joanne's range of self-controlled movement. The working mechanism of the design was based on that of a traditional pole lathe. Joanne played the instrument by wearing a slip-on shoe connected to a spring cord that facilitated transfer of Joanne's right foot motion from the vertical plane to the lateral plane. By the tension-and-release of an elasticated cord the pole rotated to operate rubber pulley bands fitted to spools giving motion to two percussion instruments at the same time. Joanne could choose from three provided percussion instruments each tuned to E-flat. The instruments were: suspended metal chime bars, brass bells and a wooden basket shuttle sounded by a spherical stone. Initially designed to be operated by Joanne's right foot movement, the percussion frame was later adapted to offer interface with Joanne's extended arm movement (Appendix 14, 30:30).

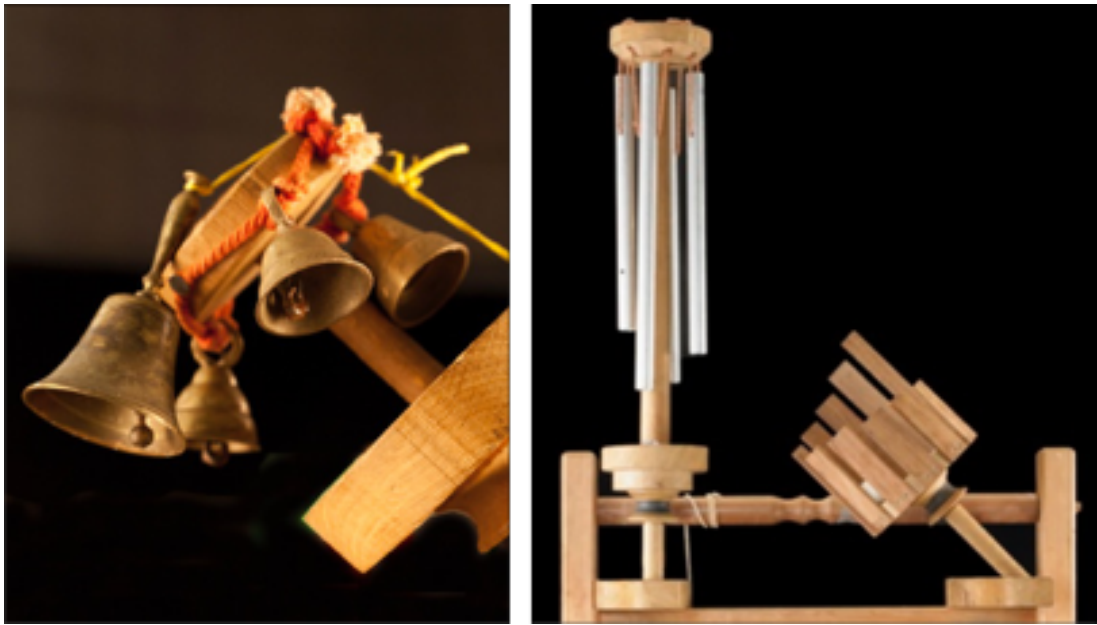


Figure 3.2.f: The percussion frame can produce three different instrumental sounds each tuned to E-flat, with a choice of any two instrumental attachments able to be sounded together at any one time.

3.2.6. The Tree Song lap harp



Figure 3.2.g: Tree Song lap harp co-designed by Ina de Smit working with a disabled JOS participant, and volunteers. Designed with strings placed beneath the soundboard, as a close to the body strap-on instrument with emphasised surface texturing for touch stimulus, and two sound holes of different size, each offering access to the strings at different places along their length so as to provide two distinct soundings and tactile sensation.

The Tree Song lap harp aimed to explore and overcome barriers to participation for JOS participants with profound and multiple disabilities who faced complex barriers to their access of participatory music making, and for whom other approaches had proved lacking. It was produced as a strap-on instrument intended for close-in one to one assisted play with support from a facilitating co-creative player. The instrument was intended to resonate outwardly and inwardly into the body of its player. A laminated wooden body was carved texturally on the outer shell to make it interesting and stimulating to touch. Nylon harp strings lay beneath the soundboard to prevent accidental interference during play with two shaped access holes of different sizes giving access to the strings. Tuning pins and all other parts were placed inside the

sound box and accessible only by unscrewing and lifting the soundboard.

3.2.7. Wheelchair presentable twin zither and adjustable stand

The wheelchair presentable twin zither has been a popular addition at JOS sessions, gaining consistent use by players using wheelchairs for whom the instrument can be adjusted quickly and safely for different angles of presentation for players with a variety of access requirements. It was made to be fully adjustable in angle and height of presentation, and incorporated two sets of six strings, making it playable by one or two people at the same time, encouraging co-creative support and facilitation for players who may have impaired mobility in one hand or arm. The zither's kidney shaped sound box was made from 6mm plywood. Its composite mild steel tube stand offered robust and stable support and ease of vertical and lateral adjustment. The zither has proved robust enough to accommodate the exploratory use of new and recycled strings of varying gauges and in multiple combinations (Appendix 14, 31:54).



Figure 3.2.h: Wheelchair presentable twin zither in use by two independent players, and as an instrument to facilitate co-creative assisted play.

3.2.8. Wheelchair presentable Celestial Bottle Organ

The Celestial Bottle organ was commissioned specifically as an experimental instrument for use by JOS participants at workshops and events. Bottles were tuned to individual notes in the scale of E-flat by the insertion of various quantities of resin set into their chambers, and sounded by wind flow generated by an electric pump connected to a mains power socket. The instrument featured large coloured palm sized keys / pads that aimed to make the instrument more accessible to impaired players and particularly to wheelchair users (Appendix 14, 33:00).



Figure 3.2.i: Wheelchair presentable Celestial Bottle Organ co-designed and made by Dan Knight working with JOS.

3.3. Key learning factors gained from the production of personalised music instruments leading into the PhD project

My experience of producing personalised instruments and access equipment leading into this research allowed me to develop a clearer understanding of the benefits and challenges involved in the design, development and making of music instruments. It also gave me time through applied practice as a JOS lead facilitator to hone my inclusive facilitation skills, to experience and understand more about the benefits and challenges involved in working towards increased social inclusion and active participation, and to become more attuned to working methods, approaches, politics and policies in the disability sector, in the contexts of personal, social and public domains. Establishing good working practices involved building relationships of trust, shared interests and concerns with management and support staff at several day care centres. Experience of doing so allowed me to enhance and increase my knowledge and experiential awareness of some of the many complex and compounded factors involved in the care of people with PMLD across a broad spectrum of need. Most important to my role and function as director and lead facilitator at JOS, I developed close working relationships and, in some instances, personal friendships with disabled participants and members of their familial and professional care and support networks. I became directly involved with an increasing number of people of different social and cultural backgrounds and abilities who attended JOS workshops and events, including many who came to JOS as volunteers. During this period, I also became a personal advocate for two JOS participants with PMLD, at the request of their immediate families, and subsequently developed closer links with them, their families and extended care, support and social networks.

The success of the first JOS instruments project led directly to me undertaking an MA (2003 – 2004) at London Met. I was invited to apply by the head of the Design Research for Disability, Alan Spindler, whom I had met on various occasions during the preceding instruments making projects that involved me giving presentations at London Met and working with undergraduate and

postgraduate students in various departments. Alan introduced me to the broader field and significance of Disability Studies, and to the development and practice of Inclusive Design. During this period, I also consulted with Lewis Jones and his associate tutors on several occasions, whilst working with students whom he supervised or was otherwise involved with on instruments making coursework projects. This working relationship proved to be fruitful. At London Met, students who chose to work on JOS projects had the benefit of immediate access to expertise, specialised equipment and assistance, and could include work undertaken in partnership with JOS towards their coursework. I made several presentations to students on various courses including Design Research for Disability, Instruments Making, Interior, and Furniture Design. A number of students became interested in JOS' work and attended sessions to experience JOS inclusive music making approaches in action. Some became volunteers and some developed instrument access devices and music instruments making projects towards their coursework or as personal projects. On several occasions London Met students or graduates were commissioned by JOS to work on specific design projects.

3.3.1. Funding and budgeting

The production of instruments and auxiliary equipment prior to this thesis provided experience of budget building. JOS project budgeting was realised in the context of a volunteer led organisation and did not reflect an economy of full cost recovery. Funding for instruments making and associated music workshops was granted as fixed funding, with little inbuilt flexibility for changes or variations in process. I gained experience of negotiating and fixing budgets with instruments makers and designers, and became more familiar with the broad range of challenges involved in attempting to build and present a working budget for the production of BMIs in an environment where any fixed projections generally proved to be impracticable.

Much of the achieved personalised instruments production work occurred in working with students and staff with access to equipment, materials, resources

and expertise that represented considerable subsidy. In some cases, instruments were researched, designed and produced at no cost whatsoever to JOS, on an entirely voluntary basis. Some designers required essential expenses and materials costs only. Others were paid pre-determined set fees. Some required re-negotiated payments after unexpected issues and delays with process or materials. In some cases, the need to appoint secondary makers to complete or to amend achieved work required negotiation of additional payments. In some instances, materials, additional labour and component parts were donated. Consultations with expert advisors and associates, auxiliary meetings, visits and research was generally undertaken on an expenses-only basis. The experience of budgeting for works and services within such limited and variable circumstances proved enlightening and often heartening. The majority of the work undertaken and its subsequent products could not possibly have happened without considerable voluntary input and donated resource.

Process on this thesis has doubtless been influenced by increased awareness gained through experience of materials and the circumstances of their use, their sourcing, qualities, costs and functions through the process of overseeing and discussing production processes with makers and design teams, all of whom contributed different ideas, beliefs, working methods and approaches. Materials used in the initial series of BMIs ranged from uniquely produced and highly specialised custom components, to off the shelf, open sourced, recycled and found components.

3.3.2. Ethical reflections

In addition to practical considerations involved in the production of the first personalised music instruments, a number of ethical issues arose, which informed the approaches I used in the case studies. There are fixed legal and ethical frameworks and protocols regarding the safeguarding and privacy of disabled and vulnerable people, care and support workers, establishments and others involved in process that must be carefully observed. Whilst I

followed protocols in accord with given requirements, there were frequent differences of definition, interpretation and practical approaches to ethical practice, attitude and function. Such differences often become heightened between familial and professional care and support networks and others where social and medical models conflicted. My role as JOS director demanded that I maintain an awareness of current ethical and legal obligations, whilst remaining open and flexible enough to determine the most appropriate actions in cases where conflicting interests and questions of comparative integrity came into play.

My most valuable learning in this area of concern throughout the initial BMI projects was that *people* must always come first, and that there can be no prioritisation other than the wellbeing of the person in any circumstance. In instances where institutional, professional or academic requirements undermine the personal integrity and/or wellbeing of any individual in any way, it is the *person* who must be prioritised. This I believe to be a fundamental responsibility in keeping with human rights law. I thus believe that working in a person-centred way is an ethical responsibility as well as providing a catalyst for social change, new knowledge creation and design innovation.

During my various invited home visits with project participants over the course of the initial BMI projects, and particularly when invited to become a personal and family advocate, I became subject to privileged insights and information regarding personal and common issues, problems and barriers faced on a day-to-day basis by disabled people, and by their familial and professional support networks. At times private information arose that I could not and would not share with others as doing so would have compromised my ethical responsibility as an advocate and friend. I often became uncomfortably drawn between the interests of disabled participants, their families, care and support givers and agencies, social services, LA and other institutional bodies and my personal beliefs, intuitions and practices. In such cases I learnt that considerate practice might best be achieved by consulting and confiding directly with disabled participants as my prime source of guidance, and when required, to seek additional support from their families or prime carers before

attempting to determine any course of action.

3.4. BMI project development

This section sets out the early stages of the collaboration between JOS, LDRC, C-Ds and instrument and design for disability specialists. It introduces the partner organisations of LDRC and MERU, and illustrates the emergence of common aims and understandings as the project began to take shape.

3.4.1. Learning Disabilities Resource Centre (LDRC)

The Learning Disabilities Resource Centre (LDRC), within the Royal Borough of Kensington and Chelsea (2016), aims “to widen the opportunities available to service users to be part of their local community and become as independent as they possibly can.”

LDRC first became involved with Joy of Sound in 2008, when disabled participants attended their first JOS inclusive music session at a local public festival. Feedback from participants at the event including disabled players, support workers, JOS volunteers and members of the public indicated that participants of all abilities enjoyed the session, were impressed by the experience, and felt that the recreational and therapeutic value of the activity offered potential benefits across a broad range of participant abilities. I was subsequently invited to meet with LDRC management to explore potentials for delivering regular JOS sessions at LDRC and for the provision of BMIs for LDRC service users.

3.4.2. MERU Design Club

Medical Engineering Resource Unit (MERU) is a charity who “designs and builds assistive equipment for children and young people with disabilities” (MERU, 2015). Their Design Club is a group of volunteer designers and engineers who meet once a month to develop disability access products.

Joy of Sound became involved with MERU in May of 2009, when CL and I were invited to give a presentation at their monthly meeting. Following the presentation, several MERU Design Club members became involved in Joy of Sound projects to develop BMIs and access devices. A key outcome of the JOS partnership with MERU was the development of the Instrument Presentation Stand in 2010, which combined elements of a snare drum stand with a Manfrotto Photo Clamp (Figure 3.4.a). This has enabled a number of instruments to become wheelchair presentable, and easily accessible to JOS participants. Moreover, the Instrument Presentation Stand had a significant impact on the development of Ricky's BMIs, which will be further discussed in his case study.



Figure 3.4.a: Above and below. Adjustable Instruments Presentation Stand (AIPS) an open sourced design using off-the-shelf products, produced by MERU in partnership with JOS as co-designers.



3.4.3. The decision to present three case studies

The three case studies presented have been chosen from a total number of ten BMIs produced towards the research. Three specific studies have been used because they offer practical insight into the process of BMI production achieved with participating C-Ds who represent the broadest range of ability and need in the context of the participant group of players. The three given case studies have been chosen to maximise potential for the development of further BMIs to meet a universal range of players inclusively. Each of the three studies provides unique learning opportunities and design outcomes by featuring an individual with distinct abilities, preferences and needs.

Nicole has profound and multiple learning difficulties (PMLD) and complex

access requirements. She is non-verbal, communicating with slight but distinct self-generated movements largely centred on her eyes and facial expressions. Nicole requires fully supported assisted play and facilitation to enable her active participation in music making. Her case study focuses on the development and production of the Mojojo as a composite music instrument specifically intended to encourage and facilitate Nicole's co-assistive play, with distinctive design features incorporated to meet this particular purpose. Whilst meeting Nicole's personal preferences and access requirements, the development of the Mojojo also provides insight and opportunity toward the development of a generic instrument design made adaptable to serve many potential players who face similar barriers to their active participation in music making and other activities.

Karim has mild learning difficulties. He requires moderate support and assistance to facilitate his choice of daily activities and lifelong living and learning opportunities. He is non-verbal, highly mobile, energetic and self-determined. Karim's case study focusses the design development and production of the Karimbek, a personalised instrument designed to stimulate and facilitate Karim's ongoing musical interests, and to support and encourage ongoing development of his social and transferable independent living skills. The case study draws attention to the challenges faced by instruments makers in working inclusively, and to the benefits and advantages arising from such inclusive collaborative process.

Ricky has learning disabilities and is physically disabled with a cerebral palsy that results in him having severely limited self-control over any movement in his body, head, legs, feet, arms and hands. He is visually impaired and has dysphagia, a condition that makes it difficult for him to swallow and to control his breathing. Ricky uses a wheelchair for his mobility and faces severe and multiple barriers to his participation in music making activities that he would like to join in. He expresses his preferences, likes and dislikes verbally though with varying degrees of difficulty, and by his facial and postural expressions. Ricky's case study reveals the importance of *presentation* of music instruments as an essential means of facilitating the personal choice of players

who have unusual access requirements. Ricky's study also reveals how the development of personalised bespoke designs can generate multiple threads that lead to new knowledge creation and product innovation.

Whilst the individual case studies narrate the production of music instruments bespoke for use by specific disabled C-Ds, they also reveal and acknowledge the potentials for subsequent design developments and outcomes that can be adapted for use by other players from across the broadest range of abilities and need for recreational, social, educational and therapeutic purpose. Furthermore, each of the three presented case studies offers specific and clear indication of how the design and production of a BMI can be a means of facilitating the self-emancipatory voice of disabled and disadvantaged people who might otherwise be unheard and unacknowledged.

3.4.4. Project funding

Initially it was intended to produce five BMIs towards the research in the context of the JOS project. On the strength of previously achieved BMIs, I forwarded an application to the Arts Council GB for £10,000 to produce five BMIs working with an established group of disabled JOS participants attending a Lambeth based day care centre.

During the process of this application, JOS was invited to apply for a second £10,000 grant from RBKC to undertake a project at LDRC. This invitation was due largely to the input of a dedicated and enthusiastic support worker who had introduced the JOS project to LDRC management after attending a JOS inclusive music session at St Peter's, Lambeth, where personalised instruments were in use. He realised the potential benefits that such a project might have for his disabled clients (this staff member was later appointed as one of two volunteer JOS BMI project liaisons at LDRC). As the application to the Arts Council was not assured, I suggested a similar project to work with LDRC disabled participants towards the production of five BMIs, the provision of auxiliary workshops, design development meeting and a culminating public

BMI presentation event. The two applications proposed working with different groups of participants. Unexpectedly, both applications were successful.

JOS received the Arts Council funding of £10,000 and an additional £10,000 sum was granted by the Royal Borough of Kensington and Chelsea LA, to produce five BMIs working with disabled people attending at LDRC. The project was overseen by LDRC management and liaised by the two appointed day care support staff. By the time the funding was granted, LDRC disabled attendees and support staff had been attending JOS sessions for almost one year and were familiar with JOS approaches.

After consultations at LDRC it was decided to produce four BMIs for specific individuals and one BMI designed for general use in the context of JOS inclusive music sessions working with LDRC participants. Funding specifications required the involvement of participants from across the broadest spectrum of need. This enabled the project to best serve the general interests of LDRC clients and build potential towards JOS BMI project sustainability and further development in partnership with LDRC. Eight of the ten BMIs were produced working with individual C-Ds.

From this point, this thesis focuses on the development of the BMI project at LDRC. In narrating the case studies, I draw on data gathered from multiple sources as stated in section 2.5, Methods of Data Collection, including:

- Personal Profiles of disabled BMI C-Ds
- Personal notes
- Feedback including individual and group, formal and informal debriefings and discussions, non-verbal communication, drawings.
- E-mails
- Hand-written and digital documents and letters
- Design sketches, hand produced drawings and CAD
- Mock-ups and models
- Focus group meetings

- Photographic and audio-visual recordings

3.4.5. Aims and Objectives of the BMI project

- To work with Co-Designers as members of an interdisciplinary team including care and support networks.
- To use person-centred, inclusive and participatory design approaches in working with Co-Designers to design and make acoustic music instruments bespoke to meet their personal preferences and needs.
- To produce an instrument that enables and encourages the Co-Designers' increased access to participation in JOS inclusive community music making sessions and subsequent lifelong learning opportunities.
- To produce music instruments bespoke for disabled Co-Designers, whilst also allowing them to be adaptable for use with other players across the broadest range of abilities, for recreational, social, educational and therapeutic purposes.
- To arrange a celebratory public event to present the Bespoke Music Instruments (BMIs) to the Co-Designers.

Timeline of project introduction

2008: LDRC began attending JOS sessions

02.03.2009: LDRC invited JOS to set up BMI project

16.4.2009: RBKC Funding for a BMI project is transferred to JOS

01.06.2009: Initial advance presentation about BMI project to LDRC team

18.6.2009: Introductory JOS workshop for all attending LDRC centre

22.06.2009: WL progress meeting with JH and LDRC management

06.07.2009: 2nd General Introductory JOS workshop for all attending LDRC centre

27.07.2009: Meeting with LDRC managers to discuss potential C-Ds

03.08.2009: Confirmation of BMI Co-Designers x 3

3.4.6. First meeting and presentation at LDRC

On 01.06.2009 I attended LDRC to give an introductory presentation about JOS approaches and practices, and to share examples of previously achieved BMIs. Participants included day care staff, LDRC associate therapists and management who were present as they would be for a regular staff meeting. This meeting was scheduled by management as a regular staff meeting. The entire on duty staff team were invited. However, no service users were present, as they had all gone home for the day. I requested that we have a second introductory meeting / presentation including all of the LDRC service users in promoting optimum levels of inclusion at the earliest stage of project development. This idea gained unanimous support. I also committed to invite JOS volunteer team members, instruments designers and makers and design for disability specialists.

3.4.7. Introductory JOS workshop for all attending LDRC centre

I was invited to return to LDRC on 18.06.2009 with a team of JOS volunteers. At this session a second presentation was given to an extended LDRC team that included members who had missed the first presentation. Attendees included service users, management, day care support workers, therapists, familial and extended support networks, JOS volunteers and potential BMI designers and instruments makers drawn from JOS established contacts, and by recommendation attended. A demonstration JOS inclusive music workshop was also provided to allow management, staff and disabled service users to experience JOS inclusive approaches, and to witness the significance of bespoke instruments and equipment in the context of JOS style inclusive music making. This workshop included several disabled service users whom the LDRC team had determined might particularly benefit from participation in social music making activities, and who were potential clients for BMI designs.

Feedback from those present included (General Design Log, pp. 18-20):

- “I felt that on the whole, given that a majority of the individuals present (both staff and service users) hadn’t participated in or experienced a Joy of Sound session before, there was a lot of positive energy and enthusiasm generated.” – JH
- “The workshop showed good emphasis on the idea of instruments for people with minimal movement... We could have brought a variety of possible stands to try out and more of a wider choice of instruments to experiment with e.g. shruti box, plectrum holder, q chord and tuned percussion.” – AG
- “The instrument will need to be something unconventional, probably non-existent so far and not necessarily playable manually but rather with elbows, feet, head or any other of the student’s body part as long as he or she is comfortable with it.” – KH

3.4.8. Progress meeting with LDRC management

At a meeting on 22.6.2009 LDRC put forward four potential C-Ds. It was intended that the suggested C-Ds would give opportunity to address design challenges across a broad range of need; and therefore, be of greatest potential benefit inclusively to people disabled from participation in music making activities by lack of adequate provision.

Next steps were discussed and determined to include (General Design Log, pp. 23-24):

Decide what kind of instrument (according to musician’s personal preferences)

- sound type / quality – wind / reed / string / tuned percussion / percussion
- rhythm / drone / pseudo rhythm (e.g. hurdy-gurdy)
- aesthetic considerations – appeal to various senses
- associative / inspirational ideas

- timbre / feel: hard /soft, metal / wood, resonance, attack
- number of notes – less is more!

Assess musicians' personal preferences for using objects / tools in general and instruments in particular

- position of arms / legs hands / feet
- playing with: e.g. whole hand / fingers / arm / leg etc.
- mode of playing: push / pull / strike / draw / blow
- use of operating device: key / lever / handle
- use of implements: plectrum / bow / stick
- angle of striking / plucking
- force required
- reach / distance

Assess how the instrument will function in relation to preferences expressed

- presentation: holder / stand / tray / wheelchair mounted / way of holding instrument
- stability of playing position
- adjustability of playing position
- guided access e.g. guard plate over frets or strings / slot / arm-rest / wrist rest
- variability of usage: plucking / bowing
- playable in different positions / configurations / orientations
- size, weight, shape

Technical Requirements

- ease of maintenance / parts replacement
- reliability of tuning mechanisms
- portability
- ruggedness of construction
- health and safety – edges

- resistance to accidental operation of e.g. tuning, fretting
- resistance to accidental blocking or damping of sound
- resistance to implements being lost, becoming stuck

Challenges to research mentioned were:

- JOS continuum throughout
- Personal health issues
- Participants health issues
- Communication with none-verbal participants
- Variables in support worker attitudes and ability
- The use of agency staff
- Disruption to schedules
- Changes in project participants and personnel
- Staff health issues
- Differences of interpretation of need
- Different attitudes and expectations concerning workshop approaches
- Difficulty in gaining information
- Difficulty in gaining feedback
- Cultural shift towards 'personalisation'
- Dealing with contentious and sensitive material relating to process
- Resources
- Volunteer input
- Differences in level of commitment
- Instruments makers' unfamiliarity with disability sector
- Instruments makers matching BMI project commitments with material needs
- Matching academic requirement with lived reality
- Questions of authenticity
- Using open systems approaches to encourage and accommodate broadest inclusive input
- Regulating numbers attending Workshops
- Ratios of facilitators at workshops

- Consistency of recording BMIs
- MERU scheduling and timeline for volunteer input
- Accumulation and logging of data sets
- Formatting issues
- Computer interface
- Dominant cultural values and aesthetic
- Entrenched attitudes in musicology
- Lack of social and political awareness regarding social inclusion
- Use of language / terminology

3.4.9. Progress meeting at LDRC to discuss potential C-Ds

On 27.06.2009 LDRC management invited JOS to collaborate with LDRC to produce bespoke instruments, working with four specific service users whom the LDRC team felt had demonstrated their enjoyment of music making activities during the demonstration workshops, and who presented a broad range of challenges to participation that the BMI project might help overcome.

Main points discussed were (General Design Log, p.35):

- WL discussed how best to deal with contentious material in logs. SO and JH agreed WL to review logs before they were forwarded on to LDRC and to edit any sensitive material that might cause issue with support workers.
- JH mentioned that the choice of potential recipients takes into account the attitudes of the C-Ds' key carers who would be involved, i.e. preferring those who are likely to be most enthusiastic.
- WL expressed that this might be taking too safe a line; and that often it is those who initially disagree with or impede process, who in the long term might become most dedicated and actively involved in process.
- The need of enhancing understanding and gaining further detailed statistics concerning the efficacy of intensive interactive approaches.

- To be aware of acts of agency, mentoring, repetition, and the use of habitual language and interpretation regarding C-Ds.
- To encourage participants not to carry preconceptions about C-Ds' potentials to understand ideas or carry out tasks whilst also welcoming and respecting interventions of care staff on behalf of C-Ds.

At this time, the decision was made that the BMI project would focus on four C-Ds: Nicole, Ricky, Karim and Daniel. One additional instrument was also commissioned, which would be designed to overcome the broadest possible spectrum of barriers to participation in music making activities for people of all abilities. The three case studies presented towards this study are drawn from this group of participants. Information regarding the additional designs is referred to in Appendix 3. From this point, the Design Journeys continue within the individual case studies of the C-Ds Nicole, Ricky and Karim. Presentation of the research case studies draws on the works of Aldridge (2005), and the Helen Hamlyn Research Centre (Royal College of Art, 2017). The form and content reflect a person-centred approach to the particular and unique character, needs and circumstances of each disabled co-design participant; and to the developmental flow of particular BMI Design Journeys.

In this chapter I have introduced the three case studies by grounding them within the JOS project, discussing initiatives leading to the case studies, and key events in the early stages of the collaboration with LDRC. In the next chapter, I present Nicole's case study as a design journey.

4. Nicole's Bespoke Music Instrument (BMI) Design Journey (Case Study)

In this chapter I introduce Nicole, and the key people involved in co-designing her BMI. I then draw on the design log to tell the story of Nicole's BMI, as it was conceived, designed, constructed, personalised and played. I outline the process by which Nicole tested and gave feedback on her BMI as a working prototype, and the subsequent alterations made.

Project Lead:

William Longden

Core Team:

LDRC liaison – Simon Powel

Project administrator – Chris Leeds

Volunteer input – JOS Management Team

Associates:

Nicole (C-D / player), LDRC (Nicole's day-care centre at RBKC), Nathan Reeves (Design Research for Disability specialist), Katia Hadaschik (Design Research for Disability specialist), John Reeves (Designer, maker), Chris Leeds (Disability access specialist, instruments designer, musician, project admin), Michael Cameron (Instrument maker / repairer, design consultant) Godefroy Maruejous (Guitar maker, advisor), JOS project volunteers and workshop participants, MERU (Design and fabrication specialists), Lewis Jones at London Metropolitan University (Organology advisor), Alan Marsh and Marcella Haddad (Audio-visual recording of process)

The team was supplemented by input from specialists appropriate to Nicole's personal preference and need.

4.1. Introduction



Figure 4.1.a: Nicole Brammer, BMI Co-Designer and player.

Nicole is a popular and very sensitive woman who first attended a JOS inclusive music making session during the autumn of 2008 (Figure 4.1.a).

As a child Nicole was lively, energetic and fond of dancing and singing, however she developed a number of impairments including cerebral palsy and epilepsy. Nicole's physical and language impairments mean that she requires intensive round-the-clock care and support. As Nicole does not speak verbally, she requires intensive support and interaction to facilitate her communication.

Nicole has full mobility support in using her bespoke wheelchair, and the assistance of a highly specialised support team. She finds it impossible or difficult to take part fully in activities that she likes; and needs support in making her preferences and choices known. Despite being non-verbal, Nicole is able to express her preferences and emotions by expressive facial gestures and eye contact. With sensitive support and assistance Nicole is able to make choices by eye pointing and by vocalised sounds.

Conditions that affect Nicole's speech, mobility and dexterity are not generally catered for in a manner that ensures her equality of opportunity for participation across the spectrum of society. Social and environmental barriers to Nicole's access leave her profoundly disabled and excluded from the majority of social and professional activities and domains, learning opportunities and other potential occupations, due to a shortfall in person-centred resources, social and political will and awareness, and the application of inclusive equal rights by which she might otherwise gain equitable access and facilitation to participate as she might choose in all areas of society.

Nicole was invited to participate as a BMI C-D because she had demonstrated enthusiasm and enjoyment in music and theatre arts activities; and due to her consistent engagement and contribution at JOS music sessions that she attended with support from LDRC staff. On consultation with Nicole's immediate family, care management and personal support team, permissions were agreed and Nicole, accompanied by her key support workers, was informed about the BMI project projected timeline.

Nicole was involved throughout the BMI project as a C-D. She was consulted at regular JOS music sessions and meetings liaised by her key support workers and health-care team. Nicole was consulted and informed regularly by William Longden during all stages of BMI development process. Professional health care, disability, design and musicology specialists were engaged whenever it was deemed advantageous by members of the design team.

The Mojojo, Nicole's BMI, whilst being designed specifically for Nicole's use, was inspired by and named after the late Joanne Warboys, a founder member of JOS inclusive music workshops at Lambeth in 2000. Joanne participated as a member of the first JOS instruments design project that culminated in 2002 with the production of Joanne's *Foot Driven Tuned Percussion Frame*, as shown in the Introduction to Case Studies. After several years of successful use, this instrument became unusable by Joanne, and a new design project

was set up to facilitate Joanne's participation. This design development became the Mojojo that was named in honour of Joanne's vital input; however, Joanne became too frail to finish the Mojojo project. With approval and support from her father and family members who had participated as C-Ds, the Mojojo design in process was offered to Nicole whose similar range of ability, mobility, access requirements and enthusiasm for participating at JOS made her the ideal co-design participant. The design project was transferred from Joanne to Nicole during June 2009.

4.2. BMI design development stages

Projected BMI production timeline

At 02.03.2009, the initial LDRC brief was that BMI production should take six to eight months in total (LDRC brief, Appendix 1).

Actual BMI production timeline from date of confirmation

03.08.2009: Confirmation of Nicole as BMI C-D
13.08.2009: 2nd Observation workshop at LDRC Centre
26.08.2009: 3rd Observation workshop at LDRC Centre
30.09.2009: 4th Observation workshop at LDRC Centre
20.10.2009: Meeting with in-house team at LDRC
14.11.2009: General request for further relevant information about C-Ds
24.11.2009: Presentation and BMI Briefing at LDRC
08.01.2010: Nicole attends JOS session St Peters
10.01.2009: Nathan & Katia present 3D images of designs
15.01.2009: Nicole begins attending JOS sessions at St Peters
10.02.2010: Nicole's BMI fitting session at LDRC
15.04.2010: Katia presents string box modelling
09.05.2010: Design development meeting Nathan and Katia + William
25.07.2010: Meeting Katia - Nathan - William sound pod development
31.10.2010: Nathan - William - Katia sound pods meeting decisions on building
21.11.2010: Nathan - Katia Pod Stand Design presented to William
24.12.2010: Makers progress report from John

24.11.2011: Nathan - presents Pod-stand prototype pictures
19.02.2011: Nathan - Pod progress - John finalising build pictures
28.03.2011: Nathan - Pod trial run at Tabernacle presentation event
24.06.2011: John - Nathan - WL - Pod final development pics (*mail*)
06.10.2011: JOS workshops move to Salvation Army Hall Portobello Rd
11.10.2011: Ongoing delays with production - studio shots - varnishing (*mail*)
16.10.2011: Building work finished! - studio shots (*mail*)
06.11.2011: We have lift off! All components fitted together (*mail*)

4.3. Nicole's BMI Design Journey

For reference to the initial introduction of the JOS project at LDRC, and leading up to the BMI project, see Introduction to Case Studies.

Nicole became directly involved with the BMI project following two introductory taster sessions at LDRC delivered on 18.06.2009 and 6.07.2009 in preparation for the BMI project. Examples of previously achieved BMI working prototypes were demonstrated. Attendees were invited to consider which LDRC service users might participate as BMI C-Ds.

Feedback following the sessions (Nicole Design Log, pp. 7-9):

- SP mentioned the reciprocity between all, saying he felt “energised” by Nicole during the session.
- “Nicole was smiling all the time, and 1-2x she smiled accompanied by a voluntary right knee extension (leg straightening) by 10-15 degrees.” – ShP
- “In particular I felt that Nicole appeared very interested in what was taking place around her. She was smiling a lot and appeared very alert; her eyes movements were tracking the activity taking place (I was informed later by her supporting staff members that Nicole remained very alert and happy for the rest of the day).” – JH
- “I felt that she responded quite positively to the vibrations that were

created and which travelled through her body and with the physical support that the staff offered by linking arms with her.” – JH

- “This was the longest time that Nicole has ever been known to maintain continual engagement.” – WL

This feedback reinforced the design team’s belief that a wheelchair presentable multiple-user instrument would be appropriate to facilitate Nicole’s assisted use; and might furnish further potentials as an interface to stimulate increased creative interaction between support workers and disabled players generally

4.3.1. JOS workshops focussing on the C-Ds

13.08.2009, 26.08.2009, 30.09.2009

Following the appointment of BMI C-Ds, three JOS inclusive music making sessions were delivered at LDRC working with any day service users who chose to attend, whilst also concentrating on gaining information relating to the personal preferences and access needs of the appointed C-Ds. This included Nicole, who was assisted by two support workers. The sessions were supported by LDRC management, in-house therapists, JOS volunteers, instruments makers and design for disability specialists.

During observation sessions Nicole worked with a variety of LDRC support workers, therapists and JOS facilitators in exploring the use of a range of tuned stringed and light percussion instruments that allowed access for her co-assisted use including: zithers, tempura, marimba, glockenspiel, violin and tuned bells. Nicole was also given opportunity and assistance to use and explore various instrument presentation approaches that might be developed or adapted to meet her personal preferences and access needs (Figure 4.3.a).



Figure 4.3.a: Nicole exploring the use of a range of music instruments at JOS workshops with co-creative support and assistance from her support workers and JOS facilitators.

Feedback following the three LDRC sessions (Nicole Design Log., pp. 10-15):

- “I think that you are creating opportunities for people to communicate. Especially for someone like Nicole who may get less interactions than someone who has speech. I think that having an instrument will encourage people to spend time with **Nicole** as they will have something to communicate about.” – MH
- “Really seemed to enjoy the intensive support of a person each side of her. She seemed focussed throughout the entire session, seeming to

enjoy each instrument. Perhaps this is linked to the level of support i.e. 2:1.” – SP

- “As with previous sessions the energy the session generated within Nicole both during and after the session was clearly a positive factor. I noticed lots of positive eye contact which indicated she was aware of and very interested in what was taking place around her. This energy was maintained throughout the day, clearly the 2:1 direct contact (similar to Ricky) is essential in ensuring that Nicole has the opportunity to make a meaningful and personal contribution. I quite liked the idea of the support staff taking the lead from Nicole’s movements (be it physical or facial (eyes / smiles etc.) This requires very close observation and attention to detail but as such this shouldn’t be an alien concept in that LDRC staff are mostly aware of the idea / practise of Intensive Interaction thinking / techniques etc.” – JH
- “The xylophone presented the opportunity for a change to the sounds she could ‘feel’ - by this, I mean experience through vibration.” – JH
- “While I felt that the introduction of percussion instruments assisted in providing a clear, easy to follow structure... it is easy in such an environment to lose focus on the subtle movements being made by such individuals and there is a danger that these individualised movements / expressions can be lost within the overall group. Perhaps the use of string instruments where the subtlety of tone, sound (and thus generated movement) would be a more ‘inclusive’ means of ensuring that the observations of individualised movement would not be missed, and the individuals concerned would not feel inhibited from demonstrating such movement.” – JH

Following these sessions, a multiple zither type instrument was suggested, that would allow one to one or two to one interaction with Nicole as co-players, facilitating Nicole’s play with under-arm support whilst being able to play also with their free hands. Below is a design concept sketch made incorporating this feedback, and a CAD development (Figure 4.3b).

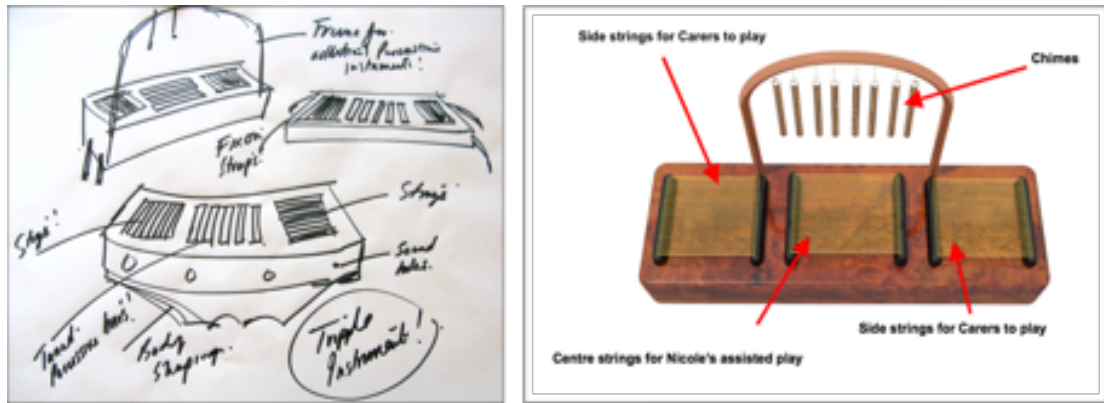


Figure 4.3.b: Initial hand drawn design concept sketch for Nicole's BMI, and CAD development.

A variation of this idea was also suggested at a MERU Design Club, with a stringed instrument, the Hugguitar. This concept design included a moulded and padded underside produced as bespoke to fit its player so that they might be physically and vibrationally connected with the instrument and its expressed sounds (Figure 4.3.c). This suggested was not developed towards the Mojojo as it was considered that any such padding would absorb and deaden the resonance of the instrument.



Figure 4.3.c: Design sketch for the Hugguitar. Produced by a member of the MERU Design Club

As a key part of the design process, a request was made to the LDRC team for additional information regarding Nicole's personal preferences (Figure 4.3.d), to help towards the personalisation of her BMI.

Nicole's favourite things:
<i>Foods:</i>
All Day Breakfast (beans, sausages etc)
Chicken Curry
Bananas
Chocolate cake
Baked Potatoes
Spicy Foods
Doesn't like yoghurt
<i>Music:</i>
Any pop music
Spice Girls
There's music on all the time at home (she enjoys watching the music programmes and channels with her sisters).
Likes the sound of maracas
<i>Other:</i>
Doesn't like cold things
Responds positively to gently touch
Likes animals – has a dog and cat at home

Figure 4.3.d: Nicole's favourite things as compiled by her Co-Design team members.

Feedback indicated that Nicole (Nicole Design Log, p. 17):

- enjoys being involved with music, movement and dance and becomes energised during these sessions.
- enjoys listening to and watching music programmes on TV; she has visited music stores such as HMV etc., where she has been engrossed by the experience.

- needs intensive input of staff support. A preferred approach being two to one support such as she received during the initial introductory JOS sessions, where Nicole would be assisted by a support worker seated on either side and giving her physical support under each arm to facilitate her playing of various instruments.
- requires help to generate movement sufficient to play an instrument.
- Support workers believe that xylophone type instruments presented to Nicole on a stand suit her access requirements.

4.3.2. BMI design development presentation at LDRC

24.11.2009

The BMI design development presentation was attended by LDRC management, therapists, key support worker, prospective instruments makers, design for disability specialists and Lewis Jones as an observing expert advisor on music instruments technology.

Feedback e-mails from LJ urged “prompt discussion of a versatile and adaptable wheelchair-presentable instrument support stand” that could serve Nicole whilst also serving the need of other participants (General Design Log, p. 67). Nylon or gut strings were felt to be preferable to metal strings as they are gentler to the touch, less wearing on the fingers, offer a warmer and more colourful spectrum of acoustic tones than metal strings, and are readily available and affordable. LJ mentioned that that this choice would also allow for relatively light structures of instrument bodies, relatively safe playing, and good sound (General Design Log, p. 67).

4.3.3. Nicole's design brief

Consulting feedback from the presentation on 24.11.2009 at LDRC, the following brief was drawn up for the creation of Nicole's BMI:

1. Wheelchair presentable
2. Combination stringed and xylophone instrument
3. For co-playing and co-creation with Nicole, a player with minimal arm movement, and [up to] two players [one] on either side
4. Should reflect Nicole's tastes and preferences.

4.3.4. Nicole attends JOS session St Peter's, Vauxhall

At Nicole's first JOS session at St Peter's on 08.01.2010, she was supported by JS of the LDRC team. JOS volunteers commented that JS supported Nicole in an uncommonly enthusiastic and sensitive manner.

JS, advocating for Nicole, filled in a feedback form. His comments noted (Nicole Design Log, p. 18):

- Nicole generally enjoys very positive experiences at JOS sessions, but that there are also times when she becomes too tired or unwell to attend; and times when the sessions become too much for her, and her support workers must then make the decision to remove her from the session.
- With a little help from those around her, Nicole could feel part of something special.
- She laughed during the final improvisation when her hands & arms were supported to move with the beat of the rhythms that she helped to create.
- Nicole would return next week without any hesitation! (Unless she was tired or unwell.)

JS also mentioned that as a regular support worker for Nicole, and for other service users from LDRC at JOS sessions, “I would like to express how beneficial I believe JOS is to all our service users that attend. I often see positive behaviours and interactions that are less common in other walks of their lives” (Nicole Design Log, p. 18).

4.3.5. Design development meeting

10.01.2010

Soon after Nicole’s first session at St Peter’s, Design Research for Disability specialists NR and KH presented their initial concept sketches and 3D CAD images for a composite multi-user wheelchair presentable musical instrument that could be made to meet any individual’s taste, preferences and access requirements, and viable for development as a generic design adaptable to facilitate the broadest range of potential players of all abilities inclusively (Figure 4.3.e).

The designs explored ideas for accessibility for wheelchair users and multiple players; compaction for storage and carriage; adaptability of interchangeable component parts for the reception and presentation of a variety of instrument types, and for the facilitation of group-work in the round.

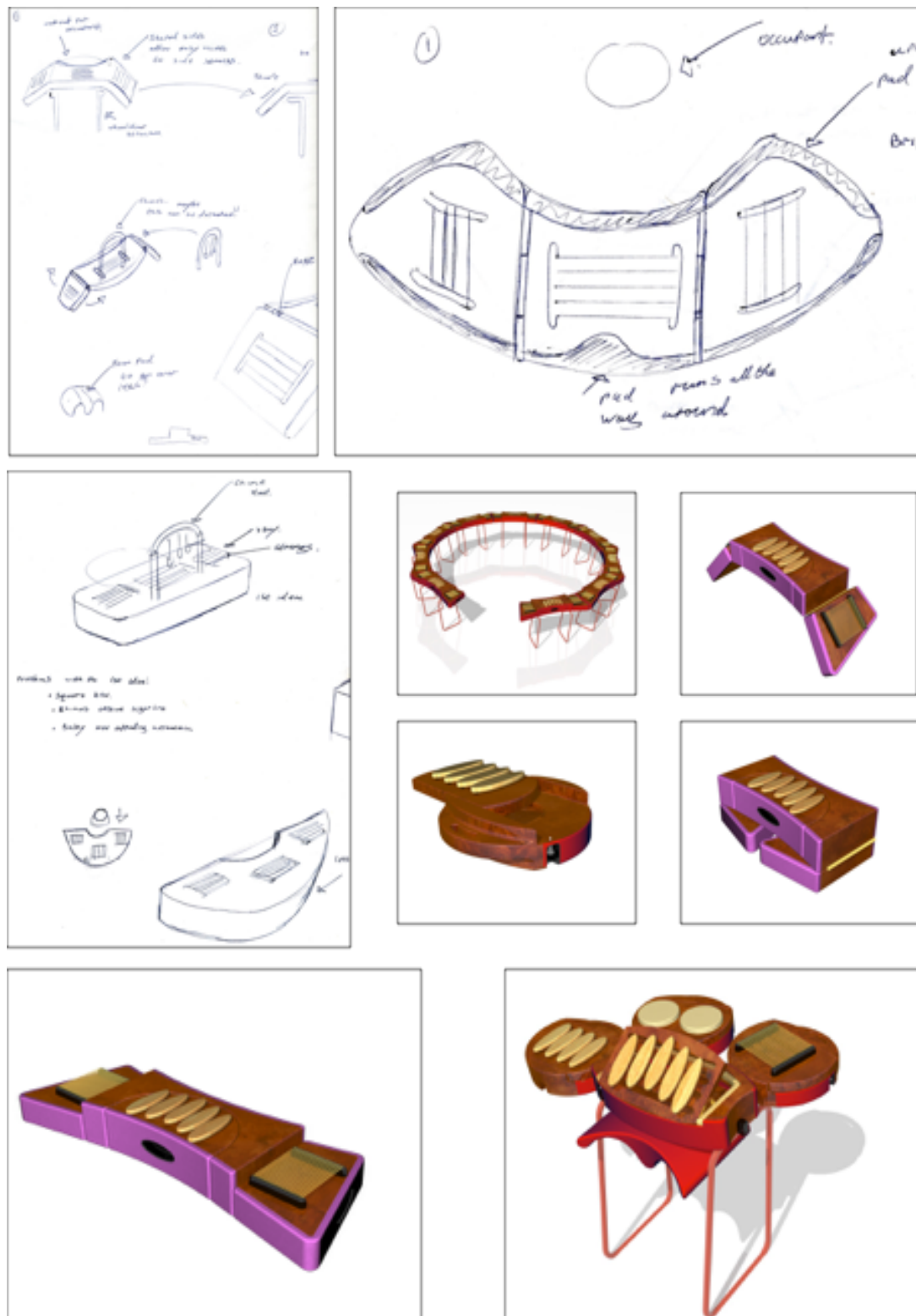


Figure 4.3.e: Initial hand-drawn concept sketches and CAD design developments for the Mojojo by NR and KH.

Questions raised at this time emphasised the complexities of designing a BMI, as well as the wealth of potentialities (Nicole Design Log pp. 19-20):

Overall considerations:

- How deep must the resonating body of the instrument be?
- What materials to choose? It was suggested to look at Hobgoblin website and at encore and ovation guitars for information on moulded guitar bodies.
- To consider carbon fibre as possible material as moulded manufacturing process lends itself to multiple production if required.
- How to tune the string section of "Pods"? A worm drive tuning mechanism (e.g. on guitars) was preferred to friction tuning (e.g. on violins) as it is more precise.
- The location and tuning method of the string and percussion elements.
- Upholstery dampens acoustics, absorbs sound, is therefore unsuitable as moulding or cushioning for the instrument
- Wood was accepted as material for prototypes
- Should there be a sound hole in the front of the sound box?

Marimba / xylophone component:

- Drums or skin-based percussion elements are too high maintenance and also too expensive to replace.
- A sensory textural element as part of the design was suggested i.e. serrated wood part to run a stick over 'Guiro' scraper / rasp type instrument.
- Rectangular plates / keys on marimba / xylophone component preferred instead of oval, easier to hit. Tuning of the plates / keys is crucial. This could be achieved by adjusting either the size (length and width) of the individual plates or by just reducing the thickness whilst keeping all plates the same size.
- Marimba / xylophone component could also include mounted tuneable

metal tubes (note wind chime) or a board of hardwood with parts cut out (tongue drum style)

- Does the marimba / xylophone component require resonating containers under the plates? If made of hardwood or metal, extra resonators would not be necessary.

String component:

- String section could have a curved profile (bridge) to accommodate being played by a bow. Bridge could have shallow as well as deeper grooves. When the strings sit in the shallow grooves, they run along the curved top edge of the bridge accommodating the running of a bow over the strings. Sitting in the deeper grooves the strings would run flat and parallel across the instrument sound box for playing by picking or strumming.
- Nylon strings to be used at the moment, but metal or gut strings not ruled out.
- Design of string component needs developing. Number of strings to be considered.
- Note: number of strings does not need to be decided as final. The design might include string holes to accommodate different numbers of strings (i.e. the bridge could have 12 grooves but only every second hole is used or some other alternative etc.)
- Pods could offer differently tuned string sections i.e. left pod heavy strings (i.e. metal) for deeper bass sound, right pod lighter strings or stringing method to accommodate both gauges of strings on any pod.

4.3.6. Development of instrument inserts for pods

Nicole enjoys a broad variety of instrumental sounds including strings, percussion and wind. The Mojojo's unique interchangeable pod system with slide-in soundboards was developed to allow for the broadest possible range of sound producing elements (Figure 4.3.f). Slide-in soundboards were

suggested for Nicole to facilitate her preferences by combining a selection of her preferred sounds; whilst also providing opportunity for the pods to be further amended and adapted as bespoke for other potential players who might prefer alternative sounds and optional design features using different colours, textures and offering variable access options. It was intended that a comprehensive set of pod-insert instruments might be built up over time to accommodate different players, and to offer a broad range of access possibilities for players of different abilities.

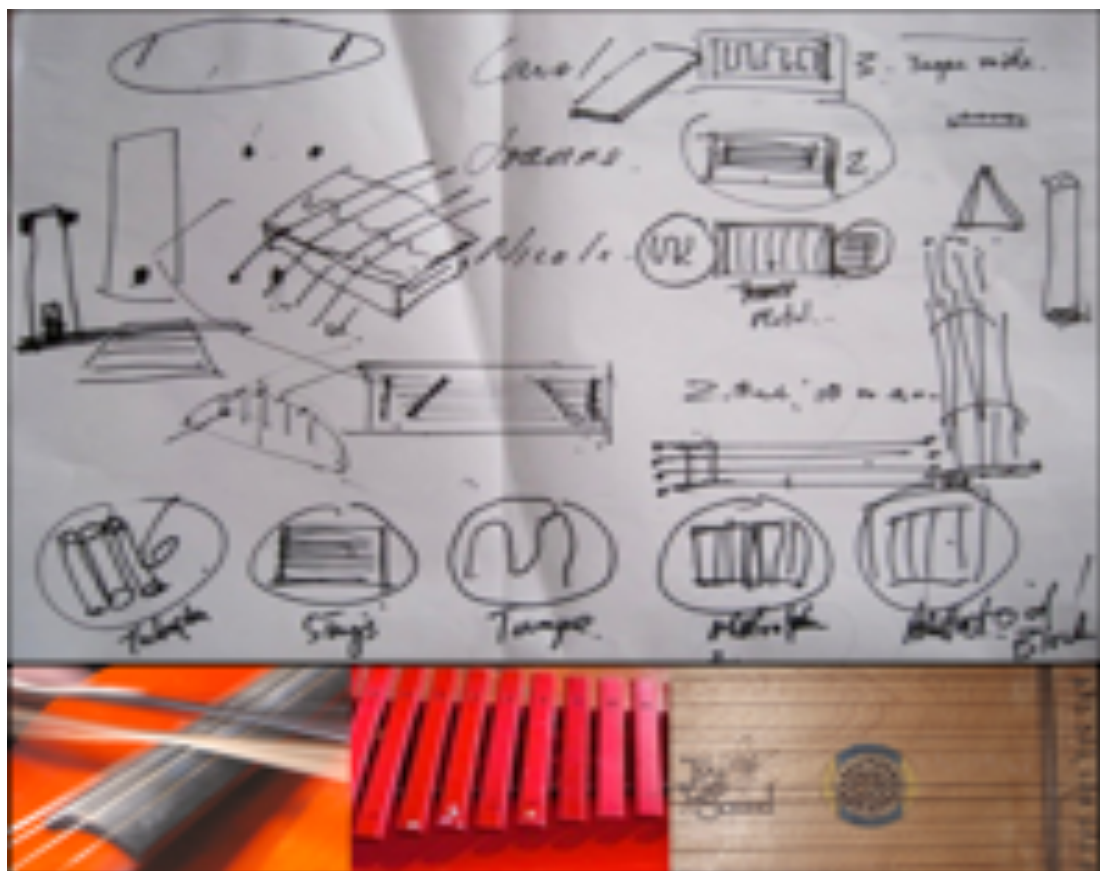


Figure 4.3.f: Design sketch and photomontage visualisations for the Mojojo's slide-in soundboard instrument pods.

4.4. Modelling Nicole's BMI

4.4.1. Nicole's presentation stand fitting session at LDRC

A stand fitting session on 10.02.2010 at LDRC gave opportunity for measurements to be made, and design alterations to be considered. This was the first meeting that Nicole attended as a singular C-D, with support from JH. Minutes were taken by KH and recorded in Nicole's Design Log (p. 22). During the process Nicole was informed about the purpose of each measurement and asked for her permissions and approvals. Nicole, KH and WL felt that having such rare opportunity for focussed interaction with Nicole was important in allowing relationships with Nicole to develop. The team measured the width of Nicole's chair from armrest to armrest, height of her chair (floor to armrest), and the distance between her chair's front wheels (Figure 4.4.a).

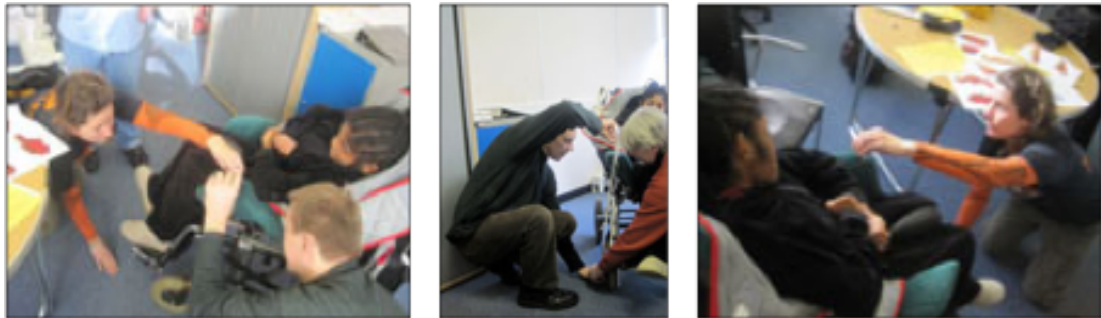


Figure 4.4.a Nicole working with KH, NR and WL to record measurements for the fitting of the Mojojo's composite presentation stand to fit Nicole's body and wheelchair size.

At this meeting, the point was raised that apart from producing sounds, Nicole's instrument could have physiotherapeutic properties, encouraging movement - i.e. reach, rotation, extension or flexion of her joints. Feedback from the physiotherapist indicated that an instrument sitting on the armrests of Nicole's wheelchair would encroach, sitting too closely to Nicole's trunk and arms. It was therefore decided that a free-standing adjustable stand for the instrument would be the way forward as long as it wouldn't interfere with Nicole's knees and feet (which rested on her chair's footplates). The type of stand currently in use for the JOS twin zither (see Introduction to Case Studies)

was recommended as an example.

4.4.2. Card models

Following the stand fitting session at LDRC, the design team made card models to test the BMIs projected shape and the dimensions of the potential pod system (Figure 4.4.b).



Figure 4.4.b: Full scale cardboard models of Nicole's BMI pod system made by NR and KH.

Issues relating to the building of soundboards to fit into slide-in sound box resonator able to safely accommodate the tensioning (tuning) of twelve strings were considered. A twelve stringed zither type pod was suggested based on lessons learned at JOS in using a broad variety of stringed instruments over time. Reasoning for the choice of a zither type instrument included (Nicole Design Log, p. 34):

- The breadth of a twelve string spread with generous spacing (such as on a nylon stringed classical guitar) would accommodate a wide range of access approaches and methods of use by Nicole; and potentially for general inclusive use.
- A twelve string set-up would provide four sets of three strings, or three sets of four strings for purpose of accommodating tuning variations using randomly available strings rather than sets of purchased generic strings in keeping with JOS spontaneous improvised approaches (see Introduction to Case Studies).
- The strength of the accommodating slide-in soundboard would need to

be sufficient to bear the strains and stresses of tensioning such an arrangement of strings safely and without risk of warpage.

- The type of strings used was seen as being important. Nylon strings were preferred by reason of their warm acoustic values, pleasant tactile qualities, possible impact on players' fingers of metal strings, and ease of access for optional sourcing such as fishing twine, garden strimmer twine, racket strings and commonly available spare strings from used and part used donated sets.
- Spacing of strings was to best accommodate ease of access by players of different abilities for variable and alternative approaches to play by strumming, picking, plucking and beating with sticks / batons

4.4.3. Cardboard and wooden test model

After preliminary investigation with the card and wood models (Figure 4.4.c), further expert advice was thought necessary. A wooden test model (Figure 4.4.d) was made to present to JOS associate Godefroy Maruejols, a respected professional guitar maker and London Met's guitar making tutor. GM had worked with JOS previously and was aware and supportive of alternative and experimental approaches to stringed instruments making.



Figure 4.4.c: Wood and cardboard model of a box-zither, made to consider dimensions and stringing requirements for the Mojojo's central pod.



Figure 4.4.d: Wooden model of Mojojo's central pod made by KH and NR and shown to Godefroy for discussion about stringing arrangements and acoustics.

A second version of the wooden model was made after the consultation with GM (Figure 4.4.e). The main problem encountered was that the tensioning of the strings pulled up the soundboard and displaced the tuning heads' mounting block (Nicole Design Log, p. 32).



Figure 4.4.e: Second wooden model of Mojojo central string-pod made by NR and KH to test the viability of the slide in sound-board.

There was some discussion at this time about the viability of producing a slide-in soundboard for the larger central pod, as the length of strings over the dimensions of the central pod produced too great a strain on the structure. It was decided to concentrate for the time being on producing a tuned xylophone pod that would not produce such severe stresses, for the central pod; and to

build a stringed slide-in soundboard for the smaller side-pod to test the viability of materials and design (Nicole Design Log, p. 32). A supporting keel system was later developed for use on the underside of the smaller pods slide-in stringed soundboard. After testing in use was regarded as safely transferable to the larger central pod for future development.

4.4.4. Stringed pod support system

The keel support system was developed as an essential means of preventing warpage caused by the combined pressure of tensioned strings (Figure 4.4.f). Maple, a strong hard and compact tone wood was considered the best material to make the keels (Nicole Design Log, p. 44).

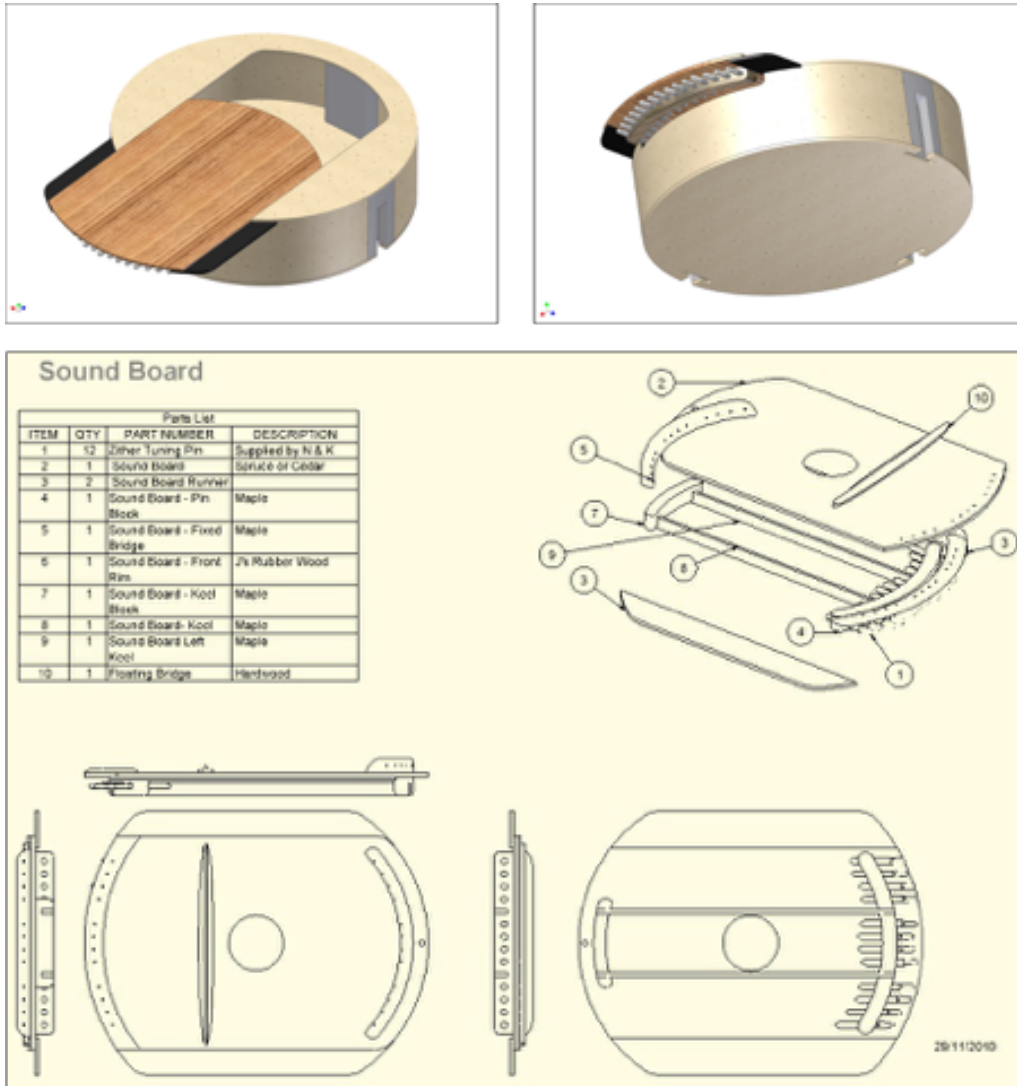


Figure 4.4.f: 3D CAD drawings of stringed pod with slide-in soundboard keel by NR.

4.4.5. Mojojo stand

A wheelchair presentable and adjustable instruments presentation stand was co-designed and built by NR to accommodate Nicole's safe and comfortable access requirements, whilst being adaptable to the broadest range of potential inclusive users (Nicole Design Log, pp. 42-43) (Figure 4.4.g). The stand was made from stainless steel tubing and was initially produced in three different sizes to test for stability. Ease of assembly and disassembly, lightweight, flat-pack for portability, easy clean, strength and durability were regarded as essential design requirements. Whilst specific to the Mojojo's presentation, the stand incorporated an instrument mounting plate designed to be adaptable

for the reception of various instruments or objects (Figure 4.4.h).



Figure 4.4.g: Mojojo stand CADs by NR, and frames produced in three sizes to test viability.

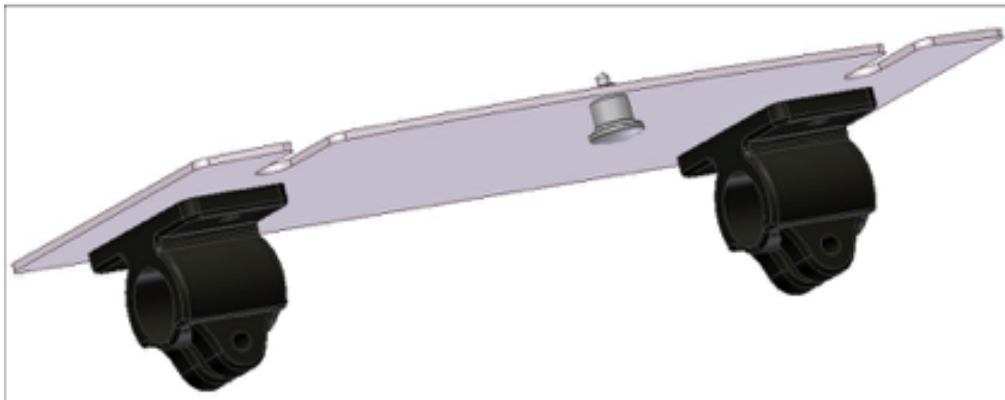
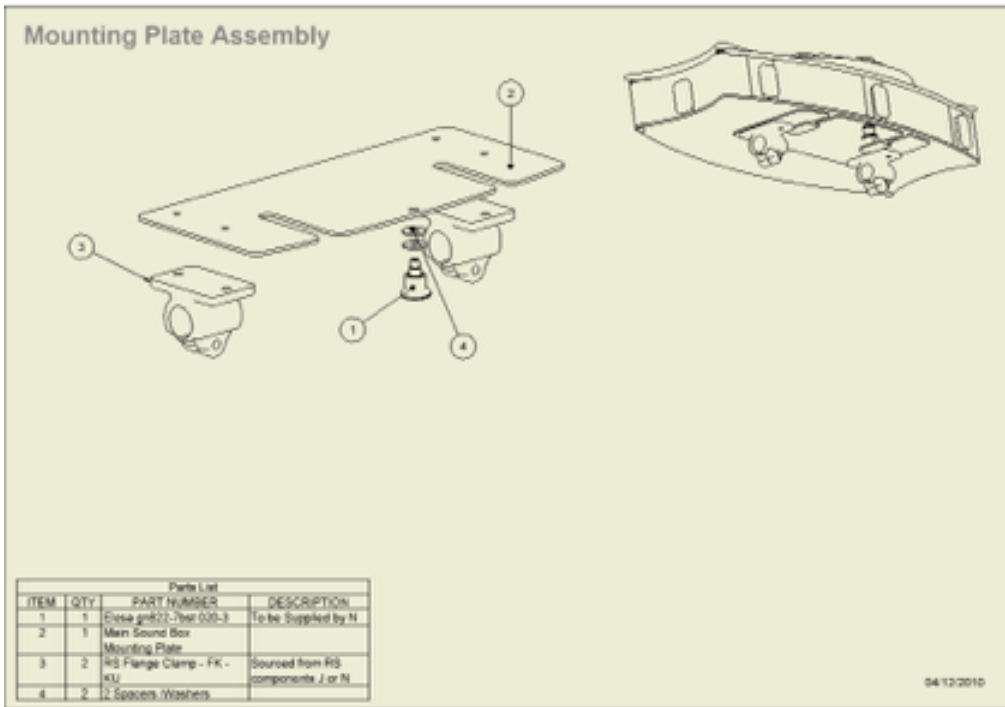
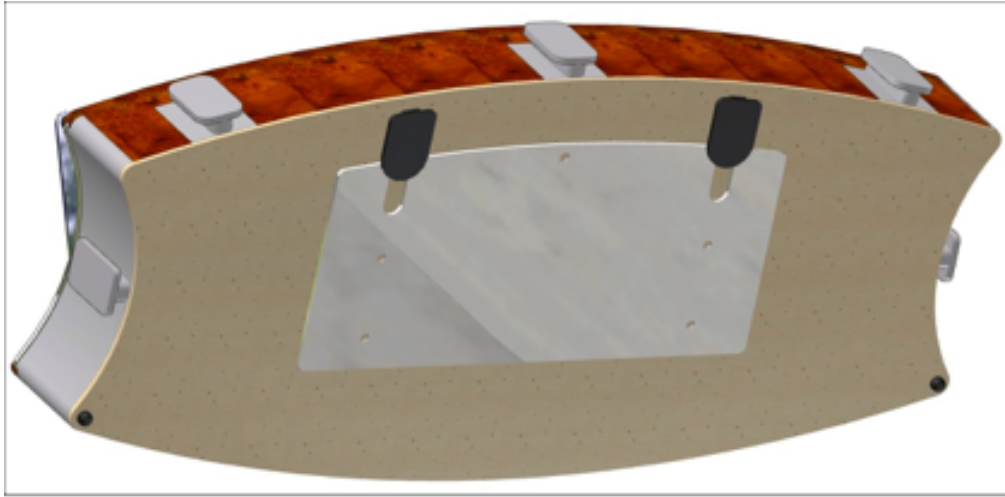


Figure 4.4.h: Instruments pod mounting plate

4.4.6. Choice of colours and graphics

The colours used in the finishing of the Mojojo and its presentation stand (Figure 4.4.i) are drawn from Nicole's personal likes, preferences and associations that include (Nicole Design Log, p. 44):

- Chocolate: Deep brown used on parts of the Zither as well as the rim around the outer Pods
- Bananas: Yellow mountings used on both inner & outer pods.
- Warmth: Deep warm red stains and lacquers used on all Pods.

Nicole's family is from Antigua. The Antiguan National flag inspired the colouring of the Mojojo's percussive scraper pod (Figure 4.4.j).⁷

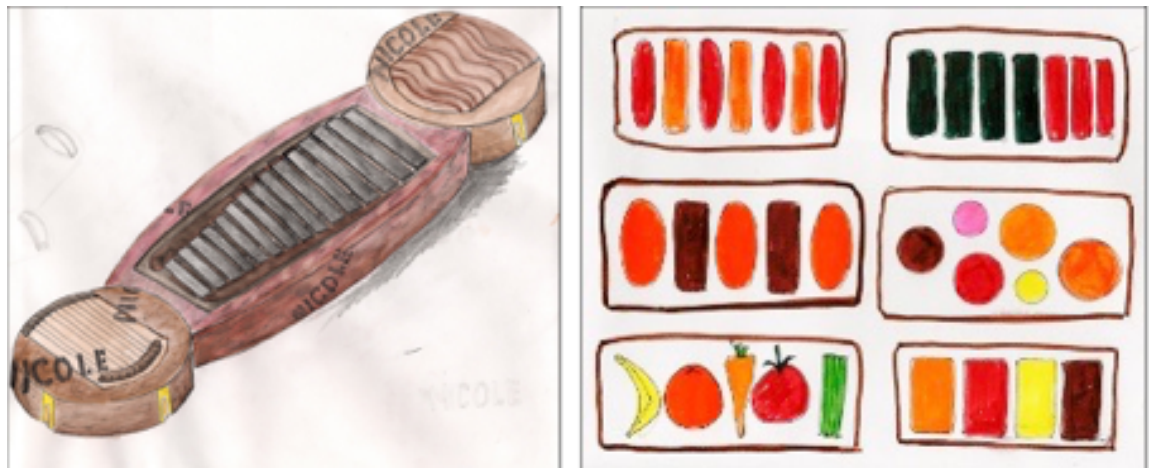


Figure 4.4.i: Finishing colour selection and graphics for Mojojo by KH.

⁷ The yellow rays of the sun symbolise the dawning of a new era. The red represents the blood of the forefathers and the dynamic spirit of the Antiguan people. The black symbolises soil and African heritage. The blue and white stand for the sea and sand of Antigua.



Figure 4.4.j: Antiguan flag and percussive scraper pod

4.4.7. Public presentation event at Tabernacle

The presentation event on 25.03.2011 had been planned months in advance and scheduled according to the projected BMI production timeline. Despite a compounded series of delays in production process caused by a variety of unavoidable factors, it was decided to go ahead with the planned event regardless of the fact that Nicole's BMI was only partially finished. The decision was to honour the advance venue booking, the expectations of C-Ds, their families and invited guests, support management and staff and JOS volunteers' availability.

The event was held as a celebration of Nicole's and other BMI C-Ds' contributions to design process and as a means of sharing the BMI project progress, and promoting JOS approaches to inclusive community music. It was well attended by service users, staff and management from LDRC, and other local social care providers, family members, JOS team volunteers, C-Ds, makers, associates, project funders and sponsors, and members of the local community. It also gave opportunity to gain further feedback towards determining any need for changes or adjustments to designs, and of generating increased public awareness regarding inclusive practices and society.

The Mojojo was presented as a work in process (only the central pod and stand were shown). Nicole played the prototype with support from her co-creators,

to lead a section of a musical improvisation (Figure 4.4.k). Nicole was acknowledged and applauded for her contribution to the process as a C-D.



Figure 4.4.k: Nicole is presented with her Mojojo as a work in process.

Feedback from the event indicated (Nicole Design Log, pp. 51-53):

- “The xylophone looks interesting, but incomplete.” – NG
- “Ergonomically the instrument fitted Nicole like a glove, and the stand cleared the wheelchair comfortably.” – NR
- “Nicole’s instrument seemed expressive of her gentle personality and it felt strongly associated with her.” – HL
- “Further refinement was required to make the stand more stable, with further testing with all three pods fixed to the stand. Locking levers, (as used on cycle wheels) rather than thumbscrew wheels might be a more efficient way to hold the adjustable legs of the presentation stand in position.” – NR

4.5. Final building process

4.5.1. Instrument choices

Glockenspiel, zither and percussive scraper-board were incorporated into the first working design, as slide-in interchangeable soundboards. The glockenspiel would serve as Nicole’s main instrument for her co-assisted play, in keeping with her demonstrated enjoyment of using tuned percussion during observation workshops. The zither and scraper-board pods were chosen to offer optional textural sounds, and to test the concept of changeable multi-instrumental combinations that might offer choice for Nicole, and a variety of options should the Mojojo be used by other players. The preferences of co-player support workers and facilitators was also a consideration (Figure 4.5.a).

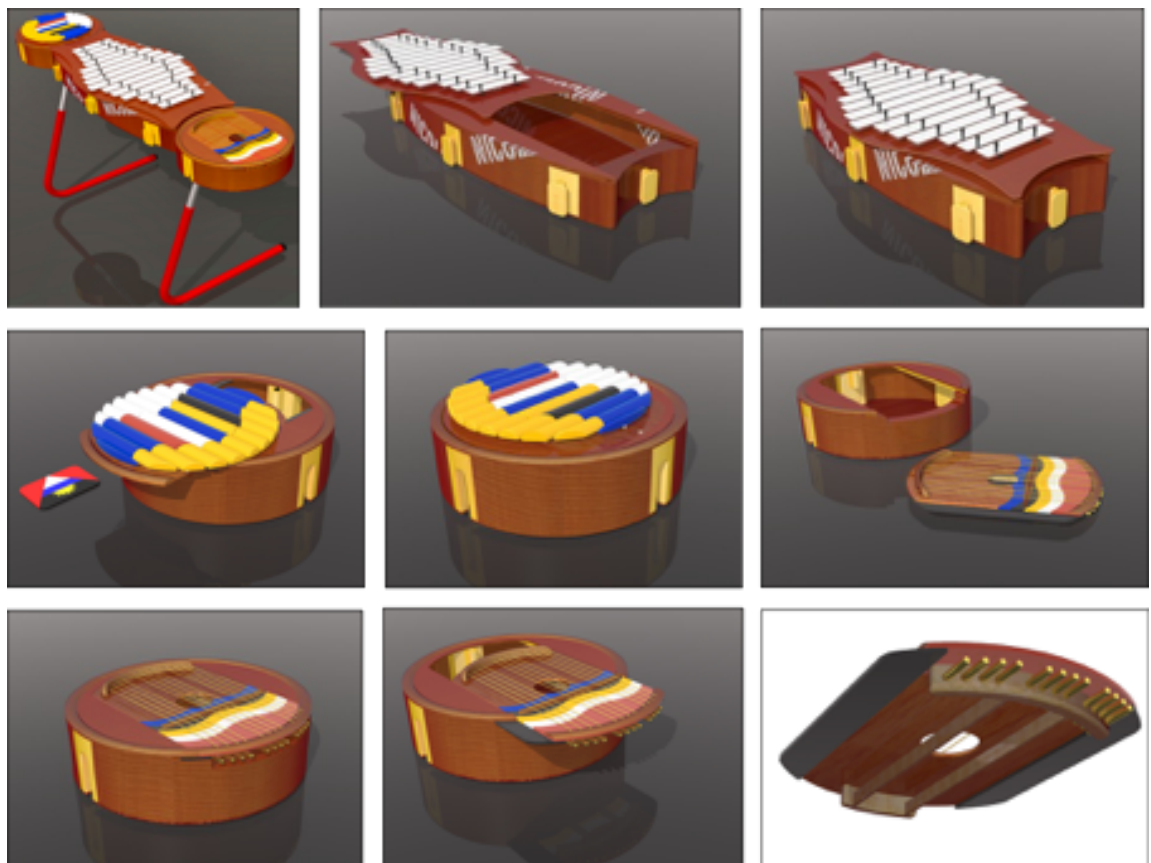


Figure 4.5.a: Final CAD drawings of the Mojojo

4.5.2. Building process

The main carcasses of the three pods were constructed from a composite of thin birch plywood, of either 0.8mm or 1.6mm thickness laminated with epoxy adhesive to make flat or curved boards of between 6.5-8.0mm total thickness, depending on requirement. Birch is a traditional tone wood although it is not commonly used (Nicole Design Log., pp. 44-51). Plywood was used for its dimensionally stability (the grain is criss-crossed throughout the layup) to avoid warping. Making bespoke plywood composite rather than using a standard birch ply sheet gave a denser, more even acoustic quality to the build. Ash, widely used in instrument making, was used for most of the structural items such as end caps and lugs. Maple, another tone wood, was used for the keels on the zither soundboard. All woodwork was epoxy bonded with no metal fixings. This helped to achieve resonant acoustics, and made the instrument impervious to damp, which might be encountered during regular cleaning and storage.

Sheets of birch plywood were bonded on a curved jig made especially for the Mojojo parts (Figures 4.5.b, 4.5.c). Elements of solid ash or maple timber were incorporated to achieve extra rigidity or extra mass, where required for the placement of screw fixings. The outer surfaces of the three pods were completely covered in ash veneer, sanded down and sealed with two coats of sanding sealer (Figure 4.5.d). The inner surfaces of the pods were left in a natural birch / ash finish and sealed with four coats of sanding sealer.

As the interior surfaces were masked, they received no further applications of lacquer. The exterior surfaces were then given two coats of tinted lacquer to achieve the correct hue for the wood (Figure 4.5.e). The final fittings were attached, and the pods were mounted (Figures 4.5.f, 4.5.g, 4.5.h). The Mojojo has the capacity to attach a total of five small pods, and one central pod. All pods have insertable soundboards, allowing a variety of options and positioning.



Figure 4.5.b: Plywood being bonded by a curved jig



Figure 4.5.c: Shaped birch plywood parts and ash mountings for pods



Figure 4.5.d: Veneer being rolled and trimmed onto the main pod



Figure 4.5.e: Varnish and lacquer being applied

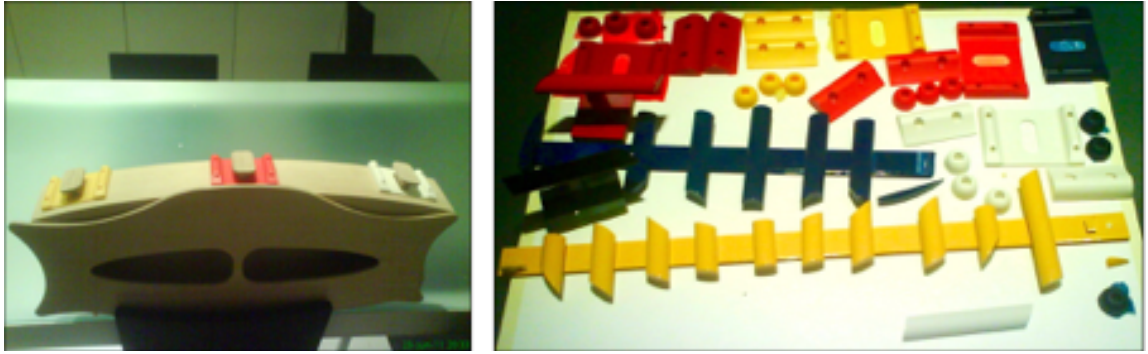


Figure 4.5.f: Fixtures from the original moulds

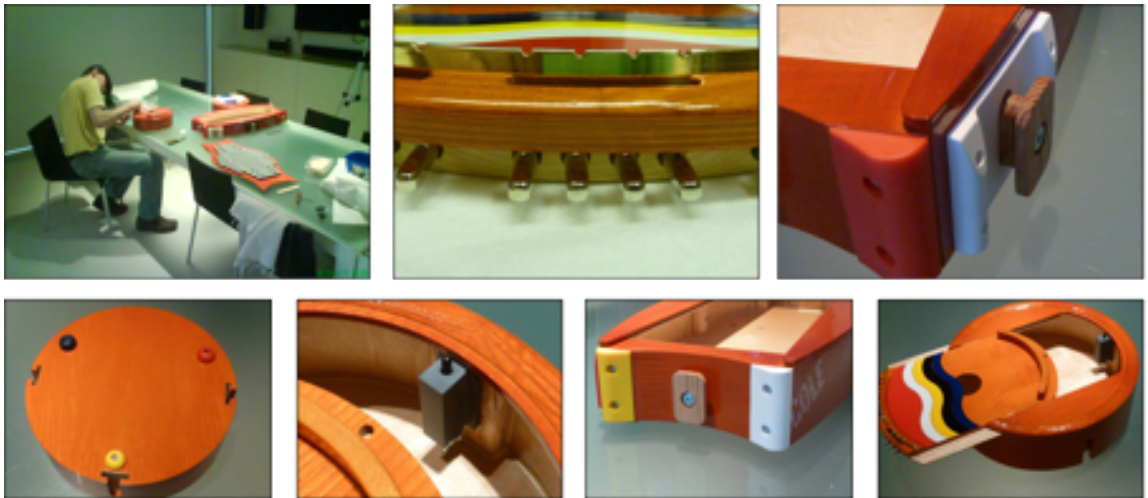


Figure 4.5.g: Attachment of fittings

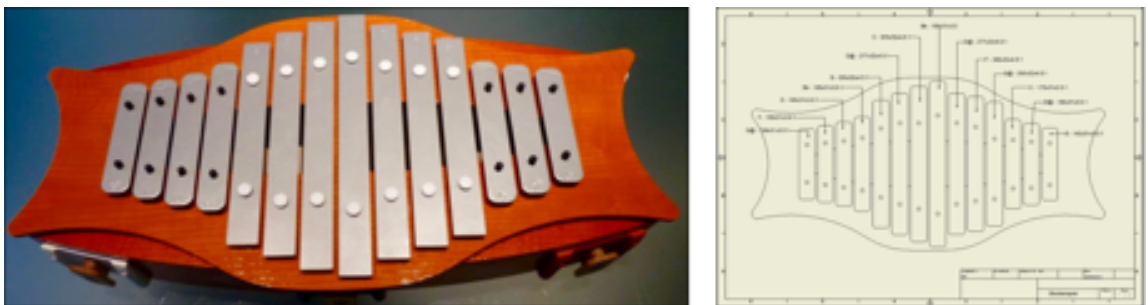


Figure 4.5.h: Details and tuning system of central pod showing slide-in glockenspiel soundboard

4.5.3. Nicole's name

'Nicole' was written using transfers that wrap around the edge of the central-pod (Figure 4.5.i). As the outer pods would be used by a variety of co-players,

it was felt they should not be graphed. PORTAGOL TC TT, font was determined to be the most appropriate as it allowed for distressing using Adobe Photoshop to give an urban streetwise feel. The image was then sent off in digital format to a transfer company who made a set of Transfers especially for the Mojojo. Rubdown dry transfers were applied, and four coats of scratch resistant clear lacquer were finally applied as a finish.⁸

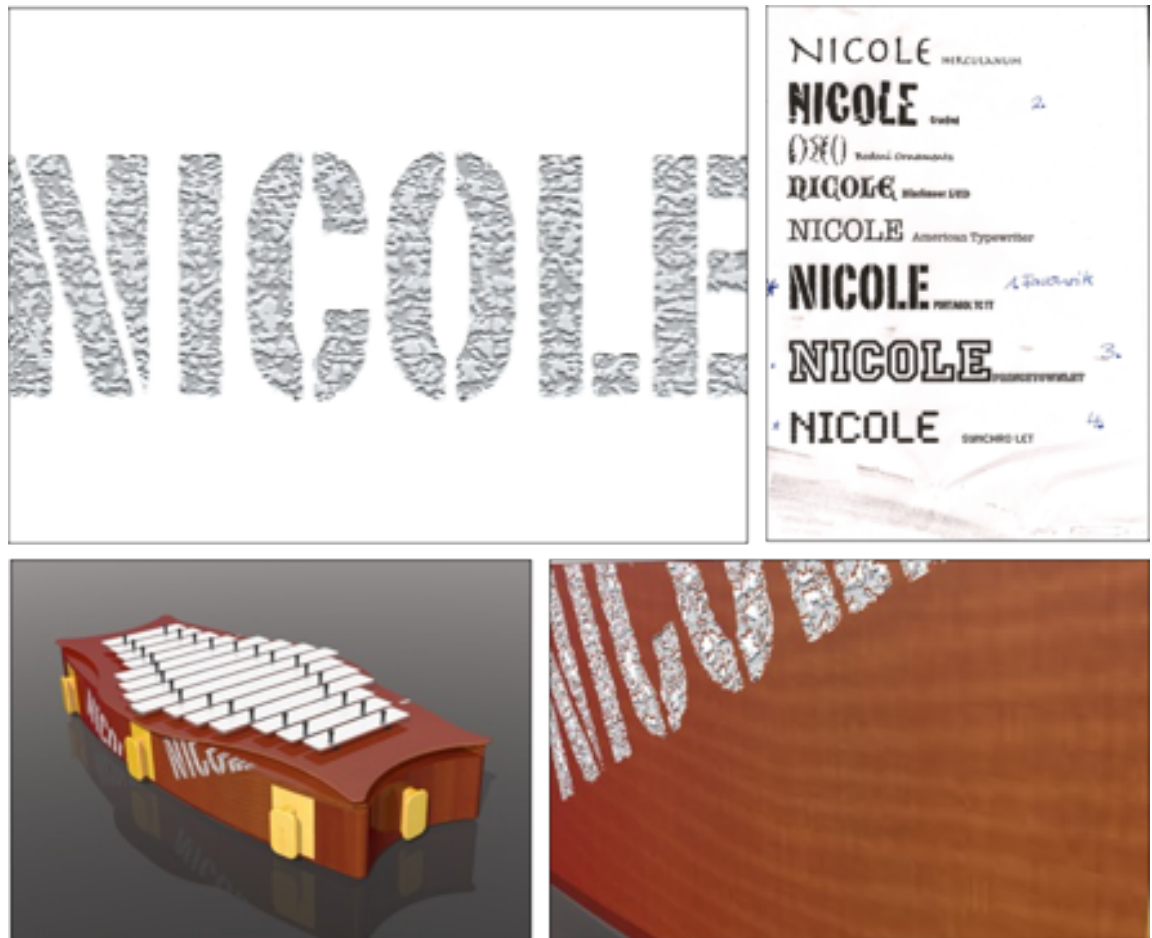


Figure 4.5.i: Designs for Nicole's name on the central pod

⁸ Reeves, N. (2011b) E-mail to William Longden. 11 October

4.6. Presenting and testing the Mojojo

The Mojojo was presented informally to Nicole at a JOS workshop (Figure 4.6.a). The instrument set-up and co-creative approaches towards Nicole's assisted play were demonstrated, and Nicole's part in the production process as a C-D was described and acknowledged. A second public event to present the finished Mojojo and other BMIs was held on 06.12.2012 (Figure 4.6.b). E-mails following the event fed back that it was "beautiful, inspiring"⁹ and "When I left the Tabernacle, I felt re-energised."¹⁰



Figure 4.6.a: Mojojo is presented to Nicole

⁹ Laeke, T. (2012) E-mail to William Longden. 6 December

¹⁰ Hadaschik, K. (2012) E-mail to William Longden. 9 December



Figure 4.6.b: Final presentation of the BMIs at celebratory public workshop event

4.6.1. Testing the set-up of Mojojo

The set-up of the Mojojo and its stand were explored and practiced with JOS volunteers who gave feedback and practical suggestions towards its use and improvement, including the need to change the stands height adjustment thumbscrews to a more effective and efficient cycle wheel lever locking system. Setting up the Mojojo and its stand have been used as an effective exercise towards JOS volunteers experiential training; and as a means of generating practical and knowledge sharing opportunities when working with volunteers with learning access requirements (Figure 4.6.c).



Figure 4.6.c: JOS pathways volunteers setting up the Mojojo

The Mojojo has been tested in use in a variety of different locations (with Nicole's consent) and by various players of different ages, abilities and with a variety of access requirements. The design has proved to be adaptable for use by seated, standing and wheelchair using players; and easily adjustable to facilitate access by players with varied physical orientations and approaches to play (Figure 4.6.d). Care and support workers and JOS facilitators have found the instrument accessible for assisted and co-creative play. The Mojojo has a wide enough span to accommodate three players side by side, with wheelchair users able to access the central pod with space for co-creative support on either side.



Figure 4.6.d: Mojojo played by different players

As a composite instrument able to express a variety of voices, the Mojojo has proved to be a popular option for players of all ages and abilities; in presenting the instrument to players with widely varied access requirements and approaches to play, its presentation stand is stable, safe and versatile.

4.6.2. Wear, tear and required alterations

Several minor repair and maintenance issues have arisen, the main reasons being:

- General wear on parts due to unaccustomed use.
- Regular change of care and support staff working with Nicole, and an

ongoing intake of new JOS volunteers resulting in unfamiliarity of handling, set-up and use of the Mojojo. (Training was initially given to LDRC staff in use of the Mojojo.)

- Materials failure
- Design fault

In answer to suggestions offered by users regarding slippage and difficulty experienced in adjusting the presentation height of the Mojojo quickly and safely during set-up, the locking mechanisms on the legs of the stand were changed from thumbscrews to levers (Figure 4.6.e). This change made the grip more secure and adjustment during presentation of the instrument easier and quicker to achieve. This was an important factor as the Mojojo often needs to be presented for use whilst a session is already in process.



Figure 4.6.e: Central slide-in pod locking mechanism

Components of the slide-in rasp / scraper soundboard began to come loose almost immediately on being used (Figure 4.6.f). The fault was two fold in that the surfaces of the component parts were not adequately prepared, and the adhesive used was not appropriate. After several attempts at re-gluing, the soundboard was replaced with an improvised tuned cowbell insert. A new integral rasp / scraper board was planned.¹¹

¹¹ Reeves, N. (2012) E-mail to William Longden. 7 January.



Figure 4.6.f: Percussive rasp / scraper pod wear and tear, shrinkage and faults

A second issue has been the gradual loosening of the slide-in sound board to fit snug with the sound box rim.

Several of the glockenspiel's metal keys came loose during play, and have been refitted on several occasions (Figure 4.6.g). It is felt that the original fixing screws were too short. The use of longer screws has proven to be more successful.



Figure 4.6.g: Glockenspiel pod faults

The original stringing system did not project the desired sound quality. Various experimental bridges were tested (Appendix 14, 18:58) and a viable design

was fitted (Figure 4.6.h).¹²



Figure 4.6.h: Testing different types of bridge for the stringed pod

4.6.3. Further developments to Mojojo's pod slide-in soundboards

The Mojojo pod system was designed specifically as a flexible system able to quickly and easily house a variety of different individual instrumental soundboards, each fitted into a pod by the use of a customised locking slide-in system. The Mojojo was designed to accommodate five small pods and one central pod; each pod might be fitted with a number of different slide-in soundboards to facilitate a wide choice of possible instrumental inserts. Advantages of this design include:

- Providing personalised slide-in instrument soundboards and access device variations for use by many different players; using the Mojojo as a multi-user facilitating agent.
- Generating practical project work with student instruments makers and

¹² Reeves, N. (2012) E-mail to William Longden. 7 January.

product designers who can use the design of pod soundboard inserts, as a means of gaining practice based experiential knowledge and awareness.

- Further development of the Mojojo as a mobile, multi-purpose, composite instrument for use as a therapeutic, educational and recreational tool.
- The production of slide-in soundboards for specific therapeutic interventions, as well-being generators and as potentially prescribed therapeutic interventions.

Tuned cowbell slide-in soundboard:

The E-flat tuned cowbell pod (Figure 4.6.i) is an improvised design solution made from an existing home-made JOS instrument that was initially built by JOS volunteer Alrick Guyler. The bell-pod has been used to replace the broken rasp / scraper pod insert during its repair and improvement.



Figure 4.6.i: Tuned cowbells (collected from Charity shops) for use as an alternative sound pod

Stringed instrument, bowing assist pod

Nicole has expressed a liking for the sound of the violin and cello, but she is not able to access available models for playing. Several other disabled people

have expressed the need for a bowing assist to allow them to access violin and cello as their preferred instruments. Explorations are subsequently under way towards the production of an assisted bowing pod.

By building on the functionality of a framer's angle cutting saw, in combination with a bent-wire bowing guide (as seen at Edinburgh museum of musical instruments used in a set-up for testing frequencies), JOS has worked with participants to explore concept designs towards the production of an assistive bowing pod that might be fitted directly onto a Mojojo slide-in soundboard (Figure 4.6.j).



Figure 4.6.j: Explorations towards a bowing assist pod. CAD 3D drawing by Chris Leeds. Concept sketch for assisted bowing pod by William Longden.

This chapter outlined the process of designing, constructing, personalising and testing Nicole's BMI. In the next chapter, I outline Karim's design journey

5. Karim's Bespoke Music Instrument Design Journey (Case Study)

In this chapter I introduce Karim, and the key people involved in co-designing his BMI. Drawing on Karim's design log, I outline the process by which the design team developed his design brief, and worked with instrument makers to realise working prototypes which Karim tested in use and gave feedback on. Finally, I discuss the process of personalising Karim's BMI, its presentations to Karim, and feedback from the presentation event.

Project Lead:

William Longden

Core Team:

Karim (C-D / player)

Simon Powel – LDRC liaison

Chris Leeds – Project administrator

JOS Management and Team – Volunteer input

Associates:

LDRC Management, day care and support team (Karim's day-care centre at RBKC), Godefroy Maruejouis (Guitar maker and tutor), Ian Burrow (Guitar maker, musician), JOS project volunteers and workshop participants, Lewis Jones at London Metropolitan University (Organology advisor), Alan Marsh, Marcella Haddad, JOS team (Audio-visual recording of process)

Supplementary input from: Mike Cameron at Hobgoblin

5.1. Introduction



Figure 5.1.a: Karim Karim (BMI C-D / player)

Karim is enthusiastic, energetic, and likes to be mobile and to dance. He is non-verbal and enjoys participating in music and arts activities where he is an enthusiastic player who enjoys moving whilst playing an instrument. By designing an instrument towards Karim's personal preferences and use, this project aimed to further encourage his musical interests, and support the ongoing development of Karim's social and transferable independent living skills.

Karim attended his first JOS inclusive music making session during the autumn of 2008 as a member of the LDRC group. He was invited to participate as a BMI C-D after his enthusiastic attendance at preliminary observations during JOS sessions, and by recommendation from his in-house support team at LDRC and with support from his brother and sister. After consultation with Karim, his brother and sister as his prime carers and his care and support management team at LDRC, appropriate permissions were granted for Karim

to participate as a C-D player in the BMI research project (Appendix 2).

Karim was involved in the BMI project as a C-D and player throughout. He was consulted at all sessions and meetings that were liaised by his key support workers, extended day-care team and family. I also kept Karim informed verbally regarding all aspects of process, using photographs and working prototypes to inform about process and progress.

Where regarded as potentially advantageous by any member of the extended design team, associate specialists in health care, disability, design and organology were consulted.

5.2. BMI design development stages

Projected BMI production timeline:

At 02.03.2009, the initial LDRC brief was that BMI production should take six to eight months in total (LDRC brief, Appendix 1).

Actual BMI production timeline from date of confirmation:

03.08.2009: Confirmation of Karim as BMI design recipient

13.08.2009: 2nd Observation workshop at LDRC Centre

26.08.2009: 3rd Observation workshop at LDRC Centre

29.09.2009: WL visit to Karim's home

30.09.2009: 4th Observation workshop at LDRC Centre

20.10.2009: Meeting with in-house team and therapists at LDRC

14.11.2009: General request sent out for further relevant information about DR's

24.11.2009: Presentation and BMI Briefing at LDRC

27.11.2009: Emailing to Karim's potential instrument maker

15.01.2010: Karim attends 1st JOS session at St Peters (Feedback given)

17.03.2010: LDRC feedback received

20.03.2010: Design development email from maker GM

01.06.2010: Design development presentation at LDRC
06.08.2010: Observation of working prototype in use at JOS session
12.08.2011: Feedback from observation
13.10.2011: IB takes over the design / building process
22.01.2012: Final Karimbek presented
25.03.2012: Public presentation event at Tabernacle.

5.3. Karim's BMI Design Journey

For reference to the initial introduction of the JOS project at LDRC, and leading up to the BMI project, see Introduction to Case Studies.

Karim became directly involved in the BMI project, following two observation sessions at LDRC, delivered on 18.06.2009 and 06.07.2009. He had already been involved with Joy of Sound for some time and regularly attended weekly JOS sessions at St Peter's, Vauxhall. Initial BMI introductory sessions were intended to familiarise those at LDRC who had not worked with JOS previously with JOS approaches to inclusive music making. At these initial sessions, Karim contributed to the "positive energy and enthusiasm" (General Design Log, p. 18).

Feedback following these sessions, in consultation with the design team, JOS personnel and LDRC management indicated that (Karim Design Log, pp. 7-8):

- "Karim is mobile and obviously loves music... He plays enthusiastically and likes to dance at the same time as he plays. An [instrument] designed towards his personal use might further encourage his musical development, and offer transferable independent living skills." – WL
- "Karim can become self-absorbed, so an instrument may aid in developing general independent living skills." – JH

On 03.08.2009, Karim was confirmed as a BMI C-D.

5.3.1. JOS workshops focussing on the C-Ds

13.08.2009, 26.08.2009, 30.09.2009

JOS ran three additional workshops at LDRC to gain further information about the participating C-Ds, and to gain feedback from Karim's support workers, day-care staff and associated specialists regarding their opinions and ideas towards Karim's personalised instrument design.



Figure 5.3.a: Karim trying out different stringed instruments, violin, Spanish guitar, kora and zither.

Feedback consistently emphasised that Karim was enthusiastically engaged in the sessions, during which he had played violin, zither, guitar and kora (lute-bridge-harp used extensively in West Africa) (Figure 5.3.a).

Extracts from Karim Design Log, pp. 9-14:

- “Karim seems happy with any stringed instrument – plucked or bowed,

can work without a strap, has effective ‘whole hand’ grip of violin bow, has repetitive style when playing, and perhaps could benefit from some one-on-one work to improve control.” – CL

- “As ever his enthusiasm was evident, trying lots of different instruments and actively wanting to lead every session.” – SP
- “I was very impressed by Karim’s involvement in this session... he appeared to be concentrating upon the instructions that he was given and the periods when he was completely wrapped up in his own thoughts and actions were less frequent and of shorter duration. He definitely displays a good sense of rhythm when he is playing either the guitar or violin and was able to maintain this. I also noticed that he was very aware of what was taking place around him.” – JH
- “He was able to demonstrate a strong grip and good aptitude concerning his hands and could happily handle the instruments.” – NR

Karim “actively wanted to lead every session” (Karim Design Log, p. 9), and was a vigorous player. He “involved himself fully with the session and assumed a very proactive stance,” and “[involved] his whole body when moving with the rhythm” (Karim Design Log, p. 13).

Given Karim’s enthusiasm, expressive physical movement and varied modes of involvement in music making, design team members felt that an instrument that he could safely hold and play in a variety of positions whilst moving around in group sessions might best suit his preference and manner of play. KH recommended “a portable string / percussion instrument with a reverberating body which he could feel and hear whilst moving around during the session” (Karim Design Log, p. 13). It was suggested that any instrument developed for Karim should include a safety strap, which would also help minimise his fatigue.

Various ideas for stringed instruments were put forward. As Karim sometimes gripped / damped the strings of his instrument whilst playing, both intentionally and accidentally, CL recommended some kind of string guard or handle. NR suggested “a bowed instrument that worked in reverse to a normal violin / bow.

That is to say the bow would have the strings attached” (Kari Design Log, p. 10). The merits of having a curved bridge / flat bridge were also discussed.

It was commented that

given a free rein with a conventional string instrument Karim tended to dominate sessions sonically due to his dynamic approach to play. In an effort to minimise this tendency and to ensure a more balanced sound field, it was suggested that a quieter type of string instrument be developed for Karim

Karim Design Log, p. 10

YH stated the importance of Karim being “[involved] in the design process such as the colour, pattern or any symbol” (Karim Design Log, p. 14).

5.3.2. Further information about Karim

29.09.2009 – 14.11.2009

To gain potential further insight about Karim’s preferences outside of the JOS sphere, WL requested a visit with Karim at his home, and was invited by Karim’s brother and sister to visit them and Karim for tea. Additionally, requests were made to the LDRC team for any further general information about Karim that might add to the personalised features of his BMI.

Information noted during the home visit (Karim Design Log, pp. 11-12) included that Karim enjoyed James Bond movies and Bollywood musicals. His favourite foods were rice, korma dishes and dahl, the colours of which could influence the colouring of his BMI. Karim’s brother mentioned that the family attend their local Mosque regularly, and also the Institute of Ismaili Studies. It was mentioned by Karim’s brother that his favourite object is his *tasbi*, Muslim prayer beads, and noted that the Tasbi might offer further reference to suggest colour and possible decorative aspects towards his instrument surface design. A photographic portrait of Karim was thought best to serve as his personal monogram for incorporating into the finished design. A prominent picture hung on the sitting room wall gave reference to a music instrument being played by a travelling musician (Figure 5.3.b).



Figure 5.3.b: Framed image of musician playing a rebab, hung on the sitting room wall at Karim's home.

The picture, bought randomly by Karim's sister was said to have no direct link to the family. The instrument shown was thought to be a rebab, a type of a bowed string instrument associated with the Islamic trading routes of North Africa, the Middle East, parts of Europe, and the Far East. The similarity of playing position with Karim's was striking.

Feedback from JH at LDRC (Karim Design Log, p. 15) reiterated observations that Karim enjoyed playing acoustic stringed instruments. JH reported that Karim had also attended various musical workshops held by the London Symphony Orchestra (during which he had played percussion instruments, drums and chimes from South East Asia). He had been involved in a week-long project with the LSO which focused around a music and dance performance based on the theme of Romeo and Juliet. This led to a general public performance in the Barbican Centre itself. Generally, there was agreement of Karim's enthuse and liking for music and drama and for being involved in group activities.

5.3.3. BMI presentation and design briefing

Design team members from LDRC, JOS gathered on 24.11.2009 at the LDRC centre to reflect on key feedback from the observation workshops, and ideas forwarded by Karim and his family during my home visit. The information was compacted to form an initial design brief for Karim's BMI. It was suggested that Karim's instrument might best combine elements of a Spanish guitar and violin (bowed), with those of a rebec – a precursor to the violin that could be strummed or bowed (Figure 5.3.c). This was in keeping with Karim's preferred way of playing during which he would often swap from bowing to plucking and strumming.



Figure 5.3.c: Rebec, and Karim playing a violin rebec-style.

The suggested instrument might be strung with gut or nylon strings to produce a warm resonant sound. This choice was deemed preferential as in addition to their particular sonic values such strings would also be less potentially damaging to fingers and pose reduced threat of injury if broken during play. The body would need to have a relatively light framework and structure to suit Karim's energetic mobile use. As Karim generally played instruments vigorously, breakage was considered an ongoing risk factor. It was also suggested that the tuning of Karim's BMI might best be achieved using a tuning key. This would reduce possible issue arising from Karim's tendency, noted at observation sessions, to become distracted by external tuning pegs and buttons that he would often interfere with intentionally or otherwise, thus interrupting his musical flow and detuning his instrument. Facilitating Karim's

focus could have a secondary effect on the dynamic of the group process. Watch-key tuners otherwise known as Preston tuners, as have been historically used with the English cittern (English guitar), and though almost obsolete are still used for the Portuguese guitar, were considered a viable tuning system. Whilst offering an alternative to popular tuning buttons, this type of tuner proved to be prohibitively expensive and less flexible in use with nylon or gut strings where the stretch of strings is considerably more than that of metal strings commonly used with watch-key tuning systems.

5.3.4. Karim's design brief

Combining feedback from the presentation meeting of 24.11.2009 at LDRC, the following considerations were used towards the drawing up of a design brief for the creation of Karim's BMI:

- Lightweight instrument, with a safety strap for mobile play
- Uses gut or nylon strings
- Can be bowed or strummed
- Uses a tuning key with buried tuning pins rather than external buttons
- Form and surface decoration of the instrument to reflect Karim's personal tastes, approaches to play and cultural background

5.3.5. Choosing a maker

The invitation to produce a design concept for Karim's BMI was forwarded to two instruments makers who had expressed interest in developing a design for a strap-on stringed instrument safe for Karim's mobile playing, with capacity for play by bowing and by strumming in the style of a hybrid rebec / guitar; personalised to meet Karim's bespoke preferences and ability.

TR's design followed the lines of a Welsh *crwyth*, with the suggestion of a solid body (Figure 5.3.d). GM's design was as a headless guitar with a reinforced neck (Figure 5.3.e). The aim of the initial briefing was to determine which of

the available designers showed the most appropriate intent, purpose and ability to move the process forward.

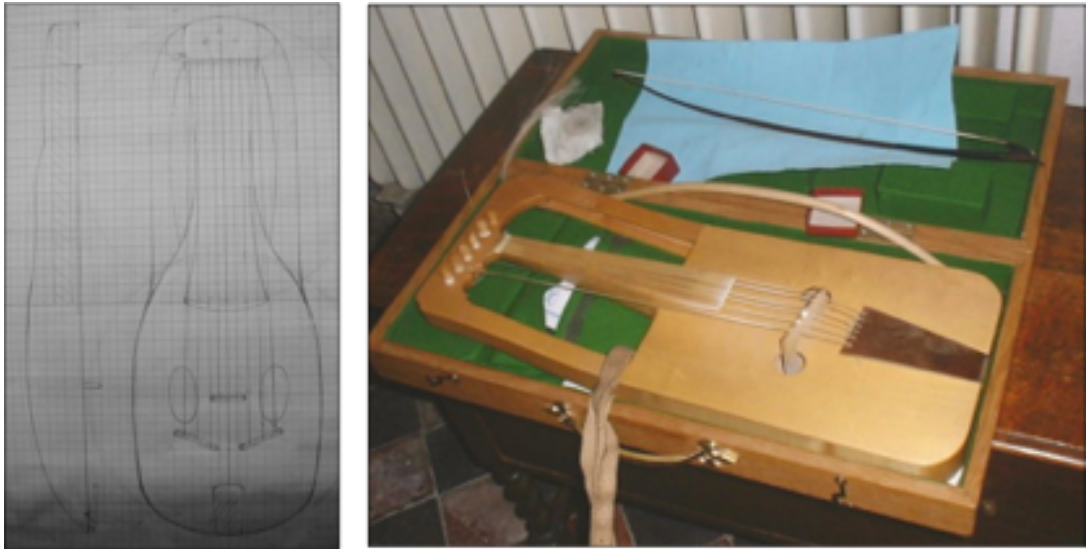


Figure 5.3.d: Initial design ideas from TR, based on the *cwrth*, a traditional Welsh bowed instrument.

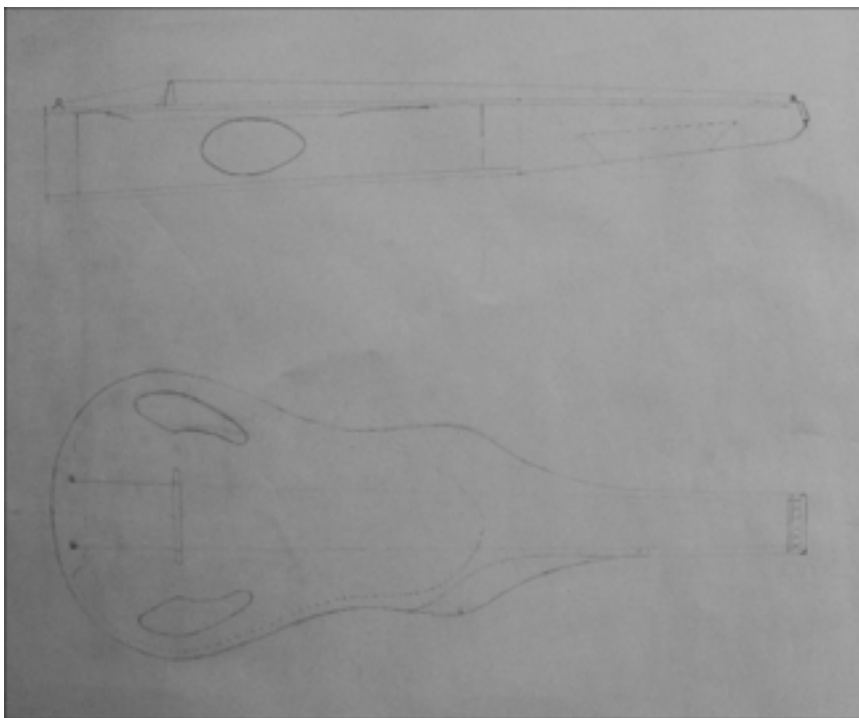


Figure 5.3.e: Initial design sketches by GM for Karim's BMI.

Both makers who submitted designs were well experienced and equipped to undertake the work with fully equipped workshops and considerable expertise

in instruments repair and making. They were invited to meet Karim and to witness his particular style of playing during a regular JOS session. Both makers were instruments players in their own right and worked with Karim as co-creators during improvisations, interacting with him whilst he explored several instruments, sang and moved around the group. On this particular occasion Karim chose not to play a guitar.

Soon after the session I visited both makers at their workshops to discuss Karim's design brief and to determine which of them might best be suited to produce a BMI, or if they might like to work on the project together. Due to his immediate availability to start work on the brief, the commission to build Karim's BMI was offered to GM, and he was asked to move the design brief forward as quickly as possible. Given that GM was employed as a tutor on the guitar making course at London Met at the time, his availability for consultation added weight to the decision to offer him the brief. His proximity to additional expert technical advice, materials access and to easy communications were assured. It was also felt that instruments making students at London Met might benefit by association, become interested and potentially influenced by an awareness of BMI initiatives and so generate potential for the involvement of up-and-coming instruments makers towards the development of further BMIs. Having accepted Karim's BMI commission GM undertook to consider design team feedback regarding his initial concept design drawing and to modify the design according to given suggestions.

5.3.6. Karim's design development

On 20.03.2010, GM reported that the design stage of Karim's instrument was nearly completed. The following modifications to the design were implemented (Figure 5.3.f):

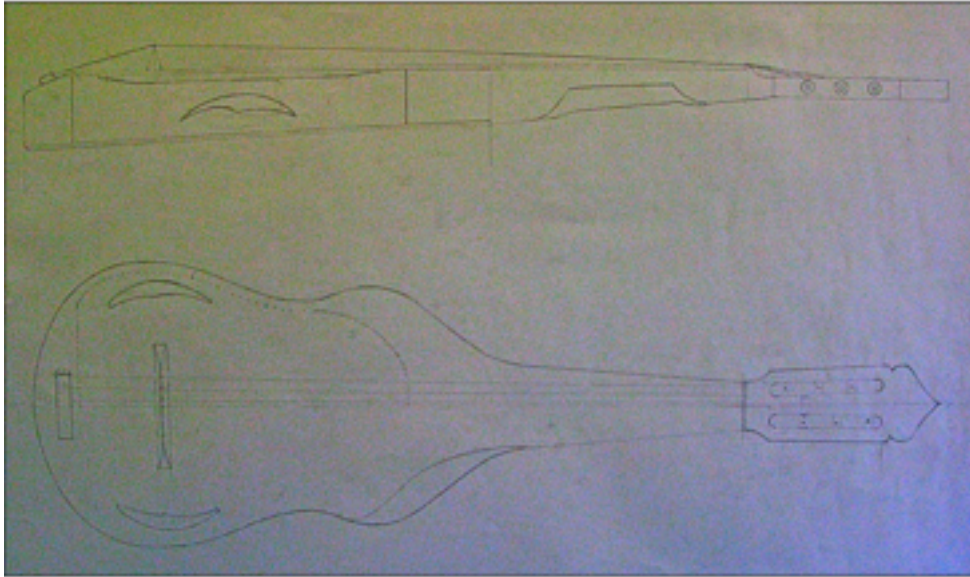


Figure 5.3.f: Modified final hand drawn designs for the Karimbek by GM.

Modifications included:

- Increase to the overall size of the instrument moving more towards the size of a small guitar rather than that of a rebec.
- Sound holes on the soundboard and on the side of the instrument were modified to a half moon shape inspired by Islamic art. This feature allowed for Karim's firm and safe holding of the instrument whilst playing in a variety of alternative ways and particularly whilst moving and dancing.
- The bridge design needed to accommodate 2 string profiles, one flat for strumming and one curved for bowing.
- A headstock was added to the headless original design that was initially intended to house zither type tuning pins. However, to accommodate zither, harp and piano type tuners, the barrel of the tuning pins needs to be threaded into the soundboard and this would require a pin mounting block. A pin tuning system would require rewinding with every re-stringing. This process was considered to be too time consuming and complicated in this instance. Conventional classical guitar tuners were chosen as being easier to use. The headstock was re-designed to

accommodate this type of tuning pin recessed into the headstock with buttons removed. The conventional buttons would be replaced by machine bolt type heads that would be tuned using a key. This system greatly reduced the risk of Karim's accidental detuning or breakage of protruding parts.

- The shaping of the headstock would be based on a minaret design drawn from Islamic art and would allow for the insertion of a picture of Karim as a mark of his personal ownership.

During the early stages of making, ideas continued to circulate between members of the extended design team and associates regarding the specific type of tuning heads to be used (Figure 5.3.g), and how best to place them in the headstock for ease of access for tuning and durability of design. Whilst the team was aware of existing headless tuning systems, time, budget and the exploratory nature of the work encouraged designers to look for new approaches. Figures 5.3.h and 5.3.i show how the barrel of a regular guitar tuning head was adapted by removal of the button, reduction of barrel length, and milling to fit a Chubb window-lock key.

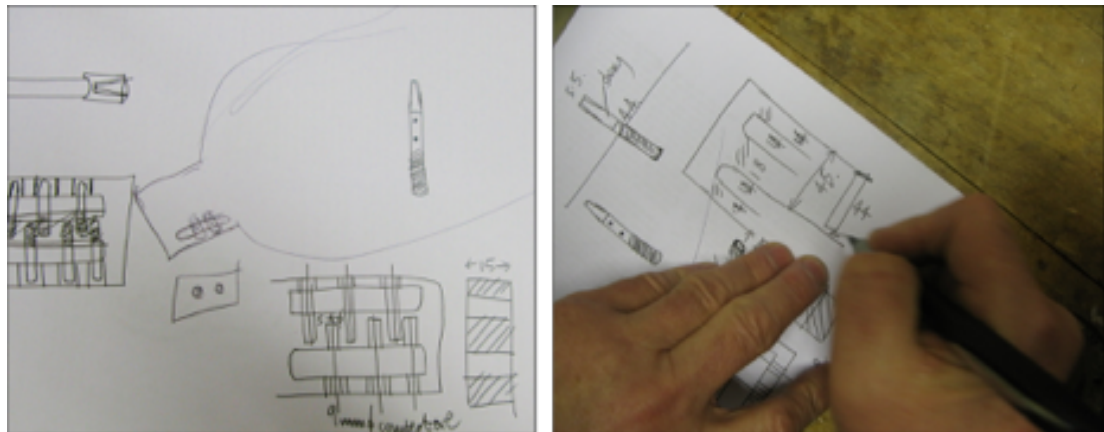


Figure 5.3.g: Exploring means of introducing key-turn tuning heads into the headstock

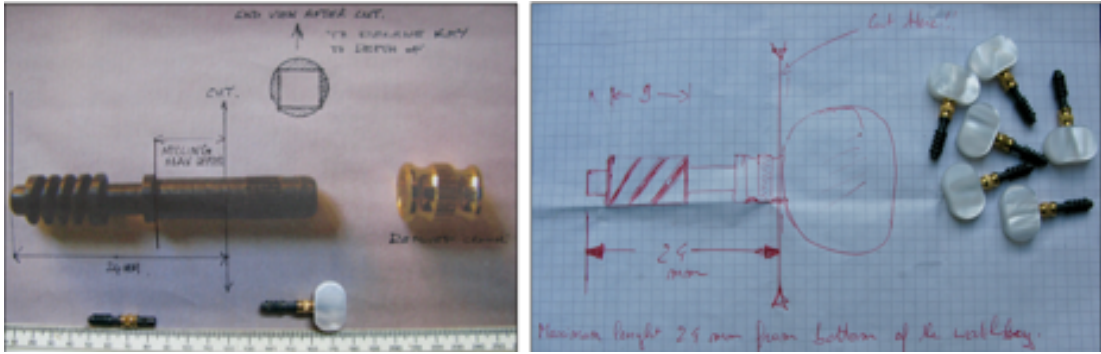


Figure 5.3.h: Guitar tuning pegs and milling specs diagrams



Figure 5.3.i: Milled tuning pegs to fit Chubb window lock key



Figure 5.3.j: GM building the Karimbek.

The body of the instrument was made from conventional Tulipwood / Yellow Poplar, a strong yet relatively lightweight wood (Figure 5.3.j). The sides were made extra thick, the end-block and neck were constructed in a manner that added considerable durability to the instrument. The soundboard was made from 3.6mm Birch Plywood. The internal braces were scalloped Redwood. All aspects of the body design were made specifically to facilitate Karim's particular style and use. The term 'robust' had been suggested to GM as being an appropriate term to define the form and functioning parts of the required instrument.

The fretting of the instruments was intended to allow Karim's spontaneous and exploratory play for strumming or bowing. The use of experimental raised frets was intended to facilitate Karim's established and preferred way of playing whilst furnishing potential for his ongoing experiential learning, and for the instrument's range of sonic expression. The raised fret wires acted as visual and tactile prompts to encourage and help facilitate Karim to achieve a range of harmonics when improvising.

5.3.7. Testing the BMI prototype

06.08.2010 – 17.08.2010

In early August, Karim's BMI was ready for trial use as a working prototype. Karim was presented with the instrument at a regular JOS session and began using it at weekly sessions. Karim's use of the instrument, and wear and tear were monitored (Figure 5.3.k). The instrument was kept between sessions at the JOS office. Observational feedback was given by various members of the BMI core design team, JOS volunteers, LDRC care and support team and associates (Karim Design Log, pp. 19-20).



Figure 5.3.k: Karim using his BMI at JOS sessions

Whilst Karim seemed to enjoy strumming the prototype, he had some difficulty holding and playing it (Figure 5.3.l). This was largely due to the unusual thickness of the instrument's neck. This caused an additional problem when Karim gripped the instrument at the wider part of the neck near the body, blocking the sounding of the two outer strings. Feedback also indicated that the sound of the instrument seemed to be very shallow and muted, without much bass response or bright treble. It was suggested that this was because of the additional weight and thickness of the materials used in building the body in such a 'robust' manner.



Figure 5.3.I: Difficulty holding the BMI

An issue also arose relating to the instruments tuning. The first fret formed a minor third note in the scale, when a major third note would be more in keeping with JOS commonly used E-flat open tunings. This may have come about due to the idea, before it was confirmed that there would be actual frets on the instrument, to mark the neck at various points like a conventional guitar, where the 3rd, 5th, 7th, 9th and 12th positions are marked. Then, when the decision was made to have actual frets, it was assumed that they would be in (some of) these positions.

Additional feedback towards potential developments of Karim's BMI included (Karim Design Log, p. 20):

- The buttonless tuning heads worked well. Karim was not distracted during his play and the instrument held its tuning throughout the

session.

- Bowing might be more accessible and effective if the bridge was further arched, and if the Karimbek used five strings, rather than six (Figure 5.3.m).

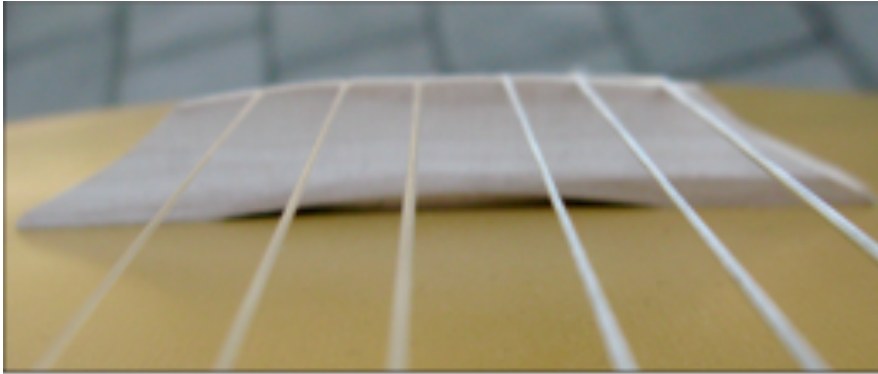


Figure 5.3.m: One of several produced trial Karimbek bridges with strings.

- A short, deep and loose bentwood bow as commonly produced for use with Indian instruments might prove easier for Karim to grip and use in a secure and sustainable good playing position.
- Cello strings might work better than guitar strings for both the strumming and bowing.
- As Karim's bowing technique often resulted in his bow sliding out of a viable playing position, reference was made to a previous device used at JOS sessions where a clothes peg was fixed to the bridge of a cello and had worked well as a bowing-stop to maintain an effective bowing position. It was considered if a similar approach might offer a potential design initiative, by adding end posts to Karim's bridge design (Figure 5.3.n).



Figure 5.3.n: Bowing a cello with a clothes peg fixed to the bridge as a stop.

- The sound holes tended to get used as holding / grips when the instrument was bowed. It was suggested that they either needed covers, or to be so fine (drilled, possibly) so as not to allow Karim to push his plectrum or other found objects inside the body of his instrument.
- The area of mould in the headstock required investigation. As it was deemed to be contained to the area seen, the effected wood was extracted and the adjoining areas treated. The hole was then filled and re-finished (Figure 5.3.o).



Figure 5.3.o: Mycelia growth on the headstock.

- The topmost pointed apex of the minaret design headstock needed de-pointing as it was regarded as dangerous when Karim played the instrument vigorously in a group. It would be easy to round of the design whilst maintaining the Muslim design feature.

5.3.8. Ian Burrow takes over the brief

At this point GM needed to withdraw from the project with some urgency for personal reasons. IB was invited to take over the brief towards its completion. IB had shown himself to be versatile, sincere and enthusiastic in working on associated JOS briefs, and was regarded by other members of the BMI project team to be a fine maker. IB confirmed that the instrument as GM had left it could be successfully adjusted in accord with feedback from its prototyping. The instrument needed modification for more effective bowing.¹³ Other modifications and finishings that IB committed to undertake were (Figure 5.3.p):



Figure 5.3.p: IB's designs for reshaping the instrument's body and the minaret headstock point before and after reduction.

¹³ Burrow, I. (2010) E-mail to William Longden. 13 October.

- The waist of the instrument would be narrowed and brought in nearer to the strings to allow easier access for bowing.
- To produce an arced bridge, with all strings comfortably accessible using a bow.
- The headstock would be rounded, retaining the Islamic iconographic mosque / minaret shape, but reduced to avoid being dangerous.
- Rather than close off the sound holes as had been suggested earlier, after consultations it was agreed that IB should rather enlarge them to encourage Karim to use them as functional hand holds.
- To replace the original protective Perspex panels over the machine head fittings with wood shaped to fit and painted to match the body, keeping the heads easily accessible for future modification if required.
- Fit two extra frets to allow Karim opportunity to produce a broader range of harmonics.

5.4. Final adjustments

A diagram showing the shape of the proposed waist reduction was produced by IB and approved by members of the design team. The reduction would allow for an unobstructed arc of the bow and string play. The adjustment would be achieved by removing the backboard, then marking up and cutting through the existing sides that were thick enough to allow sufficient reduction. New sides were made and scarf joined to the existing sides. Internal braces were cut down and re-fixed. The back was refitted and the whole body re-smoothed and cleaned in preparation to receive ground colour painting, hand painted and stencilled decorations and finishing varnish.

The initial robust dimensions of the instrument required further refinement. The size of the neck at the heel where the neck meets the instrument's body was too wide and too thick to allow for Karim's comfortable and secure handling. This section was reduced and reshaped relatively easily as the neck and body had been built from the same piece of wood. It was not difficult to remove the excess wood whilst maintaining the structural integrity of the initial design. In

order for the instrument to be bowed effectively, its waist was considerably reduced, “tucked in.”¹⁴

After IB’s initial readjustments, the instrument’s sound production was still found to be too quiet to be clearly heard in JOS group sessions that often include large numbers of participants in rousing improvisational play. Also, an internal stay had come loose and required re-fixing, and the instrument still required surface finishing and decorations intended to reflect Karim’s distinct tastes, personality and cultural orientation.

IB managed to remove the loose internal stay, by sawing along the bottom of the instrument’s walls at the lower bout and prising open the gap (Figure 5.4.a). Because the instrument’s walls were so thick, it was decided that the stay was not of significant purpose acoustically and the instrument would perform just as well without it (Karim Design Log, p. 24).



Figure 5.4.a: Prising open the back of the instrument to access loose bracing.

Aiming to improve the volume and projection of the instrument, IB created a

¹⁴ Burrow, I. (2017) E-mail to William Longden. 26 June.

number of experimental bridges (Figure 5.4.b). Their use was explored by Karim using various kinds of strings to find the preferred audible voice for the instrument. Different types and gauges of nylon and metal strings were tried.



Figure 5.4.b: Different sizes and curvature of bridges tried on the Karimbek.

The finally selected bridge was curved sufficiently to accommodate both strumming and bowing. It was possible to play each note separately like a rebec. It was also possible to utilise the lower frets and to use the higher frets as guide markers for harmonics (Burrow 2017). In finding a viable twin-purpose bridge, the volume and projection of sound produced by the instrument was increased to express a full and resonant voice that possessed qualities associated with Indian *raag*. The selected bridge was glued to the body of the instrument (Karim Design Log, pp. 23-24).

At this point IB proposed adding a fingerboard to the neck as he felt its addition might enhance the instruments playability. However, Karim was now comfortable holding and playing the newly honed / thinned neck, and there was some concern that to attempt such a further modification could make the neck too thick again, as before. The fingerboard modification was therefore not carried forward.

5.4.1. Decorating the 'Karimbek'

During the decoration phase of Karim's BMI, the team began to refer to the

instrument as the 'Karimbek'. The idea arose by combining Karim's name, with that of a rebec, a type of instrument similar to that seen in the illustration hung on the sitting room wall at Karim's home. Karim seemed to enjoy the association, as did his family and everyone else, so the name stuck.

Pigments used for painting the Karimbek were Nitrocellulose based and chosen by IB as being durable and safe pigments frequently used in guitar making. The choice of colours was selected from Karim's list of favourite things, as compiled by the design team after my visit to Karim's home with his brother and sister and with their support, and with additional input from Karim's support team at LDRC. The initial ground colour was based on brown rice one of Karim's staple foods, with a soundboard sunburst in deeper korma-like colours. Initially IB had painted playful figurative designs onto the instruments ground colour with a bronze acrylic paint, feeling them to be representative of a typical JOS workshop (Figure 5.4.c). As these designs had come from Ian rather than in consultation with Karim, they were considered by members of the design team to be inappropriate. The body was therefore re-smoothed and prepared for designs that were to be initiated by Karim.



Figure 5.4.c: IB's initial figurative surface decorations.

Karim's favoured personal objects (as defined by brother) his Tasbi, Muslim meditation beads. This milky pearl colour was agreed to be the best grounding

for the beautiful calligraphy that was suggested as finishing motifs.

A shallow recess was cut into the headstock to accommodate a personalised photograph of Karim. A clear plastic disc was cut to position above a photo to protect it and allow it to be removed easily for updating of the image if required. At first, an image of James Bond, Karim's favourite film character was inserted. A photo shoot was arranged for Karim with a LDRC team member who used a classic James Bond image as a prompt for Karim to pose with his Karimbek. Karim selected an image from those produced as his personalised portrait, for inserting into the headstock (Figure 5.4.d).



Figure 5.4.d: Karimbek headstock pictures featuring Karim as James Bond.

Karim's brother suggested that further personalised surface decorations might include Muslim symbols particular to Karim's family tradition and faith (Figure 5.4.e). Several designs were copied by hand by IB and scaled for use as templates that were then traced or transferred onto the body-colour of the instrument, before final coatings of clear lacquer were applied. The designs included traditional calligraphic representation of 'Bismillah Al Rahman Al Rahim' and 'Bismillah', and were painted over the instrument's body colouring by IB.



Figure 5.4.e: Islamic calligraphy that informed the Karimbek’s surface decorations.

5.4.2. Public presentation event at Tabernacle Notting Hill



Figure 5.4.f: Flyer for the 1st BMI public presentation event.

The BMI public presentation event on 25.03.2011 was held at a popular accessible public venue in easy reach of LDRC participants so to enable participation of Karim’s extended friends and associates (Figure 5.4.f). The event was facilitated by JOS volunteers and included Karim’s family, design team members and associates, LDRC management, support team and service users and invited guests. During the event that included open public

participatory JOS style music making, Karim was formally presented with his finished Karimbek, which he then used in the improvisations (Figure 5.4.g). Footage of the event and Karim's participation can be seen in the BMI Film (Appendix 14, 07:17).



Figure 5.4.g: Karim presented with his finished working prototype Karimbek by SCOPE management at the 2nd public presentation event.

Feedback indicated (General Design Log, pp. 150-156):

- “Karim’s guitar is clearly just right for him and is shown by his constant engagement in every piece. Its aesthetics are evidence of a fine and fully completed piece of work.” – NG
- “It was great to see Karim’s brother... and Karim’s sister participating in the session. Given that was their first experience they really threw themselves into the mix (so to speak).” – JH
- He “kicked things off in fine style and the first jam unfolded into a beautifully varied interweaving of joyous harmonies.” - HL
- “Karim seemed happy with his guitar and [the] slim model helps him to hold and carry the instrument easily.” – ME
- It was also felt that the use of emblems and calligraphy associated with Karim’s faith allowed Karim to identify with his instrument (Karim Design Log pp. 152-153).

Several months following the event, JW reported that the Karimbek had sustained some damage to the grooved nut at the top of the neck. The end was clipped off so that the bass string did not vibrate properly, as it was unsupported without a groove for it to rest in. This was repaired, and the Karimbek was quickly back in working order (Karim Design Log, p. 156) and has since been used continuously at JOS sessions by Karim and others without issue.

The instrument holds its tuning well and requires only minor re-tuning even after long periods. The chosen wound strings and bridge combination resonate with full and warm body of sound when strummed or bowed. The sound qualities of the instrument often cause some surprise as they are rich and clear and have association with Indian and ethnic music. The instrument has been a popular item both in use and on display at conferences and events. The Karimbek is strongly associated with Karim and Karim with the instrument as its C-D owner and player, and as an icon of inclusive design.



Figure 5.4.h: The finished working prototype Karimbek.

This chapter has presented the process of designing making, testing, adapting and personalising Karim's BMI. In the next chapter, I introduce Ricky, and outline the process by which he instigated the development of a number of BMIs and IADs.

6. Ricky's Bespoke Music Instrument Design Journey (Case Study)

In this chapter I introduce Ricky, and the key persons involved in co-designing his BMIs and IADs. I draw on Ricky's design log to introduce several design avenues that developed as a result of Ricky's input, and the process through which a number of BMIs and IADs were developed, tested and adapted, including his Wind Instrument Presentation Platform (WIPP) and adjustable stand, melodica fixed tuning cover, multi-reed holder, the JOS zither and Plectrum Support.

Project Lead:

William Longden

Core Team:

LDRC liaison – Simon Powel

Project administrator – Chris Leeds

Volunteer input – JOS Management Team

Associates:

Ricky (C-D / player), LDRC (Ricky's day-care centre at RBKC), Nathan Reeves (Design Research for Disability specialist), Katia Hadaschik (Design Research for Disability specialist), Chris Leeds (disability access specialist, instruments designer, musician, project admin), Allan Knight, Lizzy Barbour, Katie Stephenson at MERU (working prototypes for wind instruments holding device), Andy Brice, Firas Fayad at MERU (working prototype for wrist band tool holder), Doug Inge, Nick Woolley, John Davis at MERU (melodica cover), Mike Cooper, Ian Burrow, (instrument makers) Ben Lynam, (designer) JOS project volunteers and workshop participants, Lewis Jones at London Met (organology advisor), Alan Marsh and Marcella Haddad (audio-visual recording)

The team was supplemented by input from specialists appropriate to Ricky's preference and need including Paul Crawford, JOS volunteer and music technology specialist.

6.1. Introduction



Figure 6.1.a: Ricky Clarke (BMI C-D, player)

Ricky (Figure 6.1.a) is an upbeat and charismatic man, whose family are originally from Barbados. He puts great effort and enthusiasm into his participation at JOS workshops. Ricky has learning disabilities and is physically disabled with cerebral palsy that results in him having severely limited control over the movement in his body, head legs, feet, arms and hands. He is visually impaired and has dysphagia, a condition that makes it difficult for him to swallow and control his breathing. Ricky uses a wheelchair for his mobility. Severe barriers to access prevent him from participating in many activities that he would like to join in. He expresses his preferences, likes and dislikes verbally, though with varying degrees of difficulty, and by his facial and postural expressions.

Ricky enjoys active participation and creative interaction; he likes to use various vocal and instrumental sounds when he joins JOS music workshops

that he has attended regularly since 2007. He is a popular and determined player and enthusiastic co-creator.

Ricky was invited to participate as a BMI C-D and player because of his enthusiasm about participating in JOS sessions, and the perceived potentials for a BMI to facilitate his increased choice, independent expression and creative social engagement. Upon consultation with Ricky's family, care management and personal support team, permissions were granted and Ricky, accompanied by his key support workers, were informed about the projected BMI project timeline.

Ricky was involved throughout the project as a BMI C-D. He was consulted at regular sessions and meetings liaised by his key support workers and health-care team. Ricky was also regularly consulted and kept personally informed about process. Familial and professional care and support networks, Ricky's design team and associated specialists were consulted whenever required.

6.2. BMI design development stages

Projected BMI production timeline:

At 02.03.2009, the initial LDRC brief was that BMI production should take six to eight months in total (Appendix ____).

Actual BMI production timeline from date of confirmation:

03.08.2009: Confirmation of Ricky as BMI C-D

13.08.2009: 2nd Observation workshop at LDRC Centre

26.08.2009: 3rd Observation workshop at LDRC Centre

30.09.2009: 4th Observation workshop at LDRC Centre

20.10.2009: Meeting with in house team at LDRC

04.11.2009: Personal Session at LDRC and home visit with Ricky

14.11.2009: General request to the LDRC team including in house therapeutic

workers, further any further relevant information twirls Ricky's BMI

24.11.2009: Presentation and BMI Briefing at LDRC

11.12.2009: Ricky begins attending regular JOS sessions at St Peters

21.01.2010: VC (MERU): Flexzi-stem in production

09.02.2010: Melodica cover in development

07.03.2010: BL sends sketches of blowing instruments

16.05.2010: Nordoff Robbins horns assembled

23.07.2010: CL observation of Ricky's use of trumpet melodica mouthpiece

28.08.2010: CL sends spatula strummer ideas

18.09.2010: Ricky tests spatula strummer and Flexzi harmonica attachment

05.11.2010: Ricky tests First Wind Instrument Presentation Platform

20.12.2010: VC: Wrist support insert accepted as MERU volunteer project

21.12.2010: Feedback on Wind Instrument Platform prototype

27.01.2011: Second Wind Instrument Presentation Platform constructed

13.03.2011: Design concept for Zither presented

10.03.2011: AB confirms size of insert for Strummer wrist splint

18.03.2011: Ricky makes artwork using Strummer wrist splint

21.03.2011: IB: Zither construction pictures sent to WL

23.03.2011: Wrist support in development

25.03.2011: Formal Presentation of Works-in-Progress at Tabernacle, Notting Hill: Zither and Third Wind Instrument Presentation Platform

25.04.2011: IB / W: emails: Zither string tension / tuning problems persist

11.05.2011: Wind instrument platform fitted

21.05.2011: Prototype zither abandoned due to design faults

05.06.2011: Fourth Presentation Platform completed

27.07.2011: Ricky's Daessy Mount arrives

09.08.2011: Ricky's Daessy Mount fitted - LOG END DATE

6.3. Ricky's BMI Design Journey

For reference to the initial introduction of the JOS project at LDRC, and leading up to the BMI project, see Introduction to Case Studies.

Although Ricky was not present at the introductory sessions, staff at LDRC identified him as someone who would potentially benefit from being involved with the BMI project and had expressed interest in being so to them. It was mentioned that he had played harmonica in the past, and liked playing wind instruments. Ricky's first JOS session at LDRC was on 06.07.2009 (Figure 6.3.a). He was given a harmonica attached to a neck brace, but it did not suit his needs as the brace did not fit Ricky's body posture and was unstable. Ricky was able to use a melodica, with assistance from a support worker who held the air tube to his mouth. Feedback from this session included (Ricky Design Log, pp. 6-7):

- "When I observed Ricky during the session, he demonstrated an increased level of alertness and physical activity." – ShP
- "The main thing that stuck me was how enthusiastic Ricky became when attempting (successfully) to harmonise with his support staff... He initiated (took the lead) contributing the noise / sound, which I felt was quite impressive." – JH
- "Ricky has in the past actually physically used a harmonica during previous musical sessions that we have run using a similar neck device that you attempted to employ during the session and it has, with patience, proved a useful way of encouraging him to express himself musically." – JH
- A better-shaped neck brace was needed to hold a harmonica, maybe a stand instead.
- Due to the inward contracture of Ricky's elbow, the idea of an elbow operated bellows / bagpipe / shruti box- type instrument was also raised.
- When asked whether he was interested in process or end result, Ricky answered "End Result."

Ricky's engagement in the sessions confirmed the team's initial impression that he would benefit from a BMI which would enable greater participation and creativity.



Figure 6.3.a: LDRC introductory workshop (13.8.2009).

Over the course observation sessions, it was mentioned that given Ricky's verbal skills, he might offer valuable feedback, and perhaps vocalise his feelings and opinion regarding other BMI C-D participants who are non-verbal, acting as an advocate friend and expert by experience" (Ricky Design Log, p. 8).

6.3.1. JOS workshops focussing on the C-Ds

13.08.2009, 26.08.2009, 30.09.2009:

Following the appointment of C-Ds, a series of three JOS sessions were delivered as regular JOS style participatory inclusive music workshops at LDRC. The sessions included any LDRC service users who wanted to attend, whilst concentrating on gaining information relating to the personal

preferences and access requirements of Ricky and the other agreed C-Ds.

Ricky explored playing a melodica, an accordion, mouth organ, wooden chimes, various shakers and stringed instruments including an Indian zither.

Feedback from these sessions (Ricky Design Log, pp. 9-13):

- “Carers suggested Ricky may not have a lot of strength for squeezing action.” – CL
- “Some presentation ideas - wheelchair mounted holder.” – CL
- “Really got into participating with the mouth driven keyboard, he also seemed to enjoy the harmonica.” – SP
- “He seemed to enjoy the intensive support of a person either side of him focussing on his needs.” – SP
- “Ricky had a keyboard that was activated by a pumping bike mechanism that proved really hard for him to use with his body, as each time that we tried to hold in it against his body he felt uncomfortable, and therefore the facilitators had to do it for him.” – SB
- “At times it proved really to be a challenge to support the student with the prototypes, singing and trying to reinforce the lack energy from other facilitators.” – SB
- “Ricky demonstrated an admirable determination and real effort when asked to blow into his instrument. This clearly causes him difficulties but he was very persistent.” – JH
- “Ricky was clearly aware of what was taking place and the instructions that were given him. And his vocal contributions maintain a regular rhythm and seemed to be to be in tone?” – JH
- “One suggestion for Ricky was a harmonica that was more ‘Face Friendly’ and softer to use than a conventional metal one. It would most likely have to clamp to the wheelchair frame.” – NR
- “I agree that a wind instrument is the way forward for Ricky. Maybe we can find or make one which needs less air pressure than a conventional harmonica or flute to make it easier for him.” – KH

- “When presented with any of the wind-blown instruments (harmonica, melodica, horn) Ricky seemed to willingly want to play them, however because they had to be supported by his carer it was very difficult to know how long he wanted to play them for, as she was interpreting this for him. This is great evidence to show that a piece of equipment to support a wind instrument near Ricky’s mouth so that he can chose as and when he wants to blow into an instrument would be really beneficial in this situation – allowing Ricky the decision of whether he wants to play or not and us to see the same thing.” – VC

Due to his high levels of muscle tension and flexion, Ricky’s support workers suggested that an instrument Ricky did not have to hold would prove most effective. Some suggestions were made towards creating a “Face Friendly” device, softer to use than conventional metal ones, as an instrument holder. Such a device would most likely need to clamp on to Ricky’s wheelchair frame, and would need to be presented from the front, given Ricky’s dislike of people or objects hovering over the side or back of his wheelchair.

6.3.2. Ricky’s design brief

A meeting with the in-house speech and occupational therapists at LDRC was requested in order to gain information about any health and wellbeing factors that needed to be considered towards the approaching BMI design brief meeting, and where possible to be incorporated into the emergent BMI design development.

From this discussion (Ricky Design Log, p. 14), a brief was drawn up for designing an instrument that could:

- encourage and facilitate Ricky to be actively engaged in enjoyable creative activities that help him to relax and prevent muscle contraction
- stimulate deep breathing and breath control
- use Ricky’s lungs towards the strengthening of his respiratory muscles

- stimulate activity that stretch his stiff limbs and neck whilst maintaining a posture that is as symmetrical as possible
- prioritise the maintaining of his current health whilst looking to enhance his wellbeing
- present any objects to Ricky's mouth in the upright position, to facilitate mid line presentation, with head in neutral position

During a meeting at LDRC Ricky invited WL to visit him at his home and to take pictures of his favourite things (Figure 6.3.b). A request was made to the extended LDRC care and support team for any further relevant information regarding health and wellbeing factors that need to be considered. JH and SR, who had known Ricky for eight and seven years respectively, reported that Ricky had been involved in a number of musical and theatre initiatives, with varying levels of success. JH and another member of the LDRC team had "eased Ricky's fingers onto the keyboard" during a music session. This approach was considered to be "difficult... and potentially intrusive" (Ricky Design Log, p. 16). As Ricky had contributed to the group session by blowing a harmonica, both JH and SR believed that some type of mouth organ would be the most suitable for Ricky's BMI.



Figure 6.3.b: Ricky's favourite things and colours as seen during his invited home visit.

6.3.3. BMI presentation at LDRC

At the BMI presentation on 24.11.2009, despite considerable efforts to ensure the attendance and contribution of the three BMI C-Ds at the design briefing, only Ricky was able to attend. Several potential instruments C-Ds / makers, disability design experts, a consultant organologist, LDRC care management and team therapists, Ricky's key support worker and JOS project liaison were also present.

Attendees viewed presentations about each of the BMIs that were centred on feedback from achieved observations, with additional information and opinion regarding the particular preferences, needs and personalisation features recommended for each BMI.

Following the presentation, I reported that MERU had agreed to offer assistance with the production of a wheelchair-mountable presentation device (Ricky Design Log, p. 18).

6.3.4. Ricky begins attending regular JOS sessions at St Peter's, Vauxhall

At the JOS sessions at St Peter's, Vauxhall, Ricky was offered a variety of wind instruments to try (Figure 6.3.c). He expressed preferences for different sounds and for ways of accessing instruments for blowing. He was enthusiastic to contribute to the group music making but required considerable effort to blow and produce viable sound. His support worker determined that Ricky became over exhausted, frustrated and irritated that he was not succeeding. JS, an appointed BMI project liaison from LDRC intervened to suggest that Ricky have a break. Ricky welcomed this, but at the same time seemed determined to succeed and to play his instrument (Ricky Design Log, p. 18).



Figure 6.3.c: Ricky testing a variety of wind instruments.

As the sessions progressed, JS felt that Ricky's enjoyment was developing, and that his involvement in the JOS sessions had enhanced his ability to take

part in social activities with his friends from LDRC, to meet new people and to explore new situations within the community.

It was felt that attending music sessions promoted Ricky's interaction with his peers and support staff and increased general awareness about Rick as a person, his ability and character in new and stimulating environments that presented fresh opportunity for sharing and learning (Figure 6.3.d). Ricky enjoyed taking part in the process of designing an instrument specifically intended to enable him to take part in music making activities more independently. (Ricky Design Log, p. 19).



Figure 6.3.d: Ricky at a JOS session in the St Peters Heritage Centre at Vauxhall, SE London.

6.4. Developing Ricky's instruments

Ricky's BMI design journey stimulated several tangential design avenues resulting in the exploration and development of a number of different instruments and instruments access systems bespoke for his use including, the Wind Instrument Presentation Platform (WIPP) and adjustable stand, the melodica fixed tuning cover, a multi-reed holder, the JOS zither and Plectrum Support.

From this point Ricky's design journey became increasingly multi-faceted and

complex, making a chronological account of the several different design trajectories complex and confusing. Whilst there was a good deal of interplay between the designs, each design had its own momentum. I therefore narrate each BMI and IAD separately, making note of any significant interfaces between them.

Design process sought primarily to engage Ricky, encouraging and facilitating him to participate actively at JOS and related activities with increased independence and personal choice. Therefore, initial design developments worked towards the development of a wind instrument and an associated IAD that could be attached to his wheelchair (Figure 6.4.a).



Figure 6.4.a: Design sketch for a wheelchair mounted instrument for Ricky.

As observations proceeded, focussing on determining Ricky's preferred sounds, presentation methods and the range of his head movement towards the most effective and efficient presentation of his proposed wind instrument/s, a member of the team with experience and expertise in assistive technology observed Ricky express what he believed to be an intended and controlled range of arm movement that might potentially be used to play an instrument. This astute observation triggered an additional design trajectory that led to the development of a composite wrist-support and insertable rod-plectrum that was developed into the Plectrum Support, a design that would assist Ricky to

strum a stringed instrument, and to draw a picture by independent movement of his forearm. Ricky had never previously been able to achieve either of these actions.

These innovations led in turn to the development of the JOS zither, made specifically for use with the JOS / MERU Adjustable Instruments Presentation Stand (Figure 6.4.b). The stand was produced to facilitate a broad range of access requirements thus enabling people who would otherwise be excluded from active independent playing of a music instrument.



Figure 6.4.b: Plectrum holding wrist support and JOS zither on AIPS

Ongoing user-led design development at JOS sessions subsequently informed the production of an assistive strummer and a strummer extension rod that allowed use of the zithers by disabled players who were given access by use of the assistive devices connected to their arms and feet (Figure 6.4.c).



Figure 6.4.c: Strummer assist device and extension rod being user tested at JOS.

The following sections will explore the development of Ricky's wind instruments, his WIPP, the Plectrum Support and zither. The subsequent development of the zither strummer assist and strummer assist extension rod will be referred to in the Discussion and Conclusions chapter.

6.4.1. Wind instrument designs and developments

Ricky and his co-design team agreed that some kind of wind instrument would be best suited to fit his ability, needs and preferences, given his previous success demonstrating control over his breathing sufficient to produce sounds on a harmonica. He also showed a range of controlled head movement in a lateral arc that offered potential for him to play a range of instruments, if they could be presented to him in the appropriate position. A chief concern was to allow Ricky a range of choice. Towards this end a variety of sound producing instruments were considered.

The presentation of potential instruments for use by Ricky sought to accommodate his broadest range of achievable safe movement, whilst providing additional scope for the encouragement of any developmental potential. The harmonica, panpipes and tuning reeds were used as initial examples of possible sound producing instruments (Figure 6.4.d).



Figure 6.4.d: Initial exploratory ideas for Ricky's wind instruments.

Flute attachments

As an early example of a potential instrument saw the improvised joining of two separate recorders in the manner of a double flute. It was felt that the shape of the recorder mouthpieces allowed Ricky easy access to blow through. However, it was also felt that the sound was too shrill (Appendix 7). The team began to explore how an instrument could be made that would allow Ricky to play different notes (Figure 6.4.e).



Figure 6.4.e: Exploring mouth piece variations and sounds with joined up recorders.

Ben Lynam, a Product Design student at London Met who was undertaking a student placement at JOS towards his BA (Hons) Project-, explored how a recorder could be adapted to allow Ricky to play different notes, in tune with the group. Design sketches and a working prototype as below illustrate the concepts (Figure 6.4.f). Excerpts from BL's Design Report can be found in

Appendix 7.

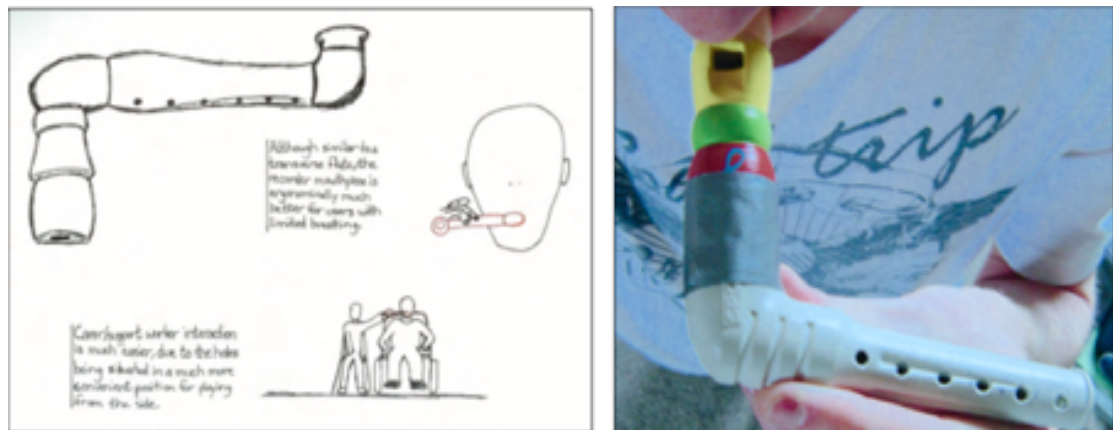


Figure 6.4.f: BL's sketch and prototype for an assistive flute.

BL's design used an upside-down recorder mouthpiece, to enable maximum sensory experience for the player. Greater skin contact would mean Ricky would feel stronger vibrations from the music he was playing. The flute bent to the side like a transverse flute, to enable co-playing by a support worker. BL also designed a rotational sleeve that would cover the flute holes, allowing users with limited dexterity to play different notes. Testing of the prototype with Ricky found that the instrument did not extend far enough to allow a co-playing support worker to facilitate effectively. Moreover, as the instrument relied on a facilitator to hold the instrument in place and to change the notes, it did not enable Ricky to play independently.

Insights and ideas gained through BL's design project were significant towards the general flow of the development of Ricky's and other BMIs. A second design stream building on BL's ideas towards a multi-reed wind instrument for Ricky, capable of changeable tunings was explored by instrument designer MC.

6.4.2. Stimpfeifen (Voice Pipes) as used in Nordoff Robbins Reed Horns

Investigations began into how the reed horns might be adapted towards

Ricky's use. As JOS workshops generally use the key of E-flat, the team purchased three horns, and installed a set of E-flat reed plates¹⁵ (Figures 6.4.g, 6.4.h). Ricky was able to play the horns, and they were earmarked as a successful option to be fitted to his WIPP. The reeds also opened up potentials towards a concurrent BMI project not included in the case studies that explored how the use the reeds as used in Nordoff Robbins Reed Horns, to produce a wind driven therapeutic and recreational musical mattress (see Discussion and Conclusions).

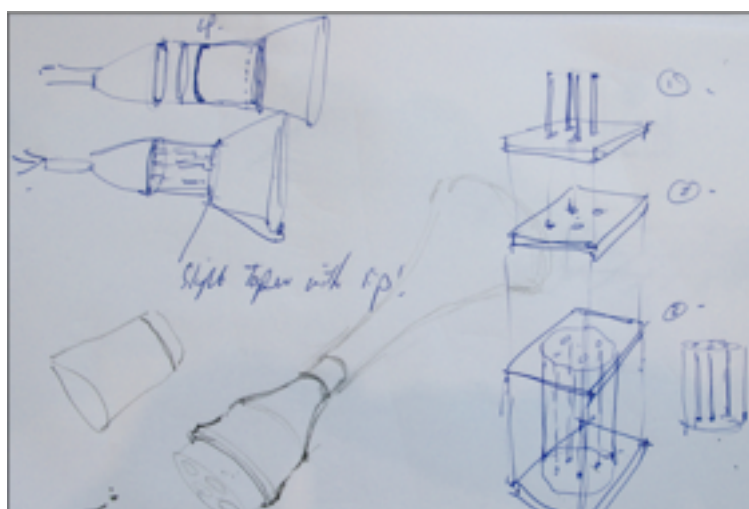


Figure 6.4.g: Sketch for multiple reed holder and mouthpiece.

¹⁵ Longden, W. (2009) E-mail to LMS Music Supplies. 11 November.



Figure 6.4.h: Nordoff Robbins Reed Horns.

6.4.3. Ricky's melodica

During the initial workshops, Ricky had played a melodica with some success, with his support worker holding it and manipulating the keys (Figure 6.4.i) (Ricky Design Log, p. 10). The melodica's keyboard and extendable blow-tube made it an accessible wind instrument towards Ricky's additional choice of playable instruments. The team set about exploring how the instrument could be adapted for Ricky's use.



Figure 6.4.i: Ricky exploring the melodica at LDRC session

CL and WL took the melodica to the MERU Design Club where members explored ideas about how best to present the instrument for Ricky's unassisted play. The desired keys (those of the E-flat) needed to be pre-set ahead of play. A wooden model was used to demonstrate the idea of a moulded plastic cover that would limit incidental access to other keys (Figure 6.4.j), allowing Ricky to express a variety pre-set chords in the desired key.



Figure 6.4.j: Melodica removable protective cover with variable fixed tuning options.

During trials the original plastic windpipe proved to be too flimsy. An alternative windpipe with mouthpiece was improvised from a shower hose. It was initially thought that Ricky would be able to blow into this mouthpiece as into a trumpet. The mouthpiece proved inaccessible for Ricky. (Ricky Design Log, p. 22). The original mouthpiece was therefore re-fitted to the stronger tubing (Figure 6.4.k).



Figure 6.4.k: Testing various melodica mouth pieces and tunings.

While the adapted melodica broadened the range of achievable sounds available to Ricky, he still required an enabler to assist by holding the melodica in position of him to play, so the aim of creating an instrument he could play independently was not yet achieved.

6.5. Presenting Ricky's wind instruments

Ricky's wind instruments were intended to answer his personal choice, to encourage his breathing and social engagement whilst being presented in a steady position for his range of safe movement.

Ricky needed a bespoke Instruments Access Device (IAD) that would allow him independent choice of several different instruments, and choice of when to play them independently. During early observations, Ricky played, amongst other instruments, a harmonica, mounted and presented in an adapted generic harmonica holder. Whilst this particular presentation approach was inadequate, due to lack of stability (Figure 6.5.a), the experience reinforced Ricky's liking of playing the harmonica (Ricky Design Log, p. 10).



Figure 6.5.a: Ricky testing a modified generic neck brace to hold a harmonica at an early LDRC session.

Ricky's support workers suggested a wheelchair mountable device that could present a variety of instruments. A source of inspiration came from a wheelchair mountable flexible straw, designed for hands-free drinking (Figure 6.5.b).

Drinking Aids	Wheelchair Accessories				
	<p>1 Drink-Aide Drink-Aide consists of an insulated water bottle, a vibration resistant flexible drinking tube and a universal clamp for wheelchair mounting. Drink-Aide allows users to drink fluids with little or no upper body movement. It is one of only a few completely hands free drinking bottles of this kind available. Drink-Aide allows for more freedom and travel.</p> <p>Drink-Aide is a new look for independence and is a cost-effective solution to many carers concerns and provides a number of practical benefits including:</p> <ul style="list-style-type: none"> • Frees caregiver to attend to other needs • Users no longer have to wait for a carer to quench their thirst • May reduce the frequency of hospitalisation due to urinary tract infections caused by inadequate hydration <p>With Drink-Aide an individual has control over fluid intake. This is especially important to those individuals who are aware that good hydration is important for decreasing the potential for urinary tract infections, to improve skin integrity and voice quality.</p> <table border="0"> <tr> <td>PR35076</td> <td style="text-align: right;">£28.00</td> </tr> <tr> <td>PR35076/S 1 Straw</td> <td style="text-align: right;">£4.95</td> </tr> </table>	PR35076	£28.00	PR35076/S 1 Straw	£4.95
PR35076	£28.00				
PR35076/S 1 Straw	£4.95				

Figure 6.5.b: The Flexzi-Stem system that inspired one of Ricky's instruments presentation devices.

CL and WL discussed this idea at the MERU Design Club, where members set about exploring the use of a Flexzi Stem that could connect to a harmonica. When a harmonica was attached to the Flexzi Stem (Figure 6.5.c), the Stem allowed it to be presented at the correct and safe angle for Ricky's use. However, the Flexzi Stem was not sufficiently stable to withstand Ricky's head movements; it gave way every time he tried to play (Appendix 14, 22:55).



Figure 6.5.c: Ricky trying out the Flexzi-Stem.

The first working model of the WIPP had used a reinforced version of the Flexzi Stem, screwed onto an instrument presentation platform made of plywood and covered in anti-slip polymer. Elasticated toggles were attached as required,

according to the instrument(s) Ricky would be using (Figure 6.5.d). In a further development, a model featuring a multi-instrument mounting platform was created for presentation on a reinforced Flexzi Stem.



Figure 6.5.d: Ricky testing the first WIPP prototype.

A Manfrotto Photo Clamp was used to secure the Flexzi Stem to Ricky's wheelchair. This system went a long way towards offering Ricky both choice and the ability to play independently; however, the platform broke under the strain of being fixed onto the Flexzi Stem, and the polymer did not prevent the instruments from slipping (Figure 6.5.e).



Figure 6.5.e: Breakages on first WIPP prototype

Issues relating to the stability of instruments and the accommodation of Ricky's range of movement meant that several versions of the platform were designed and tested before a final working prototype was agreed as viable (BMI Film, Appendix 14, 23:05).

A second model used moulded polyurethane for the platform, and a third wooden model was made to explore the use of silicone strip inserts intended to create friction hold for more efficient instruments hold. (Figure 6.5.f).

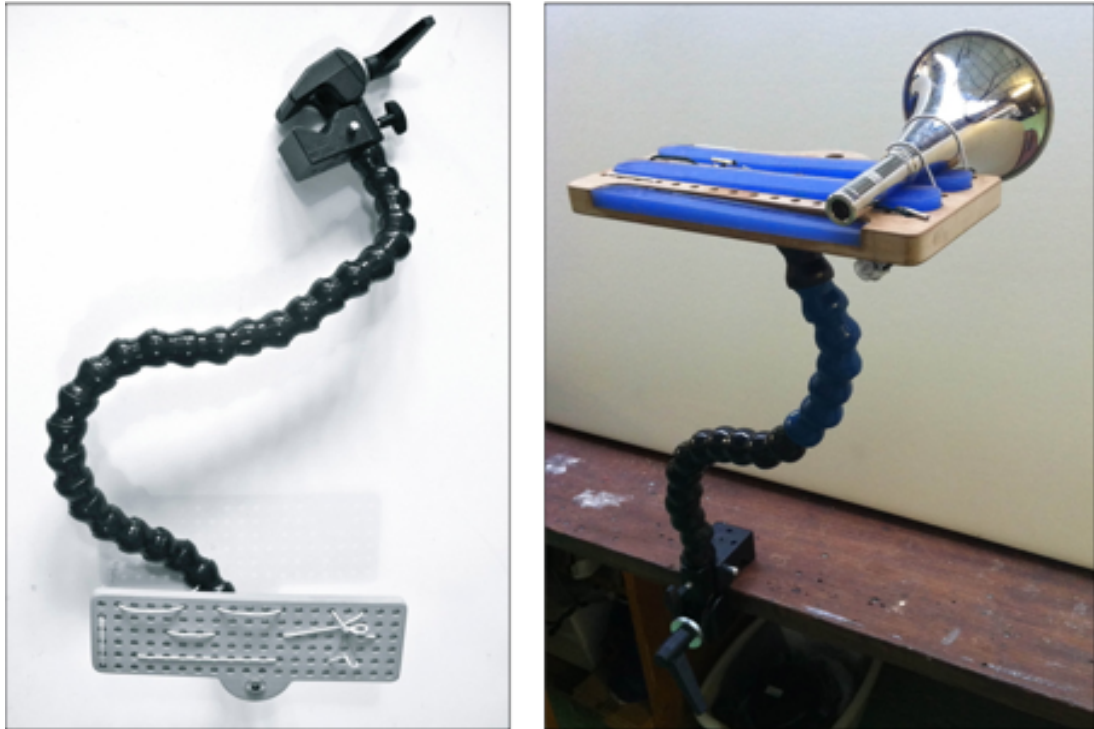


Figure 6.5.f: Second and third WIPP prototypes.

The rectangular shape of the platform meant that Ricky needed to strain in order to reach instruments placed at the outer edge of the platform. A further prototype was therefore built from moulded polyurethane with insert silicone strips. The platform was curved to accommodate the full and safe range of Ricky's laterally arced head movement.

At this point an issue arose in making the mounting for the presentation board stable. The reinforced Flexzi Stem could not hold the weight of the combined presentation board, silicon inserts and various instruments.

Further attempts were made to try to find a secure means of presenting the melodica using an off the shelf mobile phone holder (Figure 6.5.g).



Figure 6.5.g: Further experiments with the Flexzi-Stem.

At the BMI presentation event on 25.03.2011 Ricky's presentation platform needed to be held in place by his support worker (Figure 6.5.h). An alternative mounting system needed to be found.



Figure 6.5.h: Ricky at the Tabernacle presentation event.

6.5.1. The Daessy wheelchair mount

A Daessy wheelchair mount (Figure 6.5.i) was purchased on 09.07.2011.¹⁶

The DAESSY Rigid Mount (DRM1) provides a simple but highly adaptable and adjustable support structure for mounting laptop computers or communication devices on wheelchairs. The Mount consists of two lengths of tube rigidly connected to form a right angle structure. Mounted devices are attached to a horizontal tube crossing the wheelchair and supported by a vertical tube in a clamp that is permanently attached to the wheelchair.

Daessy 2006



Figure 6.5.i: Ricky's Daessy wheelchair mount.

While the mount was an additional and relatively expensive item not included in the initial budget, it was felt that it offered a direct, stable and robust option. MERU Design Club members agreed to build a reliable and adjustable interface between the mount and the platform. In the months immediately after the arrival of the Daessy mount Ricky was able to explore the use of his WIPP (Figure 6.5.j).

¹⁶ Longden, W. (2011) E-mail to Ian Bullock. 9 July.

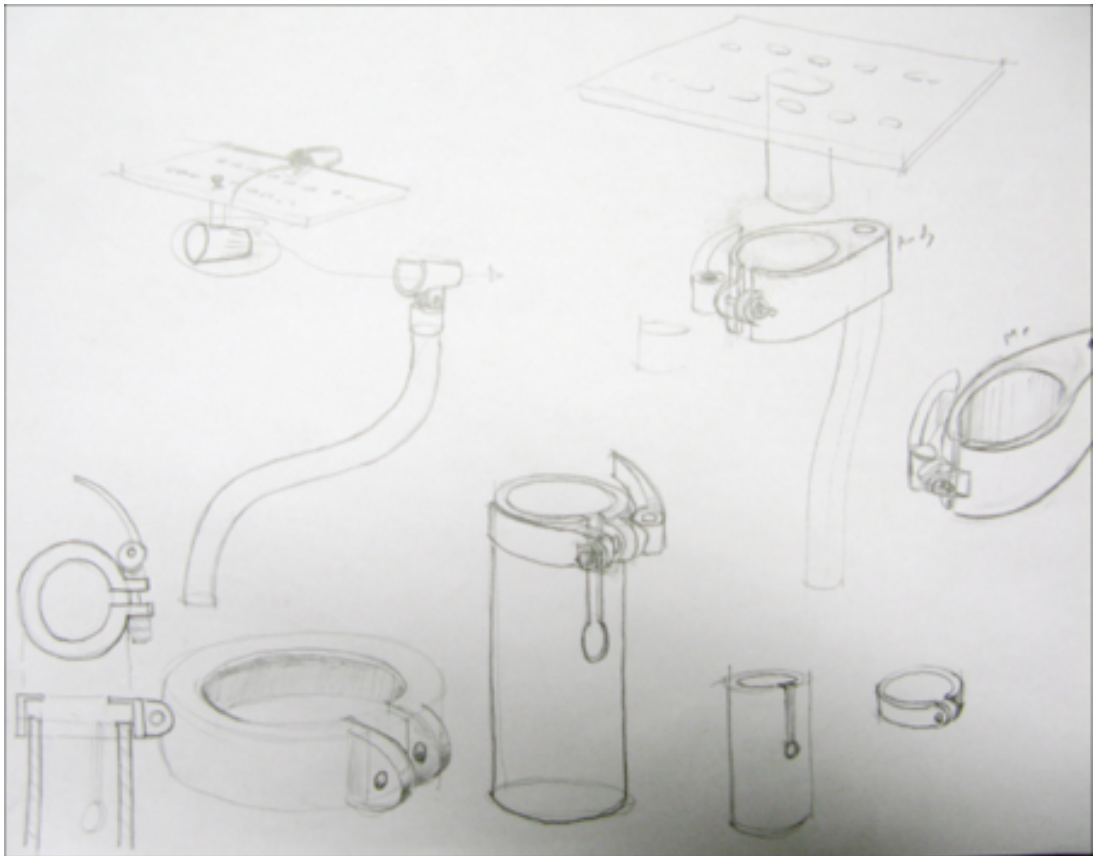


Figure 6.5.j: Daessy mount and WIPP interface design sketches and working prototype being tested by Ricky with a choice of up to four different sounding instruments.

Six months after the fitting of the Daessy mount to Ricky's wheelchair, his chair was changed to accommodate his altered postural needs. During the changeover the connector fitting for his Daessy mount was not removed from his old chair that was discarded, so the fitting was lost. Considerable efforts were made to trace, and to replace the fitting without success. The new chair

design did not accommodate the Daessy fitting.

6.5.2. Adjustable Instrument Presentation Stand (AIPS)

Concurrent with the Daessy frame incident the design of a JOS / MERU Adjustable Instruments Presentation Stand (AIPS) was in process in partnership with the MERU Design Club. The working prototype combined open sourced generic snare drum stand base with a Manfrotto clamping system commonly used in film and photography studios. Combined with an interface made by the MERU team, the resulting stand provided a robust, stable and versatile presentation device that became increasingly used at JOS sessions to offer a variety of instruments to participants with a broad range of access requirements (Figures 6.5.k, 6.5.l).



Figure 6.5.k: AIPS



Figure 6.5.l: The AIPS in use at JOS workshops to present a variety of music instruments and a drawing board.

As Ricky's Daessy mount was no longer usable, Ricky's WIPP was presented by clamping it on to the new instrument stand. After trial use it became obvious an extension rod would allow for a broader variety of access requirements. This was achieved by use of an aluminium tube sleeve with a fixing screw to hold the extension rod in place. The aluminium tube could then be gripped by the adjustable presentation stands to allow for the presentation of the WIPP (Figure 6.5.m).



Figure 6.5.m: Ricky's WIPP mounted on the AIPS

6.6. Ricky's Plectrum Support

The initial consensus informing Ricky's BMI was that a wind instrument would be best. However, a member of the extended design team observed that Ricky used an intended and controlled range of arm movement by which he might potentially play another type of instrument. This observation led to further explorations with Ricky and to the development of a bespoke zither for use with the AIPS and a Plectrum Support to enable Ricky to play it. During early explorations to determine how Ricky might be facilitated to play using his arm movement, a plastic cut-out plectrum was taped to the end of a cooking spatula and inserted into a neoprene wrist splint for Ricky's use (Figure 6.6.a).



Figure 6.6.a: First plectrum support prototype using kitchen spatula inserted into a neoprene wrist splint, purchased at a Pound Shop for £1.

Tests with Ricky during a JOS sessions revealed that after initial gentle introductory assistance that showed Ricky what was required, he could strum a zither independently using the assistive plectrum insert if the instrument was held in a position accessible to his range of movement (Figure 6.6.b). This was a moment of great delight and celebration for Ricky and the team. Ricky was also able for the first time to play a zither without direct intervention and to lead part of the improvised music by starting a rhythm for the rest of the group to follow (Ricky Design Log, p. 33). At this point the Plectrum Support in its first working model state was shown to members of the MERU design cub for their ideas and suggestions towards further development (Figure 6.6.c).



Figure 6.6.b: Ricky working with his co-creative support worker to test the Plectrum Support.

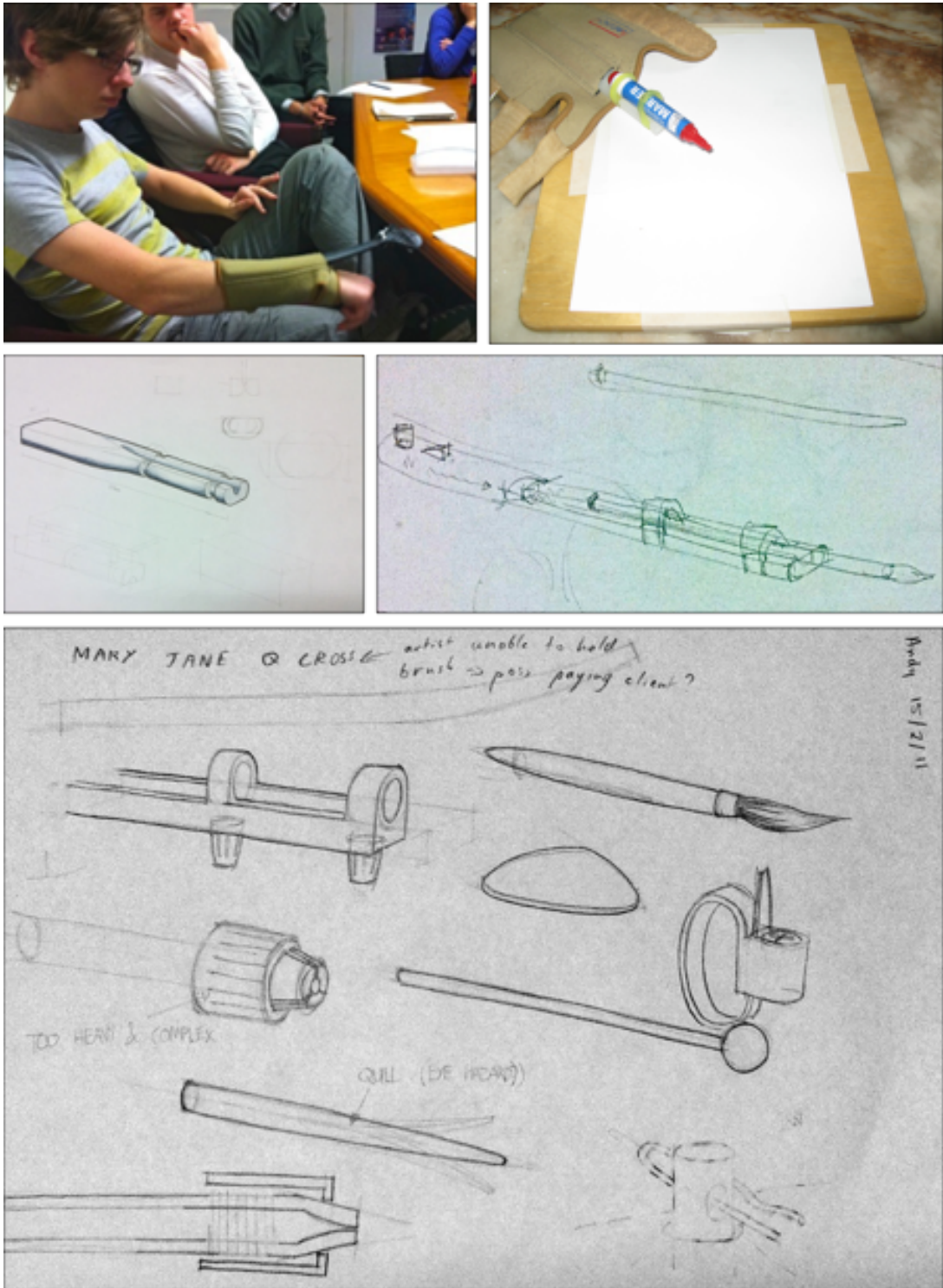


Figure 6.6.c: MERU Design Club, demonstration of first working model and design development for the Plectrum Support.

With input from the MERU Design Club, the plectrum insert benefitted from successive design developments and refinements (BMI Film, Appendix 14, 26:10). The final version of the Plectrum Support featured an off the shelf wrist

splint with adjusted stitching, and a sharpened nylon rod plectrum held in a holder using silicone rubber bands and inserted into the splint pocket (Figures 6.6.d, 6.6.e). The rubber bands were coloured in keeping with Ricky's favourite things. Ricky's Plectrum Support was seen as an opportunity for him to participate in more than just music. It was designed so that the strumming component could easily be exchanged for a paint brush, felt tip pen and potentially for other tools.

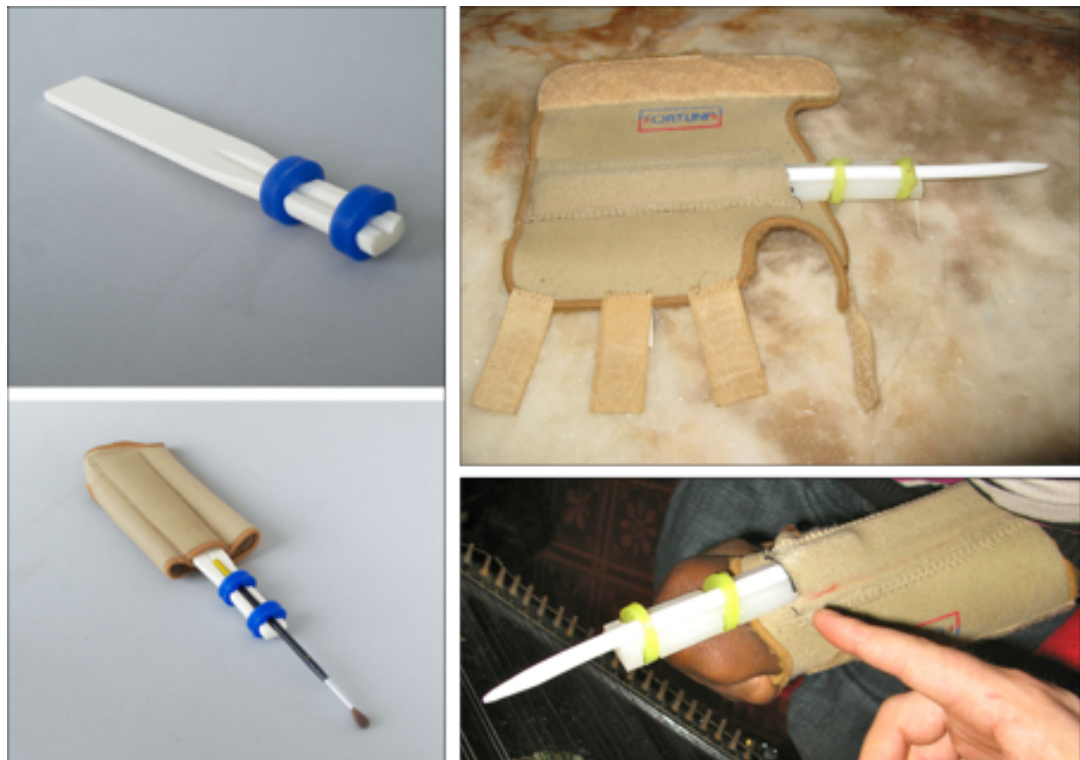


Figure 6.6.d: Plectrum Support and insert plectrum holder that can also hold a paint brush, marker pen, miniature garden rake, and various other tools for Ricky's choice and use.



Figure 6.6.e: Ricky using his Plectrum Support at JOS.

6.6.1. Ricky's drawing

On 18.03.2011 Ricky used his completed working prototype Plectrum Support for the first time at a JOS session. He was also offered a sheet of paper mounted onto a wooden board and presented for his use within his given range of movement. He happily drew marks with a felt tip pen held in position by the Plectrum Support insert. The marks that Ricky drew indicated the range of his self-generated movement, and were seen as a deliberate and distinct statement of his independent ability and self-expression. On completing his first drawing and after acknowledgement and celebration of his achievement by those present, Ricky was asked if he would draw another image immediately underneath his first. Ricky agreed. The drawing board was adjusted to accommodate this request (Figure 6.6.f).

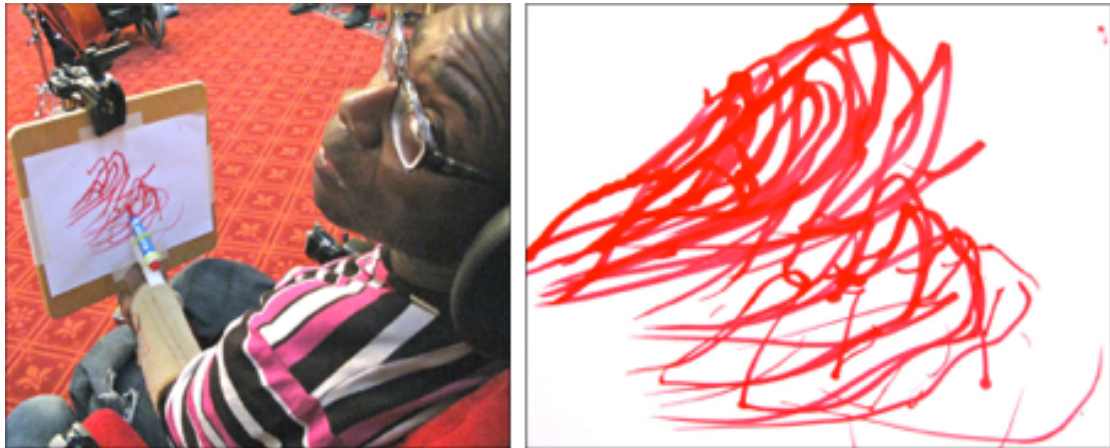


Figure 6.6.f: Ricky's drawing, produced with a marker pen inserted into his Plectrum Support.

Ricky drew a second image immediately underneath his first image. The composite of both images by contrast gave immediate concrete information about Ricky's span and potential range of movement. Dimensions from the drawing were used in planning the spread of strings for Ricky's bespoke zither and to determine the most effective placement and angle of presentation of the zither for his strumming using his bespoke Plectrum Support.

Ricky's original drawing was mounted, framed and presented to him during the celebratory public event. Several copies of the drawing were also made for other members of the team and for LDRC. Ricky's drawing is seen as an icon of Inclusive Co-design that clearly illustrates how disabled, marginalised and disadvantaged people, when given opportunity and facilitation to do so, can contribute as dynamic and creative team players towards the production of original designs and as potent self-advocates for social change.

6.6.2. Zither developments

The original zither used for testing Ricky's Plectrum Support proved to be too heavy for use with the AIPS. JOS possessed several other zithers because they had proved to be a popular instrument at sessions, though their presentation for access by disabled players was an ongoing challenge. As a result of Ricky's BMI design development, plans were put forward to produce

a zither designed specifically to be used in conjunction with an AIPS. Ian Burrow, whose involvement with other BMI design briefs had revealed him to be a versatile, enthusiastic and sincere collaborator, and who was at the time an instrument maker student at London Met with access to the required facilities, was invited to progress the co-design and production of a zither for Ricky's use, that might also be used as a working prototype towards the production of a series of JOS zithers designed specifically for use with the AIPSSs.

IB initially produced a computer-generated 3D Sketch-Up model of a proposed zither. The design was intended to be lightweight whilst allowing for the AIPS to securely grip the zither on either side in the middle of the sound-board (Figure 6.6.g). The clamping position was strengthened by internal support blocks. Clamping positions were clearly marked by an indent on the underside of the zither (Ricky Design Log, p. 28).

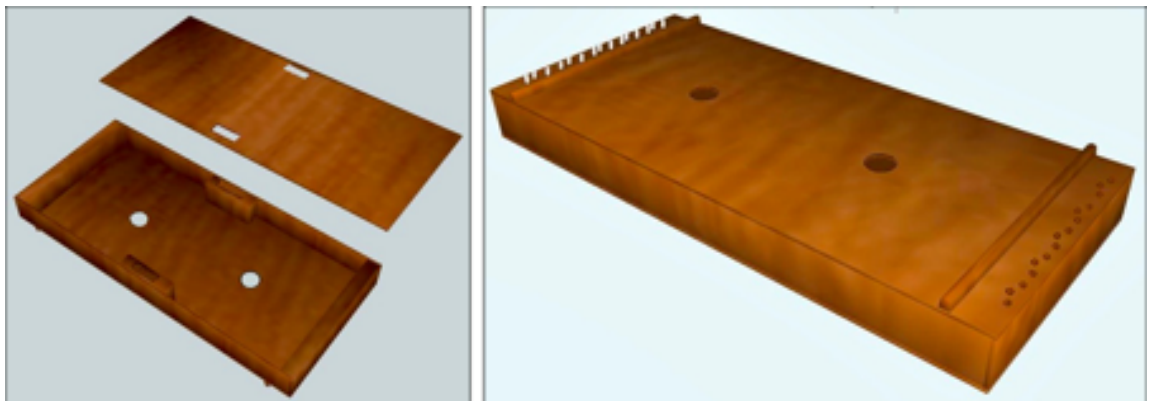


Figure 6.6.g: CAD model of Ricky's zither.

The first version of the zither was made of plywood. Strings were attached to the soundboard by screws and tuning pins, grouped in threes. Side handles were added to make it easier to stack the zither safely as it was envisaged that a successful design would be replicated for use at JOS sessions. A Joy of Sound Logo was printed in the centre, and the perforated sound holes were outlined in Ricky's favourite colours (Figure 6.6.h).

The zither proved successful as a working prototype. It could be mounted on the AIPs, and Ricky was able to play it with the assist of his Plectrum Support. This was an important and moving development considering that it was initially considered that Ricky was not able to use his arms to make music.



Figure 6.6.h: Ricky's working prototype personalised zither with his favoured colours.

6.6.3. Public presentation event at Tabernacle

Although some of Ricky's BMI components were unfinished at the time, the projected public event went ahead to present the designs as works in progress. Attendees included Ricky, his sister and friends, JOS participants and volunteers, LDRC management, care and support team, representatives from

MERU Design Club, BMI C-Ds and makers, design team associates and members of the public.

Ricky was presented with (Figure 6.6.i):

- Working prototype WIPP with attached reed horn and whistle.
- Personalised zither
- Plectrum Support
- His framed picture

Ricky's support workers needed to hold his WIPP platform in place for him to use during the celebratory music session as the Daessy mounting system had not yet been put into place. Ricky was able to exercise choice in the instruments he blew and contributed towards the music making.

Feedback from the event in relation to Ricky's BMIs was (Ricky Design Log, p. 33)

- "The zither has good tone, is well built but has a few strings that don't hold their pitch when tuned." – NG
- Ricky "didn't play very much of the instruments and seemed to enjoy listening more and experiencing the sounds. However, it seemed that when asked to play in a quieter environment he really enjoyed being able to do so." – VC
- "Rickie's [sic] multi harp / scraper / twangable perc. looked and sounded great - I was interested too in his mouth piece." – JB



Figure 6.6.i: Ricky presented with his BMIs and mounted framed drawing.

6.6.4. Wear, tear and required alterations

The pegs on the zither prototype continued to be prone to slipping, and could not hold tuning. IB suggested that using a hardwood such as Beech or Maple would prevent this from occurring in any future model. In the meantime, he recommended using lighter strings that would require less tension, and swelling the wood around the pegs. Despite applying modifications to the zither as suggested, the body began to warp, and the prototype was abandoned (Ricky Design Log., pp. 32-24). However, the design was successful in generating user feedback that led to the creation of the improved zither design that still in popular use at JOS (see Discussion and Conclusions, section 8.4.1).



Figure 6.6.j: Ricky with his choice of four instruments and sounds

In this chapter, I have presented BMIs and IADs developed through working with Ricky, and outlined the design processes and prototypes by which they were realised. In the next chapter, I offer reflections on the BMIs and their design processes, using qualitative feedback of those involved in the project, by reflecting on stated project aims and objectives, and through examining a film made about the project.

7. Reflecting on the BMIs

In this chapter I reflect on the produced BMIs and associated IADs. I refer to the LDRC focus group and general design log feedback, focussing on individual designs and revealing common considerations. Considering the produced BMIs in relation to the project Aims and Objectives, I highlight advantages arising for C-Ds and note challenges to process. Acknowledging benefits gained by C-Ds' participation, I draw attention to their contributions as co-designers towards achieved process and design innovations that include and advocate for increased access to participation and lifelong learning opportunities.

7.1. LDRC focus group

A BMI focused feedback meeting was arranged on 13.08.2012 with the support of staff and management at LDRC. The meeting involved care and support staff and management including Nicole, Ricky and Karim's key workers, all of whom attended voluntarily. Achieved BMI designs including those for Nicole, Ricky and Karim were presented, described and demonstrated in use. Design process sketches and CAD drawings were shown. Participants were encouraged to interact with the instrument and to ask questions. A feedback form (Appendix 8) was devised with support from LDRC staff and was used to record feedback in situ. Twelve LDRC team members offered their comments.

7.1.1. General feedback

Feedback has been coded and analysed using guidance from Walliman (2005) to draw out responses to each instrument that have implications for users with similar requirements. However, some of the feedback was common to all three instruments, which has implications for the general benefits of inclusive design. These commonalities are presented first.

Developing BMIs

In terms of developing BMIs – those currently in use, or creating new BMI projects – the feedback indicated that the process should be person-centred and led by the service user, whilst consulting families, professionals and carers. Experimental / improvisatory design, publicity and funding were also felt to be important. Feedback pertaining to person-centred methods for developing BMIs and the BMI project emphasised Intensive Interaction as a way of understanding a person's preferences (Coded focus group feedback, Appendix 9).

- We can develop the instruments design project further “by being led by Karim, does he reveal / unfold any further characteristics that can be reflected by the instrument.”
- “Talk with Ricky, find out how he would like to develop his instrument.”
- “Continue to observe Nicole when she plays instrument. Continue to monitor her interaction with it. Feedback this information to its creators.”
- “Following Nicole's lead.”
- “Observe agreement to choices made by body language signs, ask questions.”
- “Continue inclusive process and monitor the results with service user participation integral to the participation.”
- “Ask Ricky how he is feeling, watch his facial expression, body language, vocalisation, try out on instrument.”
- “Take time and give time for the service users to react to any given opportunity, so their responses can be measured and contribute towards the design process.”
- “Remember that individual is central to process, don't let theories / technology get in the way. Remember who the instrument is for.”

Feedback also demonstrated the importance of involving a variety of people, including families, care and support networks and professionals (Coded focus group feedback, Appendix 9).

- “Get her mum and sister to do it with her, dad was a musician, and she [sic] might have a good suggestion.”
- “Working with family to explore what would be good instrument for him.”
- “Professional input i.e. speech + language therapists, behavioural.”
- “Ask questions, ask family, ask professional, ask designer, try out the instruments.”
- “Family members, other professionals in speak language.” [sic]
- “His sister [H] will know many songs and music that Ricky has liked all his life and which have significance for him – he likes singing along with things he knows and also enjoys playing them as well.”

Feedback for the three BMI projects highlighted some potential ways of making the project public (Coded focus group feedback, Appendix 9).

- “Keep playing, advertising, gigging.”
- “Public performance. Newsletters. Website.”
- “Musical activities in the future, public performance will raise the profile of those with LD.”
- “Form a band, etc.”

Improvisation, experimentation, and bringing in new ideas and equipment were also felt to be important to developing the project (Coded focus group feedback, Appendix 9).

- “Enable people to handle as many instruments as possible.”
- “Develop IT designs, adaptive when needed to individuals changing abilities.”
- “Involve other equipment and encourage designers to submit ideas.”

Finally, it was mentioned in feedback for both Ricky’s and Nicole’s BMI that “increased funding” / “more funding” would enable further development (Coded focus group feedback, Appendix 9).

Benefits of the process for C-D

All those present at the LDRC feedback sessions had been involved in the BMI design process, via attendance at workshops and by their regular daily interactions with Nicole, Ricky and Karim over time. They were well placed to identify ways in which the process had affected the C-D.

Confidence and enjoyment were among the chief benefits noted, which in turn influenced the project's impact on participants' wellbeing (Coded focus group feedback, Appendix 9).

- “Users have become more confident around using the instrument – it seems to have become an extension of their personalities.”
- “Individuals were engaged, came alive, informed process.”
- “Ricky enjoyed using the instrument, you could see that he was having fun.”
- “With respect to Ricky, his confidence seems to have grown over the time and as he becomes aware of the capabilities of the instruments, so has his energy levels with regard to playing them.”
- “Nicole enjoy playing the instrument, always smile.”
- “Nicole has become more engaged + happy within sessions.”
- “To enjoy playing an instrument feeling part of a group of like-minded musicians having fun together.”

Feedback indicated that the instruments, through their design, and also through their use, had become vehicles of self-expression for the C-Ds (Coded focus group feedback, Appendix 9).

- “This session [sic] could really demonstrate a new level of self-expression for Nicole.”
- “Self-expression and interaction (positive) has improved.”
- “Having musical instruments provides some authenticity for the individual, a sense of power in the production of sounds.”

- “For Ricky personally, I believe much of the success of various instruments here is due to their ability to allow Ricky to express himself musically.”
- “The instrument strongly reflects... Nicole’s cultural heritage, which is element to her personality.”
- “The Karimbek is direct and clear reflection of Karim himself, his character and personality traits.”
- “Fact that it meets Ricky’s musical abilities – he has informed creative process – functional brings joy.”

Choice and independence were seen key advantages of the instruments’ impact on C-Ds’ wellbeing, linked to the development of new skills (Coded focus group feedback, Appendix 9).

- “Choice. A feeling of freedom independence... Developing new skills.”
- “Learning new skills, having new sounds.”
- “Once instrument fixed to chair, independence in use.”
- “When I first know Ricky, he had a mouth organ, it is now fantastic to see this wide variety of instruments Ricky has access to – brilliant!”

Feedback indicated that the C-Ds benefitted from the process by not only accessing a wider community than they had previously been involved in, but that they had impacted members of that community as well (Coded focus group feedback, Appendix 9).

- “The instrument have given [sic] Nicole opportunity to full more community involvement / participation.”
- “More interaction with Nicole, from volunteers / staff.”
- “As participants see the response it generates with Nicole, they become more energised.”
- “Their preference [sic] in the local community (via Thursday session) has raised profile of our service users within local community, exposing them to the opportunities they would not have had.”

- “Improves extended community – getting to know people outside of RBKC e.g. Vauxhall.”
- “I believe that levels of confidence and energy from the individual service users has caused a ripple throughout the staff and volunteers attending the sessions and the local community has felt this through our Thursday’s sessions.”

Comments highlighted that benefits brought by the C-Ds have broader implications for disability culture, and that the C-Ds, by virtue of their involvement, had become advocates for disabled people (Coded focus group feedback, Appendix 9).

- “A clear advantage is that many people would wrongly draw the conclusion that Nicole could not play an instrument. This clearly demonstrates otherwise!”
- “Opens up involvements – challenges how we support – move away from traditional ‘clash bang!’ disability work groups.
- “This could be crucial in raising awareness of disability in other territories.”
- “The advantages are endless i.e. new + increased skill base, recognition of talents, admiration from his brother.”
- “Challenged ‘Can’t be done thoughts,’ demonstrated individual potential(s) – opened up possibilities of using technology learned to other realms. Rattled a few cages.”
- “Good way to raise awareness of disabled people.”
- “New people are always amazed when Ricky plays independently.”

Feedback on the BMIs indicated that the advocacy discussed above extended to C-Ds’ own care and support networks, in terms of best inclusive practice. The BMIs also serve as transitional objects towards building relationships with their C-Ds (Coded focus group feedback, Appendix 9).

- “By spending time with Nicole when she is using instruments, this could

- be effective introduction to getting to know Nicole.”
- “The instruments can provide a great introduction into one aspect of getting know Ricky, when spending time with him.”
- “The entire team who collaborated to create the instrument will have had heightened exposure to the world of learning disability.”
- “Wider acknowledgement of PMLD (*Profound and Multiple Learning Difficulties*) and how to support and communicate with them.”
- “All involved will have heightened awareness of ability / disability.”
- “A greater understand of PMLD and how the sharing of experience + knowledge has produced such important work.”

Disadvantages and points of concern

The LDRC Evaluations asked those present to highlight disadvantages and areas of risk associated with the instruments, and to provide suggestions for improving the BMIs and the BMI design process. Feedback specific to individual instruments will be presented in the next section. However, there was some overlap, which provides guidance for developing the process in the future. There are seven instances of feedback expressing concern about the instruments’ weight and size. Feedback also indicated a concern that those supporting Ricky and Nicole have adequate training in set up and use of their BMIs (Coded focus group feedback, Appendix 9).

- “Simply to ensure that Nicole is always safe when using the instrument and supported by those who knows her well.”
- “Supporting staff to know how to use / set up instrument in a way that is not stressful for Ricky.”
- “It is a heavy instrument and could do damage if dropped.”
- “The instrument can be made a bit smaller and lighter.”
- “Disad’ – large storage.”

In the next sections I present feedback relating to specific BMIs and their C-Ds. In each case, the feedback reflects distinctive elements of each Design

Journey, and unique aspects of each individual, and their relationships with their care and support networks.

7.1.2. Feedback on Nicole's Mojojo

Feedback unique to Nicole highlighted the Mojojo's therapeutic effect, some issues and potentials around the Mojojo, instrument-specific safety concerns and a variety of thoughts about the viability of the Mojojo as a multi-player instrument.

Two commentators on the Mojojo fed back that the experience of playing was "therapeutic for Nicole," and "very relaxing" (Coded focus group feedback, Appendix 9). This may be due to the instrumentation, or the experience of being supported on either side.

Feedback specific to the Mojojo highlighted its unique design and versatile pod system, whilst offering some critique about the musicality (Coded focus group feedback, Appendix 9).

- "It is beautiful instrument & very eye contacting, which I am certain Nicole will appreciate."
- "Inclusive colouring of the instrument flag."
- "Potential to expand pods = expand groups."
- "Develop other sound pods."
- "Could have other instrument attached such as bell etc."
- "The legs could be more robust, though their current status is more than safe."
- "Few of the sound bars are broken and need repair, some strings need tuning."
- "Bit on the right is too dull – not sharp enough."

Safety concerns about the Mojojo highlighted the importance of mounting the instrument carefully and positioning it correctly in relation to Nicole's legs

(Coded focus group feedback, Appendix 9).

- “That the stand is secured safely to the instrument.”
- “Quite close to her legs in ... ILLEGIBLE...”
- “Careful of positioning of equipment very near legs.”

Participants in the LDRC Evaluation session offered salient feedback about the Mojojo’s viability as a multi-player instrument, that both celebrated its potentials for enabling Nicole to take part, and suggested that staff were considering ways for her co-assisted play to become increasingly independent (Coded focus group feedback, Appendix 9).

- “As a multi-player instrument it works well, in the future it would be amazing to somehow give Nicole opportunity to play more independently or semi-independently e.g. sound beam focused to eye blinking.”
- “Easy for Nicole to use, when staff supports.”
- “Challenge for Nicole ‘support’ not to take over, really need to tune into Nicole’s movement / being.”
- “If Nicole’s movement ability was to improve, her support with Mojojo could be modified accordingly.”
- “May be bit difficult for staff to support Nicole to play instrument e.g. twisted sitting position.”
- “Read Nicole’s facial expression. Play in time with blinks.”
- “Advantage – 2 staff support Nicole to use the Mojojo so that she can fully experience the use of instrument.”
- “Player (Nicole) requires 2 staff to be fully ...ILLEGIBLE...”

7.1.3. Feedback on Karim’s Karimbek

Feedback unique to Karim’s design journey emphasised its impact on his personal development, specific aspects of the BMI, safety concerns and future potentials inspired by the Karimbek and Karim’s engagement with it.

Karim, already “an enthusiastic session attendee” (Karim Design Log, p. 7), with his Karimbek, began to take “a lead facilitator role” (Coded focus group feedback, Appendix 9). Whereas Karim was previously prone to becoming “fixated in his own actions” (Karim Design Log, p. 13), feedback was that his “self-expression and interaction (positive) has improved” (Coded focus group feedback, Appendix 9).

Feedback about the Karimbek indicated an appreciation for a number of aspects of its design, including its tuning, dual modes of play, and decoration (Coded focus group feedback, Appendix 9).

- “The parent [sic] lack of tuning to keep Karim’s focus, the cultural references, the ability to strum + bow, name.”
- “Right weight, strap – supportive. Likes to use his hands to express himself.”
- “Robust and feels good. I like his picture at the end.”
- “The unorthodox tuning procedure.”
- “Head, easy to tune... personalised pictures / symbols, etc.”
- “Combination of two instruments.”
- “Fact he can use bow or can pluck it.”

Although, as indicated above, some feedback felt the Karimbek to be of a robust and good weight, others were concerned that it was too heavy, and expressed other concerns about safety (Coded focus group feedback, Appendix 9).

- “Too heave [sic] perhaps? Sharp edges.”
- “The sharp screw on the head can be used as weapon, he bang on head.”
- “Could be used as weapon, easy to break, can be difficult to transport, store.”
- “The screw on the head may need to go ‘in’ a bit more.”

Feedback about future potentials for Karim and the Karimbek highlighted his love of performing, and the fact that he had already begun to demonstrate potential as a facilitator. It seems there was a growing tendency to see Karim as a musician with potentials beyond JOS (Coded focus group feedback, Appendix 9).

- “Something that responds to the way Karim likes to move, whilst playing e.g. bells attached to sides.”
- “He helped to create a dance which was performed at Barbican (the college of Dance).”
- “Karim to participate as co-learner in this process (teach others how to play it).”
- “Form a band, etc.”
- “Get more people involved.”
- “Are there any Indian instrument players around in London?”

7.1.4. Feedback on Ricky’s BMIs and IADs

Feedback unique to Ricky emphasised the way his BMIs and IADs created opportunities for him to access musical instruments, and the advocacy such access brought about. There was also feedback specific to his various BMIs and IADs, points raised about safety, and future potentials for Ricky.

Feedback related to Ricky’s access and advocacy showed how revolutionary the BMI co-designing experience had been for him, and suggested that those working with Ricky were also affected by his design journey (Coded focus group feedback, Appendix 9).

- “Fantastic to see this wide variety of instruments that Ricky has access to – brilliant!”
- “Opportunity to play instruments that may be otherwise out of bounds.”
- “These instruments provide Ricky with superb accessibility to sound / music.”

- “Choice of different instruments to play.”
- “Pushed individuals outside their comfort zones, challenged perceptions / beliefs.”

Instrument-specific feedback mentioned that replaceable parts would be helpful, and that there were some issues in setting up the melodica (Coded focus group feedback, Appendix 9).

- “The melodion is tricky to set up sufficiently for RC to play.”
- “Replaceable parts available.”
- “Cleaning, repairing, replacing parts.”

Safety concerns about Ricky’s BMIs and IADs were mainly focussed on the proximity of the Wind Instrument Presentation Platform to Ricky’s face, and Ricky’s general comfort. Confidentiality was also mentioned (Coded focus group feedback, Appendix 9).

- “Occasionally Ricky can start violently and could (although not likely) bang his face off anything close to it.”
- “The positioning is key so RC is comfortable, and no instruments are likely to poke him in the face, must always wear chest harness!”
- “The weight of instruments and the hardness of the materials is a prob...”
- “Make sure that RC is comfortable, i.e. enough to drink, is he too hot, cold, seated correctly. Ask him open questions and act on his responses.”
- “Confidentiality with individual personal details – vulnerable adults.”

In considering future potentials for Ricky and his BMIs, and IADs respondents mentioned potentials for developing the BMIs, as well as opportunities for partnerships with other arts organisations, suggesting that Ricky could act as an ambassador for inclusive design (Coded focus group feedback, Appendix 9).

- The BMIs “give Ricky heightened equal opp, and further insight to his opportunities.”
- “As his skills develop, maybe the instruments could develop accordingly.”
- “You could invite LSO musicians to come to centre and observe / participate. They do outreach.”
- “Liaise with London school of music.”
- “The college of dance might be interested too.”

7.2. Reflections on the production of BMIs in relation to given Aims and Objectives

7.2.1. To work with Co-Designers as members of an interdisciplinary team including care and support networks.

The case studies reveal how Nicole, Karim and Ricky participated as C-Ds in the initiation, development and production of their BMIs. By their participation as experts by experience they instigated and led the design process on their own terms. They did so by contributing core motivational drivers, information, and feedback towards design developments that resulted in new knowledge creation regarding inclusive design processes and the achievement of unique design features of their BMIs and associated access devices that were of personal and social benefit. In doing so Nicole, Karim and Ricky acted as personal and social advocates by demonstration for equal rights of access to wellbeing activities and to all areas of society, for disabled and marginalised people.

As C-Ds and players of their BMIs they participated in process by:

- Instigation of BMI design processes as motivational drivers.
- Input at key design development meetings.
- Inviting design team members to visit them at their homes in order to gain detailed references towards the personalisation of their BMIs.

- Demonstration of their ability and skills by user testing of BMI models and working prototypes.
- Providing user feedback at LDRC and JOS sessions regarding the viability of designs.
- “Energising” and motivating other project participants during JOS sessions that occurred during design process.
- Attending public events and workshops to demonstrate their BMIs in use.
- Motivating music instrument designers and makers towards the exploration and development of new approaches to the design of music instruments and instruments access devices by demonstration of their BMIs in use.
- Allowing BMIs to be used in demonstration of their power of advocacy for inclusive society, at conferences, seminars and workshops throughout London, the UK and internationally.
- Allowing other disabled people to use their BMIs and access devices to demonstrate transferable qualities and potentials.

Prime input from Nicole, Karim and Ricky was supplemented by input from their familial and professional care and support networks, associates and friends, instruments designers and makers, LDRC management and day-care team members, MERU management team and Design Club members, staff and students of London Metropolitan University Department of Instrument Technology, specialist therapeutic consultants, JOS BMI core team and extended volunteers, JOS disabled project participants and their care and support workers, members of local and extended communities and others. Engaging a multi-disciplinary team of individuals and institutions within the BMI teams increased opportunity for breakthrough solutions to emerge fuelled by the rich array of perspectives.

7.2.2. To use person-centred, inclusive and participatory design approaches in working with disabled Co-Designers to design and make acoustic music instruments bespoke to meet their personal

preferences and needs.

As discussed in Chapter 2 (Research Methodology and Methods), a person-centred, inclusive and participatory design approach is characterised by the core participation and consideration of C-Ds at every stage of design development, from inception to realisation and throughout ongoing post-production testing and re-modification of the designed object. Each BMI was generated and determined by its C-D's unique presence, personality, choice, ability and need. Nicole, Karim and Ricky were central to design instigation, development and flow by their testing of components and versions of their BMIs, and by giving direct user feedback concerning the viability of form, content and purpose of their BMIs' design development.

In the first instance, C-Ds were invited to introductory JOS workshops where they were given opportunity to access and explore a broad variety of generic music instruments with the support and assistance of design team members when required. These sessions revealed the individual abilities, preferences and access requirements that were referred to in building the BMI design briefs to potential makers. Design team members worked closely with BMI C-Ds to test ideas and prototypes, considering and responding to feedback about the viability of emergent ideas and designs that were modified and re-tested according to C-Ds' user feedback to optimise accessibility, playability and personalisation of design features.

Reflection on process outcomes constantly re-informed design process in responding to C-Ds expressed preferences and abilities. For example, when Ricky demonstrated his arm movement during an observation that was primarily focussed on his range of head movement in developing his WIPP, this was immediately seen as an opportunity to broaden the possible ways in which he might make music. The occurrence led to the production of an additional BMI and Instrument Access Device – his personalised zither and Plectra Support.

The BMIs and IADs reflect the person-centred, inclusive and participatory approaches that underpinned their development and realisation. As C-Ds are players in the JOS idiom, the BMIs and IADs also reflect the music that is the JOS idiom, in their tuning, adaptability, ease of access and personalised designs.

Mojojo

- The Mojojo is a composite multi-player instrument intended to facilitate Nicole's assisted co-creative play, by encouraging the participation of her care and support workers and others.
- The choice of xylophone, stringed and percussive instruments as changeable inserts for the Mojojo's slide-in pod system answered Nicole's preference for a variety of instrumental sounds (Nicole Design Log, p. 19), and for the variety of physical contact interventions that encourage movement in accordance with her physiotherapy programme.
- The Mojojo's colour scheme reflected Nicole's preferences (warm and chocolate colours) and cultural background (Antiguan flag) (Nicole Design log, p. 44).
- The Mojojo and its flat-pack adjustable presentation stand were designed as adjustable to fit snugly with Nicole's body position and wheelchair proportions. Measurements were determined by consultation with Nicole (Nicole Design Log, p. 22).

Karimbek

- The Karimbek design was based on Karim's demonstrated enthusiasm for stringed instruments. It facilitated his preferred methods of playing that included strumming and bowing.
- A shoulder fitting safety strap was fitted to accommodate his preferred style of play that involved moving and dancing as he played.

- The ground colour and calligraphic surface decorations were preferred by Karim in reflection of his Muslim faith.
- In acknowledgment of one of his favourite film characters, James Bond – Karim chose the personalised headstock picture insert that showed him holding his instrument in a manner typical of James Bond. The image was produced with Karim’s input specifically for this purpose.
- The embedded tuning-heads were developed to reduce the possibility of detuning during play and to discourage compulsive behaviour.
- The sound holes were shaped to amplify the instrument’s Muslim design motifs, and specifically located so that Karim could hold the instrument securely and safely without impeding its use during his preferred modes of play.
- Three different bridges were produced to facilitate Karim’s different styles of play.

Ricky’s BMIs and IAD

- Ricky’s use of *Stimmpfeifen* (Nordoff Robbins Reed Horns), various whistles and flute-like instruments, harmonicas and melodica reflected his ability to play, and his enjoyment of wind instruments.
- Ricky’s WIPP enabled him to choose from a variety of combinations of blown instruments, and to select which he wished to play.
- A Daessy Mount, and subsequently the AIPS made it possible for Ricky to independently and safely access his WIPP.
- The Plectrum Support that fitted around Ricky’s wrist, made it possible for him to play an appropriately presented zither, guitar and potentially other instruments. The access device also enabled him to draw an image, and potentially to participate in other activities such as gardening.
- The colours red, white and blue, reflecting Ricky’s favourite football teams Chelsea and Manchester United, were used as pigmentation for the various component parts of his moulded WIPP.

7.2.3. To produce instruments that facilitate and encourage disabled Co-Designers' increased access to participation in JOS inclusive community music making sessions and other lifelong learning opportunities.

Increased access to participation

Disabled C-Ds' involvement as experts by experience made them the focus of attention at meetings, workshops, public events and in a variety of other situations over a prolonged period of time. These circumstances provided opportunity for meaningful and purposeful creative social interaction and continuum that enhanced established relationships and introduced new ones. This included meetings with other C-Ds and design team members, designers, makers and consultants and a broad range of volunteers, attendances at JOS workshops in a variety of settings, social and educational visits, and public events that resulted in C-Ds being introduced to new environments and stimulating experiences including people of all ages, abilities and cultural orientations.

Nicole's customary support from the LDRC team was frequently enhanced by her having two support workers as were required to work with Nicole as co-players during the design development of the Mojojo, after its production in testing the instruments functions, and on an ongoing basis (Nicole Design Log, p. 12).

Feedback from LDRC indicated that throughout his BMI design process, changes in behaviour were observed in Karim: His "self-expression and interaction... has improved" (Coded focus group feedback, Appendix 9). Following an observational session, JH mentioned "I did notice that [Karim] was paying more attention to the demands and requests made upon him, so he was more conscious of the movements and actions of others and therefore

he was included within the overall process” (Karim Design Log, p. 13).

Participants in the final LDRC Focus Group frequently mentioned Ricky’s benefits in terms of access, emphasising that through his role as a C-D, Ricky’s participation and potential self-expression had transformed (Coded focus group feedback, Appendix 9). Using his WIPP, Ricky both played independently, and chose which instrument to play. The Plectrum Support facilitated him to play instruments that he had never previously played independently and to produce drawings in a manner he had never previously achieved. Ricky’s drawings gave important information to his design team members that helped to determine design features of his BMIs. In doing so Ricky’s ability to self-advocate and by extension his capacity to act as an advocate for social change was enhanced.

Lifelong learning opportunities

Feedback from the LDRC Focus Group indicated that the BMI project “raised [the] profile of our service users within local community, exposing them to the opportunities they would not have had” (Coded focus group feedback, Appendix 9). By their participation, Nicole, Karim and Ricky’s social profiles became raised amongst their associates and support teams at LDRC, at additional workshops elsewhere, at presentations, and at public events. Several members of the extended BMI design teams developed new associations with C-Ds that became evident at meetings as an expression of shared familiarity, camaraderie and friendship. In Nicole’s case, this was illustrated by MH’s comment that

I think that you are creating opportunities for people to communicate. Especially for someone like Nicole who may get less interactions than someone who has speech [...]. Having an instrument will encourage people to spend time with Nicole as they will have something to communicate about
Nicole Design Log, p. 11

During the project Karim began to explore and express “a lead facilitator role. Using [his] Karimbek, by moving around his fellow players encouraging their

input” (Coded focus group feedback, Appendix 9). It was suggested that he could develop this tendency, by teaching other participants to use his Karimbek, and by collaborating with other musicians, or by forming a band. The ability to focus, which Karim was seen to be developing suggested further potential for lifelong learning.

Ricky’s use of his IADs provides a wealth of potential for his further participation and development as a musician. Beyond this, the Plectrum Support facilitates Ricky’s potential access to, and use of, a variety of other tools and devices that might substantially increase his access to activities that he could not have previously participated in, such as drawing, painting or gardening.

A number of participants in the LDRC focus group suggested partnerships with other organisations, and advocacy and representation potentials for Ricky, including the London Symphony Orchestra, London School of Music and College of Dance (Coded focus group feedback, Appendix 9). The fact that these potentials were particularly highlighted for Ricky suggests that his process had not only created new potentials in terms of access, but had transformed the way people were seeing him. As “‘can’t be done’ thoughts” were challenged, new potentials for lifelong learning and advocacy were opened up (Coded focus group feedback, Appendix 9).

7.2.4. To produce music instruments bespoke for disabled Co-Designers, whilst also allowing them to be adaptable for use with other players across the broadest range of abilities, for recreational, social, educational and therapeutic purposes.

Participating disabled C-Ds were central to the design process of their BMIs and IADs. This ensured that the achieved designs were bespoke to their particular individual ability, choice and need. In all three cases, however, it became clear that the BMIs and IADs might also be used by other people as

recreational, educational and therapeutic tools either in the same form, or with slight adjustment or adaptation.

The Mojojo

Whilst being specifically bespoke for Nicole, the Mojojo was designed with multiple potential players also in mind. In an e-mail to KH, WL stated that “It seems that we now have a third potential design recipient for whom the pod designs might best be suited... Two, Nicole and Joanne, are wheelchair users and Carol is mobile though only plays sitting down” (Nicole Design Log, p. 31). Since the Mojojo’s completion as a working prototype, it has been used by a number of players in JOS sessions, revealing a variety of potentials for its further development as a broad reaching inclusive design initiative.

As a composite, multi-player music instrument the Mojojo brings into focus the function and significance of co-creative assistive participation, providing opportunity for creative interaction between disabled players and their support workers and facilitators. It also encourages the self-expression and individual creative contribution of support workers. Several aspects of the Mojojo design make it an ideal choice of instrument for a variety of players with broad ranging abilities, preferences and access requirements.

- The Mojojo’s unique pod system: easily interchangeable and variable sound boxes give the instrument multiple potentials as a composite music instrument with the capacity to facilitate an extensive range of recreational and therapeutic opportunities for people of all abilities to use as individual or co-creative players.
- The sound-pod’s specific slide-in soundboards allow for the presentation of a broad variety of interchangeable bespoke and generic instruments, and assistive devices that might serve the broadest range of players of all abilities and preferences.
- The distinctive flat pack, lightweight, adjustable wheelchair presentable Mojojo presentation stand is adaptable for use in multiple contexts as a

presentation device.

The Mojojo has proved to be useful as a therapeutic and training tool for the familiarisation of care and support staff, JOS facilitators and others with approaches to co-creative and assisted play. Additionally, at JOS sessions in Hackney volunteers with complex learning needs have learned how to set it up, and then passed on that knowledge. In this way, the Mojojo has exceeded its purpose as a musical instrument, and become an object of co-learning and teamwork.

The Karimbek

The Karimbek, as noted by the feedback from the public presentation, was “clearly just right for him” (General Design Log, p. 150). Initially, Karim took his instrument home. However, support workers said it was not viable to transport it from home to the session, so it has remained at the Salvation Army Hall, where the JOS sessions take place. Karim has not been attending sessions recently, and the Karimbek has therefore been used by other JOS participants. Its inclusive design has allowed its use by players with a range of abilities at JOS sessions and it has served as an exemplar of inclusive design at educational outreach events.

The Karimbek’s shoulder strap means that it can be played by a player who is not able to hold it. The fact that it can be bowed or strummed means it is usable by players with a range of dexterity, and its frets allow for more advance playing. Its size means that it can be played by two players, when placed across the lap, offering social potentials. Finally, the Karimbek’s unique design and decoration opens up dialogue about the nature of the instrument itself, which can be a means of education about inclusive design and organology.



Figure 7.2.a: Another player uses the Karimbek at JOS.

Ricky's IADs

Whilst bespoke for Ricky his BMIs and auxiliary equipment are an ideal set-up for players with similar access requirements. Their impact has been greatest as agents of education and advocacy, inspiring the development of further instruments.

The WIPP and Plectrum Support allow for access to a wide range of instruments and devices, and have been presented at events as a demonstration of inclusive design potentials towards a more equal and inclusive society.

The production of Ricky's Plectrum Support led directly to the ongoing development of a strummer assist and other auxiliary design innovations including the strummer assist extension rod and a bowing assist. These innovations are regularly used at Joy of Sound workshops and outreach events, and are presented at greater length in the Discussion and Conclusions chapter.

Ricky's IADs and those that they inspired have served as experiential training tools towards the instruction and familiarisation of care and support staff, JOS

facilitators, volunteers and others in sharing approaches to co-creative and assisted play. JOS volunteers, including those with learning access requirements have learned how to set up Ricky's BMIs and have then been able to pass on their knowledge. As such, Ricky's BMIs serve as instruments of co-learning, team building and social advocacy.

One participant in the LDRC feedback session commented that "having musical [instruments] provides some authenticity for the individual, a sense of power in production of sounds," (Coded focus group feedback, Appendix 9) suggesting wider sociological implications in terms of access, communication and power, which have social, educational and therapeutic possibilities. All three C-Ds' BMIs and IADs have been used at outreach sessions with the Occupational Therapy department and Sydney De Haan Research Centre at Canterbury Christchurch University, where students have fed back that it is "really positive to see instruments made especially towards service user needs."¹⁷ This feedback in addition to the mental wellbeing outcomes for C-Ds as a result of this process indicates potential for BMIs as socially prescribed objects, which will be explored further in the Discussion and Conclusions chapter.

7.2.5. To arrange a celebratory public event to present the Bespoke Music Instruments (BMIs) to the Co-Designers.

The public presentation event at Tabernacle on 25.03.2011 was the culmination of months of collaboration. Although the BMIs and IADs were at different stages of development, they were presented to the C-Ds and demonstrated in use.

At the presentation event, only the central xylophone pod and stand of Nicole's Mojojo could be shown. The delay in completion was a result of a number of

¹⁷ Longden, W. (2015) E-mail to Pat Chung. 15 May.

complications:

1. The central pod of the Mojojo proved complex to build, because original designs used strings, and there were difficulties with string tension causing the sound board to warp (Nicole Design Log, p. 32).
2. NR, a principal instrument maker, was unable to work on the Mojojo for periods of time due to illness.¹⁸
3. The instrument designers and makers were working on a voluntary basis, and therefore needed to pause in their work on the Mojojo, due to paid obligations.¹⁹

Ricky was presented with his zither and Plectrum Support and framed drawing, which had been completed in the weeks prior to the event at Tabernacle. His WIPP had to be held in place by a support worker, as a suitable mounting device had not yet been found. Ricky's BMI / IAD development was slowed, due to the development of multiple instruments and devices within his project. Additionally, within each new design, multiple options were explored and adapted, in order to find the ideal design.

Unlike Nicole and Ricky's BMIs, the Karimbek had been completed by the time of the public presentation, although its design process had also gone over the original projection of six to eight months due to the need to change instrument makers, and faults in the original design as presented in this chapter. The relative ease with which the Karimbek was designed and built was partly due to the fact that GM and IB were both guitar makers, and the Karimbek fell directly within their expertise. Additionally, Karim had relatively few access requirements, so little external consultation was required in that regard.

Although the BMIs and IADs presented on 25.03.2011 were mostly works in progress, the event served as a celebration of the C-Ds' efforts and involvement in the process. It was also an opportunity to gain valuable

¹⁸ Reeves, N. (2010) E-mail to William Longden. 20 January.

¹⁹ Reeves, N. (2011a) E-mail to William Longden. 19 January.

feedback that contributed to the refinement of Nicole's and Ricky's instruments. When the Mojojo and the WIPP were completed, a second presentation event was held on 06.12.12, which all three C-Ds attended.



Figure 7.2.b: Celebrating the BMI presentations at the Tabernacle, Notting Hill.

7.3. Reflections on the BMI film

Throughout the process of BMI and IAD development, I have worked with filmmakers including Vesna Marich, Marcella Haddad and Ralph Killius. The resultant film is intended to serve specifically as supporting material towards this thesis showing research participants involved in various capacities such as: C-D players using their BMIs and IADs, co-design team members including JOS volunteers, LDRC support team, music instruments makers, designers, MERU Design Club members, participants at JOS workshop, BMI presentation at London Metropolitan University, and a variety of stills photographs and photomontages that are incorporated to give detail to specific elements and processes.

As discussed in my Methods chapter (section 2.5.4), whilst the film itself cannot be treated as an unbiased data set, the process of collecting, editing and curating the footage has proved significant in generating reflections towards answering my research questions. In particular, the film demonstrates the self-expressed feelings of individual participants, of achievement, personal empowerment, physical effort, pleasure, shared communication, focus of intent and purpose, and of shared new-found confidence, giving a practical exhibition and explanation of how BMIs were designed and made, indicating the attitudes, skills, craft and challenges involved. Additionally, the film shows the manner in which BMIs are used by their C-Ds, and how they might be used as recreational and therapeutic devices. Finally, the film shows how support workers and JOS volunteers work with impaired players as co-creative facilitators to enable their active engagement and creative participation in music making; more than written narrative, the filmic material brings to life and makes real the BMI C-Ds and other participants, giving voice to their unique characters and demonstrating the sounds produced by their BMIs and the inclusive social music making environments in which they are used.

The film's time log in Appendix 14 marks salient moments that illustrate BMI development process, providing material for reflecting on BMIs as agents of OBL, their potential as agents towards physical and mental wellbeing, and their

broader implications as advocacy towards equitable society. I now go on to explore reflections generated by the film towards my research questions. The time references given in parentheses indicate where a particular quote or instance can be found in the BMI film, as indicated in the time log in Appendix 14.

Towards my first research question on BMIs' function as agents of OBL, a telling statement is made in reference to Ricky's BMIs and IADs: "All these instruments are essentially connected to Ricky" (21:50). Indeed, the same can be said of other instruments presented in the thesis, which tell the story of their C-Ds' participation in community music making. Throughout the film, BMIs produced towards this thesis are presented being played by their C-Ds, exemplifying the OBL that can occur, when instruments are appropriately contextualised. Whilst the entire thesis gives context to the research, in some cases mere moments as filmed give voice to the delight, beauty and nature of those involved and to the achievement of their participation. In conclusion the film presents additional BMIs produced before, during and after the research, with images of their C-D players, and in some cases sound files of them being played (30:19). The use of images of real players and of sounds produced by their instruments gives a great deal more information about the BMIs, their players and the JOS context than does a display case, as seen at 02:27.

The film footage generates reflections towards my second research question, "How can disabled and impaired BMI co-designers influence design process and outcomes towards new knowledge creation through design innovation significant to the field of organology, and the achievement of personal and social change?" Lewis Jones, Senior Lecturer in Music and Technology at London Met, points out that often, conventional instruments are "not suitable or possible to play" (06:22) by some individuals, as is exemplified by the images of commonly occurring damage to conventional music instruments in inclusive music environments (07:52). However, he states that through identifying the "particular needs and potentialities" of their C-Ds, BMIs "[afford] musical possibilities that didn't exist before" (06:28), and provide "a remarkable stimulus to fresh thought" for students who devise instruments for someone

who “otherwise wouldn’t have been able to make music” (29:16). IB, who worked on the Karimbek and Ricky’s bespoke zither in the research, states that designing instruments for people who have particular requirements has provided an opportunity to “pioneer” working with unusual materials in new and different ways to answer the stresses and strains they undergo in inclusive environments, providing “a useful way for me to find my niche in making musical instruments” (06:40). C-Ds’ personal input towards their BMI development is most obvious in Ricky, who is shown testing the first Flexzistem and providing feedback about its viability (22:55). Nicole’s Mojojo is said to be the “first instrument of its kind that is specially made for co-assistance” (14:21). Additionally, conversations with designers at MERU illustrating the development of Ricky’s WIPP and Plectrum Support show the way that designing his IADs has led to innovations that can be of benefit to others with similar requirements (23:05). Reflecting on the Karimbek and Derek’s guitar, luthier MC notes that whilst being robust enough to serve the needs of their players, the instruments have “proper resonance” (08:19) indicating that the BMIs deserve to be seen as instruments in their own right, and worthy contributions to the fields of design and organology.

The film contains many instances that indicate ways in which BMI C-Ds influence design outcomes towards the achievement of personal and social change. LJ points out the “purely musical outcomes... social outcomes, and outcomes to do with the mode of interaction of the many practitioners, the designers, instrument makers and other practitioners who have come together in the generation of each of these instrument designs” (29:16). These outcomes can be seen in the C-Ds themselves, and in the many people the process has linked and galvanised. As an example of this, when formally presented with his Karimbek at the Tabernacle event, Karim is shown starting an improvisation (07:17). The man next to him is smiling, and soon picks up his own guitar and begins to play. Whilst this can be read as an indication of Karim’s personal development as a leader, it also indicates the wider potential of inclusive music, as his enthusiasm spreads to encourage others to pick up their instruments and play. Nicole’s Mojojo is seen to provide personal development, in that it facilitates her participation on her own terms. Designer

KH states that Nicole responds to physical contact, and “this is part of her musical experience, part of her contribution to the whole process” (16:22). On a social level, the film shows Nicole using the Mojojo with assistance from her support worker who has not yet been trained in its use, making visible her contribution – and the Mojojo’s – to the professional development of those who work with her (13:58). By nature of its design as a co-creative device, the Mojojo engages support workers, building their confidence as participating musicians and making them part of a musical dialogue (16:59). Ricky’s influence towards personal change can be seen and heard in the instances where he verbally indicates his preference (21:04, 26:32). From the point of view of social advocacy, a sequence of shots in the film show Ricky leading an improvisation, the resulting music that occurs, and his enthusiastic acknowledgement by other participants (28:35), exemplifies the potential of BMIs to raise the profile of disabled people.

In relation to the third research question, which asks how BMIs can serve as therapeutic tools towards Arts on Prescription and Social Prescribing, the BMI film suggests a wealth of wellbeing outcomes in demonstrating the community engagement, physical exercise, self-advocacy and creative output that resulted from participants’ involvement as C-Ds. For Nicole, there is the added benefit of having an instrument designed that facilitated physical contact, which was so important to her (16:22). In showing the continuum of plectra developments in which Ricky’s Plectrum Support was designed, a woman who had never previously played a music instrument is shown testing a foot strummer extension, while two other musicians play the flute and harp in accompaniment (12:11). At first, her movements are gentle and exploratory, but as she gains confidence and understands that the other musicians are playing with her and responding to her, she begins to use her leg in a stronger and more controlled way. This indicates the potential of instruments to facilitate the enhancement of physical wellbeing through exercise, and also the way in which BMIs and IADs can encourage situations in which disabled people can be facilitated towards self-empowerment in taking the lead as co-creators and as personal and social advocates by demonstrating their personal intent, purpose and ability.

The fourth research question explores the potentials for ongoing BMI development. Whilst the film focuses on the BMIs achieved by Nicole, Karim and Ricky in the course of the research, it also contextualises it within the wider JOS project, and associated streams of ongoing innovation. Plectra developments connected to Ricky's Plectrum Support are shown (09:40), indicating an array of potential ways in which they can enable players' access to stringed instruments for strumming, plucking and bowing. At MERU, members of the extended BMI design team show the development of the Adjustable Instruments Presentation Stand (27:07), which exemplifies Open Design (27:50) by combining readily available generic products to make a device that can be used in many situations as a facilitating device. The continuing progress of potential BMI and IAD development is made possible by the co-creative participation of disabled and impaired C-Ds who present the challenges that stimulate exploration, innovation, and opportunity for families and care and support networks, designers, makers, students, volunteers and others who are "open to look at possibilities" (27:45).

In this chapter I have reflected on the produced BMIs and IADs, referring to feedback from the LDRC focus group, design logs, and project Aims and Objectives. In the next chapter I discuss how the case studies answer my principal research questions and I present my final conclusions.

8. Discussion and Conclusions

In this chapter I connect the case studies with references drawn from the literature review to answer my research questions as set out in Chapter 1. I then discuss procedural limitations and personal factors that affected the outcomes of the research. Finally, I set out my conclusions from this research to propose its significance to the fields of musicology, organology, OBL, Arts for Health and Wellbeing, Social Prescribing, emancipatory design, improvisation and inclusive society.

8.1. How do BMIs function as materials towards Object Based Learning (OBL)?

Dawe (2001, p. 221) describes musical instruments as “objects existing at the intersection of material, social and cultural worlds, as socially and culturally constructed, in metaphor and meaning, industry and commerce, and as active in the shaping of social and cultural life.” The BMIs’ unique capacities and qualities reflect their own “intersection of material, social and cultural worlds,” drawing attention to, generating interest in, and promoting fresh insights about their disabled C-Ds, and about the social and cultural context in which they are produced and played.

BMIs can be seen as repositories of information relating to the individuals and processes involved in their production and playing. The sound producing capacity, social and cultural attributes, range of physical movements required to play, surface decoration and structural design all provide detailed practical knowledge and increased awareness concerning the individuals for whom the BMIs are intended. As one-of-a-kind objects, BMIs provoke curiosity about their origins, generating consideration and discussion about their C-Ds’ involvement in development and production processes, and in their playing. This nurtures a deeper interest and appreciation about C-Ds individual personalities and abilities. Mark Jeffery (2012, p. 1) suggests that we might take each disabled person as a “Rosetta stone,” a point of focus for integrating

multiple threads of information to generate deeper knowledge and understanding about self, society and culture. I propose that this research reveals BMIs to possess the same capacity.

Within JOS inclusive community music making workshops, BMIs' capacity to convey information about their C-Ds is heightened, as they encourage social interactions through co-creative music making, providing further opportunity for participating disabled C-Ds to actively engage with other participants of differing abilities.

Whilst disabled C-Ds are the focus of this research, other participants and facets of BMI production would be equally viable as foci for further investigation in demonstrating the extensive capacity of BMIs as potent learning tools towards OBL. By interaction during the research process with other research networks, educational establishments and organisations that extended internationally and included the delivery of presentations, workshops, and the sharing of interests with people in more than fourteen countries, the BMIs have given focus to new relationships, communities of shared interest, collaborative projects, personal, social and professional development.

The BMIs here presented have been created within the context of JOS, a distinct social and musical environment. As agents of OBL, BMIs can be seen to embody JOS culture, just as a drum might be seen to embody the culture in which it was created, and from which its historic and cultural lineage arises. JOS culture can be found in the BMIs' shapes and forms, in their tuning system of E-flat, in their personalised features, in their facilitation of co-creative play and in their emphasis on providing options for access and for sound production, and encouraging independence. Additionally, as emancipatory designs, the BMIs embody the JOS culture of advocacy towards increased social awareness, equal rights and social inclusion.

Within the field of organology, as continual works in progress adapted to fit the needs of individual players, BMIs can be seen to promote exploratory design, and the potentials of improvisation within emancipatory arts research (Douglas

and Gulari, 2015). Aspiring and practicing instruments designers and makers can extend their practice and awareness by reflecting on what is achieved with BMI research, and the potentials for design innovation that the research illustrates and inspires.

8.1.1. Objects of therapeutic learning

BMIs can be used to promote learning about therapeutic strategies, and may be of particular relevance within the Occupational Therapy field. Used in the context of JOS sessions, BMIs encourage their users to develop strength and dexterity, and as with Ricky's Plectrum Support, they can reveal new potentials for the development of his physical movement and creative self-expression. With permission of their owners BMIs can be brought into use with other disabled players with similar access requirements who could both benefit from them, and indicate further potentials for their development and broader inclusive use.

BMIs produced towards this research and for other JOS projects have been used as teaching aids on the OT course at Canterbury Christchurch University to demonstrate how a music instrument can facilitate music playing, be used as a tool towards physical therapeutics, and to encourage personal and social wellbeing. Given BMIs' capabilities as therapeutic tools, they can be said to embody the potential for production as prescribed music instruments towards health and wellbeing by Social Prescribing, as Arts on Prescription and for uses in keeping with the Transformational Design Model in NMT interventions (as presented in Research Methodology and Methods, section 2.2.3).

As the BMIs were designed to facilitate inclusive music improvisation, they open up therapeutic potentials "in service of a person's experience of wellness" (Proctor, 2009, p.63). By facilitating their players' production of a range of simple and complex sounds, they enable exploration of and access to "essentially original" options for self-expression (Wigram, 2012, p.432).

8.1.2. Objects of subversion and social change

As aids to self-expression, BMIs enable creative communication between person and person, between person and group and between person and society that leads to learning and potential challenges to dominant cultural values and systems. BMIs' uniquely idiosyncratic design characteristics have been produced by means that embrace spontaneous improvised approaches, suggest playfulness and encourage exploration. As objects that embody notions of playfulness, BMIs are subversive. They raise questions about the authority of established systems, institutional values and practices. They undermine dominant cultural values and suppositions about disabled people as people of difference. They raise important issues regarding aesthetic and cultural values and norms that lead to the questioning of historic precedents and epistemology, and so find place within the decolonisation movement as instruments towards the achievement of humanitarianism.

Giving voice to the creative capabilities of their C-Ds, BMIs act as examples of emancipatory design, and facilitate opportunities for their disabled C-Ds to present as self-advocates. This has the potential to open up possibilities for attitudinal changes towards disabled people, and insights gained through the inclusive co-design process of BMIs might prompt people working in other fields to explore and adopt inclusive approaches. Within the field of musicology, effective demonstration of BMIs in use could be a motivational driver towards further development of BMIs and the broader proliferation of an inclusive community music that is unconditionally open to all-comers.

8.1.3. OBL in multiple contexts

Whilst the prime use of BMIs is situated within the context of JOS, they can also be used to facilitate learning in other contexts such as home visits, one to one and family sessions, public festivals and events, student workshops, lectures and presentations, exhibitions, museums and galleries. Within music instruments museums and collections BMIs have the potential to encourage

and facilitate inclusive social interaction and awareness by practical means that demonstrate the advantages to be gained by social inclusion, and the significance of such approaches towards the human rights agenda.

The way BMIs are presented, however, could have a significant impact on what OBL occurs. In the context of a participatory JOS workshop, BMIs are most likely to be seen in use by their disabled C-Ds, allowing their immediate significance as enabling agents of social inclusion, therapeutic purpose and increased social awareness to be witnessed and felt. It is perhaps this felt experience that can amplify the effect of a transformational learning encounter. When exhibited in a museum display case, or in any situation divorced from its relational connection with its disabled C-D a BMI is more likely to become an object for voyeuristic appreciation than to be acknowledged as an agent of emancipatory change²⁰.

Feedback from LDRC focus group indicates that the best learning about C-Ds takes place through using their BMIs with them. Similarly, in the Literature Review, it has been discussed that non-Western music, experienced outside its original cultural context, can only be understood to a limited extent. If OBL can only take place to the extent that objects are contextualised, I would argue for further development of practices within the museums and media sectors that explore the variety of contexts where music instruments are created and used, including inclusive contexts, towards enabling a deeper understanding about the knowledge we might be able to share and learn through objects, and how objects (BMIs) can serve as agents for social inclusion and change.

²⁰ BMI film (Appendix 14, 02:27) illustrates how music instruments are often encountered in display cases.

8.2. How can disabled and impaired BMI co-designers influence design process and outcomes towards new knowledge creation through design innovation significant to the field of organology, and the achievement of personal and social change?

8.2.1. Design innovation significant to the field of organology

In 1946, composer Harry Partch remarked that artists and instrument builders are “reluctant to undertake the thankless groundwork essential to the improvement of music instruments except where commercial exploitation looms in the background” (Partch, 1946, p. 198).

Whilst the literature indicates that market forces continue to hold sway over the mass-production of music instruments, the number of people who have worked on the BMI projects in a voluntary capacity, or for relatively little financial gain would appear to contradict Partch’s statement. Although the BMI budget has been restricted in keeping with general resources in the disability sector, due to the high motivation of volunteers and the input of those involved, the design teams have managed to achieve a significant number of innovations despite their limited resources. Moreover, improvements to BMI working prototypes over the course of the research illustrate that the active engagement of Nicole, Karim and Ricky as participating C-Ds and experts by experience, influenced the final products’ success. By enabling their increased participation, and in providing valuable insights as inspiration to other instruments makers and potential users, the produced BMIs can be seen as emancipatory design icons.

Although the BMI designs created have each been bespoke to one person, they might be readily adapted to serve the broadest potential generic markets, in keeping with inclusive design principles (Royal College of Art, 2016). A number of design innovations have been achieved solely through the participation of disabled C-Ds. This can be seen as material evidence of the

social and economic advantages to be gained from increased social inclusion.

Wheelchair presentation stand: The made-to-measure, adjustable design allows the Mojojo to be presented to Nicole in a safe and comfortable way. The flat-pack design is easily transportable. With slight adaptations it can be used to present a range of instruments or items to other wheelchair users.

Mojojo as a composite instrument: The Mojojo is a unique instrument that is bespoke to an individual with impaired mobility. As a composite instrument, it encourages and facilitates care and support workers, volunteers and others to participate actively as co-creators in community music making activities. This fosters co-creative relationships and heightens the need for shared responsibility for creative process and outcomes. By facilitating and encouraging co-creative interaction the Mojojo helps to generate the shared acknowledgment of participants of all abilities as equals.

Slide-in soundboards: The system of adaptable slide-in soundboards on the Mojojo demonstrates how the personalisation of music instruments for multiple users with a broad range of preferences, abilities and access requirements can be achieved.

Wind Instrument Presentation Platform and associated devices: Specifically enabling for Ricky, these devices can be used for other players. The WIPP sets a precedent for the creative engagement of people with impairments of movement that disallow them from participating in music making in other ways. Importantly, it makes the user an independent participant by facilitating personal choice.

Assistive Wrist Band Plectrum Holder: This IAD makes it possible for someone who cannot grip a conventional plectrum, stick or other such tool to independently play an instrument. If desired, the plectrum-rod can be exchanged for another tool such as a pen, paintbrush or gardening tool, creating further opportunity for independent engagement in activities of choice.

Karimbek: Blending the features of a violin and a guitar, this guitar-sized instrument accommodates multiple styles of playing and associated movement. The robust design has since been further explored towards the development of other JOS instruments.

Buried tuning heads on Karimbek: This approach adapts the use of readily available systems in a novel way that allows Karim to play his instrument without putting it out of tune. The same principle has been applied to subsequent Joy of Sound instruments which are played by individuals with a tendency to de-tune instruments.

8.2.2. Knowledge creation towards personal and social change

Literature in the field of ethnomusicology suggests that the Western paradigm's focus on music as a fixed product rather than a process results in an exclusive view of musicianship (Blacking, 1973; Bailey, 1992; Bohlman, 2009). This idea is underscored by the fact that many of the mass-produced instruments are ill-suited to play by those with non-standard access requirements.

Thaut's (2008) Neurologic Music Therapy, however, makes clear that everybody can participate in musical activities, and Lubet's (2011) social confluence model indicates that what is required for participation is an environment that is enabling, rather than disabling. This research has been undertaken within the emancipatory paradigm, exploring ways in which disabled people can self-liberate, through dialogue, authentic participation and mutual acknowledgement. Through testing and providing feedback about the BMIs, participant C-Ds have influenced designs in ways that have created new knowledge about the ways self-advocacy can lead to personal development, and towards a more inclusive society.

Through their participation and contribution as C-Ds of BMIs, Nicole, Karim and Ricky are recognised by their associates at LDRC and other participants at JOS workshops and events to have self-advocated, by making their preferences and abilities known, and by demonstrating as experts by experience what worked and what didn't work about their instruments. As their feedback has been acted upon, they have become agents of change within the workshop setting. As improvisatory arts researchers (Douglas and Gulari, 2015), they have raised important questions that have influenced the course of this research. Focus group feedback that suggested Karim joining a band and Ricky using his BMIs and IADs to do outreach with other organisations indicates a change in perceptions about their capabilities and potentials that has the potential to challenge the generally limited expectations of disabled people's participation in music and in community at large (Purtell, 2013).

The produced BMIs continue to be used regularly by participants at JOS workshops, and encourage ongoing user-led development of other BMIs and IADs. Regular use of BMIs allows disabled C-Ds to interact with a variety of care and support workers, JOS volunteers and others as active co-creators, demonstrating by example their potent motivational and generative capacity as objects for advocacy towards social change, and as tools towards increased participation at all levels of society and by all members of society.

The range of influence that has occurred during BMI research has involved many thousands of participants in London, throughout the UK and internationally. This includes participants at JOS regular weekly year round workshops, research development workshops and meetings, festivals, public events and outreach, training events, lectures, and presentations. Additionally, aspects of the BMI research have been shared by many on-line participants internationally at the JOS website that shows examples of BMIs.

8.3. In what ways can BMIs serve as therapeutic tools in relation to Arts on Prescription and Social Prescribing?

The BMIs presented in these case studies have been designed in keeping with the JOS-adapted Transformation Design Model (Research Methodology and Methods, section 2.2.3) which aims to create sustainable changes by “[designing] interventions with outcomes that are directly related to users’ functional goals” (Thaut, 2008) and extended personal and social aspirations and potentials.

Through their enhanced participation in JOS music making, BMI players are exposed to the extensive wellbeing outcomes associated with inclusive, improvisatory community music that include aesthetic self-expression (Procter, 2016), “developed self-awareness and confidence, the ability to communicate and collaborate, and enhanced ability to think and act creatively” (Brown, Higham and Rimmer, 2014, p. 44) that can lead to reduced anxiety and decreased dependency on medication, (All Parliamentary Group on Arts, Health and Wellbeing, 2017), improved resilience and coping skills (Hurt-Thaut, 2009), improved memory and greater social inclusion (Williams, 2013). For care and support workers, volunteers and others, BMIs establish opportunities for creativity in the workplace, which have been linked to increased wellbeing (All Parliamentary Group on Arts, Health and Wellbeing, 2017).

Feedback and notes from Nicole, Karim and Ricky’s Design Logs reveal ways in which using their BMIs have contributed to their wellbeing, including through physical occupation, self-expression, enjoyment, increased confidence, choice, social participation and impact on others. Participants in the LDRC focus group emphasised that by the project’s person-centred process, C-Ds achieved greater community engagement, personal choice and independence. This indicates that whilst the BMIs enabled their C-Ds to participate more fully in inclusive community music making, in addition the processes by which the instruments were created validated Nicole, Karim and Ricky as participating C-Ds, and so carried significant self-emancipatory worth, and therefore acted as therapeutic tools.

8.3.1. Social Prescribing implications

Reports on Social Prescribing presented in the Literature Review indicate its potential to help individuals develop sustained, resilience building changes, if community-based programmes are properly funded, and if a culture of inter-agency communication can evolve (White and Salamon, 2010; Jackson, 2016; Polley, et al., 2017).

Effective communication between service providers, service users, members of their health and social care networks, their families and friends and extended social networks is necessary to bring about effective needs assessments, and appropriate responses by Social Prescribing service providers. The case studies presented here have involved the active participation of disabled C-Ds, familial and professional care and support networks, instrument makers, designers, volunteers, students, medical professionals, families and the broader community. This diversity of input has given a comprehensive scoping of C-Ds' preferences and needs, which has in turn led to the creation of their BMIs as effective, responsive tools which enable them and others to participate as co-creators in therapeutic music making activities.

Although funding was achieved from London Borough of Kensington and Chelsea as well as The Arts Council, the outcomes of the BMI project have relied heavily on the input of many volunteers, including designers, instrument makers, component parts manufacturers, expert advisors and others. Joy of Sound is a volunteer-led and managed organisation, with a high percentage of its volunteers on health and wellbeing pathways. The benefits of volunteerism, as cited by a report commissioned by Volunteer England include “[improved] self-rated health, mental health, life satisfaction, the ability to carry out activities of daily living without functional impairment, social support and interaction, healthy behaviours and the ability to cope with one’s own illness” (Caisday, et al., 2008). These benefits can be observed in many JOS and other participating volunteers, whose motivational drives have made the BMIs

achievable. It is highly likely that the BMIs would not have been created if the project was not predominantly facilitated by volunteers.

In developing Social Prescribing programmes, it is therefore important to consider the impact of the voluntary sector, and particularly those organisations which have an inclusive ethos. A 2017 report of the input of the Voluntary, Community and Social Enterprise (VCSE) sector calls on organisations in the health and social care sector to do more to involve local voluntary organisations, who may be able to reach a broader spectrum of the population (Fox, 2017). By engaging people inclusively, it is potentially possible to reduce costs in certain areas of medical and social provision, and to transfer those benefits into other areas of mutual societal benefit.

8.4. What are the potentials for continuing BMI project development?

This thesis provides a clear example of inclusive methods used for designing and making BMIs with disabled and impaired C-Ds in a way that enhances their wellbeing and facilitates their participation in community music. Some of the potentials for continuing development such as broadening the approaches discussed in this thesis into Arts and Prescription programmes have been discussed above. In this section, I discuss ongoing potentials for BMI development in the realm of design. Finally, I explore opportunities for BMIs that lie within the field of sonic arts.

8.4.1. Ongoing design initiatives

The research continuum used in the development of BMIs for this project actively seeks new ways in which previously excluded people might actively participate in music making activities as co-creators. This attitude and drive towards inclusion has frequently resulted in the design and development of new BMIs or IADs. A design project might involve the creation of one-off BMIs and IADs exclusively for particular players, or in alterations and adaptations to existing BMIs and IADs to allow use by new and additional players. Adaptations to generic instruments can enable broader inclusive access for playing and in the continual development of approaches used by facilitators and enablers that aim to engage players of all abilities in music making as equal co-creative players. I present here a few examples of ongoing design initiatives that indicate the potentials for BMI development.

The BMI case study research has opened up fresh opportunities for the presentation of a variety of music instruments to disabled players, and particularly to players who use wheelchairs, by the development of adjustable IADs. When instruments are presented in positions accessible to impaired players, a subsequent need arises for alternative kinds of plectra, sticks, batons, bows, beaters and any such tool that can act as an interface between player and instrument. One such tool arising out of the research is the split

bamboo beater, which is long enough for use by participants in wheelchairs, enabling them to access zithers and other instruments. (Figure 8.4.a) This simple and easily produced tool has proved a popular and frequently used means of facilitating the play of a variety of music instruments by disabled and impaired players.



Figure 8.4.a: Garden split bamboo beaters.

One research workshop participant enjoys the use a particular kind of empty water bottle filled with seeds for use as a shaker, because she feels comfortable gripping it. Working with her and with her care and support networks and MERU associates a mould has been produced of her favourite bottle. A moulded receptor was fitted into the mould. It can grip up to three beaters firmly in position, thus creating a device for its user to play a xylophone with increased precision and sound generation. Although the first prototype design has proved to be too heavy, the idea stimulated fresh ideas for new solutions that are still being explored (Figure 8.4.b).

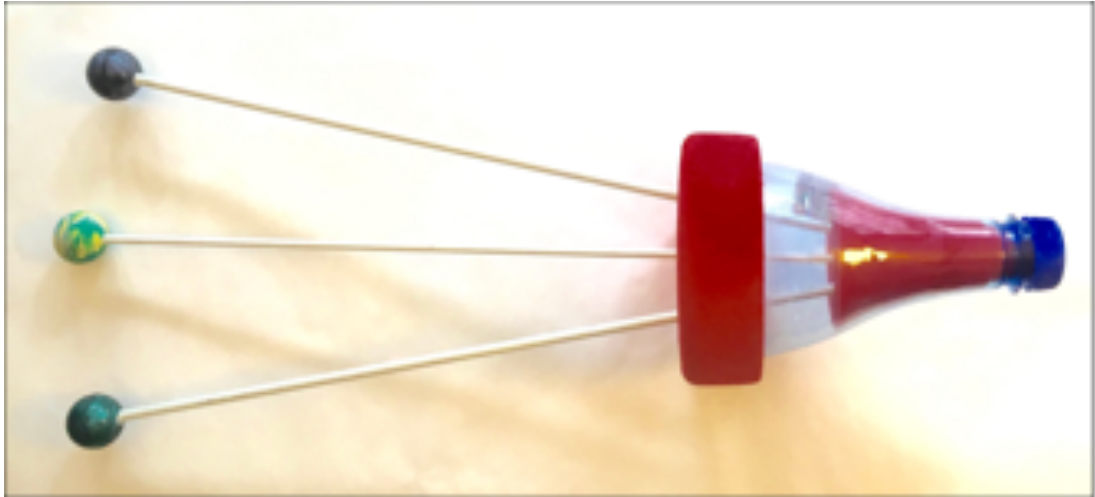


Figure 8.4.b: Moulded bottle hand grip with beaters.

Whilst produced as bespoke to Ricky, his Plectrum Support has been part of a long line of continuing research development exploring different forms of plectra to find ways of facilitating the broadest possible range of dextral ability for existing and potential players. This research includes the design of a template for the periodic cutting of large JOS-specific plectra, developing individually bespoke plectrums and plectra housings, and a variety of ongoing moulded and engineered devices (Appendix 14, 09:45). One of the most successful outcomes of this development has been the plectra assists, which work specifically with zithers but can also be used on some generic guitars (Appendix 14, 10:40). Work continues on the development of a bowing assist that follows on naturally from the plectra assist (Figure 8.4.c).



Figure 8.4.c: JOS plectra and strummer assist design developments.

Towards Ricky's case study, a bespoke zither was produced which, while initially promising, lacked functionality due to warping caused by string tension, and subsequent detuning of strings. Based on lessons learned through this experience, four new project specific zithers have been developed and built by a specialist instrument maker from London Met. The zithers have been made specifically for use with the Adjustable Instrument Presentation Stands and have become a popular and successful feature at workshops where they can be presented in a variety of positions and for varied methods of use. (Figure 8.4.d).



Figure 8.4.d: Updated JOS zither design on presentation stand.

Building on insights gained through the production of the Karimbek, IB has collaborated further on the co-design a Generic Inclusive Guitar, made to cope with the broad ranging demands of inclusive participatory group music making (Appendix 14, 31:25). The design uses an off-the-shelf self-build guitar as a first working prototype. Incorporating a reinforced neck, buried tuning heads, safety strap fittings, coloured fretboard markers, a reinforced body, and receptors for the attachment of various percussive elements, the Generic Inclusive Guitar is currently used as a working prototype at ongoing workshops. (Figure 8.4.e). Continual use has resulted in wear and damage to the body that has indicated a need for additional strengthening. The loss of component parts, and observation of methods of use by its players has continued to reveal ways in which the design might be improved and developed.



Figure 8.4.e: Generic inclusive guitar.

Following on from bespoke guitar designs produced towards this research, a bespoke asymmetric guitar has been produced on the commission of an enthusiastic disabled player who desires a guitar made specifically to fit his playing position whilst seated in his wheelchair (Appendix 14, 32:10). The instrument has specific shape and dimensions to fit his body and allow for a comfortable playing position (Figure 8.4.f). The achieved working prototype demonstrates a means by which other disabled players with varied access requirements might be enabled by the design of a personalised BMI.



Figure 8.4.f: Front and side view of bespoke guitar.

The Music Mattress was initiated concurrently with the BMIs presented here as case studies. It was intended to be a generic instrument with potential multiple uses as a therapeutic intervention in Neurologic Music Therapy, in Occupational Therapy, as an educational tool, and as a recreational tool with potentials for adaptation as a musical game. The design was conceptualised with JOS participants and developed in collaboration with MERU. In the early prototype stages the mattress was designed to be an acoustic instrument using reeds as fitted in Nordoff Robbins reed horns, as seen in use with Ricky's WIPP (Appendix 14, 33:11). Working prototypes have been successful at testing and have gained popular enthusiasm and support towards further development. Unfortunately, the specialist labour and cost required to advance this design have proved to be far beyond the resources of JOS. Therefore, following a combined workshop with Skoog and Soundbeam technology I invited Ben Schögler to explore potentials for the development of the mattress by applying available and developing Skoog technology. The Musical Mattress' development is ongoing (Figure 8.4.g).



Figure 8.4.g: Musical mattress showing reeds (L) and being trialled (Centre and R)

During 2016 – 2017, JOS commissioned several variations of the JOSKrar, a design based on the Ethiopian *krar*, used recycled drums, guitars, banjos and a violin as the body of the instrument (Appendix 14, 32:24). After testing the experimental models, three different sizes were settled upon, including one that would fit into an in-flight bag, for easy travel. JOS plans to make an easy to access and follow template design available on-line as an inexpensive, easy-build, family oriented home or school based craft project. The JOSKrans can be strung with a variety of nylon strings including fishing line and garden strimmer twine, and can be held or mounted on instrument presentation stands

in a variety of positions. Due to their broad ranging accessibility and warm resonant sound, the JOSKrar have become a popular workshop instrument and have proved to be particularly attractive to African, Eritrean and Ethiopian participant care and support workers who are attracted and motivated to play them by association with their ethnic and cultural origin (Figure 8.4.h). A young member of the South London Eritrean community tested a JOSKrar towards a potential production project working in partnership with members of the Ethiopian and Eritrean community as a business development opportunity.

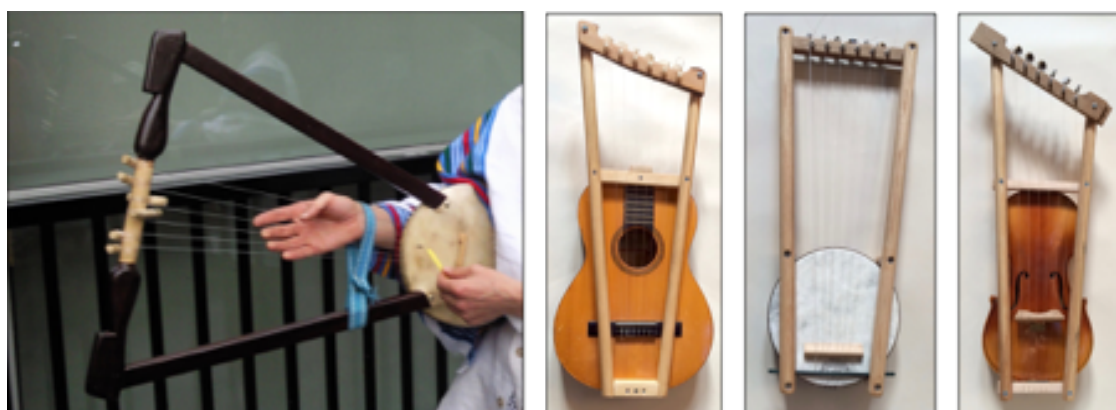


Figure 8.4.h: Traditional Ethiopian Krar and JOS self-build Krar design developments.

Over the course of this research and subsequent to its various successful outcomes there have been continual developments in the JOS project. These developments include an increase in the number and range of disabled and impaired players attending workshops, an increasingly diverse array of volunteers, opportunities to present BMIs at workshops and in educational settings both in the UK and internationally, and the spread of JOS methods as former volunteers set up their own initiatives.²¹

²¹ Statistics for JOS project attendances between 2013 and 2017 show an increase of 8,473 (Appendix 11). This number does not include increases also experienced in online viewings of the JOS website and via other social media platforms such as Vimeo, YouTube, Facebook and Twitter. This ongoing increase indicates that knowledge and experience gained through the BMI and IAD research has had significant impact on JOS project development, attendance and popularity. This increase has in turn provided resource and opportunity for continuing research development and advocacy.

By hosting a program of experiential training events that attract professional and aspiring music, arts and social practitioners, participants have gained first-hand

BMIs are in continuing use by the disabled players with whom they were co-designed and by others. A growing number of workshop participants regularly witness various BMIs and IADs in use by disabled players. In doing so they witness how care and support workers can provide assistance as co-creative facilitators. By such witness, participants can gain a better understanding of the purpose and function of person-centred approaches as used towards the research. By becoming more aware of the use of inclusive approaches and of the significance of subsequently enhanced participation that such approaches facilitate, the research provides a growing legacy that encourages and advocates for ongoing emancipatory design initiatives and equitable society.

8.4.2. Sonic arts

The fields of sonic arts and experimental music continue to open into a broadening definition of what music making is and can be, and by which means such music might be achieved. This exploratory attitude invites a broad scoping of the types and variety of music instruments and objects that might be considered for playing and as producers of sound. This change in paradigm from the confines of any traditional norm invites wide ranging new opportunities for inclusive participatory music improvisation, and process-

experience and knowledge regarding approaches to the facilitation of inclusive participatory community music that includes an awareness of the purpose and use of BMIs and assistive devices.

Ongoing increase in participation has led to increased interest and enquiry into JOS' work and subsequently to an increase in the number of JOS volunteers from a variety of different sources such as students on placement, graduates and professional practitioners looking for experiential training, healthcare workers on training with LA, private disability care and support providers, unemployed people, learning disabled people on pathways as referrals from LA social services, people on mental health pathways, elders, participant's families and local community members. Several design project participant volunteers have progressed to set up independent workshops in Slovenia, Australia and New Zealand where the use of BMIs and IADs is seen as an essential composite aspect of project design for the facilitation of participatory inclusive community music.

oriented music engagements that use non-standard instrumentation. In 2016, JOS launched a sonic arts album as a collaboration between participants including disabled and impaired players, care and support networks, project volunteers, professional and amateur musicians, recording and visual artists (Joy of Sound, 2016). The outcome of this collaboration indicates that the JOS style of improvisation can be comfortably situated within the sonic arts and experimental music paradigm, and that future BMIs might go further in exploring the nature and production of sound and the facilitation of a universally accessible participatory community music.

8.5. Limiting factors

This research has been subject to a variety of procedural limitations that have affected the course of the project, and the collection and analysis of data. My multiple roles as researcher, JOS director and lead practitioner, project manager, advocate and friend have, whilst acknowledging the viability of such a multiplicity of roles in the context of inclusive and emancipatory research, have influenced to some extent the viability of certain claims.

8.5.1. Procedural limitations

Working from an emancipatory viewpoint, I have in all instances prioritised working inclusively. This research has sought to bring together input from disciplines that include disabled C-Ds, carers, families, volunteers, professional instruments makers, students, academics and expert advisers. While the construction of BMIs has benefited from the input of such a diverse group, the intersection of needs and motivations of those involved has affected the course of the research in various ways.

The main procedural limitations to the research have stemmed from the limitations and narrow expectations often projected onto the lives of disabled people. The hardships and challenges faced on a day-to-day basis by disabled people, their families, and the services that they depend upon have constantly been reflected in the research process. The essential prioritisation of disabled participants' health and personal care needs has frequently resulted in changed schedules and arrangements that have been further complicated by the need to align research meetings, associated JOS workshops and volunteer availability. These problems have been compounded by regular problems of access to inclusive transportation, frequent changes in care and support staff, and the wellbeing of familial and professional care and support givers who have higher than national average of health issues (Mental Health Foundation, 2016).

Access to disabled participants has ever been dependant on the availability

and willingness of their care and support networks and management. Care and support workers, often working under non fixed contracts and on low pay have frequently been fatigued and stressed, and subject to procedural obligations from their employers, which have limited their capacity to engage with the BMIs and JOS sessions on a regular ongoing basis. A large proportion of care and support workers have been in the process of learning English as a second or third language, and so communication has sometimes been difficult or geared towards essential and minimal interactions. This has limited the expression of opinion and experiential feedback relating to the BMI project.

The involvement of broad sweeping cultural orientation of care and support workers from the global diaspora also means that there have been many differing attitudes, traditions, views and approaches to the care and support of BMI C-Ds and other disabled participants. Whilst in some ways these differences have enhanced the research, for instance by the incorporation of different ethnic music stimuli into the workshop improvisations, in other ways the research has been inhibited by a lack of common understanding of intent and purpose. This has ranged from certain individuals regarding disabled people as 'cursed', to others who regarded them as 'angelic children'!

8.5.2. Personal Independent Payments (PIP)

UK Governmental systemic changes to disabled people's care and budgeting has resulted in forced changes to their care and support networks, which has had far-reaching implications for their lives, and by extension to this research. Personal Independence Payment (PIP) is a UK welfare benefit intended to support the living costs for people living with a long-term health condition or disability. PIP was introduced by the Welfare Reform Act 2012 (Great Britain) and began to replace Disability Living Allowance (DLA) for new claims made after 8 April 2013. Administrative complications have resulted in long delays in rollout of the program that has become fragmented and variable across UK regions and Local Authorities. The BMI research has been affected by the transition to PIP, which was introduced at different times and paces in the

Local Authorities where the research was undertaken. These various rates of change affected the day-to-day care and choice of activities that disabled participants, as service-user 'clients', were able or not to purchase. The additional pressures and workload placed on day care services due to these changes have resulted in further complication and delays to research process.

A report produced by the Multiple Sclerosis Society of Great Britain (2015) states that many of those who undertook face-to-face PIP assessment felt that the hidden symptoms of their condition were not taken into account. More than a third stated that face-to-face assessments had caused their condition to relapse or deteriorate. In the cases of BMI research participants who face profound and complex health challenges, PIP assessment processes are often complicated, long running and have resulted in delays and challenges to their BMI project involvement.

8.5.3. My personal roles

This research has grown out of a project in which my role has been that of a founding member, director and lead facilitator with responsibility for instigating, managing and maintaining all aspects of BMI project continuum. The person-centred approaches central to this work are by nature based in relationships of shared intent and purpose, mutual respect and trust. The intensive interactions that are central when working with impaired and non-verbal people can generate relationships of intimacy, affection and lasting friendship with the disabled participants and their extended families. These relationships are often rooted in intuitive and deeply emotional alignments rather than in intellectual and language based interactions. Such relational factors whilst having the capacity of enhancing the research, can also be an impediment to progress by reason of their high demand on physical and emotional energy.

In the case of this research, I accepted the roles of BMI project manager and researcher. Instances have arisen when my academic commitments and responsibilities, circumstance and associations have been at odds with the

priorities of my person-centred practices, relationships and role as advocate for disabled participants. This has been especially evident in relation to the weight of time based deadlines issued without foresight of the plight of research participants, or of my personal health and wellbeing in relation to the extreme demands that have needed to be faced in negotiating the research environment and in prioritising respect for those involved. Things cannot be rushed when dealing with human interests. This is particularly so when working with disabled people and their care and support networks who live and work under high levels of stress and ill-health and who frequently require adjustments to schedules through the prioritisation of personal care requirements. Any such pressure will invariably affect a researcher's role and capacity, and impact research undertakings.

8.5.4. Limitations to outcomes

The person-centred processes at the core of this research demand that any BMI created is regarded a working prototype in process. People change. BMIs by nature of their purpose and function must change accordingly. They need to be designed, used and understood as objects that serve ever-changing requirements. Treating anything created by this research as an intentional work in progress may contradict the notion of fixed outcomes. Indeed, whilst this thesis is submitted as a fixed item, I regard that the elements it contains will continue as project-based research in progress.

The outcomes of the research have been limited by material resources. Budgets have been limited and the majority of the work undertaken has been achieved on a voluntary basis. While I have elsewhere discussed the benefits of volunteerism, progress has at times been limited by volunteers' personal circumstances, work and study schedules. For want of material and labour resources, some BMI initiatives have not been fully realised, although in cases such as the music mattress, open sharing of innovative ideas has allowed others to advance them.

8.5.5. Challenges to the viability of claims

A potential limit to the research may be found in my own viewpoint, which is close to the subject by nature of my involvement as founder of JOS, and motivated by deep personal humanitarian convictions. The viability of any claims made by the interpretation of qualitative data is subjective. By choice grounded in my lifelong personal experience I generally trust in people, and am ever open to the inclusion of any individual in process. This obviously has implications for JOS and for any research undertaken within its sphere of influence.

During the research I was invited by two disabled participants' families to become a personal advocate. I accepted these invitations as an honour and privilege. In this role, I often became triangulated between the needs of the families, the procedural protocols of their care and support providers, the requirements of my research and my personal wellbeing. As a family advocate I have gained in depth experiential insight regarding the lives of disabled people and their families, of their relationships with professional care and support networks and of the social and political environment that effected their day-to-day lives. It has often been troubling and demanding to work with the emotional consequences of this experience that included interfacing with social and health care providers on behalf of families, where the services provided are frequently under resourced and at breaking point. As a researcher, I therefore make no claims to be unbiased. Rather, my awareness of this situation has motivated me to pursue this investigation into BMIs as emancipatory objects towards inclusive equal rights of access to participation in all aspects of society for all peoples regardless of ability, race, gender or "assumed sagacity" (Jeffrey, 2012, p. 1).

Conclusions

This research is situated within the context of the JOS project of which I am founder, creative director and lead facilitator. It is primarily by my personal founding volition and creative co-directorship that JOS has sustained its core aims and objectives and developed project-specific, person-centred practices as a volunteer led charitable organisation committed to universal social inclusion. My informal practical explorations into the production of BMIs and IADs for use by impaired and disabled people has been of central significance to my creative, social and academic development, and to the development of the JOS organisation since its founding in January 2000. These explorations have been integral to the development of a specific inclusive participatory community music idiom that works to make participation accessible to all-comers regardless of age, ability or assumed sagacity. Without the contextual framework of the JOS project, and the participation of JOS volunteers this research could not have been achieved.

My three case studies formally acknowledge and document the processes and outcomes associated with the production of BMIs and IADs, creating new knowledge about approaches to participatory inclusive design and co-design, the benefits of such approaches for those involved, and the implications of such approaches within the fields of organology, Object Based Learning and Social Prescribing.

In particular, the research contributes to the field of Music, Health and Wellbeing, by documenting the production of music instruments that are used to realise an inclusive, participatory community music idiom that positions itself as equal to any other music tradition or aesthetic. By creating instruments and associated access devices that facilitate participation in music making for all, this research activates and brings into play a raft of personal and social wellbeing factors that arise through participatory music making and design. Health inequalities, in keeping with the UN Sustainable Development Goals (United Nations, 2019), are subsequently reduced. The research facilitates,

amplifies and brings to focus the often unheard and under-acknowledged voices of disabled people who self-advocate here as participating BMI C-Ds, and explores the broader significance of the BMIs they co-design across a range of disciplines including organology, musicology, OBL, arts for health and wellbeing, disability studies and social inclusion. The social model of disability and by extension the social confluence model of disability underpin my interpretation of the fields in which the research is situated, the methods I use, and the ways in which I present and reflect on the research data.

This research creates new knowledge by example of the function and potentials of inclusive co-design and related improvisatory approaches, when applied to musicology and organology. It demonstrates ground-breaking features that arise when working inclusively with disabled people, including those with PMLD that are significant towards self-emancipation and achievement of equal rights. The original design processes and resultant design innovations produced here, deliver a variety of wellbeing benefits, whilst also indicating gaps in social awareness, care and services provision, and provide fresh insights towards signposting. Focussing on the self-emancipatory abilities of participating disabled C-Ds this thesis demonstrates the value and significance of the BMIs they co-design as social and technological drivers towards personal and social change.

Examining BMIs through the lens of OBL reveals them to be potent repositories of information and narrative centred on their disabled C-Ds, including the social and cultural context in which they were produced. Here, BMIs become powerful concrete and symbolic learning aids of particular relevance to those working in inclusive social, wellbeing and therapeutic contexts, and by extension, agents of social and cultural change. Additionally, the journey of their design development and production interweaves narrative threads that bring together and intersect multiple disciplines and practitioners from various fields, all of whom gain fresh and increased awareness of each other and of the various disciplines in which they work.

The research indicates that in order for BMIs and IADs to achieve their fullest potential as emancipatory objects, clear attention needs to be given to the manner and context of their presentation. To bring music instrument museum collections up to date with progressive inclusive cultural systems and values, their curation, display, associated curricula and public engagement policies need to include current examples such as BMIs, which demonstrate culturally significant ways in which music instruments are being produced inclusively, and used inclusively, in environments that lie outside prevailing cultural or aesthetic paradigms.

In addition to the produced BMIs and IADs and the design innovations that they embody and incorporate (as discussed in section 8.2.1), is the new knowledge created by the mapping of inclusive, participatory process and approaches used in their design and production. Participating disabled C-Ds have led process and determined outcomes throughout, by demonstration of their personal choice and requirements, by their testing of working prototypes and by their feedback concerning the viability of work in process. Whilst the majority of music instruments currently produced in Western society, and increasingly so in globally industrialised societies function within cultural idioms that exclude much of the population from participating as players, Nicole, Karim and Ricky have led the way as driving forces toward the achievement of design innovations that demonstrate the practical advantage to potential users, and the viability of the production and general provision of music instruments designed specifically as accessible to people of all abilities, and adaptable to users with unique preferences and needs. In so doing they advocate for universal access to participatory music making and subsequently to the raft of personal and social benefits that might be derived from such participation.

The transferability of insights revealed through the research's mapping of inclusive processes, and of the design innovations achieved through them, indicate far-reaching potentials for their application across society in educational, political, industrial, cultural and social spheres. Unique design features of achieved BMIs and IADs, and their use as self and social

emancipatory design objects by their disabled C-D users and others, illustrates in microcosm socio-economic benefits that can arise by working inclusively, and that can be advantageously transferred into other contexts such as personal and social wellbeing, design and product innovation, new knowledge creation and economic and political arenas. From a micro-economic perspective, reduction of healthcare and associated costs resulting from the wellbeing factors achieved by any research participant, points to a projective reduction of pressure on the healthcare sector and to associated social and economic benefits. Further social, wellbeing and economic advantages can be assumed by the significant contribution of volunteers in BMI production and project delivery.

Regarding the personal and societal benefits associated with the production and use of BMIs, the research reveals scope for their use within Social Prescribing programmes as Arts on Prescription (music instruments on prescription). This applies particularly to disabled and impaired people whose participation in music making and subsequent exposure to its wellbeing benefits might be otherwise restricted by a lack of availability and/or adaptability of conventional music instruments for use by people with particular access requirements, and by exclusively oriented aesthetic values and cultural preferences that determine who might be considered a musician, and how they might play a musical instrument.

Feedback within the research reveals that participation in process can be every bit as important as achieved outcomes. Within Social Prescribing, this indicates that for BMIs on prescription to be successful as wellbeing interventions, participating team members need to understand and share inclusive social values as foundation toward common intent and purpose, and to have sufficient time, resources and commitment to work inclusively. The achievement of these goals would be greatly aided by a shift in emphasis in funding priorities away from increasing audience attendances and supporting assumed excellence based on dominant exclusive cultural values, towards a prioritisation of generating the inclusive social participation of people of all abilities as co-creative partner designers, artists, players and co-producers of

a practical inclusive cultural aesthetic. If this is not the case, there is a risk of BMIs falling into the category of Social Prescribing initiatives that exist as “[‘buzz words’] lacking any real substance” (Jackson, 2016, p. 15).

In agreement with Lubet’s social confluence model (2011), I propose that universally inclusive participatory community music, such as produced by participants in this research and at JOS, is unique in its own right as an idiom of music making. Whilst initiatives that operate within the Classical idiom (OHMI Trust, n.d.; London Symphony Orchestra, 2017) may enable access to music making for a small number of impaired musicians, the product-oriented nature and aesthetic determinants of such music making nevertheless excludes the majority of disabled people and many others besides – and particularly those aspirant players who have Profound and Multiple Learning Disabilities. By contrast, this work demonstrates that the particular mode of universally inclusive musical improvisation that has been used and developed throughout the process of this research, engages and incorporates the contribution of participants of all abilities as equally valid and viable creative material towards a wholly inclusive social music that practices and promotes acknowledgment, adaptation and innovation as an idiom in which BMIs, their C-Ds and all others can participate and flourish as co-creators.

The benefits of improvisation (Procter, 2009; Wigram, 2012) have informed this research throughout, as the recreational (playful) therapeutic musical idiom for which the instruments were designed; and as the method of design, which involved an ongoing process of adjustment in response to C-Ds’ continual feedback (Douglas and Gulari 2015). Improvisation as a mode of playful exploration challenges and subverts disabling viewpoints, theory, dogma and practice (Rumney, 1989).

Given popular recent and ongoing developments within Sound Art and experimental music that broaden definitions of what music is, what a music instrument can be, and the processes and aesthetics by which music is made, defined and appreciated (Bašič, 2005; Gottschalk, 2016; Kolaitis, 2014; Licht, 2009; Tonkin Liu Architects, 2008), there is distinct indication that inclusive

participatory music promises increasing fruition. Consistently increasing popularity of attendance at JOS over the period of this research suggests that people of all abilities can, and want to participate together in music making when facilitated to do so and when the music being produced is grounded in an inclusive social aesthetic that invites, facilitates and acknowledges participants of all abilities as equal co-creative partners. There has been an associated increase in demand for BMIs and IADs and expressed interest in the inclusive approaches that support their use. Music, musicianship and the instruments of its production are being constantly explored, developed and re-defined. This research establishes participatory, inclusive community music as a universally accessible birth right and humanitarian aesthetic that is transferable as a model of inclusive, participatory practice across the full spectrum of human endeavour.

Throughout the research I have been strongly influenced by emergent and often intimate associations and friendships that have developed with disabled participants, their families and their care and support networks, in addition to the ever-changing and extending network of participating JOS volunteers. I have gained privileged insight and information about the problems and challenges faced on a day to day basis by disabled people, their support networks and the organisations that manage their care, and regarding the social, institutional and political environments in which the research is situated. Following debilitating injuries sustained during the course of the research, I became an expert by experience about some of the complexities and challenges that impaired and disabled people commonly face in dealing with medical, social and academic institutions and bureaucracies. My experience served only to increase my determination as an advocate to generate greater awareness and change toward a more inclusive society.

From my background practice as a multi-modal artist exploring participatory music through a multiplicity of genres and global influences, and in my capacity as a researcher, JOS facilitator and disabled participant, I have been privy to insights gained from multiple perspectives into the function and significance of inclusive attitude and improvisation as facilitating agents towards equitable

society.

By this research I have formulated a composite integral approach to the practice and production of universally accessible, participatory community music, to which the research participants bear witness, and that continues to develop under the auspices of the JOS project and its body of dedicated volunteers who support the ongoing development of BMIs and IADs, and the facilitation of any individual who might wish to engage in making music.

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Appendices

Appendix 1: LRDC Brief



promoting social inclusion through music and the creative arts

SCOPE/Joyofsound Bespoke Musical Instruments Design Project

Overall management of project by JOS Board and Scope Liaison (Simon) via JOS Project Manager (William)

**Design and Build 5 bespoke acoustic musical instruments – provide inclusive music workshops - CD production - launch event and project evaluation:
(Total Budget £10.000)**

All participants will be regarded as co-creators.

The production of each instrument will involve a core team: the design recipient and carer, the instrument maker and a JOS administrator. The core team will be supplemented with input from one or more specialists appropriate to each design recipients need - e.g. a musician, physiotherapist, music therapist, occupational therapist, with additional input from JOS workshop facilitators and volunteer assistants.

The process:

- Select design recipients from Scope across the spectrum of need
- Assess and match design recipients with appropriate instrument makers
- Assemble support teams
- Form initial brief for each instrument
- Produce prototype / model / drawings / concept design
- Develop design
- Build Instrument
- Final Adjustments
- Presentation
- Evaluation and follow up at 3 and 6 months post completion

The development process will involve 5 (minimum) meetings of the core team plus specialists as appropriate.

Music workshops

There will be 5 (minimum) music workshops - 2 to test out instruments during development, and 3 after completion. Workshops will be facilitated by JOS team members

- Audio recordings will be made during process where appropriate.
- Design recipients may lead recorded music development according to their preferences (the processes could range from continual recording of free play with a view to later compilation, sampling and collectively composing, or rehearsing and recording set pieces. The recording process will evolve in line with the instruments development and usage and include creative input from Scope team members and JOS in working with the 5 design recipients.

CD Production

- Either Compiling and Editing or Recording basic tracks
- Mix Down
- Mastering
- Duplication

The final instrument presentation event will include an open workshop and CD presentation,
(Perhaps this event might also involve some creative collaboration with Turtle Key Arts?)

Members of Scope and JOS are encouraged to participate if desired in any aspects of process, for example in designing CD artwork, participating in edits, production process etc. The launch event will happen at the Scope Centre.

A detailed and illustrated document will be produced in logging and recording all aspects of design process as an aid to others wishing to undertake similar projects. A full copy of this document will be given to Scope.

Any issues regarding disclosure permissions will need to be resolved fully before the project commences.

All design and conceptual copyrights will be held by the JOS project with permissions granted by designers and project participants.

The projected time scale for this project is 6 to 8 months.

Outline Budget

Individual Instruments			
Fees (Makers)	Design, materials and manufacture	£1,200	
Development Costs	Assessments, workshops, recording and events - travel and sundry costs	£200	
	Sub Total for 5 instruments		<u>£7,000</u>
General Project Costs			
Fees (JOS)	Project management, monitoring and administration	£1,500	
Fees (JOS)	Evaluation and written report	£500	
	Sub Total General Costs		<u>£2,000</u>
Additional Costs			
CD Production	Studio costs and duplication		<u>£1,000</u>
	Total Project Costs		<u>£10,000</u>

Please call me on 07906 916 524 for any further information.

Yours,

William Longden. Director JOS

On behalf of the Joyofsound project team.

Appendix 2: Permissions

Housing Health and Adult Social Care
SCOPE Resource Centre, 1-9 St Marks Road , W11 1RG

Executive Director - Housing, Health and Adult Care Services
Ms Jean Daintith

Head of Adult Social Care
Ms Stella Baillie

John Hendry
Day Services Co-ordinator
SCOPE Resource Centre
1-9 St Marks Road
W11 1RG



02/10/09
My reference:
Your reference:
Please ask for: John Hendry

To whom it may concern.

William Longden, PhD research student at London Metropolitan University, as project manager for the Joy of Sound/SCOPE Bespoke Acoustic Musical Instruments Design project, has been granted full and appropriate permissions from all participating design recipients' familial and/or prime carers for the purpose of undertaking the given project research.

Permissions include Williams's use of agreed audio, visual and narrative materials as derived from research development workshops, feedback and process evaluations towards his academic requirements, presentations and thesis.

All project participants will only ever be referred to in any documentation by their first names only, and will remain otherwise anonymous unless otherwise formally agreed by additional approvals given in writing by familial or prime carers.

Design recipients at SCOPE are those listed below.

Nicole Brammer
Ricky Clarke
Daniel O'Sullivan
Karim Karim

I trust that this will meet your requirements.

Please contact John Hendry should you require any further confirmation.

Regards

Direct Line: 020 7313 6823
Fax: 020 7313 6802
Email: john.hendry@rbkc.gov.uk
Web: www.rbkc.gov.uk

Appendix 3: General Design Log

See Auxiliary CD attached to back page

Appendix 4: Nicole Design Log

See Auxiliary CD attached to back page

Appendix 5: Karim Design Log

See Auxiliary CD attached to back page

Appendix 6: Ricky Design Log

See Auxiliary CD attached to back page

Appendix 7: Excerpts from Ben Lynam's Project Report

User Case Studies Ricky



At JoS, they have a small tupperware box, full of instruments.

These are all blown instruments that have been tried with Ricky; some of which work and some which don't.

The main issue is usually the mouthpiece, as Ricky always tries to put the whole mouthpiece in his mouth to blow, instead of pursing his lips. Due to this technique, he pushes the instrument away with his lips, because they cannot grip onto the mouthpiece.

Good



Long, thin mouthpiece

Bad



Too straight-edged



Curved mouthpiece allows for his blowing technique



Confusing, plus big mouthpiece

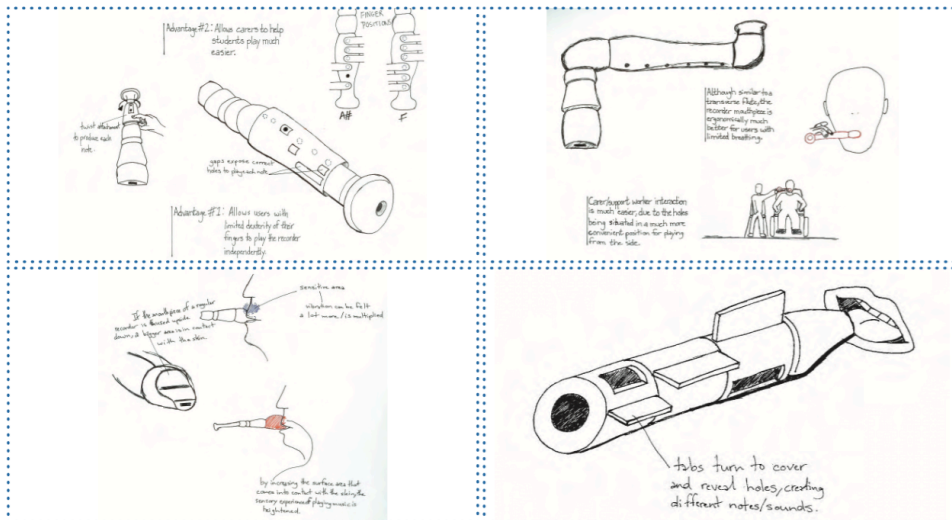


Multiple tone with good mouthpiece



One tone, plus whole mouthpiece is in mouth

Recorder Adaptations



Appendix 8: LDRC Focus Group Feedback Form

JOS/SCOPE Bespoke Music Instruments (BMI) Design Project Feedback	
Please write clearly: The emphasis here is on your personal responses to questions. Any answers that you give will be valuable	
Please use additional notes if necessary and clearly state the number of the question that you are referring to	
Your name (optional) Your role in relation to the BMI instrument player	
Please state which BMI instrument you are referring to :-	
1: How you suggest that we might gain additional input and information towards this process from disabled instruments player/s	
2: Any changes that you have observed during the instruments design process in relation to players, yourself, support staff, management, extended team members, JOS volunteers, co-designers and makers, members of the local and extended community, such as health and wellbeing, attitude, enjoyment, participation, self expression, interaction, opportunity for co-learning and/or lifelong learning skills and educational impact specifically on players and generally on others	
3: Any advantages or disadvantages towards raising awareness of issues relating to disability, personal and social advocacy, accessibility, equal opportunity, human rights or other criteria	
4: In relation to the specific instrument in front of you, what do you feel works and what does not work	

5: What improvements can you suggest towards instruments or design process

6: Any benefits or disadvantages that might be useful to other professionals or non professionals as transferrable skills or knowledge






7: Any benefits or disadvantages arising from the projects inclusive approaches, such as involving participants from different professions and specialist fields in sharing knowledge, experience, skills and insights

8: Any possible areas of risk that need to be considered regarding the instrument, or ongoing design process

9: How can we develop the instruments design project further

10: Any other comments or ideas that you might like to suggest

Appendix 9: Coded focus group feedback

 = common to all three players  = Nicole  = Karim  = Ricky
 = commonalities noticed within each question

1: How you suggest that we might gain additional input and information towards this process from disabled instruments player/s?

Nicole:

...ILLEGIBLE... and getting feedback from observers new to the participants, off the staff spontaneous observations, include other musicians

Get her mum and sister to do it with her, dad was a musician, and she might have a good suggestion

Public performance. News letters. Website.

Videos of instrument payers - to update our experience of their involvement

Continue observe Nicole when she plays instrument. Continue to monitor her interaction with it. Feed back this information to its creators.

By spending more time with Nicole and those who knows her well

Again Speech+Language plus Physiotherapist

by observation, Learning about Nicole's likes/dislike's

NO ANSWER GIVEN

observation from support workers, carers

input from families, other professionals (eg. phisiotherapist)

observation of Nicole's facial expression, eye contact

NO ANSWER GIVEN

As with Ricky, total involvement of Nicole+those who support/know her - direct observation, off the ...ILLEGIBLE... observation, try and error

Karim:

By observation whilst service user is playing, participating in music sessions

By continuing to do what you are currently doing, simply spending time with instrument players and those who ..?... is vital

Professional input i.e speech + language therapists, behavioural

Watch how they react and use the instrument

Listen to Karim, watch how he responds to the instrument, what signs is he displaying, does he look happy?

NO ANSWER GIVEN

Observe agreement to choices made by body language signs, ask questions, try out on instrument

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Enable people to handle as many instruments as possible.

Ricky:

Ask Ricky how is he feeling, watch his facial expression, body language, vocalization, try instrument with him at scope

Ricky's input, listen to, ask questions, ask family, ask professional, ask designer, try out the instruments

Asked Ricky, observed Ricky, observed Ricky's interaction with support workers carers, family members, other professionals (SALT, Physio, Designers)

observations from support/carer's workers

family members, other professionals in speak language

information from Ricky, facial expression

NO ANSWER GIVEN

Ask Ricky which he likes ...ILLEGIBLE...

His sister Heather will know many songs and music that Ricky has liked all his life and which have significance for him - he likes singing along with things he knows and also enjoy playing them as well

NO ANSWER GIVEN

Once again, simply by spending more time with Ricky and those who know him well.

by observation, communication (speech), likes/dislikes, by experimentation

S+L Therapists, Physiotherapist

Take time and give time for the service users to react to any given opportunity, so their responses can be measured and thus contribute towards the design process

Commonalities - Involvement of families, care & support networks.

- Observation
- Observation of body language
- Person centred
- Improvisation
- Public performance

2: Any changes that you have observed during the instruments design process in relation to players, yourself, support staff, management, extended team members, JOS volunteers, co-designers and makers, members of the local and extended community, such as health and wellbeing, attitude, enjoyment, participation, self expression, interaction, opportunity for co-learning and/or lifelong learning skills and educational impact specifically on players and generally on others?

Nicole:

I don't attend Joy of Sound sessions myself, but they are very high energy and they seems really enjoy them...ILLEGIBLE...

This is leading question, I think. Many things have changed for Nicole over past tree years

NO ANSWER GIVEN

It has been encouraging to know how that this process has been happening for our service users, to enable them to be involved in musical activities - sense of wellbeing. I have experienced JOS and realized that lot of people with LD enjoy participating

As Nicole has realized that this instrument has been created for her needs, she seems to have become more responsive to it, when it is placed before her. As participants see the

response it generates within nicole, they become more energized

Nicole greatly enjoys sound and music, her facial expression and mood can directly respond to the sound and music. This sessions could really demonstrate a new level of self-expression for Nicole.

Nicole has become much more engaged + happy within sessions

Nicole seems to like this

NO ANSWER GIVEN

more interaction with Nicole, from volunteers/staff

developing new skills

the instrument have given Nicole opportunity to full more community involvement/ participation

Nicole enjoy playing the instrument, always smile

NO ANSWER GIVEN

Same as Ricky, Benefits of being around, involved in music, open up possibilities

Karim:

Service user's self expression and interaction (positive) has improved

Karim clearly enjoys attending JOS session and frequently begin to imitate the use of the Karimbek.?....

Karim takes a lead facilitator role. Using Karimbek, by moving around his fellow players encouraging their input

Users have become more confident around using the instrument - it seems to have become an extension of their personalities. Their preference in the local community (via thursday session) has raised profile of our service users within local community, exposing them to the opportunities they would not have had

NO ANSWER GIVEN

NO ANSWER GIVEN

Choice. A feeling of freedom/independence. To feel part of a group. Inclusion. Developing new skills. Working with family to explore what would be good instrument for him.

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Karim does love music and musical involvement + dance, he is a performer. Having musical interments provides some authenticity for the individual, a sense of power in production of sounds

Ricky:

Ricky enjoyed using the instrument, you could see that he was having fun. learning new skills, having new sounds. I felt a connection with him and the music he was playing
People ...ILLEGIBLE... early about process...ILLEGIBLE... one tried players enjoy the person centered approach in the process
Individuals were engaged, came alive, informed process, pushed individuals outside their comfort zones, challenged perceptions/beliefs, reinforced person's centered approach.
fun, inclusive - promoted meaningful participation.
...ILLEGIBLE...-Ricky's willingness to attend the session, be happy that he will have opportunity to play his instrument
...ILLEGIBLE...

Confidence. Choice making...ILLEGIBLE...
Once instrument fixed to chair, independence in use
Ricky enjoys Joy of Sound

Ricky has had many new experiences over last 3 years eg. has begun paid employment
NO ANSWER GIVEN

It is apparent that Ricky greatly enjoys JOS session. When I first know Ricky, he had a mouth organ, it is now fantastic to see this wide variety of instruments that Ricky has access to - brilliant!

improves extended community - getting to know people outside of RBKC eg Vauxhall RC's confidence has grown immensely and he is a fantastic contributor to the group
With respect to Ricky, his confidence seems to have grown over the time and as he becomes aware of capabilities of the instruments so he has his energy levels with regard to playing them. I believe that levels of confidence and energy from the individual service users has caused a ripple through the staff and volunteers attending the sessions and the local community has felt this through our Thursday's sessions

Commonalities:

- Increased confidence
- Enjoyment
- Access to an extended community
- Choice (in Ricky's case, access to a variety of instruments)
- Independence
- Energy is encouraging to others

3: Any advantages or disadvantages towards raising awareness of issues relating to disability, personal and social advocacy, accessibility, equal opportunity, human rights or other criteria?

Nicole:

It is interesting that disabled people could be in position to entertain people.

NO ANSWER GIVEN

I don't feel there are many disadvantages in raising awareness relating to the issues of disability.

Musical activities in the future, public performance will raise the profile of those with LD
The service users profile has been raised with the local community via participation with these instruments at our Thursday sessions

A clear advantage is that many people would wrongly draw the conclusion that nicole could not play and instrument. This clearly demonstrates otherwise!

I think it shows Nicole in positive light

NO ANSWER GIVEN

NO ANSWER GIVEN

Very therapeutic for Nicole, instrument given Nicole more opportunity for social inclusion
disadv: lack of carry case, possibly more lighter, storage, transportation

NO ANSWER GIVEN

don't need to be "musically inclined" to get involved, very inclusive, all participants = force in process. Opens up involvements - challenges how we support - move away from conventional traditional "clash bang!" disability work groups. Very relaxing, tuning might be difficult, accessible

disadv- easy storage and transport

Karim:

NO ANSWER GIVEN

If, as is planned this experience becomes global and impacts accordingly. This could be curtail in raising awareness of disability in other territories

The advantages are endless i.e. new + increased skill base, recognition of talents, admiration from his brother

It work extremely well because it was created to suit the personality of it user. This it does. to enjoy playing a instrument feeling part of a group of like minded musicians having fun together.

NO ANSWER GIVEN

Expense, funding difficulties: complexity of instruments for support workers (new ones) . choice, publicity, marketing, interest

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Ricky:

Being able to play an instrument, meeting a new people with same interest.

Unique players opportunity to play instruments that may be otherwise out of bounds, person centered approach to choice and talents, skills. Instruments are larger and ..ILLEGIBLE... to transport

Challenged "Can't be done thoughts", demonstrated individual potential(s) - opened up possibilities of using technology learned to other realms. Rattled a few cages.

Opportunity to learn and play an Instrument, developing new skill. ..ILLEGIBLE...

There are no disadvantages in raising awareness

Participation build Ricky's self esteem

NO ANSWER GIVEN

NO ANSWER GIVEN

These instruments provide Ricky with superb accessibility to sound/music and opportunity to self express + have a great time!

good way to raise awareness of disabled people

New people are always amazed when Ricky plays independently

For Ricky personally I believe much of the success of the various instruments here is due to their ability to allow Ricky to express himself musically

Commonalities:

- Challenged "can't be done" thoughts, preconceptions about individuals
- Raising awareness - potentially in other sectors, as well.
- Raising profile - "recognition of talent"
- Disadvantage - storage, transport (not specifically related to the question, but it came up multiple times)

4: In relation to the specific instrument in front of you, what do you feel works and what does not work?

Nicole:

The ...ILLEGIBLE...bit on the right is too dull - not sharp enough

It is beautiful instrument & very eye contacting, witch I ma certain Nicole will appreciate

...ILLEGIBLE.... Working with support workers and others to work joyfully to make music

The Mojojo seems well designed, but I haven't seen it in action yet

The legs could be more robust, though their current status is more than safe

The instrument strongly reflects and ..?. Nicole's cultural heritage, which is element to her personality.

As a multi-player instrument it works well, in the future it would be amazing to somehow give Nicole opportunity to play more independently or semi-independently eg soundbeam focused to eye blinking

Easy for Nicole to use, when staff supports

NO ANSWER GIVEN

The instrument was tailored made for Nicole, and it can be raised to Nicole's?....in her wheelchair

NO ANSWER GIVEN

Tone, design = works, encourage participation, challenge for Nicole "support" not to take over, really need to tune into Nicole's movement/being.
Potential to expand pods= expand groups

Karim:

Instrument is personalized with picture and shape (slim model) for Karim
The Karimbek is direct and clear reflection of Karim himself, his character and personality traits.
The parent lack of tuning to keep Karim's focus, the cultural references, the ability to strum + bow, name :)
NO ANSWER GIVEN
The sound is great, using a bow or plucking is good as he has a choice, very individual to him as a person
NO ANSWER GIVEN
Personalized favorite instruments ...?... Right weight, strep - supportive. Likes to use his hands to express himself.
NO ANSWER GIVEN
Robust and feels good. I like his picture at the end.
The design is related specifically to Karim, especially art work makes it personalized to Karim
NO ANSWER GIVEN
Too heavy perhaps? Sharp edges

Ricky:

Made to Ricky's needs, great bespoke instrument.
Very accessible + tailor made for individual, very functional for individual.
Fact that it meets Ricky's musical abilities - he has informed creative process - functional brings joy
...ILLEGIBLE... made instrument for Ricky
Accessible instrument made for Ricky
It gives Ricky choice of different instruments to play
Perhaps ...ILLEGIBLE... more easily
Instrument match Ricky's range of abilities really well
Have not seen in action.
All instruments appear to work well and give Ricky heightened equal opp, and further insight to his opportunities
Ricky does not need to use his hands, he can blow into instrument
The melodian is tricky to set up sufficiently for RC to play. The stand and presentation modules are fantastic.
NO ANSWER GIVEN

Commonalities:

- Personalisation (reflects personality)
- Reflects / responds to needs
- Accessibility

5: What improvements can you suggest towards instruments or design process?

Nicole:

Too hard to get a ..ILLEGIBLE....on the left hand..ILLEGIBLE....

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

If is Nicole's movement ability was to improve, her support with Mojojo could be modified accordingly.

can not think any, may be bit difficult for staff to support Nicole to play instrument eg. twisted sitting position

NO ANSWER GIVEN

....ILLEGIBLE....

NO ANSWER GIVEN

Sounds great but few of the sound bars are broken and need repair, some strings needs tuning.

NO ANSWER GIVEN

Karim:

Can't think any

None that come to my mind

NO ANSWER GIVEN

Having watched the process develop along with service user I feel it has been a very inclusive process with service users being part of the process.

NO ANSWER GIVEN

Smaller, lighter

NO ANSWER GIVEN

The instrument can be make a bit smaller and lighter

Something that responds to the way Karim likes to move, whilst playing eg bells attached to sides...

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Ricky:

light weight equipment

n/a Lighter

NO ANSWER GIVEN

Light weight

NO ANSWER GIVEN

You could invite LSO musicians to come to centre and observe/participate. They do outreach.

NO ANSWER GIVEN

...ILLEGIBLE.. Replaceable parts available.

Brilliant so far, simply be guided by Ricky himself

can not think any

NO ANSWER GIVEN

NO ANSWER GIVEN

Commonalities:

- Could be lighter weight (Ricky & Karim's)

6: Any benefits or disadvantages that might be useful to other professionals or none professionals as transferrable skills or knowledge?

Nicole:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

By spending time with Nicole when she is using instruments, this could be effective introduction to getting know Nicole.

Read Nicole's facial expression. Play in time with blinks.

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

advantage - 2 staff support Nicole to use the Mojojo so that she can fully experience the use of instrument

NO ANSWER GIVEN

Karim:

NO ANSWER GIVEN

The information sheet that accompanies the Karimbek should always be available to new staff who do not know Karim as it provides good insights

The unorthodox tuning procedure

This process needs to be inclusive with service user being at the centre of the process

NO ANSWER GIVEN

Head, easy to tune, instrument designers - easier to tune like personalized pictures/symbols etc, combination of two instruments - karim seemed to naturally take to playing

NO ANSWER GIVEN

The sharp screw on the head can be used as weapon, he bang on head.

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN
NO ANSWER GIVEN

Ricky:

NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN

All knowledge is beneficial, ideas to share.

...ILLEGIBLE..

NO ANSWER GIVEN

Liaise with London school of music.

The instruments can provide a great introduction into one aspect of getting know Ricky, when spending time with him

NO ANSWER GIVEN

Make sure that RC is comfortable, ie enough to drink, is he too hot, cold, seated correctly.

Ask him open questions and act on his responses

NO ANSWER GIVEN

Commonality: Getting to know the BMI player

7: Any benefits or disadvantages arising from the projects inclusive approaches, such as involving participants from different professions and specialist fields in sharing knowledge, experience, skills and insights?

Nicole:

NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN

The entire team who collaborated to create instrument will have had heightened exposure to the word of learning disability

Player (Nicole) requires 2 staff to be fully ...ILLEGIBLE....

i can think only benefits eg wider acknowledgment of PMDL and how to support and communicate with them

2 staff to support Nicole, Disadv- large storage

NO ANSWER GIVEN

Inclusive coloring of the instrument flag ..ILLEGIBLE....

NO ANSWER GIVEN

Karim:

Sharing knowledge and experience with others is good

A direct benefit is the heightened awareness of disability throughout other professions, others than those who are involved in care

All knowledge/is useful thoughts

NO ANSWER GIVEN

NO ANSWER GIVEN

Take longer to build, but engages. Different perceptions - help overcome perceived barriers

fact he can use bow or can pluck it (it = karim's likes, dislikes etc.)

NO ANSWER GIVEN

Benefits: It is Karim's personal instrument made with his?.....

NO ANSWER GIVEN

NO ANSWER GIVEN

I have supported Karim to a dance workshop - he helped to create a dance which was performed at Barbican (the collage of Dance...)

NO ANSWER GIVEN

Ricky:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

It is always good to make the process as inclusive as possible, to invite ideas from different perspectives.

As above

NO ANSWER GIVEN

Confidentiality with individual personal details - vulnerable adults

All involved will have heightened awareness of ability/disability.

benefits to everyone's experience

A greater understand of P.M.L.D how the sharing of experience + knowledge has produces such important work.

NO ANSWER GIVEN

Commonality: Heightened awareness of disability, and approaches

8: Any possible areas of risk that need to be considered regarding the instrument, or ongoing design process?

Nicole:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Simply to ensure that Nicole is always safe, when using the instrument and supported by those who knows her well.

That the stand is secures safely to the instrument

NO ANSWER GIVEN

Quite close to her legs in

NO ANSWER GIVEN

Careful of positioning of equipment very near leg's

NO ANSWER GIVEN

Karim:

NO ANSWER GIVEN

Simply that instrument is always safe and does not endanger Karim at all

NO ANSWER GIVEN

It is a heavy instrument and could do damage if dropped

NO ANSWER GIVEN

Could be used as weapon, easy to break, can be difficult to transport, store

NO ANSWER GIVEN

The screw on the head may need to go "in" a bit more

NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN

Ricky:

equipment heavy

NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN

Fitting to chair. Supporting staff to know how to use/set up instrument in a way that is not stressful for Ricky.

The risk that you might miss at ...ILLEGIBLE..input from people LSO!

Occasionally Ricky can start violently and could (although not likely) bang his face off anything close to

Cleaning, repairing, replacing parts

As before, safety is ...ILLEGIBLE..

NO ANSWER GIVEN

The positioning is key so RC is comfortable and no instruments are likely to poke him in the face, must always wear chest harness !!

NO ANSWER GIVEN

Commonalities:

- weight of equipment

- Important that supporting staff know the player

9: How can we develop the instruments design project further?

Nicole:

NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN
NO ANSWER GIVEN

By following Nicole's lead, her expression and?.....

Know how's she feeling.

By getting more recognition, increased funding by contributing in a same positive vain

- could have other instrument attached such as bell etc

NO ANSWER GIVEN

NO ANSWER GIVEN

Develop other sound pods

NO ANSWER GIVEN

Karim:

NO ANSWER GIVEN

By being let by Karim himself, does he reveal/unfold any further characteristics that can be reflected with the instrument.

NO ANSWER GIVEN

Continue inclusive process and monitor the results with service user participation integral to the participation

NO ANSWER GIVEN

React to individualized sound, movement etc. Try out process on another individual.
Karim to participate as co-learner in this process (teach other how to play it).

Form a band etc

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Continue to get more people involved, develop it designs, adaptive when needed to individuals changing abilities.

Are there any Indian instrument players around in London?

NO ANSWER GIVEN

Ricky:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Talk with Ricky, to find out how he would like to develop his instrument

As above

NO ANSWER GIVEN

Involve other equipments and encourage designers to submit ideas. Gather info from those who work closely with service users.

By spending more time with Ricky, as his skills develop, maybe the instruments could develop accordingly

NO ANSWER GIVEN

Keep playing, advertising, gigging. More funding!

NO ANSWER GIVEN

Commonalities:

- Funding

- Developments should be led by service user

10: Any other comments or ideas that you might like to suggest?

Nicole:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Karim:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

Not at present time

NO ANSWER GIVEN

Remember that individual is central to process, don't let theories/technology get in the way.

Remember who is instrument for.

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

.....?.....

NO ANSWER GIVEN

Ricky:

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

The college of Dance might be interested too

NO ANSWER GIVEN

The weight of instruments and the hardness of the materials a prob.?... soft instruments

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

NO ANSWER GIVEN

COMMON FEEDBACK

Towards developing BMI

- Observation of user
- Observation of body language
- Involvement of families, care & support networks.
- Funding
- Developments should be led by service user
- Person centred
- Improvisation
- Public performance

- Benefits of process

- Increased confidence
- Enjoyment
- Access to an extended community
- Choice (in Ricky's case, access to a variety of instruments)
- Independence
- Energy is encouraging to others
- Challenged "can't be done" thoughts, preconceptions about individuals
- Raising awareness - potentially in other sectors, as well.
- Raising profile - "recognition of talent"
- Personalisation (reflects personality)
- Reflects / responds to needs

-

Disadvantage - storage, transport (not specifically related to the question, but it came up multiple times)

- Accessibility
- Could be lighter weight (Ricky & Karim's)

-

Advantage as transferrable skills: Getting to know the BMI player

- Heightened awareness of disability, and approaches
- weight of equipment
- Important that supporting staff know the player

BMI-Specific FEEDBACK

Nicole

Therapeutic effect

therapeutic for Nicole,
Very relaxing, tuning might be difficult, accessible

Instrument-Specific

bit on the right is too dull - not sharp enough
Inclusive coloring of the instrument flag
It is beautiful instrument & very eye contacting, witch I ma certain Nicole will appreciate
The legs could be more robust, though their current status is more than safe
Potential to expand pods= expand groups
- could have other instrument attached such as bell etc
Develop other sound pods
few of the sound bars are broken and need repair, some strings needs tuning.

Safety

That the stand is secures safely to the instrument
Quite close to her legs in
Careful of positioning of equipment very near leg's

Multi-player - pros and cons and techniques

As a multi-player instrument it works well, in the future it would be amazing to somehow give Nicole opportunity to play more independently or semi-independently eg soundbeam focused to eye blinking
Easy for Nicole to use, when staff supports
challenge for Nicole "support" not to take over, really need to tune into Nicole's movement/ being.
f is Nicole's movement ability was to improve, her support with Mojojo could be modified accordingly.
can not think any, may be bit difficult for staff to support Nicole to play instrument eg. twisted sitting position
Read Nicole's facial expression. Play in time with blinks.
advantage - 2 staff support Nicole to use the Mojojo so that she can fully experience the use of instrument
Player (Nicole) requires 2 staff to be fully
2 staff to support Nicole,

Karim

Leadership / personal development

Karim takes a lead facilitator role.

Service user's self expression and interaction (positive) has improved

Instrument-Specific

The parent lack of tuning to keep Karim's focus, the cultural references, the ability to strum + bow, name :

Right weight, strep - supportive. Likes to use his hands to express himself.

Robust and feels good. I like his picture at the end.

3. The unorthodox tuning procedure

Head, easy to tune, instrument designers - easier to tune like personalized pictures/symbols etc, combination of two instruments

fact he can use bow or can pluck it (it = karim's likes, dislikes etc.)

Safety concerns

Too heavy perhaps? Sharp edges

The sharp screw on the head can be used as weapon, he bang on head

Could be used as weapon, easy to break, can be difficult to transport, store

The screw on the head may need to go "in" a bit more

Future potentials

9. Something that responds to the way Karim likes to move, whilst playing eg bells attached to sides...

he helped to create a dance which was performed at Barbican (the collage of Dance...)

Karim to participate as co-learner in this process (teach other how to play it).

Form a band etc

get more people involved

Are there any Indian instrument players around in London

Ricky

Access / Advocacy

fantastic to see this wide variety of instruments that Ricky has access to - brilliant!

Unique players opportunity to play instruments that may be otherwise out of bounds

These instruments provide Ricky with superb accessibility to sound/music

choice of different instruments to play

pushed individuals outside their comfort zones, challenged perceptions/beliefs,

Instrument-specific

The melodian is tricky to set up sufficiently for RC to play.

Replaceable parts available.

Cleaning, repairing, replacing parts

Safety concerns

Confidentiality with individual personal details - vulnerable adults

Occasionally Ricky can start violently and could (although not likely) bang his face off anything close to

The positioning is key so RC is comfortable and no instruments are likely to poke him in the face, must always wear chest harness !!

Make sure that RC is comfortable, ie enough to drink, is he too hot, cold, seated correctly.

Ask him open questions and act on his responses

The weight of instruments and the hardness of the materials a prob.?... soft instruments

Future potentials

give Ricky heightened equal opp, and further insight to his opportunities

You could invite LSO musicians to come to centre and observe/participate. They do outreach.

Liaise with London school of music.

as his skills develop, maybe the instruments could develop accordingly

The college of Dance might be interested too

Appendix 10: List of Object-Based Learning Capacities

MUSIC INSTRUMENTS towards OBJECT-BASED LEARNING

Upon visiting the Celtic Exhibitor at the British Museum, January 16th 2016 -
Objects in the exhibition embodied the given qualities:

Mark of identity
Statement of creating difference
Used in worship and devotion
Symbol of status
Symbol of power
Mark of wealth
For use as Magic
Communicating secrets codes
Marker of events and/or locations
Commemorative object
Token of ancestry
Relational signifier - tokens
Proof of identity
Mark of strength
Symbol of courage
Object of protection
Item of trade, barter and exchange
Object of personal local social regional hemispherical and global indicators of
politic, faith - dogma - belief
Intended to impress / scare - instil fear - admiration - etc.
Object as cultural interface - combining local traditions - used as cultural
tools of integration
Diplomacy gift and offering
Offering to deities
Object as a God
Sacrificial object
As Shrine - object of death - (i.e. Celtic bell shrine)
As object to secure divine protection
Decorative object
As totemic - tribal - cult object
As protector in natural and supernatural worlds
As marker of trade and aesthetic dispersion as with the Silk Road
Object that can be stolen undermined rented borrowed desired - as focus for
any human emotion need or desire as metaphor
Interphase of oral cultures

**Appendix 11: JOS Income, Expenditure and Attendances
2013-2017**

Years	2013-14	2014-15	2015-16	2016-17
Total Income	46310	50500	59962	29198
Total Expenditure	36724	39579	48577	28922
Attendances workshops and events	3292	7014	8413	11765

Appendix 12: Marc Jeffrey's Statement

"If ...

you get it right for the disabled you get it right for all. Irrespective of gender, age or perceived sagacity"

This tenet underpins the very principals of Universal law.

Equality is the basis for human life. We learn that they who are able bodied are the needful learners, as opposed to the misconception of disability that decrees that those who are labelled the disabled, are learning challenged; for true learning lies within those who are hardest to reach.

Disability, in its many forms, affects one in six of Lambeth's residents. Diversity affects us all, and from it, we benefit. Yet, learn we can and should. Interact with disability and learn from it, for it knows no boundaries, it goes beyond imagination and makes the impossible possible.

This is the website of the Joy of Sound (JOS) <www.joyofsound.net>. For us, we have realised the wealth within us and are sharing that wealth equally. We take each person as a Rosetta stone. For from these precious few we learn about ourselves; and from their collective music we allow our collective imaginations a never ending access to the global village that can enable life to imitate art and inspire a collective capability that goes far beyond the playing of the first note on a global map of harmony.

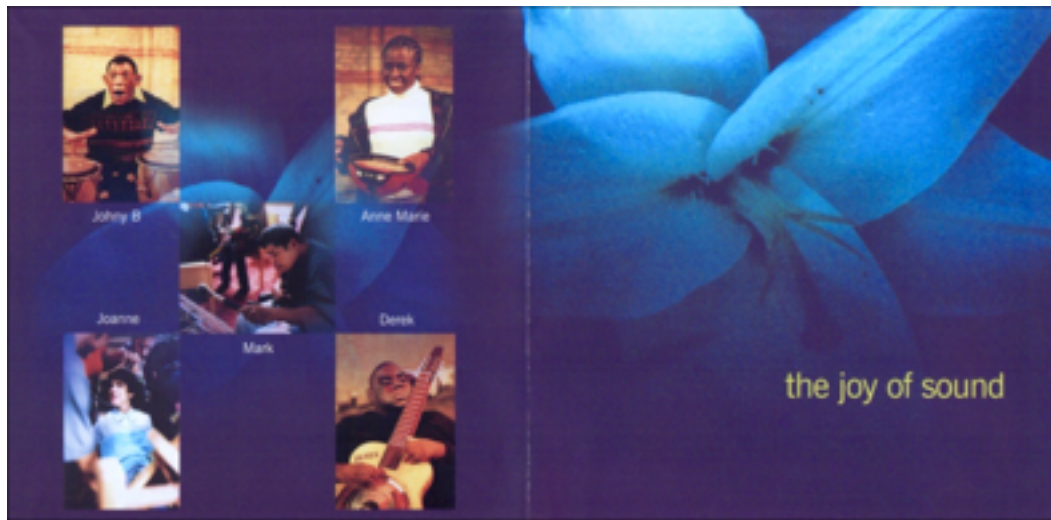
Each individual adds to the layers of our knowledge and from their capabilities we fashion the capability of all to communicate, and from that communication reap the benefits of communal ability.

We do not deny, we do not manage medically or socially, we do not patronise. Instead we learn from these, our co-teachers and co-creators. Through collective capability, collective trust, and collective thought, a microcosm that can inspire all to learn.

Listen to the Joy of Sound... and then ... then, discuss.

Marc Jeffrey May 7th 2012.

Appendix 13: Liner notes from first JOS album



The Joy of Sound Project began in 2000 as a joint Millennium Fellowship Award for William Longfitt and James Twissell, friends and artistic collaborators. After initial developments at Lambeth Walk Day Centre, William took over management of the project working with Danny Simpson, and later Tony Scantlebury, both key workers at Lambeth Walk. The objective of our project was to create ways of enabling students with severe learning difficulties to create and enjoy interactive music, to express feelings through sound and to extend possibilities for learning. Having devised a system of musical play based around Indian Raga (the expression of ever changing moods) the chord of E Flat Major was chosen as being most expressive of our spectrum of feelings, and used as the foundation to our musical process. Five students were chosen, these students having expressed continued enthusiasm and commitment throughout a one-year period of exploratory weekly sessions. Instruments were devised, designed and produced after consultation, and in collaboration with students from the Guildhall University and other music instrument makers. Instruments evolved in accord with the personality, dexterity and spirit of each student. Over fifty guest musicians helped to facilitate and explore musical interplay with the students, who used their own newly created and personalised instruments.

In November 2002 all of these musicians who had participated in the project during the previous two years, were invited to a recording session with students at Yeoball St. Peter's Heritage Centre. The resultant CD reflects the joy and enthusiasm, the humour and those shared moments which cause us to flower during our 100 weekly meetings. A 'Sound Boxer' was purchased from project funding and will be used for further works with our resident sound bank, which now stands at five CDs of session recordings and studio produced tracks. This project has been a joyful, moving and rewarding experience for us all. We hope to continue further with the help of funding generated through sales of this CD and believe that with empathy and commitment, with open spirit and enthusiasm, any group of people can play and enjoy music together. We can all learn from each other and can extend our communicative potential. Simply and most importantly, we can all enjoy the joys of musical creativity.

Thanks to Margaret Edwards and the Millennium Awards Team at the Peabody Trust, Alan Spinler, Lewis Jones and students from the Guildhall University Dept. of Design Research for Disability, Danny Simpson, Jill Kelly, Beverly, parents, staff and helpers at Lambeth Walk, Sharon and Dawn at Kensington Flowershop, Eddy, Eddy, Julie and Anne at Yeoball St. Peter's Heritage Centre, Sarah and the staff at Bellamy's Cafe, Kensington.

The Champions for Change Millennium Awards Scheme is managed by the Peabody Trust and funded by the Millennium Commission.

M:
Millennium Awards

Peabody Trust

Band
Johnny B - Peg Congo and Vocals (congas made by Richard Buckley)
James - Percussion Frame (made by Jamie Loudwood) with additions by Dan Knight)
Ann - Marie - Lap Flap (made by Ian De Saeni)
Derek - Guitar (made by Godfrey Martignoli and Andrew Scantlebury)
Mark - Maracas (made by James Loudwood), Bane by Dan Knight)

Guest musicians
Wilburforce - tenors vocals and session recordings, Sandra Harley - vocals and Big snare
Boris Twissell - bass guitar and vocals, Danny Simpson - Italian vocals, Pappy Longfitt - vocals,
Dan and Dan Knight and Nathan - percussion, Karim - piano, Iain Houghton - Beach feet,
Rena rhythms and vocals, Sylvia Pauline - vocals La Lata, Vincenzo DeCuzzo - accordion and vocals,
Domenico DeCuzzo - slide guitar and vocals, Conrad Williams - classical piano,
Chris Peggmont - cello and vocals, Gabriella Gial - handily rock piano and vocals,
Eve Shilcock - guitar and vocals, Diego A. Levarich - Acoustic guitar,
Ira De Saeni - Flamingo vocals and wonderful commitment, Elise Kertis - vocals portuguese,
Ricky Edwards - sax and flute, Caroline Hall - trombone, Glen Gordon - trumpet,
Keith Mason - Euphonium, Julien Dupuy - Saxophone, Alonzo Cabana - guitar,
Tony Green - male and vocals, Boris and Brenda - cello, viola and violin,
Tony McFarland - Scottish Bagpipes, Henry - Banjo, Brian Miller and the Salvation Army Band,
William Longfitt - guitar, Bass, dulcimer and vocals, Frank Bangay - jazz,
Nicholas Pugh - handily guitar, Scottish pipes and organ,
T Southwood - kit drums, Tony Scantlebury - vocal rap, DJ - gear cello.

Project concept and direction: William E. Longfitt - william@joy-of-sound.net.uk - 0207 759629
Project session director: Tony Scantlebury (Senior, Lambeth Walk Day Centre)
Cover photography and group photos: Elise Kertis - elisek@btinternet.com - www.williamandjane.com - 07904 116 80
Black and White photographer: Alan Marsh - www.alanmarsh.com - 0207 4871751
Cover production: Domenico DeCuzzo

Recorded live at St. Peter's Church, Yeoball, London.
Arranged and mixed by Vincenzo and Domenico DeCuzzo at Their Artwork Studios
in collaboration with 'The Band' and the 'Joy of Sound' team.
Their Artwork Music: 510 Brunton Road London SW9 8EN UK. www.theirartworkmusic.com
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BMI film

See Auxiliary CD attached to back page

Appendix 14: Production details and time log of BMI film

The BMI film attached as auxiliary material was produced in order to generate reflections towards answering the research questions.

Length: 33'50

Produced by William E. Longden at Joy of Sound
Vesna Marich Film Editing
Darko Marich. Graphics
Ralph Killius. Filming, Editing and in camera sound recording.
Marcella Haddad. Filming, Editing and Stills Photography
Alan Marsh. Presentation Images of BMIs
Additional Sound. JOS CD (produced by - Details?)

Film funded by:
Arts Council Great Britain
William Longden
Supported by:
JOS Volunteers and project participants
SCOPE
MERU
Salvation Army at Portobello Rd
St Peters Heritage Centre at Vauxhall

8.5.6. BMI film time log:

The following time log was used to highlight salient aspects of the BMI project, and to gather evidence towards the research questions.

00:58: Summary of BMIs produced with each C-D
01:31: Ricky using prototype WIPP (held by support worker)
01:37: Karim leading an improvisation with Karimbek
01:43: Nicole playing Mojojo with assistance at SCOPE centre observation session
01:49: WL explaining BMI concept: "It fits me perfectly..."
02:01: Karimbek
02:13: Karim testing finished Karimbek
02:27: Stringed instruments on display in locked case at London Met
02:36: Karimbek design images
02:57: London Met design studios – discussion with IB, with other BMIs in background
02:59: IB explaining Karimbek name
03:19: Karim's unique way of holding the Karimbek
03:28: Shape changed to facilitate bow access

03:35: Decorations of the Karimbek to reflect Karim's tastes and faith

04:35: Home visit – discovered Karim's interest in James Bond

04:43: Karim's James Bond photo shoot for headstock

05:24: Modifying the headstock for safety

05:33: Karim using Karimbek at JOS session, Portobello Rd Salvation Army

06:22: LJ: Conventional instruments "not suitable or not possible to play"

06:28: LJ: Identifying the "particular needs and potentialities of that player"

06:35: LJ: BMIs "[afford] musical possibilities that didn't exist before"

06:40: IB: An opportunity to "pioneer... think outside the box"

06:55: IB discussing different materials that are used in BMIs to answer the different strains and stresses they may undergo.

07:02: "A useful way for me to be able to find my niche in making musical instruments."

07:17: Karim starting an improvisation at Tabernacle event. Man to his left smiling, before picking up his instrument and playing – example of Karim taking the lead with his BMI.

07:52: Commonly occurring damages to generic instruments when used for inclusive group work.

08:19: Mike Cameron, Luthier: Karimbek and Derek's 2nd Guitar have delicacy for good sound, and robustness to handle use in inclusive environments, mentions buried tuning heads. "Has a proper resonance."

09:40: Plectra developments

09:45: Customised plectrum and other accessible varieties of plectra

10:09: CL demonstrates first strummer assist prototype

10:40: DG explaining lateral strummer, with pin plectrum

11:32: Lateral strummer in use on zither on presentation stand

11:57: Attaching the foot strummer extension rod

12:11: First trial of the strummer extension rod – player first explores, then gains confidence, taking the lead. Other players responding to her lead.

13:40: Nicole's Mojojo

13:58: Nicole and support worker – provides platform for training in appropriate facilitation

14:09: Assembling the Mojojo with sliding soundboards

14:21: WL: "First instrument of its kind that is specially made for co-assistance"

14:33: Demonstration of co-assistance, with support workers playing instruments as well

14:56: Nicole playing her Mojojo at BMI presentation event.

15:30: NR explaining how an instrument designed for one person can be adaptable to many people's needs.

15:40: WL: Needs are contextualised within a social music making that is dependent on everybody participating

16:22: KH: Nicole responded to physical contact. What support workers play, she feels "and this is part of her musical experience, part of her contribution to the whole process."

16:59: How Mojojo engages support workers, building their confidence as musicians – importance of support workers being part of the musical dialogue

17:27: Nicole beginning improvisation, with support worker playing and supporting

17:50: Mojojo design developments with CAD drawings

18:31: Demonstration of the slide-in soundboards and potentials for extending the instrument.

18:58: Using a tin whistle as a bridge – using materials at hand to experiment

19:22: Ongoing development of the slide-in soundboards – bowed zither

19:36: Mojojo sounds demonstration

19:44: Composite flat-pack stand and attachment plate

20:02: Flag of Antigua, used for finishing colours for Mojojo

20:10: Mojojo co-design and making team

20:19: Acknowledging Nicole and her co-players

20:26: Ricky's BMIs and IADs

20:36: Ricky testing WIPP, attached to Daessy mount.

21:04: Ricky voicing his opinion: WL: "Do you want to play on this?" Ricky: "Yes."

21:12: Prototypes and models of Ricky's BMIs

21:50: WL: "All of these devices are essentially connected to Ricky." – OBL

22:08: VC discussing rationale for Ricky's presentation devices – so that he can be independent in his choice of using instruments.

22:55: Ricky testing Flexi stem presentation device

23:05: VC discussing the progression of WIPP prototypes and rationale for design adaptations

24:24: WIPP on Daessy mount

24:26: VC showing features of final WIPP

25:05: Ricky choosing which instrument to play in improvisation

25:16: Initial ideas for wristband plectrum

26:02: Ricky using wristband and spatula plectrum, with assistance

26:10: MERU designer discussing ideas for making mould for insert

26:32: Ricky testing his plectrum wristband insert independently – saying "Thank you" to person who moved the stand when the plectrum was stuck under a string

26:45: Ricky drawing with a pen in his plectrum insert

27:07: Adjustable Instruments Presentation Stand development

27:45: Contribution of being open to look at possibilities.

27:50: Open Source Design – combining readily available products to make a device that can be used in many situations

28:35: Ricky leading improvisation: starting with harmonica, resulting improvisation, being acknowledged.

29:16: LJ: "there are clearly... purely musical outcomes as a result of this, there are social outcomes and outcomes to do with the mode of interaction of the many practitioners, the designers, instrument makers and other practitioners who have come together in the generation of each of these instrument designs. Certainly for the students who have been involved, it seems there has been a remarkable stimulus to fresh thought, both in being presented with a particular player, a particular potential player, someone who perhaps didn't have the capacity to play on a normal instrument, but has been presented with the challenge of devising something that enables someone who otherwise wouldn't have been able to make music, or wouldn't have been able to make music in a particular way to be able to do so."

30:19: Additional BMIs, designed before, during and after this research, with sound files.

30:30: Foot-driven tuned percussion frame
30:37: Derek's first guitar
30:52: Derek's second guitar
31:11: Daniel's bespoke harp
31:25: Generic inclusive guitar
31:40: Mark's wheelchair presentable marimba
31:54: Wheelchair presentable double zither
32:10: Jim Bates' bespoke guitar
32:24: JOSKrar
32:34: Anne Marie's ladybird Lap Harp
32:49: Portable piano frame zither
33:00: Wheelchair presentable celestial bottle organ
33:11: Music mattress

Appendix 15: BMI precedents 2003 – 2007: Further information

This appendix provides additional information about BMIs briefly presented in Chapter 5: Introduction to Case Studies.

Mark's marimba



Mark's marimba was co-designed and made by Jamie Linwood, a London Met alumnus whose PhD research explored traditional African marimba making. Jamie also made other traditional ethnic instruments, specialist instruments for outdoor recreational use, and had undertaken one-off instruments designs working with Oily Cart, a theatre company specialising in interactive theatre for young people with PMLD. At the time of his commission Jamie had gained considerable experience and reputation as a professional instruments maker and had produced instruments for several internationally renowned musicians (Linwood, 2017).

Jamie attended one meeting with Mark, his support team and myself before commencing work on his marimba; and one upon completion when he delivered the finished instrument to Mark. All other consultations between myself and Jamie regarding development and building took place by telephone. The marimba was designed to fit Mark's range of single armed movement, as he used only his left arm whilst seated in his wheelchair. Initially the marimba was mounted onto a composite stand that sat securely on a table top to allow Mark's access. The marimba was designed with a narrow spread

of six keys that fitted his specific range of achievable movement. Individual keys were made long and broad enough to comfortably facilitate his play. The instrument expressed a deep and resonant voice in the key of E-flat. Mark often required support, assistance and encouragement as he often experienced multiple seizures. Mark very much enjoyed his marimba that he played with great enthuse at regular weekly JOS workshops and occasional events. Soon after the delivery of the marimba it became obvious that the table top presentation stand was impracticable. As Jamie was unavailable to make alternations, design alternations were commissioned from Dan Knight.

Dan, a multi-media artist, experimental musician and instrument maker with a reputation for designing and building unusual instruments often incorporating found objects and recycled materials, explore the vagaries and boundaries between fine arts, music practice and performance. He adapted the marimba's presentation frame to allow wheelchair access to the instrument without the need for additional auxiliary support. Mark frequently experienced debilitating seizures, often needing assistance and encouragement to play his marimba. The freestanding composite stand proved the perfect fit for Mark's wheelchair access. It also allowed Marks support team to offer co-creative assistance if required.

Derek's guitar



Derek's 1st bespoke guitar was designed by Godefroy Maruejouis and Juliane Bozzolini, fellow guitar players and students on the Guitar Making course at London Met. Juliane left the UK soon after his graduation and the completion of the instrument. Godefroy became an independent guitar maker specialising in flamenco guitars, and a tutor on the London Met guitar making course. Derek was very strong, self-determined and expressive. He enjoyed playing acoustic guitars. The guitars he had previously been given to play were quickly damaged and broken due to their lack of structural strength and design features able to cope with Derek's physical strength, his particular access approaches and needs, and his personal techniques and manner of playing. Derek was non-verbal, a wheelchair user with PMLD and facing severe and complex barriers to access of activities of his choice and liking.

Godefroy and Juliane met with Derek once at a JOS music session before embarking on the making of his guitar. The instrument needed to be sufficiently durable and functional to accommodate Derek's playing style, his physical size, strength, range and control of movement. The resulting design featured metal resonator panels that transmitted sounds in a manner that allowed Derek to hear and feel his instrument through his body, a locking safety strap to

ensure safe handling, a reinforced neck to accommodate Derek's considerable strength, a strum-guard-plate that prevented the strings from being accidentally blocked, and a grip bar at the back of the neck that allowed Derek to hold and support the instrument next to his body without blocking the strings. The solid guitar body was made from poplar, a wood selected for its strength and fragrance. Derek's name was inlaid into the body of the instrument. The instrument was strung with thick gauge metal strings that expressed a clear, bright and warm spectrum of sound when played by Derek.

Anne-Marie's Ladybird lap harp



Anne-Marie's ladybird lap harp was co-designed and made by Ina de Smet, a post-graduate student on the Design Research for Disability MA course at London Met. Anne-Marie had learning disabilities and experienced seizures that made her prone to dropping or throwing anything that she was holding during a seizure. The project served towards Ina's course work requirement. She had prior experience as a harpist and harp maker and worked closely with

Anne-Marie over a period of 6 months, visiting her for regular co-design development sessions at the day care centre she attended and liaised with her care team and family. The lap harp grew directly out of Anne-Marie's preferences and access requirements. It took the form of her favourite creature, a ladybird, and preferred colour, red. Ina gained sponsorship from a car manufacturer for the body of the lap harp to be moulded from carbon fibre as used in building lightweight racing cars, making it safe and resilient for Anne-Marie's use. The harp was strung with natural and coloured nylon harp strings and expressed a mellow high pitched range of sounds.

Johnny B's tuneable peg drums



Johnny B was an enthusiastic, energetic and popular participant at music sessions. He was non-verbal with learning disabilities. His drums were made and presented specifically to fit his repetitive range of movement and liking of rhythm. Johnny B's tuneable peg drums were designed and made by Richard Huxley, an ex-tree surgeon, musician and self-trained drum maker who specialised in using locally sourced wood and animal skins to make drums following traditional African designs and making techniques. Richard learned his drum making craft experientially after researching traditional makers and

players during several field trips to Africa.

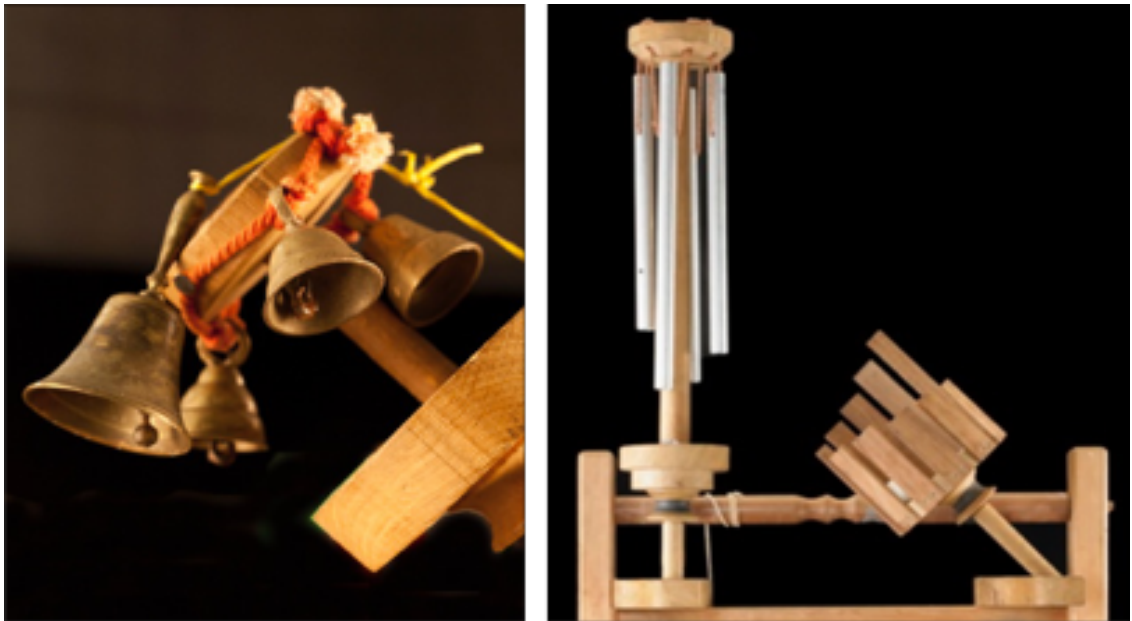
Joanne's wheelchair presentable tuned percussion frame



Joanne had an infectious spirit and wit that often surprised and impressed those whom she met and worked with. Her father and extended family network gave round the clock support and were engaged enthusiastically and wholeheartedly throughout the production process. Joanne had cerebral palsy that greatly increased her muscle tension. She was non-verbal and used a wheelchair for mobility. She gave clear facial and bodily gestural signals whenever she wanted to express her preferences and feelings.

Jamie who also worked on Mark's marimba, met with Joanne on two occasions: once before making her instrument and again upon delivery of her finished wheelchair presentable tuned percussion frame. This composite instrument's design was built to fit Joanne's range of controlled movement. Its design process was influenced by her character and humour. The working mechanism of the design was based on that of a traditional pole lathe. Joanne played the instrument by wearing a slip-on shoe connected to a spring cord that facilitated transfer of Joanne's right foot motion from the vertical plane to

the lateral plane. By the tension and release of an elasticated chord the pole rotated to operate rubber pulley bands fitted to spools to give motion to two percussion instruments at the same time. Joanne could choose from three provided percussion instruments each tuned to E-flat. The instruments were: suspended metal chime bars, brass bells and a wooden basket shuttle sounded by a spherical stone. Initially designed to be operated by Joanne's right foot movement, the percussion frame was later adapted by Dan Knight to offer interface with Joanne's extended arm movement.



The Tree Song lap harp



Ina de Smit's second JOS instrument commission occurred largely due to the success of the Ladybird lap harp, her first co-design commission that had demonstrated Ina's enthusiasm and ability to work inclusively with disabled JOS participants as a C-D. Ina's second commission followed on naturally and aimed to explore and overcome barriers to participation for JOS participants with profound and multiple disabilities who faced complex barriers to their access of participatory music making, and for whom other approaches had proved lacking. The Tree Song lap harp was produced as a strap-on instrument intended for close-in one to one assisted play with support from a facilitating co-creative player. The instrument was intended to resonate outwardly and inwardly into the body of its player. A laminated wooden body was carved texturally on the outer shell to make it interesting and stimulating to touch. Nylon harp strings lay beneath the sound board to prevent accidental interference during play with two shaped access holes of different sizes giving access to the strings. Tuning pins and all other parts were placed inside the sound box and accessible only by unscrewing and lifting the soundboard.

Wheelchair presentable twin zither and adjustable stand



The wheelchair presentable twin zither was produced at London Met as Ian Gill's major project towards his successfully achieved B.A. (Hons) Furniture Design in 2004. Initial visits to JOS led to the production of exploratory design sketches, and then to finished computer generated technical design drawings. The instrument was produced in the context of the London Met Furniture Design studios where it gained considerable interest amongst students and staff, and upon completion and presentation at the Degree Shows it drew attention as a novel and effective approach to producing a musical instrument in the mode of a piece of accessible, playable interactive furniture. Ian was an enthusiastic guitar player without any previous instrument making experience. After attending JOS sessions for several weeks, during which he explored range of movement and abilities of wheelchair user participants and the interaction of facilitators. With support and encouragement from JOS he proposed a twin zither in answer to a number of identified needs: it provides accessibility for those in a wheelchair, is fully adjustable in angle and height of presentation, and incorporates two sets of six strings. It is playable by one or two people at the same time and encourages co-creative support and

facilitation for players who may have impaired mobility in one hand or arm than the other.



Ian's instrument has been a popular addition at JOS sessions, gaining consistent use by players using wheelchairs for whom the instrument can be adjusted quickly and safely for different angles of presentation for players with a variety of access requirements. The zither's kidney shaped sound box was made from 6mm plywood. Its shape, double string sets and finishing was unusual in the context of instruments making. The instrument's composite mild steel tube stand offered robust and stable support and ease of vertical and lateral adjustment. The two sets of metal strings allow for variable and contrasting tunings in the range of E-flat. The twin zither transmits clear, bright sound and is comfortably accessible by wheelchair using players, often two at a time. The zither has proved robust enough to accommodate the exploratory use of new and recycled strings of varying gauges and in multiple combinations.

Wheelchair presentable Celestial Bottle Organ

Commissioned specifically as an experimental instrument for use by JOS participants at workshops and events. The organ was designed and made in keeping with Dan Knight's established approaches using a combination of new and recycled materials. Bottles were tuned to individual notes in the scale of E-flat by the insertion of various quantities of resin set into their chambers. The bottles were sounded by wind flow generated by an electric pump connected to a mains power socket. The instrument featured large coloured palm sized keys / pads that aimed to make the instrument more accessible to impaired players and particularly to wheelchair users.



The Celestial Bottle Organ proved to be a popular novel addition to the JOS instruments collection. However, it did not function well in the context of JOS workshops due to the continual audible hum produced by its pump that impeded on other workshop sounds and particularly into the silences between improvisations. Its requirement of a power cable and safe access to power socket presented health and safety issues. Also the relatively large size and heavy weight of the instrument rendered it difficult to transport and cumbersome to position. The instrument was eventually returned to Dan Knight for his use in the context of his participatory sound art installations,

events and exhibitions with open access for use by JOS should the requirement arise.

