

‘Conductology:

An original gesture system, co-created with intellectually disabled musicians, to enhance their creative ability and raise quality of output in their musical improvisations’

Denise Ann White FRSA M.Ed. B.Ed. (Hons)

Faculty of Arts, Humanities and Social Sciences, Ulster University

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I can confirm that the word count of this thesis is less than 100,000

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Abstract

This practice-based participatory study investigated the effects of an original gesture system, *Conductology*, co-created by intellectually disabled musicians, on participants' creative thinking in music and quality of their music improvisation output. Twenty-four intellectually disabled musicians participated in this research. Four co-created *Conductology*; and twenty participated in the main investigation, the testing of *Conductology*. The intervention group (N=10) and control group (N=10) took part in a twelve-week music improvisation project. Both groups used visual stimuli in week one through to week six to assist with the creation of music improvisations based on the agreed topics of 'Love' and 'Nightmares'. The intervention group utilized the *Conductology* system from week seven through to twelve while the control group continued to only use visual stimuli. Individual participants were administered an adapted version of Webster's Measurement of Creative Thinking in Music II (MCTM-II) immediately before the twelve-week workshops, and after the final workshop. In comparison with the control group (N=10), results indicated significant advancements in the three of the four MCTM-II subcategories of musical extensiveness (ME), musical flexibility (MF), and musical originality (MO) for intervention group participants. Furthermore, significant advancement in six key areas including collaboration, confidence and self-esteem, self-efficacy and challenge, novelty, creativity, and output is noted. Additionally, assessment of recorded improvisations indicated significant improvements in quality of music output for the intervention group. This research provided innovative opportunities for four intellectually disabled musicians to collaborate in the study's design and methodological approaches, an area which has received little attention in the literature. This participative study has the potential to inform funding bodies and policy makers about how empirical music interventions can positively impact on a marginalized section of population.

Author's Declaration

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Chapter 1 Presentation of the Study

1.1 Introducing *Conductology* (Appendix A, ex.1 and ex.2)

The reader is directed to view examples one and two in Appendix A which illustrates the fully developed co-created gesture system in preparation for the detailed discussion which follows.

‘The learner is no longer an “object” of pedagogy but becomes a creator in the field being taught’ (Mazzola, Park and Thalmann, 2011, p.161)

‘The new gesture system really gives me power to create all different pieces of music. I enjoy it.’ (Simon, co-creator)¹

‘I always learn something new. It [*Conductology*] really helps build my confidence and really strengthened me. I am proud of myself. The gesture system is getting better. I’ve got the hang of it now. It’s getting into me now. I am more powerful’. (James, co-creator)

People with intellectual disabilities (ID) encounter a variety of challenges, including low self-esteem, limited social and communication skills, and emotional and behaviour disorders. Most often, music improvisation is used as a therapeutic tool to assist ID individuals with social skills, communication, emotional expression, and rehabilitation (Darrow, 2014), yet, very little attention is given to the creative ability and quality of output of the improvising musician. Beaty (2015, p.109) describes music improvisation as one of the most articulated expressions of creative behaviour:

‘The improvising musician faces the unique challenge of managing several simultaneous processes in real-time- gathering and evaluating melodic and rhythmic

¹ Co-creators were given pseudonyms to protect their identity.

sequences, coordinating performance with other musicians in an ensemble, and executing elaborate fine-motor movements- all with the overall goal of creating esthetically appealing music.’

Furthermore, cognitive components are developed during the improvisation process, where musicians cooperate and collaborate to create a new piece extemporaneously, compounding difficulty for ID musicians (Wilson and MacDonald, 2017; Morgan *et al.*2015; and, Schober and Spiro, 2014). The thrust of this practice-based research is to explore the combination of enhancing the creative ability of ID musicians and raising the quality of output in their musical improvisations by co-creating and utilizing an original gesture system ‘*Conductology*’.²

1.2 Background and motivation

I grew up having a close relationship with my uncle Dessie. Even though Dessie had an ID, the family regarded him as ‘music-mad’, highly creative, and proudly confident. In my teenage years, where piano practice, composition and Bach chorales were an essential part of my day, Dessie would manoeuvre into my rehearsal/work space, stand beside the piano and stare at me. The ‘stare’ had only one meaning and that was to accompany Dessie’s singing. Dessie’s choice of songs was not to my liking. Preferring the country music of Daniel O’Donnell and Dominic Kirwan over my Queen and U2 favourites was consistent. There was never any negotiation. Dessie wanted to sing Daniel’s and Dominic’s songs, repeatedly.

As I accompanied Dessie on the piano, I asked myself several questions:

- Why does he enjoy singing so much?
- Why is Dessie crying while singing?

² *Conductology* is the portmanteau word which combines ‘Conducting’ and ‘Ology’-the study of conducting- and title for the co-created gesture system for use in real-time music.

- Does he not realise that he cannot ‘sing’?

Briefly into the rendition of a song, the tears would build up in Dessie’s eyes. By the end of the song Dessie would be crying uncontrollably. As we got further into the performance, doors would close, dampening the output. Dessie, and only Dessie, believed that he could sing brilliantly. It did not matter if he forgot the words to a song, as he would confidently improvise and be proud of the output. Three decades later, I continue to ask similar questions.

1.3 Gateway Club

From 1994 until 2005, I was Leader-in Charge of Mencap³ affiliated ‘Maiden City Gateway Club⁴’. Ninety students with ID were registered with the club. As Leader, I began to implement music projects, stage music productions, and promote the members’ capabilities in the public arena. The aim of doing this was to gain an insight into the relationship between music and ID, the processes involved in music projects, the final products, and audiences’ perceptions, reactions, and opinions. At this stage in my career, I believed that a relationship between music and ID existed. The relationship between ID and music has, for many years, been discussed and investigated (Tervo, 2001; Daveson & Edwards, 1998). Music has been recognised as a powerful tool for students with ID, in structuring learning, influencing choices, focusing attention, promoting social interaction, and managing mood (Abramo, 2015; Laird, 2015; McCord, 2013; Humpal, 1991; Eidson, 1989; Gunsberg, 1988). As a professional group, music educators and music therapists have a visibly active role working with individuals with ID (McCord, 2013). I was persistent in exploring the relationship by producing numerous and varied music projects. The music projects were popular, with most

³ Mencap is a UK charity for people with a learning disability who support families and carers.

⁴ Maiden City Gateway Club is a social club for young people and adults with intellectual disabilities based in Derry/Londonderry and affiliated to Mencap.

Gateway club members expressing a desire to participate. The co-ordination of all participants alongside accommodating individual capabilities and talents was a huge challenge. Why? In hindsight, I wanted a quality production. I believed in the music and ID relationship. I believed that producing high quality music output was achievable. I accepted that the public audiences were glad to see the ‘special’ musicians gaining an opportunity to perform. By staging high quality music events, I trusted that audiences’ perceptions of music and ID could change. The many music projects which I initiated, developed, and led, affirmed my belief in the strong relationship between music and ID. I carried this belief through the next stages of my career, teaching in formal and informal education sectors.

1.4 Music teaching experience

Intensive and differentiated music training sessions revealed special capabilities and potential in all the Gateway club members. This revelation cascaded into my formal teaching, both in special schools and further education colleges. To understand this phenomenon further, I developed self-constructed baseline assessments⁵ for individual students in order to gather vital information that would allow me to assist in the development of a skill, such as singing, sustaining a rhythm, composing a melody, or aural awareness. The baseline assessments measured seven elements of music, namely: rhythm; melody; harmony; timbre; form; texture; and dynamics. Most of the students I have taught over the years have: displayed an interest in music; demonstrated an ability to participate in group music making; and, responded well to differentiated instructional teaching methods.

Furthermore, performances received positive feedback. I proceeded to ask myself a further question: Why are the performances being received with such acclaim?

⁵ A baseline assessment provides a basis for comparing the situation before and after an intervention.

In answer to this question, it was important to acknowledge that audiences mostly consisted of family and friends who were thrilled that their son/daughter/sibling or friend was on stage performing ‘anything’ as they did not normally get such an opportunity. Deep-seated insight into audience make-up, perceptions and expectations revealed that quality of output was irrelevant. The main consideration for the audience was the opportunity that was provided which allowed an ID individual to grab the experience of ‘performing’ in front of an audience. I continued to initiate, develop, and lead music programmes in formal and informal education settings for many years. During this time, I frequently focused on small and large group music making, often involving improvisation.

1.5 Intellectual disability experience

For many years I have taught ID young people and adults a variety of music courses in addition to educational programmes, yet the music improvisation lessons were the most productive and creative in terms of collaboration, idea development, social interaction, and discipline. Music improvisation exists in special schools, community, and voluntary groups, and during music therapy sessions, and is delivered by a range of professionals, including music specialists in schools, music therapists and music facilitators. What I have come to value immensely is ID student-centred collaborative group music-making. Creating music spontaneously is one of the best ways to learn about elements of music⁶ (Burnard and Murphy, 2017). Over the years, I have observed remarkable student achievements. Students highlighted an eagerness to explore, improvise, compose, and share during the music sessions. I have always been interested in students’ processes in music making; however, I was also keen to explore the quality of the end product.

⁶ Key elements in music are: pitch; tempo; texture; timbre; duration; dynamics; and, structure.

1.6 Music improvisation practices for intellectually disabled musicians

Intellectual disability is the term used by the World Health Organisation (WHO)⁷ to identify an individual who has limited intellect (Hooper et al., 2008). A person with an ID may have difficulty understanding, learning, adapting to new situations, and remembering. There may also be difficulties with social/interpersonal skills, communication, self-care and self-determination, with limited access to community services, which impact on creative ability and self-expression (Brown et al. 1997).

Music improvisation has been actively researched in relation to therapeutic interventions and ID. While MacDonald et al. (1999) argue that music improvisation is often viewed as a 'fun' pastime where the participants in fact are passive recipients, much recent research focuses on the development of enhanced participant well-being, improved communication skills, exploration of feelings, problem solving, confidence building and self-esteem (Rickson, 2014, Nordoff & Robbins, 2007, Tervo, 2001; Daveson & Edwards, 1998). Whilst Sternberg (1988, p.145) suggests that 'people are creative by a combination of intellectual, stylistic, and personality attributes', Doron (2017) suggests that creative ability can be developed and enhanced through structured training. Similarly, Balkin (1990, p.29) defines creativity as an 'acquired behaviour- learnable, teachable, tangible and crucial to human development'.

Improvising is essentially a creative process that results in a musical product, which contributes to the improviser's experience, as expressed verbally or in another art modality (Bruscia, 2001). Music improvisation occurs in a wide variety of settings, ranging from music therapy and non-music therapy-based interventions to education and community-based

⁷ The WHO is a specialized agency of the United Nations that is concerned with international public health.

music. There is detailed examination on how the creative process of improvising has potential benefits for participants (Higgins and Mantie, 2013; Pavlicevic, 2000; Sarath, 1996). However, the research on measuring creative ability and quality of output is more limited with much of the emphasis on the therapeutic process of improvising (Ockelford, 2011; Bruscia, 2001) rather than the quality of the creative product.

1.7 Creativity

There is scholarly consensus that creativity involves producing an output that is innovative, novel, unusual, yet simultaneously, pertinent, and valuable (Runco and Jaeger, 2012; Amabile, 1983), and that creative potential can be realized and magnified (Plucker et al. 2011; Richards, 2007). Additionally, it is broadly welcomed that creativity can be improved and enhanced particularly through training, with most instruction programmes reliant on divergent thinking (Lubart and Guignard, 2004). Divergent thinking is thinking in an original way. Koutsoupidou and Hargreaves (2009) regard improvisation as a fundamental form of creativity, which galvanises students to apply their decision-making skills and imagination to create original music. Moreover, Kwon et al. (2017) suggest that the more unfamiliar and interested an individual is in the output, the more likely the individual's divergent thinking skills will convert into a definite creative product.

1.8 The Study

The current study's approach was action research. The aim was to take action and create knowledge. The action research in this study addressed the fact that little research literature or practice exists that addresses the creative thinking ability of ID students to produce high

quality music improvisations. Moreover, participatory practice-based research involving innovative hybridized measurement and assessment tools is neglected in the literature and practice. The study's cyclical process involved planning, taking action and evaluating action, and investigated if a co-created original gesture system could enhance ID musicians' creative ability and raise quality of output in their musical improvisations.

'Action research is neither a method nor a technique; it is an approach to living in the world that includes the creation of areas for collaborative learning and the design, enactment and evaluation of liberating actions; it combines action and research; reflection and action in an ongoing cycle of cogenerative knowledge' (Greenwood, 2007, p.131).

1.8.1 Study Rationale

Many research studies have evidenced the therapeutic benefits of music improvisation processes for people with ID (Ockelford, 2011; Nordoff & Robbins, 2007) yet there has been little discussion on improving creative ability and quality of output, and how to achieve these. In particular, research has yet to:

- measure ID students' creative thinking in music tasks
- create and implement an original gesture system that will enhance creative ability and raise quality of output

The purpose of this study was to explore how a co-created, original gesture system, used in real-time group music improvisation sessions could positively influence an ID musician's creative thinking ability compared to traditional instructional group music improvisation methods.

The overarching research question is:

Can the intervention of an original gesture system, co-created with intellectually disabled musicians, enhance their creative ability, and raise quality of output in their music improvisations?

1.8.2 Thesis structure

This introductory chapter has provided an overview of the study, including background and motivation. The chapter outlined the current study's rationale in addition to the author's music teaching experience and music improvisation practices with ID students.

Chapter Two presents a review of the literature and overview of current practice. It examines music improvisation practices within ID, gesture systems in music, and creativity, process, and output. The key themes of music improvisation and ID, gesture systems in music, creativity, and quality of creative output are interrogated and gaps in knowledge identified.

Chapter Three presents the research questions and methodology, including research design and rationale and the methodological approach. This chapter reports on ethical considerations, study procedures, data collection, and introduces an innovative hybridized measurement and assessment tool.

Chapter Four presents the development of the gesture system, *Conductology*, providing information on the co-creators, the co-creation process and development.

Chapter Five, The Main Investigation, describes the assessment instruments used in the current study, and the testing of *Conductology*.

Chapter Six, presents the analysis of findings, and finally Chapter Seven offers final conclusions and potential further research. Documentary video, audio and visual materials are archived in the relevant Appendices.

Chapter 2 Literature Review and Overview of Relevant Practice

2.1 Introduction

The creation, development and testing of an original gesture system for use in music improvisations by ID musicians aligns with many key themes in the literature and in practice, namely: music improvisation and ID; gesture systems in music; creativity; and quality of creative output. The current literature review and overview of practice interrogates these areas and identifies gaps in knowledge which the current study was designed to address.

2.2 Music improvisation and intellectual disability

This section examines the meaning of music improvisation, the role of music improvisation in formal music education, music improvisation in music therapy and special music education⁸; and, post-school music education opportunities for musicians with ID.

2.2.1 Music improvisation

Music improvisation is well documented in the literature (McPherson et al. 2016; Pavlicevic; 2000; Ruud, 1998; Sarath, 1996; Kratus, 1995), however, there are varying opinions on what music improvisation is. While Moore & Schnebly-Black (2003), Caldwell (1995) and Mead (1994) claim that music improvisation is a process which stems from musical knowledge, theory, and practice, spontaneously combining and experimenting with musical elements, Eisenberg and Thompson (2003) note that there are very few empirical studies of music improvisation and regard music improvisation as highly practical and experimental where pedagogical materials are rarely needed. Some scholars argue that

⁸ Special music education is targeted at students with intellectual or physical disabilities, or other challenges that prevent them from conventional music studies.

music improvisation requires high attainment in musical literacy, a vast amount of knowledge and skills and intense preparation (Duby, 2006; Wade, 2004; Gridley, 1997). Furthermore, Liao and Davidson (2016) regard music improvisation as the manipulation of musical elements in a spontaneous fashion, where the musician progresses through learned structures to improvisatory freedom.

2.2.2. Formal music education

For many years, music educators have suggested that music education, music practice, or listening to and responding to music can have a significant impact on students' conduct, attendance rates and achievement (Waller, 2007; Koopman, 2005), with the potential to increase intellect and improve chances of social inclusion (Bastian, 2002). The Northern Ireland Curriculum (NIC) was introduced in 2007 and covers twelve years of compulsory education. It places equal emphasis on knowledge, skills and understanding. Music is an integral feature of the NIC which states that all students should receive music education.

Higgins and Mantie (2013) argue the value of teaching music improvisation in schools, stating it should be a central part of music education. Thinking of improvisation in three ways, as a component of a holistic view of musicianship, an aspect of a situated form of musical practice, and as a distinct way of being in the world, embodying such qualities as risk-taking, reflexivity, spontaneity, exploration, participation, and play, the authors reinforce the importance of play as having the greatest educative potential for students as exploratory learning is realized. Not only is music a popular subject in mainstream schools, it is also a vital part of special education provision, whether through therapeutic practices or standard music classes (Williams, 2015; Rickson, 2014; Akoyunoglou-Christou, 2014; Higgins and Mantie, 2013; Campbell, 2002).

Special schools and special education provision are widely associated with music and music therapy, with learning goals developed in response to the individual needs of pupils (Davis, 1992). The aim of the NIC is to empower young people to develop their potential so they can make informed choices and responsible decisions throughout their lives (CCEA, 2017). There is a range of resources readily available and aligned to the NIC, to support teachers in meeting the diverse needs of students with ID including students with Severe Learning Difficulties (SLD) and Profound and Multiple Learning Difficulties (PMLD). These adapted curriculum resources include thematic units in Literacy, Science, World Around Us (WAU), Personal Development and Mutual Understanding (PDMU) and Learning for Life and Work (LLW). Music as a subject is relatively neglected and lacking presence in curriculum resource form or as an important subject within the special educational needs sector.

Citizenship education (a unit within LLW) provides opportunities for students to explore and discuss issues affecting young people growing up in Northern Ireland today. Within this unit, students can experience aspects of composing, performing, and listening with a focus on the influence of music on mood and behavior, the purposes of specifically composed music, the effectiveness of music in expressing social comment, and the manipulation of sound to create mood and atmosphere. The NIC states that students should develop their musical potential by having opportunities to improvise, compose and perform music, discover, and combine music elements, experiment with music technology, listen to and appraise a wide range of music and respond critically, and become aware of music-related industries. This may be attainable within mainstream schools however, special education is often complex, making such unit strands appear unachievable for the teacher and ID student in some instances. Although music improvisation is part of the NIC it is not a prominent feature and there is evidence that

music educators are uncomfortable teaching it (Higgins and Mantie, 2013). Hickey et al. (2016) state that this is due to the lack of teacher preparation in music improvisation. Yet, the reported benefits of using music with ID students are extensive (Abramo, 2015; Campbell, 2002; Daveson and Edwards, 1998).

Literature suggests that music is a significant component in the lives and learning of those with ID (Ockelford, 2011; Darrow, 2011). There is widespread recognition of the potential benefits of music, both throughout the curriculum and in therapeutic work (Higgins and Mantie, 2013; Hickey, 2009; Bruscia, 2001; Alvin, 1976). While Ockelford et al. (2002) acknowledge that significant work is taking place in special schools, evidence gathered by the authors from a study examining the frequency of music activities in special schools suggests that although students were exposed to significant amounts of music throughout the school day, it was idiosyncratic in its conception and usually a catalyst for another activity. The authors recommend that further research, leading to new curriculum and staff development resources is crucial to the comprehension of music's full potential in the lives of students with severe, and profound and multiple learning difficulties.

Music educators and therapists have professional responsibility for working with individuals and groups with ID, however, increasingly, the responsibility for music in schools is moving from the specialist teacher⁹ to the generalist classroom teacher (Wiggins and Wiggins, 2008; Holden and Button, 2006). Participation in music education means that students can become actively involved in music activities. Darrow (2011) underlines music as a desirable subject, that can be used in various ways to promote psychomotor skills to structure movements, motivate physical movements, distract from pain during physical movements, synchronize

⁹ Specialist teachers are primary and post-primary school teachers who have expertise in a particular field.

selected movements, and facilitate relaxation during movement programmes. Additionally, it can promote cognitive, physical, social and emotional wellbeing (Welch and Ockelford, 2015). Based on these insights, music education arguably could be integrated into the learning objectives for all students with varying capabilities without any intellectual or physical prejudice.

Hallam (2000, p.117) claims that we are all musical, and that 'our musical development begins pre-birth, with musical behaviours in the one form or another being evident across the lifespan'. Hallam's claims suggest that everyone, regardless of varying needs, has musical potential. While Hallam (2010, p.269) states that 'recent advances in the study of the brain have enabled us to get a better understanding of the way that active engagement with music may influence other development', Pellitteri (2000) regards music as adding an aesthetic strand to the education process which is all too often underemphasized or nonexistent. These claims align also with Pitts (2005) who states that participation in musical activities encourages personal development and social interaction. Hickey (2009) notes that improvisation should be an integral part of the music curriculum as it enables students to be lifelong creative improvisers with a sense of freedom. Reinforcing Alvin's (1976) positive belief in music as an effective tool for motivating those with autism, Darrow (2011, p.28) highlights that individuals with ID have a greater need for motivation and repetition, claiming that students with disabilities should have the opportunity to participate in music activities, including music lessons, attending concerts, and practicing an instrument.

'Music can be used as a carrier of information, or as a reinforcement, for learning academic material.' Whilst there is much debate around the value and effectiveness of music activities for those with ID (Bruscia, 2001), there is limited literature on the value of music improvisation.

2.2.3 Music therapy and special music education

Authors indicate many uses of music improvisation with persons with ID (Akoyunoglou-Christou, 2014; Bunt and Stige, 2014; Pavlicevic et al. 2014; Watts et al. 2012; Ockelford et al. 2011; Luck et al. 2008; Bruscia, 2001). Music therapy is a creative art therapy that crosses multiple areas of treatment and can be effective in facilitating development in various areas of an individual's functioning (Pellitteri, 2000). Pellitteri cites Bruscia (1989, p.47) who defines music therapy as 'a systematic process of intervention wherein the therapist helps the client to achieve health, using musical experiences and the relationships that develop through them as dynamic forces of change'. In attempting to understand this specialized field, it is useful to differentiate between music therapy and music education. The goals of music therapy are to improve participants' psychological functioning using musical activities with a focus on attention, concentration, social functioning, impulse control, self-determination, and motivation (Pellitteri, 2000). The focus is on the psychological process and not the musical skill. Music therapy is also utilized with persons with physical disabilities who may have difficulties with communication, limited means of interaction, low levels of arousal, and poor self-determination.

In comparison, the aim of music education is increased music knowledge and skills in playing an instrument (Pellitteri, 2000). For school-going young people with ID, planned music-therapeutic and music-educational activities only form a small part of their total musical experience, with the largest part occurring on an unplanned and casual basis within the school setting (Ockelford et al. 2002).

Music therapy and special music education have a long association with disability (Brown,

1994). Music therapy is often offered in special school settings to students from age three through to nineteen with wide-ranging disabilities and complex needs (Ockelford et al. 2011; Bruscia, 2001). Many special schools recognize music as integral to the school curriculum and of educational value to students with intellectual and physical disabilities. However, music provision is generally therapy-based and there is some consensus that if students are enjoying the music activity, the quality of the product, (for example a song or a composition) is less relevant (Rickson, 2014). Daveson and Edwards (1998) illustrate how music improvisations between student and therapist is an opportunity to develop and demonstrate the abilities and skills of the ID student with support, encouragement, and challenge from the therapist. Special music education, in special school settings and in community organizations, provides opportunities for individuals with ID to be more visible through performances, showcase events, and celebrations, and challenges society's perception of disability (Akoyunoglou-Christou, 2014). However, many people with ID consistently must negotiate a range of environmental, societal and attitudinal barriers in order to participate in music activities outside formal education (Kaikkonen and O'Neill, 2014).

Nilsson (2014) suggests that music educators, facilitators, and researchers are well placed to promote openness to diversity and encourage greater accessibility in various forms. Hairston (2014) claims that students with ID rarely get opportunities to create and produce their own musical performance, while Rickson (2014) recognizes prevailing tendencies within the public domain to view ID musicians as vulnerable and in need of protection from the patronizing attitudes and behaviors of others. With regard to equal opportunities, Akoyunoglou-Christou et al. (2014) refer to the potential of inclusive music education to develop independent musicians who are able to create and perform music in the same variety of ways as their non-disabled peers.

Students with ID frequently perceive themselves as inferior and they face various challenges and difficulties to participation in their daily lives (Rickson, 2014). In attempting to make sense of themselves and the world around them, they can often exhibit bursts of emotion. A study by MacDonald & Miell (2002) cited in Hassan (2017) amongst people of different ages with ID found that music was regarded as a powerful part of their identity, not least in how others perceived them. This finding reinforced a key aim of special music education, namely that a goal-orientated music curriculum should be offered to all students, integrating therapy if necessary, and adjusted according to their current needs through a regularly reviewed individual education plan (IEP) (Sutela et al. 2016).

More specifically, music improvisation has been widely researched in relation to therapeutic interventions and ID. Much of this investigation focuses on the participant developing enhanced well-being, increased communication skills, exploration of feelings, problem solving, confidence-building, and self-esteem (Rickson, 2014; Ockelford et al. 2011; Bruscia, 2001; Tervo, 2001; Daveson and Edwards, 1998). However, MacDonald et al. (1999) argue that music-improvisation is often viewed as a 'fun' pastime wherein the participants are passive recipients with little personal or musical autonomy.

2.2.4 Post- school music opportunities for ID young people and adults

Music is regarded as a medium which can offer effective opportunities to those with ID (Humpal & Wolf, 2003) where subject learning takes place without conscious awareness (Blakemore & Frith, 2000). Post-school music education and music-making opportunities for young people and adults with ID often resides in the realm of community music. Community music is process-centred and the approach to making music is active collaboration between musicians who create, play, improvise, compose, and perform together. Higgins (2012, p.83) identifies fourteen characteristics of community music activities that include an emphasis on diverse music, active participation, social and personal

growth, and ‘a belief in the value and use of music to foster intercultural acceptance and understanding’.

*Soundsense*¹⁰ briefly defines Community Music as ‘making music with people.’ Community Music involves musicians working with people (participants) to enable them to actively enjoy and participate in music. This can happen anywhere and with anyone, because a ‘community’ does not have to be a geographical one. It can be a group of people who share common interests, experiences, or backgrounds.

Community music can assist in keeping participants' minds and bodies active and can improve longevity which ‘means they are healthier than those who do not participate’ (Lee, 2013, p.80). However, for those with ID, opportunities for participating in music-making activities, post-school, are limited and often confined to ad hoc projects led by music facilitators (Darragh et al. 2016). Curtis and Mercado (2004) suggest that although those with ID may be more present in their local communities, their sense of belonging is not necessarily developed (cited in Rickson, 2014, p.100). Rickson claims that the Western view of music-making has led many people to believe that persons with ID do not have the talent, knowledge, skill, expertise or the ‘right’ to participate in music programmes. Hays (2005, p.28) found that music engagement ‘contributes to positive ageing by providing ways for people to maintain positive self-esteem, feel competent, independent, and avoid feelings of isolation and loneliness’. Laes (2015) claims that while it seems natural to relate formal music education primarily to children and youth, there is an increasing demand to address the needs of the adult population, primarily by challenging professional music educators to acquire relevant knowledge to better understand the ageing process. Furthermore, Laes notes the potential benefits of research in community music which could inform music educators

¹⁰*Soundsense* is a UK agency devoted to Community Music workers and promotes equal access to music making for all. (<http://www.soundsense.org/scripts/WebObjects.exe/soundSense/>).

in evaluating and reformulating formal music curricula as part of lifelong learning.

Many community music programmes designed for adults with ID are led by volunteer musicians or facilitators rather than professional and specialist music teachers (Varvarigou et al. 2012). These music programmes frequently focus on health, well-being, and social interaction (Varvarigou et al.2012), implicitly ignoring any desire that participants may have in music skill acquisition. Usually the programme facilitator is surrounded by the participants who are encouraged to sing or play a basic rhythm on a percussion instrument. As Koopman (2007, p.152) notes 'most literature on community music describes specific projects of community music without dealing systematically with educational issues'. Bracefield et al. (2000) claim that adults with ID have difficulty in finding activities that will engage their attention for any length of time. They further state that most people working with individuals with ID have used music in some form to stimulate a therapeutic response. Music is widely recognized as non-threatening and an effective means of motivating individuals with ID, and furthermore it allows for successful participation among individuals of varying ability levels (Humpal, 1991; Oldfield and Adams, 1990). Bunt (2014) further notes that people of all ages can become engaged in exploring a wide range of musical activities, improvisation being one of them. Case studies from the United Kingdom, Canada, and Australia have demonstrated how other disadvantaged and marginalised social groups find a source of well-being and support through their musical activities (Pitts et al. 2015).

2.3 Gesture Systems in Music

This section examines the use of gestures in general terms, and within the ID field. Established gesture systems in music and role of the conductor are then discussed.

2.3.1 What are gestures?

‘Gesture’ is a word with diverse connotations, often encountered in musicology, psychology, aesthetics, anthropology, and human-computer interaction contexts.

Godey and Leman (2010, p.4) refer to the use of ‘gesture’ as a testimony to the importance that people attach to the idea of making a recognizable action or movement. They also refer to ‘gesture’ as either a form of body movement or as a category of our perception-action system, referring to action (moving with a purpose), intentionality (goal-directed movement), agency (being moved), and embodiment (movement-based mental schemata).

‘Gesture’, as a body movement, can be used to express an idea or meaning. DeYoung and Ramaswamy (2008) claim that gestures can be easily learned and picked up by almost everybody. They indicate that music generation with gestures can become a common mode of interaction in the future. Gesture use in the field of ID is extensive (Sheehy and Duffy, 2009; Purcell et al. 2000; Brown et al. 1997; Attwood et al. 1988). For the most part, gestures are used to symbolize meanings for words and phrases with the aim of improving language acquisition, social interaction, knowledge retention, and reinforcement (Taylor-Dileva, 2011).

2.3.2 Established Gesture Systems

King (2013) claims that the value in educating students how to use gestures in everyday communication and discourse about music is immense. King refers to the work of Fulford and Ginsborg (2013) who ask if it is possible to sign music or to support the development of

a formal sign language of music in the absence of speech. They claim that such a system does not exist because it has never been necessary. They further insist that even though vocabularies of signs to produce musical sound (for example, Solfège and Kodály (1922) have been constructed, a sign language for music that draws upon them would be more natural to produce and more easily understood by both musicians and non-musicians.

2.3.3 The Conductor

A conductor is a person who directs an orchestral or choral performance by the use of gesture. Literature is vague on the impact of conductors' gestures on performance.

Some researchers have found that certain gestures have the capacity to transmit specific musical ideas (Mayne, 1992; Byo, 1990; Sousa, 1988); while others have discovered that more experienced conductors use more idiosyncratic dramatic gestures (Byo and Austin, 1994). Price et al. (2016) refer to Grechesky (1985) who discovered that conductors of high school bands with greater musicality had more dramatic and expressive gestures, while Price (2011) cites Schultz and Lipscomb (2007) who argued that it was possible to create varied aural experiences in audiences when the conductor uses an array of gestures.

2.3.4 Harmony Signing

Bannan's (2013) system of harmony signing is often concerned with the signing of musical responses linked to a tonal system, in which the gestures are closely linked to the position of notes within such a system. Harmony Signing uses the nonverbal communication of musical ideas by means of physical gestures.

'This experimental musical practice has grown out of a sequence of research and development projects devised over the last ten years to improve aural awareness and musical sensitivity through group participation. The signing and pedagogical systems of Guido d'Arezzo, Dalcroze and Kodaly have been extended through the application of procedures drawing on information theory, semiotics and digital control systems in eliciting a naturalistic human communication that exploits social intelligence and kinaesthesia'

(Bannan, 2005, p.1).

Participants get the opportunity to express their ideas in a collaborative manner. Verbal communication is not used while participants lead and perform a sequence of musical tasks.

2.3.5 Game Pieces

Zorn's (2002) game pieces, bearing titles derived from various sports and board games like *Pool*, *Archery*, *Cobra*, and *Lacrosse*, involve challenging and complex rule sets. Zorn offers a set of rules and allows the musicians freedom of interpretation in relation to the melodies, tempi, harmonies, and transitions. John Zorn is one of the most prominent and prolific members of the New York avant-garde. His work has been extensively documented by many writers in the field (Schyff, 2013; Brackett, 2010; Vickery, 2010; Pressing, 2002; Mandel, 1999). Zorn uses sets of interactive instructions to determine the priorities of improvising musicians where hand signals and cue cards are used to achieve their aims. The performers dictate the content of the performance. The performers largely take the lead by attempting to influence the prompter in displaying a desired symbol. Schyff (2013) refers to the inclusive and challenging game piece *Cobra*¹¹ where all music performance depends upon physical movement, facial and bodily gestures, as well as sound.

2.3.6 Conduction

Butch Morris (1947-2013) was a composer and band leader who was part of a cadre of North American jazz innovators whose work came to public attention in the mid-1970s when he developed, refined, and implemented a method for creating unique ensemble music using a patented gestural vocabulary called Conduction (Stanley, 2009). Morris' system has been exhaustively documented (Veronesi, 2014; Stanley, 2009; Mandel, 1999).

¹¹ <https://youtu.be/KxW0mer1tyg>

Morris used his gesture system with thousands of musicians throughout the world. By conveying and interpreting a lexicon of directives the composer/conductor and instrumentalists can construct sonic arrangements/improvisations (Appendix B).

Stanley (2009, p.ii) states that,

‘Conduction is accomplished by instructing an ensemble in a predetermined vocabulary of bodily gestures (performed with the arms and hands, usually with a baton); rehearsing the ensemble under the specific requirements of that vocabulary; and then performing a work (almost always before a live audience).’

Morris (2006) claims that Conduction links notation and improvisation, fosters individual and collective identity revealing motive, content, skills, utility, function, and stimulus.

It is a source from which an ensemble can become a living organism, capable of taking new shapes and revealing new expressions.

2.3.7 Soundpainting

Walter Thompson’s (1974) ‘Soundpainting’¹² is appropriate for comparison with Morris’ Conduction. Thompson spent a lot of time expanding and diversifying his Soundpainting system, which could be applied to a range of creative artists including actors, storytellers, visual artists, and dancers. It is described in the website as:

‘... the composing/conducting language developed by Walter Thompson for musicians, dancers, poets, actors, and visual artists working in the medium of structured improvisation. At present this language includes more than 1200 gestures made by the composer/conductor indicating the type of improvisation that is desired by the performers.’

Soundpainting commences with a set of basic signs which depict the musical concepts, volume, pitch, tempo, and duration (Appendix C). When the musicians are competent with these concepts, the Soundpainter introduces more complex signs such as style, genre, key.

¹² <http://soundpainting.com>

The Soundpainter creates a composition in real-time through the parameters of signed gestures. The Soundpainter guides the ensemble as they interpret complex combinations of signs through a performance.

Duby (2006) states that Soundpainting is not carried out in isolation, and the Soundpainter is able to draw inspiration from the musicians, who converse about their histories and personalities in the group flow of the Soundpainting event. This process is structured through a common acceptance of the permissible range of interpretations of a given gesture. Duby indicates the values of Soundpainting workshops, primarily, the collaborative learning of the specific signs used in Soundpainting, which ultimately leads to the creative art of improvising. In Soundpainting, the Soundpainter is in control, using physical movements which the performers understand and can relate to. The score (Appendix D) usually does not take pride of place and the performers create improvised music in real time with no reference to written instructions. This embeds a sense of freedom in the performers, allowing them to interpret the gestures as they see fit while simultaneously watching and listening with determined concentration. Thompson's system guides performers from moment to moment.

Soundpainting shares many similarities to orthodox conducting however, there are clear differences. The gestures involved in Soundpainting are very precise and require diligent practice. A Soundpainting performance is live composing, using a vast array of specific gestures, whereas an orchestral performance is rehearsed, and the conductor and instrumentalists know what the product should sound like. Using a vast array of gestures, which serve as instructions to carry out specific tasks, it is possible to construct a wide variety of musical events (Duby, 2006).

Many individuals with ID have seen tremendous gains when they are taught to use sign language, as they learn best visually (Taylor-Dileva, 2011). British Sign Language, American Sign Language, and Makaton are all forms of gesture communication for those with ID. Lindsay (2005) insists that people with ID are likely to rely more on informal gestures, sometimes with a few formal signs, as well as informal means of communication including facial expression and vocalizations. Although gesture systems such as Morris's Conduction and Thompson's Soundpainting are widely recognized in the literature, they are much too complex to be interpreted by ID musicians. Conduction and Soundpainting both require musicians to have a sophisticated level of musical training, and Thompson's gestures are too numerous and difficult to learn. Consequently, neither system is appropriate for effective use with ID musicians.

2.3.8 Brian Irvine

Belfast born Irvine has created orchestral works, operas, film scores, community oratorios, installations, and dance works. His music has been performed and commissioned by many international artists and organisations, involving close collaboration with artists from a diverse range of disciplines. In 2011, Irvine won the Irish Allianz Arts and Business Award for 'best use of creativity in the community'. Irvine frequently uses a menu of gestures when creating music (Appendix E). Irvine described his pyramid gesture menu as a palette of six gestures (personal communication, March 8, 2016). His pyramid structure consists of a 'ring leader', who controls everything, making authentic judgements with effective parameters and developing compositional technique and creativity. The 'generals' follow and apply the gesture pallet. Irvine realizes creative choices with what is happening around him 'through aesthetic intelligence which has huge psychological, well-being and mental health aspects' (personal communication, March 8, 2016). Individual decision making is vital in Irvine's

music making which he believes can add further layers to the output. Irvine's compositions frequently take the form of large structures such as the seven day performance installation of 3000 collected objects, symphony orchestra, choir, intervention performers and soloists in NEST¹³ (the Northern Ireland Artists Taking The Lead commission for the London 2012 Olympics) or Montana Strange¹⁴, the fifty minute homage to filmmaker David Lynch for symphony orchestra, his own twelve piece ensemble, turntables, two conductors, and a free improviser.

2.4 Creativity, Music improvisation, and Intellectual Disability

This section examines creativity in general terms, and within music improvisation and ID. It also investigates inclusion and accessibility obstacles in relation to music activities. Additionally, the process and the product of music improvisation, the output, and collaboration are discussed.

2.4.1 Creativity

Lyons (2006) claims that to be a virtuoso, creative artistry is required at work. Numerous educators have forwarded theories on how to incorporate creativity into the learning environment. Most of these activities are in the area of music improvisation (Kokotsaki and Newton, 2015; Hickey, 1997; Addison, 1988;), although research also shows that teacher surveillance can often hinder students' intrinsic motivation and creativity (Hickey, 1997). Folkestad et al. (1997) suggest that 'creating music is no longer seen as reserved for geniuses, but as an activity in which everyone can participate' (p.1). However, there is some controversy over what creativity represents and many educators have questioned whether

¹³ <https://vimeo.com/88795671>

¹⁴ <http://www.culturenorthernireland.org/features/music/works-brian-irvine>

creativity can be taught. Tervo (2001) cites Hagglund (1984, p.89) who claims that creativity cannot be taught in the same way as skills and knowledge: 'Our whole personality is involved in a certain developmental path, when creativity is allowed room'.

Burnard (2012) claims that many teachers believe creativity is a natural gift that cannot be taught to all students, although suggests that, if given the appropriate support and nurturing, students have the potential to produce creative material. However, the emphasis is on the teacher to encourage creative behaviour. Kokotsaki and Newton (2015) highlight that a student's creative efforts pinpoint how a student can be given opportunities through new experiences. Furthermore, they state that the creative process can be described as the thinking that takes place as a person is planning to construct a creative product. MacDonald and Miell (2000, p.58) refer to the difficulties faced with regard to music education claiming that creative tasks are infrequent in the learning environment:

'Whilst there is a strong commitment to developing creative musical skills within the current UK National Curriculum for music, there is evidence that in practice there are challenges and difficulties with this aspect of music teaching.'

Byrne (1996) suggests that further training is necessary if teachers and educators are to become familiar with the concept of creativity and how it can be consistently and effectively integrated into learning programmes. Whilst Hairston (2014) suggests that students with ID do not have an opportunity to experience creativity, Koutsoupidou and Hargreaves (2009) regard creativity as a means of expression not only for skillful professionals but for any human being. The National Advisory Committee on Creative and Cultural Education Report (NACCCE, 1999) further suggests that every individual is capable of being creative in some way. Hargreaves (1989) indicates that every individual has the potential to be creative in music. The author further suggests that creativity could be enhanced and developed if appropriate environmental conditions and stimulation are in place. In contrast, Balkin (1990,

p.29), claiming that creativity is ‘overused, misused, confused, abused, and generally misunderstood’ argues that creative people demonstrate particular characteristics, including confidence, persistence, and being intellectually ‘playful’.

Craft’s (2001) ‘little c’¹⁵ creativity can be seen as a frequent occurrence in the music learning environment where students are enabled to produce new pieces of work. Kokotsaki and Newton (2015) suggest that students can produce creative work on the basis that educators nurture and support this creative thinking and creative behaviour. However, Running (2008) implies that even if educators teach all the necessary tools for a student to be creative, this does not directly generate a creative product.

Creativity is an extensively researched topic in the literature. Varied and complex models exist which aim to investigate, test, and evaluate various forms of creativity (see Appendix F). In relation to improvisation and creativity, Koutsoupidou and Hargreaves’ (2009) quasi-experimental study revealed that improvisation significantly affects the development of creative thinking among students and, particularly, promotes musical flexibility (pitch, tempo, and dynamics), originality, and syntax (patterns of repetition, development, and contrast) in music making. According to Odena and Welch (2009, p.417), creativity can be defined as ‘imagination successfully manifested in any valued pursuit.’

Zbainos and Anastasopoulou’s (2012) study on teachers’ perceptions in music education found that there are educators who believe that creativity is an innate characteristic that cannot be taught to all individuals. In contrast to this opinion, Koutsoupidou and Hargreaves (2009) suggest that improvisation, as a certain form of musical creativity, is a high-level teachable skill that improves with intellectual development, learning, practice, and

¹⁵ Little c creativity describes an approach to life which is driven to find solutions and ways through all situations, an approach to life which assumes ‘can do.’ (Craft et al. 2001, p.53)

experience. Clark (1986), however, believes that if a creative leader educates students, then they will undoubtedly learn by example and will develop creative skills. The emphasis in today's learning environment has shifted from the identification of the few to the encouragement of all students to develop their creative ability (Hargreaves, 1989; Folkestad et al. 1997). Houtz & Krug (1995) describe creativity as involving both the product and the process of producing it and there is debate about which of the two to assess (cited in Kokotsaki & Newton, 2015). They claim that it is important to consider both musical processes and products stating that music educators should 'aim to instill in students a creative attitude to all music making through the development of their imagination and activities that encourage meaningful exploration of sound' (p.505). They also state that students should be encouraged to thoughtfully endeavour in the creative process and use their imagination to the fullest potential. Furthermore, the authors refer to Hennessey (2014) who claims that there is evidence of a definite agreement between judgments of creativity evident in the product and in the process.

Koutsoupidou and Hargreaves (2009) claim that improvising motivates students to use their imagination and create music that is structured and original, suggesting a link between creativity and improvising. The authors further state that the music-learning environment should be a place of musical experimentation and exploration that is highly enjoyable. Claiming that the topic of musical creativity has not been extensively researched, the authors suggest a need for experimental studies examining improvisation and creativity.

Boon (2015) refers to Davis' (1995) definition of 'ableism' where society tends to compare and categorise people based on set standards of cognitive and physical forms. Boon clearly

states that the concept of ‘ableism’¹⁶ in music is apparent in most cultural and institutional practices, indicating that the dominant perception of ideal bodies for creative music making contrasts with the disabled body. In relation to Western views on music, Rickson (2014) claims that music making is for people who have a talent, formal training, or extensive experience in playing or singing. This in turn has led many people, regardless of creative ability, to believe that they do not have the skills, talent, or right to take part in music making and develop their creative potential. Lubet (2009, p.730) argues that such views deprive many people of practical musical experiences, and therefore ‘[for] students with major physical or sensory impairments, the prospects for active participation in any sort of music programme are, with few exceptions, very grim indeed’.

Stigmatization is part of daily life for disabled people. Disability discourse falls into two broad categories: *medical* and *social*. The medical model treats impairment and emphasizes diagnostic labels. The social model centralizes unaccommodating social structures. In August 2014 the social model was endorsed by the Government Equalities Office who recommended the model for use by all government departments in the way they interact with disabled people. Haegele and Hodge (2016) claim that the way in which disability is understood is vital because the language people use to describe disabled individuals influence their interactions with them. The social model (Figure 1) was created by disabled people and examines barriers erected by society in terms of disabled people being able to fully participate in everyday life.

¹⁶ Ableism is discrimination in favour of able-bodied people.

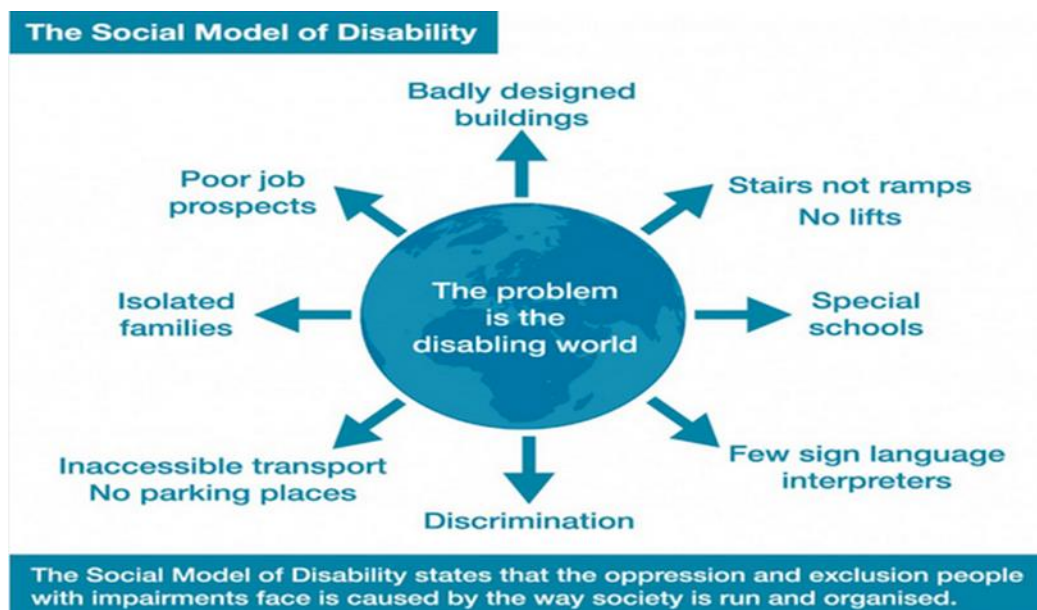


Figure 1 The Social Model of Disability <http://www.thefourcorners.org.uk>

According to the social model disability is something a person experiences. This model also focuses on people's attitudes towards disability. These attitudes are many and varied, ranging from stereotyping and discrimination, to unwanted organizational practices and procedures. The social model has resulted in successfully changing discourses around disability and in developing schemes to give disabled people autonomy and control in their lives (Oliver, 2017).

The medical model of disability (Figure 2) looks at a person's impairment first. The focus is on the impairment being the reason that disabled people cannot access goods and services or being able to participate fully in society.

The Medical Model.

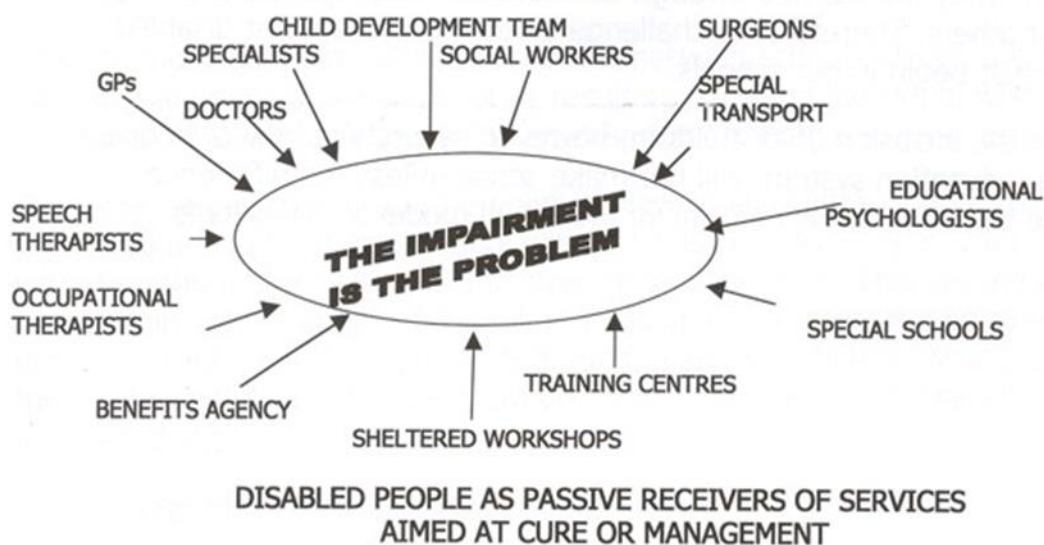


Figure 2 The Medical Model of Disability

<http://attitudes2disability.files.wordpress.com/2007/02/impairment>

2.4.2 Music for All?

It is evident that everyone can partake in some form of musical activity, and they have the right to do so (Arts Council NI, 2016; United Nations, 2014). For individuals with ID, however, this is not always easy to achieve. Boon (2015) reinforces the need for liberated teaching methods as well as mutual discovery, learning, and caring. Disability activist James Charlton (2000) argues that we have an obligation to attempt to improve the lives of those with disabilities even at times when it seems highly challenging or impossible. Everyone has the right to actively participate in music activities; perhaps even more important is the need for those with ID to access music-making. Learners with diverse abilities are increasingly emerging as artists like any other; diversity in music is thus becoming increasingly widespread and available to the public (Kaaikkonen et al.2014). For example, The

Amplified Elephants¹⁷, a sonic art ensemble for people with intellectual disabilities, which develops improvisations into repeatable pieces, guided by a mentor, is evaluated by Hullick (2013, p.232):

‘[T]hey are consummate sonic adventurers, who, against the anvil of limitation, have forged their own capacity for deep concentration and creative listening. These unique abilities have then inspired audiences to hear worlds and ideas beyond the standard sonic terrains of able minds often bolted to the experiential confines of the mainstream.’

Another music group, recognized for their desire to raise awareness on autism, is AutistiX¹⁸. The rock band offers its members opportunities to develop musically, personally, and socially. Recently, AutistiX went on a multi-city tour in Northern Spain with Motxila 21, a rock band which includes musicians with Down’s syndrome. Both sets of band members long to be successful as musicians first, and persons with disabilities second. Through performances, they are keen to challenge negative perceptions of disability and highlight the potential of disabled people and their contribution to society.

2.4.3 Process and Product

Improvising is essentially a creative process that results in a musical product, which contributes to the improviser’s experience, as expressed verbally or in another art modality (Bruscia, 2001). Bunt (2014, p.19) refers to Bruscia’s claim that the emphasis is usually on the process rather than the final artistic musical product, which for most part is ‘simple

¹⁷ The Amplified Elephants is a sound art ensemble for musicians with intellectual disabilities (Hullick, 2013).

¹⁸ <https://youtu.be/z5XaD9k3gcE>

sound forms'. Furthermore, there is much debate on whether the emphasis of music therapy and special music programmes should be process or product orientated (Kokotsaki and Newton, 2015; Rickson, 2014; Koutsoupidou and Hargreaves, 2009; Koopman, 2007 Gilboa et al. 2006; Hickey, 1999; Balkin, 1990). It is clearly important that educators and therapists see for themselves the processes that students use to arrive at the product. It is important, therefore, to consider both musical processes and products as areas worthy of further investigation (Kokotsaki and Newton, 2015).

Hall (2015) questions the value of the process and the product advising that an innovative approach to pedagogy is needed instead if the aim is to add value to the student's learning, unlock creative potential and develop group learning.

'If significant and creative new music is not being produced as a direct result of the ensemble workshop then it is worth questioning what is being produced and what benefit it is providing to the student' (p.111)

Stating that creativity is not directly connected to talent, IQ, originality, or cleverness, Balkin (1990) suggests that what separates creativity from simple spontaneity is a result that represents an important contribution to society – a product.

2.4.4 The Process

The creative process is defined as an active, constructed, and dynamic mental process that swings between convergent (factual) and divergent (imaginative) thinking (Webster, 2002; 1992). Hamm (1991, p.21) referring to the process states:

'Music exists as a three-fold series of processes: a first stage of creation, or composition; a middle stage of mediation, involving publication, production, performance, and dissemination; and a final one of reception and perception.'

Process is a word which is largely associated with music therapy. Pellitteri (2000) claims that systematic interventions in this field can potentially alter a client's musical behaviour, suggesting psychological change. Furthermore, Pellitteri, states that there are three types of positive change associated with the intervention, namely greater degree of affective self-regulation, expansion in the range of self-expression and enhanced social perception, and that the major elements of music (tempo, harmony, melody, rhythm, timbre) used in various ways produce such changes. However, Pellitteri insists that numerous considerations should be made in this therapeutic process, highlighting the importance of the therapeutic relationship with the client, insisting that it is vital for the therapist to have substantial training in the therapeutic processes, as this field involves sophisticated psychological intervention.

With specific reference to the uses of music improvisation with ID, research has shown that much of the focus is on the process (Rickson, 2014; Hullick, 2013; Tervo, 2001; MacDonald, et al, 1999). Rickson (2014) claims that the process of music-making is more beneficial than the product as the process allows for social interaction, connectivity, and social network building. Gilboa et al. (2006) regard the process of improvisation during music therapy sessions as personally intended for the client, emphasizing the importance of the process over the product. Furthermore, Bruscia (1987) claims that when analysis is focused on the product, the therapist is particularly interested in the musical materials that result from the process of improvising. Bruscia reinforces that the focus should be on the therapeutic process rather than on the musical materials. Koopman (2007) claims that community music making should not be directed at the reproduction of fixed musical works, stating that the focus should be on the musical activities of the group rather than the finished product. In further defence of the process, Rickson (2014) refers to Small's belief that musicking enables people to express their understandings of the world and their places in it, thus becoming a process in which

social relations are played out. Robb et al. (2017) identifies a multisensory design technique with children and young people with special educational needs and disabilities. The participatory approach arose from the lack of research examining the necessity to develop techniques that could involve children with profound and complex intellectual disabilities, and the need to evaluate actual participation and not merely the end product.

2.4.5 The Product

Koutsoupidou and Hargreaves (2009) refer to the creative product as an outcome of the creative thinking that occurs through exploration of musical ideas and experimentation with musical sounds; thus, improvisation becomes product-orientated rather than process-orientated. The importance of the product appears in the research of Clark (1986), Tang and Leonard (1985), Amabile (1983), and Symes (1983). Tang and Leonard (1985) add that a truly creative product must be the unique solution to a problem; in music, this problem is the need for a product that will be considered both original and desirable. While Clark (1986) regards the process and product to be of equal importance, Amabile (1983, p.359) suggests that 'a product or response is creative to the extent that appropriate observers independently agree it is creative.' Balkin (1990) reinforces the claims of Oehrle (1986) and Hickey and Webster (2001) that a product is the result of a four-stage process: gathering of necessary information and skills; allowing the unconscious to develop ideas and concepts; the 'eureka moment' where the great idea is formed; and finally, verification of this great idea through time and testing.

In the history of musicology, music improvisation has a relatively low status (Duby, 2006; Nettl, 1998), evidenced by its focus on the final product and not on the creative process.

In the history of musicology, improvisation- sometimes defined as the creation of music in

the course of performance- has played a minor role. Musicologists have been concerned in the first instance with composition, and less with the process than with the completed piece of music as set down by its creator. Affected by the research traditions of visual art and literature, they have concentrated on the finished work, analyzed the interrelationships of its components, and looked at its history, but rarely have they been concerned with the varying orders of creativity that may have led to the final product' (Nettl,1998, p.1)

Regarding both the process and the product to be valuable and worthwhile, Kokotsaki and Newton (2015) describe the process as liberating, which allows students to produce novel and original pieces of work while helping them understand how their end products can be of better quality.

2.4.6 Performance

In relation to output and performance, Pitts et al. (2015) refer to Juniu, *et. al.*'s (1996) study of amateur and professional musicians, summarizing that the satisfaction of playing to a responsive audience offers some compensation for those who find rehearsals less rewarding. This highlights the potential thrills and rewards of performance, essentially distinguishing between rehearsals (process) and performance (product).

Regarding ID musicians, there is the likelihood that audience members will be made up predominantly of family members and friends (Rickson, 2014). The author indicates in a paper based on an analysis of post-performance interviews of ID musicians that the narrative of vulnerability persisted. Interviewees remained convinced, however, that there was artistic value in their work and they remained positive that they have the potential to attract wider audiences. In addition, Watts and Ridley (2012) offer a philosophical defence of music's importance in enjoying a truly human life and addressing the element of shame during performances.

2.4.7 Collaboration

Sawyer (2003) defines five characteristics of group improvisation as follows:

- an emphasis on the creative process rather than the creative product
- an emphasis on the creative processes that are problem-finding rather than problem-solving
- the comparison of art to everyday language use
- the importance of collaboration, with fellow artists and with the audience
- the role of the ready-made, or cliché, in art

While Sawyer believes that collaboration is important, Pitts (2005) claims that individual satisfaction results from the group experience. Group music improvisation can involve an ensemble of indeterminate size, ranging from small to large. In music therapy the group comprises between four to eight participants. Pellitteri (2000) emphasizes that when participants play music together they gain the opportunity to express their individuality:

‘The group setting in music therapy is ideal for facilitating socialization and interpersonal interactions. When the members of the group play music together they are united by a common musical beat, and this unity contributes to group cohesion. Creating and playing different musical motifs or different-sounding instruments in the song allows children to express individuality while participating as a group’ (p.386).

In special music education workshops, the number of participants ranges vastly depending on the aims and objectives of the workshops/performances. While Vararigou (2016) claims that collaborative learning and working together sustains musicians' enthusiasm, motivation, and interest in taking part in music workshops, MacDonald and Miell (2000) cite Hakkinen (1999), suggesting that the participants must have good communication, confidence, and

trust with each other in order for effective collaboration to exist. Hakkinen therefore advises that 'friends would be in a position to offer these conditions to the collaborative situation and in turn develop their ideas through the extended use of transactive communication' (p.64)

2.5 Webster's (1994) Measurement of Creative Thinking in Music II (MCTM II) and Amabile (1983) Consensual Assessment Technique (CAT)

Webster's (1994) MCTM II and Amabile's CAT are well documented in the literature.

Koutsoupidou and Hargreaves (2009) present findings of a quasi-experimental study of the impact of music improvisation on the development of children's creative thinking in music. The MCTM- II (Webster, 1987, 1994) was carried out pre-and post a six-month teaching programme in order to assess the children's thinking in terms of extensiveness, flexibility, originality, and syntax. The results of this experimental study revealed that improvisation promotes musical flexibility, syntax, and originality in children's music making.

Koutsoupidou (2008) investigated how various teaching styles impact on primary school children's musical creativity. Findings revealed that pupils who experienced improvisation as part of their music lessons scored higher than those who did not in Webster's MCTM- II. Interviews with music specialists were then conducted, revealing that the didactic/teacher-led style and the creative/child-centred style have differing impact on pupils' musical development. Koutsoupidou claims that a creative teaching approach could assist pupils' creative progression in addition to their social and cognitive development.

Boehm (1999) reports on the effects of a compositional instructed approach utilising invented notation and a noncompositional approach (which did not include invented notation activities) on music achievement scores and music creativity of first graders. Two first grade (N=39) classes carried out pre- and post- tests using the Test of Visual Contours (TVC)

(Domer and Gromko, 1996) and Webster's MCTM II (1994). Participants' scores on the Primary Measures of Music Audiation (Gordon, 1979) were utilised as a covariate. Compelling score variations arose between the pre-test and post-test scores of the TVC and the MCTM II, in particular Music Flexibility.

Fung (1997) examined the effect of a sound discovery programme on children's creative thinking ability in music. This post-test only experiment used Webster's MCTM. Significant differences in Musical Flexibility, Musical Originality, and Musical Syntax were evident, however there was no variation in Musical Extensiveness. The study implies that participants have the potential to develop creativity in music after participating in a non-conventional sound discovery programme.

Hagedorn (1997) investigated twenty deaf children's creative thinking in music, exploring factors of Musical Extensiveness, Musical Flexibility, Musical Originality, and Musical Syntax. Results from the scores of the deaf students were descriptively compared to hearing students' results. Results indicated that the students scored considerably lower than the hearing students in the categories of Musical Extensiveness, Musical Originality, and Musical Syntax, however marginally greater in Musical Flexibility.

Hickey (1995) examined the connection between children's creative thinking in music processes and the quality of output (musical compositions). Twenty-one students recorded music compositions after spending three days using MIDI synthesizers with a custom arrangement computer software package to explore musical composition. Based on the composition ratings, the students were divided into high and low creativity groups for process data comparison. Results have shown that the high creativity group demonstrated increased flexible and fluent musical behaviour trends than the lower creativity group. Furthermore,

this group experimented with entire musical ideas more. No significant relationships between the MCTM II scores and the musical output (compositions) were found.

Wolfe and Linden (1991) conducted a three- strand investigation examining the feasibility of incorporating convergent, divergent, and imaginary factors in models of creative thinking in music; classifying the link between musical creativity processes and musical activity motivation; and, establishing the degree of generalizability of Amabile's Intrinsic Motivation Principle for Creativity to musical creativity environments. Results highlighted that the Intrinsic Motivation Level (IML) scores were significantly connected to the MCTM scores.

Schmidt and Sinor (1986) indicated a significant difference for gender on three of the four MCTM factors in a study investigating success in convergent and divergent thinking ability in musical activities as an action of reflection-impulsivity.

Amabile's (1983) CAT assesses creativity of products by obtaining collective judgements of experts. The componential model of creativity predicts that three major components contribute to creativity: skills specific to the task domain, general (cross-domain) creativity-relevant skills, and task motivation. Lee et al. (2005) introduced a variation of CAT to measure creativity in business settings. The authors found that 'professionals are very consistent in rating the product creativity in their field' (p.143).

In a study which focused on children's musical compositions, 17 practicing music teachers were asked to rate the products relative to one another rather than against any objective criteria. The agreement between their ratings was found to be 0.91, suggesting that the practicing music teachers can recognise the creative work because of their expert knowledge and experience (Hickey, 2001).

2.6 Quality of creative output

Guilford's long quest to measure creativity began in 1950 with the Structure of Intellect (SOI) model proposing 180 cells of thinking operations (Hickey, 1997). Tests that measure creativity based on the SOI model measure factors of fluency, flexibility, originality, and elaboration. In music, Webster (1990) adapted these four factors to create the *Measurement of Creative Thinking in Music* (MCTM)¹⁹. Hickey claims that it is the best-known and most thoroughly researched tool for assessing creative thinking in music (Hickey, 1997).

A widely held definition of a creative product is that it is both 'novel' and 'appropriate' (Davis, 1992; Amabile, 1983). Amabile's (1983) Consensual Assessment Technique (CAT) suggests that creative ability is best measured by assessing the creative quality of products that are a result of creative processes. The CAT has been used successfully for rating the creativity of musical improvisations by Amchin (1995) and Priest (1997).

2.7 Chapter Summary

The literature review suggests that researchers have developed suitable and reliable means for assessing musical aptitude, creative thinking, and compositions (Hickey, 1997; Webster, 1990; Amabile, 1983). The apparent variance, however, between factorial measures of creative thinking, consensual assessment, and holistic measures warrants further investigation to discover the meaning behind these differences. The continued development and refinement of a consistently reliable technique for rating the creativity of ID musicians' improvisations will prove useful for the research community, as well as for educational purposes. The current study developed a reliable form for rating quality in improvised music, by collecting and examining those improvisations that were consistently rated as

¹⁹ MCTM is Webster's original test (1983) and MCTM II is Webster's updated version of the test (1994)

highly ‘creative’. By studying the most creative products, researchers may be able to formulate essential rubrics to aid in assessing ID music improvisations, which could potentially be used as models. An original co-created gesture system, *Conductology*, was developed and refined and the Measurement and Assessment of Creative Thinking in Music (MACTM)²⁰ was applied which investigated ID musicians’ creative thinking in music and the quality of creative output of their improvisations. This is a much-neglected research area.

The review of literature and relevant practice has identified that:

- Reported benefits of using music improvisation with ID participants are extensive. The benefits are frequently documented as being therapeutic, and the goals frequently process-orientated, but the focus is on language acquisition, social skills, and knowledge retention.
- Music improvisation is not a prominent feature within the NIC and is relatively neglected within the ID sector.
- There is much unresolved debate surrounding process versus product and which should take precedence.
- Post-school music-making opportunities for young to middle aged ID adults often reside in community music, however, such opportunities are often limited and confined to ad hoc projects.
- Gesture use within the ID sector is extensive with a focus on language acquisition, social interaction, and knowledge retention, however research on gesture use in music improvisation is lacking.
- MCTM-II and CAT have been documented in the literature as suitable measurement and assessment tools. The MCTM-II has been widely used to measure young

²⁰ The MACTM is a hybridized measurement and assessment tool which combines a variation of Webster’s MCTM II with Amabile’s CAT principles.

children's creative thinking in music. This test has yet to be adapted and administered to young people and adults with ID. The CAT is a widely used assessment tool, yet its application to music improvisation output is sparse.

The current study aims to address identified gaps in knowledge as follows:

- There is currently no appropriate gesture system in music for ID musicians. The current study seeks to co-create an original and effective gesture system for and by ID musicians for use in real-time music-making.
- No empirical research has investigated ID musicians' creative thinking in music and how this influences quality of output. The current study involves empirical research into creative processes and quality of output.
- A hybridized methodological approach in order to reap robust data in ID musicians' improvising processes and products is lacking. The current study presents such an innovative hybridizing approach that is significant and original.

The following chapter will present the study's research questions and methodological approach.

Chapter 3: Research Questions and Methodology

‘When creativity is equated with genius and the process of creation is thought to be wholly mysterious, there is no need to develop the measurement of creativity. But when creativity is taken to be a valued potentiality of all men and its development a valued social aim, then measurement becomes important’. (Mooney & Razik, 1967, p.217).

3.1 Introduction

The review of the literature and overview of current practice has identified the benefits of using music improvisation with the ID population. However, there is currently no appropriate gesture system in music for ID musicians. Moreover, no empirical research has investigated ID musicians’ creative thinking in music and quality of output. Furthermore, a hybridized participatory methodology which seeks to gain robust data in ID musicians’ improvisation processes and products is lacking.

ID musicians were selected as the target population for this investigative study. Chapter Two's literature review and overview of current practice highlighted this population as one of the major target groups for music interventions (Campbell, 2002; Bruscia, 2001; MacDonald et al. 1999; Wigram, 1995; Oldfield and Adams, 1990), although research suggests the need for further empirical appraisal of the relationship between music interventions and ID (Murphy and McFerran, 2017; Gooding, 2011; MacDonald et al. 1999).

This chapter presents the study’s research questions and the chosen methodological approach devised for the investigation. Figure 3 presents an overview of the methodological approach.

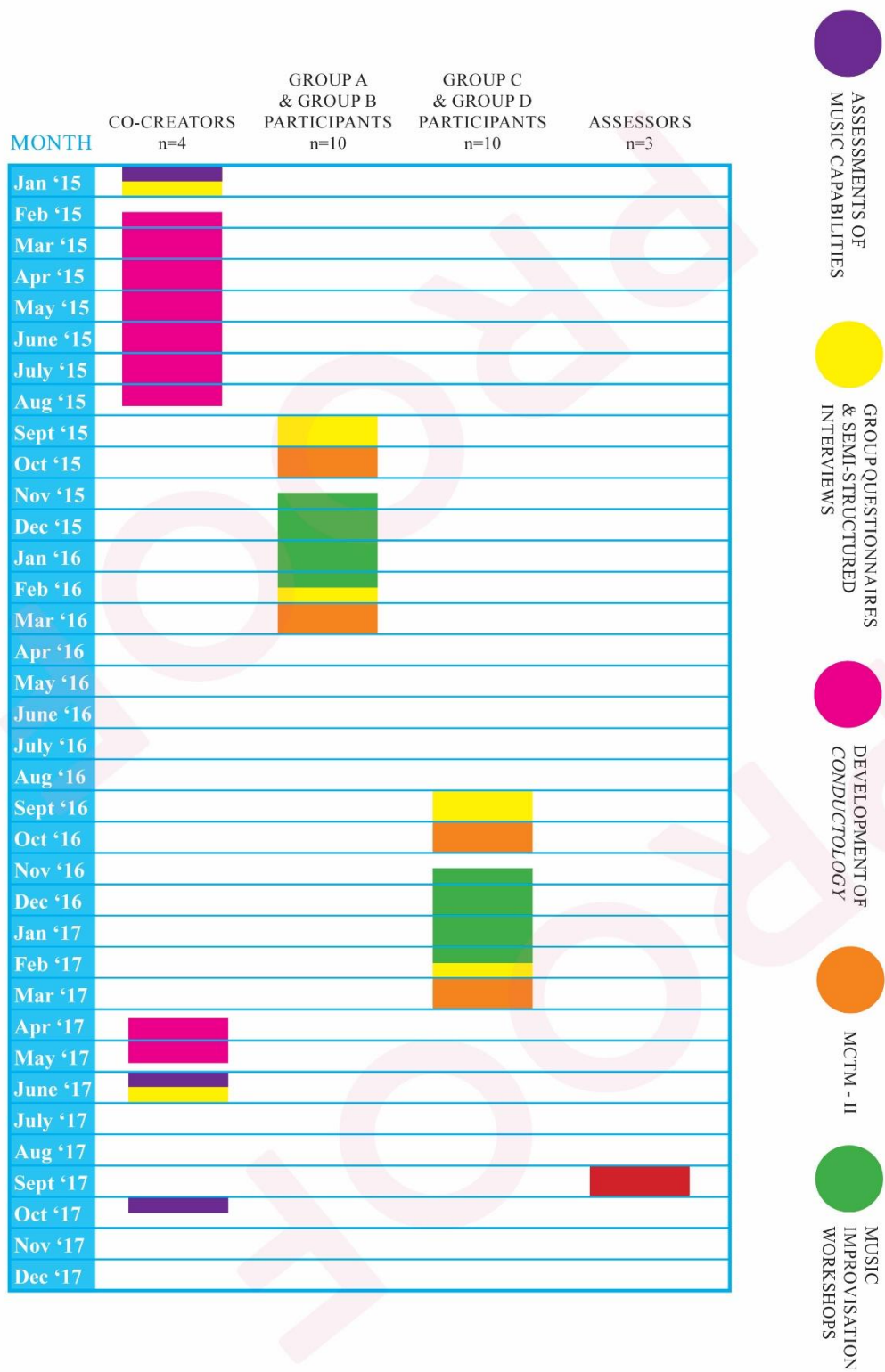


Figure 3 Methodology and data gathering timeline

3.2 Research Questions, Research Design and Rationale

The original aim of this practice-based participatory study was to address the overarching research question:

Can the intervention of an original gesture system, co-created with intellectually disabled musicians, enhance creative ability, and raise quality of output in their music improvisations?

The selected approach for this study was action research. Research questions were identified, an original gesture system for use in real-time music improvisation was developed and tested, data gathered, and results analysed. The British tradition, especially that associated to education, tends to view action research as research related to the enhancement of direct practice (Smith and Doyle, 2017). Carr and Kemmis (1986, p.162) provide a simple definition of action research:

‘Action research is simply a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out.’

The purpose of action research in this study was to co-create, develop, refine, implement, test, review, and evaluate an intervention for use with ID in music improvisation. In the case of this study, the intervention is the gesture system, *Conductology*, for use during real-time music improvisation sessions. However, researchers engaged in action research must consider the extent to which their own reflective research impinges on others such as the dual role of teacher and researcher which could introduce tension in confidentiality and must be addressed accordingly (BERA, 2011). The action research in this study consisted of an approach to improving the quality of music improvisation using an original gesture system

co-created by ID musicians through systematic cycles of reflection, identification, observation, trial and error, evaluation, refinement, and implementation. The study sought to contribute new and significant knowledge through innovative practice-based participative research to assist in the development and understanding of ID musicians' creative ability and quality of their improvised musical output. This study placed ID musicians at the core of the research by involving them from the outset, with an ID-led methodological approach. Arising from the literature review and overview of relevant practice, gaps in knowledge were identified and addressed through the following research questions:

1. Can co-creation of, and participation in, an original gestural system be used to encourage ID musicians to explore their creative ability?
2. Can such a system be utilised in order to enhance ID musicians' creative ability?
3. Can this system generate high quality of output?

Dependent measures in this study included: (1) Measure of Creative Thinking in Music (MCTM-II) (Webster, 1994), (2) Consensual Assessment Technique (CAT) (Amabile, 1983).

Independent variables included: (1) Intervention group (*Conductology*), and Control group.

Pre- and post-intervention questionnaires and semi-structured interviews were also conducted.

3.2.1 The Setting

A charitable music organisation 'Something Special' based in a rural location outside the city of Derry, Northern Ireland, served as the location for this study. The charity accommodates forty young people and adults with intellectual disabilities across the North- West region of Northern Ireland. The charity's main focal points are music-making, outreach workshops, and performances.

3.2.2 Participant Selection and Timeline for Study

Twenty-four students participated in the study, four co-creators, ten intervention group participants, and ten control group participants. To meet the experiential criteria,

participants:

- had an intellectual disability
- were registered at Something Special for at least one year
- had a keen interest in music and performance
- had experience in music making for at least one year
- had experience in music making in a mixed music environment

Using the above criteria, ten participants were selected at random from the Something Special register to form the intervention group. The intervention group participants were then matched as closely as possible to a further ten participants for the control group in terms of gender, age, ability, and experience in music. Participants' parents and /or guardians were given an information letter and consent form asking if their son/daughter could participate in the study. The ID participants received a user-friendly information sheet and were asked to give their assent. It is important that all research participants understand the process, how their participation will be used and to whom it will be reported (BERA, 2011). To ensure participant confidentiality, the author obtained informed consent from each participant and their parent or guardian in the form of a signed letter (Appendix G). The information letter introduced the study and clearly outlined the potential participant's involvement. The letter further identified the purpose of the study and outlined the details and content of the workshops. Due to the vulnerability of the participants, the author provided assurances to

participants and parents/guardians that any participant could withdraw at any time without giving a reason. The author also described privacy protocols, including the use of pseudonyms and secure storage of data, and provided contact details if parents or guardians or the young person had any queries about any aspect of the study.

3.2.3 Ethical Considerations

Ethical consideration is a central issue in the design of any research study involving human participants as it ensures good conduct and integrity (Ulster University Research Governance, 2018). The current study included participants from a vulnerable population, which was justified by the research team. This study was subjected to appropriate scrutiny before proceeding. This ensured that the appointed investigators were appropriate, the study was necessary, risks were identified, and all component parts were in place, including consent forms and information sheets.

All research should be ethically sensitive and should not cause upset or indignity to the participants. It is crucial to strike the best balance between the significance of the research and the human treatment of people who provide the data (Cohen et al. 2013). Additionally, all participants in the control group were provided with the opportunity to experience the gestural system when the study was complete.

3.2.4 Validity

Cohen et al. (2013, p.105) claim that validity in qualitative data is addressed through the integrity, copiousness, depth, and scope of the data achieved, and the breadth of triangulation and the researcher's objectivity. Furthermore, they refer to improving quantitative validity

through attentive sampling, suitable instrumentation, and pertinent statistical treatments of the data.

‘The attempt to build out invalidity is essential if the researcher is to be able to have confidence in the elements of the research plan, data acquisition, data processing analysis, interpretation and its ensuing judgement’ (Cohen et al., 2013, p115).

Invalidity in the research was minimized through rigorous and astute data gathering, data analysis, and data reporting which included: matching Phase One and Phase Two intervention and control groups fairly in terms of age-range, gender, ability, and music experience; inter-rater reliability in the MCTM-II scoring; having an appropriate time interval between the MCTM-II pre- and post-tests; ensuring consistent and controlled conduct when administering MCTM-II pre- and post-tests and data gathering; adapting the MCTM-II to suit the intellect, age appropriateness, and concentration span of the participants; refrain from generalizations, biased data analysis, weak qualitative data coding, and use of prejudicial data. The MCTM II had a clear purpose with appropriate content therefore having high face validity and content validity.

3.2.5 Bias

Bias distorts results and affects outcomes. As the founder of Something Special, the author knew some of the participants and therefore had minimised bias in the research by: piloting the questionnaires and semi-structured interviews; remaining neutral in body language, tone, and dress; avoiding biased questions by not leading the participant to a specific answer and logically ordering questions and topics; consistently challenging pre-existing assumptions; being cognizant of cultural assumptions; avoid summarizing what respondents have said; matching participants appropriately; MCTM II inter-rater reliability; and, accurately reporting results and findings.

3.2.6 Security and Confidentiality of Participant Data

Coding, confidentiality in and between the groups and anonymity in dissemination and publication was explained clearly to participants and guardians before the study commenced. Coding in the form of reversed initials was utilized for study participants while pseudonyms were used for the study's co-creators. Only the core investigative team knew the names of the participants and coding was used for dissemination and publication purposes. All data is stored on the Ulster University FileShare system. This secure, password protected folder is accessed only by the research team named by the CI.

3.3 Methodological Approach

This study adopted an action research and applied a mixed methods approach (Figure 4).

3.3.1 Mixed methods

Data was gathered from semi-structured interviews, questionnaires, the development and testing of an original gesture system, *Conductology*, MCTM II tests, and assessment of quality of output.

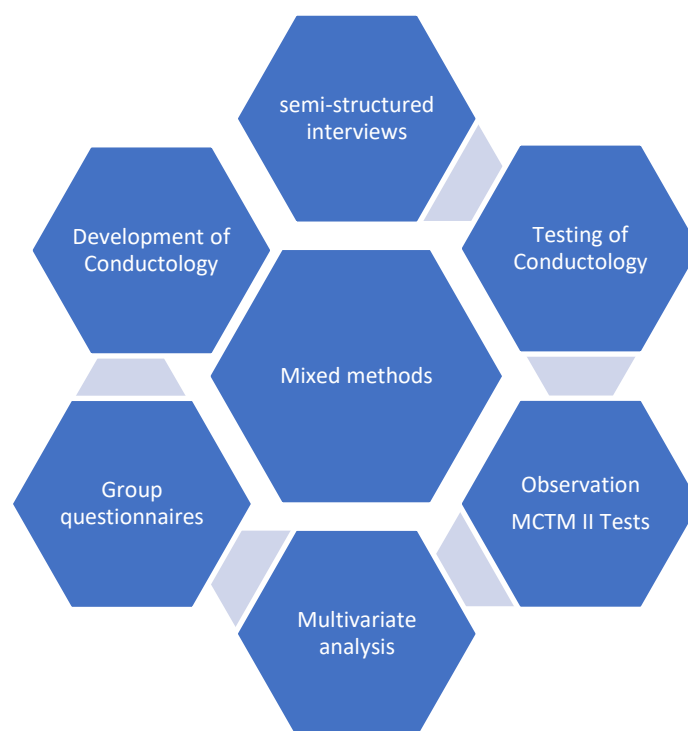


Figure 4 Mixed methods

Qualitative measures included questionnaires, containing predominantly open-ended question, and semi-structured interviews. Quantitative measures included MCTM-II. I devised an innovative, hybridized measurement and assessment tool ‘Measurement and Assessment of Creative Thinking in Music (MACTM) which was applied to garner both qualitative and quantitative data. This hybrid measurement and assessment tool is a blend of Webster’s MCTM-II and Amabile’s Consensual Assessment Technique. There is very little attention given to such measurement and assessment blends in the literature. More specifically, this hybridization, with participatory input by ID musicians, is novel and original.

Qualitative and quantitative approaches have been traditionally associated with separate paradigms. The qualitative approach seeks to comprehend individuals’ concepts of the world in an insightful manner through concepts and categories. This method can employ a range of approaches including, in-depth interviews, case studies, structured interviews, focus groups, field research, ethnography, and observation. Qualitative researchers usually have their own

ideas, opinions, and presumptions that they bring to the study. This research is concerned with a more in-depth comprehension of a problem. The aim is to present illustrative information in order to understand the problem. Data collection occurs which is sensitive to the study participants and the data analysis establishes themes. Qualitative findings and results can be presented as a complex and descriptive understanding of the problem, in addition to its contribution to literature. Case studies, focus groups, and field research are the most adopted methods within qualitative methodology (Queiros et al., 2017).

The quantitative approach is based on fact collection and comparison. The two most common quantitative research approaches are surveys, and correlational studies (Queiros et al., 2017) although field experiments, simulation and multivariate analysis can also be employed. Measurable techniques are utilised which generate measured and generalizable results. The qualitative approach is less pervasive, while the quantitative approach has been primarily associated with the dominant empirical-analytic paradigm. Qualitative data can provide in-depth descriptive interpretations which can support the quantitative data.

The rationale for using a mixed methods approach in this study is to gain clear insight into processes and participants' qualitative experiences and to triangulate the qualitative data with the quantitative data. Some authors have argued that a mixed methods approach is best used in cases where the aim is to generate greater understanding of the mechanisms underlying quantitative results in at least partially new territory (Edmondson & McManus, 2007). Choy (2014) advocates that a complementary approach between qualitative and quantitative methods has the potential to produce sounder results than only using one isolated approach.

Brock-Utne (1996) refers to qualitative research as being holistic with the aim to recording the many clarifications of, and motives given to, experiences and situations. However, Ruddock (1981) claims that qualitative methodologies are castigated for being insignificant,

subjective, and biased. While quantitative research accepts replication feasibility, Eisner (1985) states that quantitative measures are condemned for failing to differentiate between statistical and educational significance. Bradt et al. (2013) declare that academic teams consisting of individuals with qualitative, quantitative, and mixed methods skills are increasingly popular. Mixed methods research involves the collection of both quantitative and qualitative data to answer the research questions.

'Mixed methods research is research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry' (Tashakkori and Creswell, 2008, p.4).

Within the context and scope of this study, mixed methods research offers unique opportunities for strengthening the evidence base in special music education (Bradt et al. 2013).

'Simply collecting quantitative and qualitative data and reporting the results separately without integration through merging or connecting the data does not meet mixed methods research criteria, as it does not take full advantage of the strengths of combining the data.' (p.125)

The combination and integration of qualitative and quantitative data must be carried out with diligence and accuracy. By utilising the MACTM and implementing a triangulation technique, the research question(s) were fully addressed. Anecdotal and descriptive narratives are important in data collection in the social sciences, however, it is also critical to proceed towards empirical investigations in music therapy (Bunt and Hoskyns, 1987; Bunt, 1984). Lin (1976) claims that reliance on one method is not appropriate, suggesting that the more the researcher's methods contrast with one another, the greater the confidence in the data (cited in Cohen et al. 2013). Campbell and Fiske (1959) state that triangulation is a powerful way of demonstrating concurrent validity, particularly in qualitative research (cited in Cohen et al. 2013). Similarly, Sarvimaki (2017), refers to triangulation as a cross examination between

multiple points which can include data, investigators, theories, analyses, or methods, claiming its necessity in confirming the credibility of qualitative research outcomes in multiple cases. However, in contrast, Cohen et al. (2013) cites Patton (1980) suggesting that having multiple qualitative data sources does not ensure regularity or reproduction. Furthermore, Fielding (1986) asserts that methodological triangulation does not necessarily increase validity or reduce bias (cited in Cohen et al. 2013) as invalidity and bias can enter at every stage of the research. Moreover, Brannen (2017, p.3) stresses the importance of ‘treating the data sets produced by each method as complimentary to one another rather than to integrate them unproblematically.’

The critical element of mixed methods research is the connecting and unification of the qualitative and quantitative data. This study collated the two datasets in a systematic, incremental, and premeditated approach through the development of *Conductology*, MCTM-II pre- and post-intervention of the gesture system, pre- and post-intervention questionnaires, and semi-structured interviews, and finally, consensual assessment of output (recorded improvisations). The data was linked in a sequential format allowing for better understanding and appreciation of the experimental effects. Mixed methods research is well suited to examine complex issues which require empirical evidence to inform education policy. This study’s mixed methods approach allowed the author to: analyse and report on participants’ opinions and experiences in relation to music improvisation workshops; measure participants musical extensiveness, musical flexibility, musical originality, and musical syntax; assess the effectiveness of *Conductology*; and, report on the quality of the sixteen improvisations (products).

The study comprised the following main elements for data gathering: (For ease of reference see page 48, Figure 3 for Methodology and data gathering timeline)

- Questionnaires
- Semi-structured Interviews
- Co-creation of, and participation in, the gesture system *Conductology*
- Measurement and Assessment of Creative Thinking in Music (MACTM)

3.3.2 Questionnaires

The purpose of the pre-intervention questionnaires (see Appendix H) was two-fold: firstly, to examine the participants' use of music in everyday life, focusing on the value placed on music, elements of enjoyment, and potential benefits; and secondly, the use of gestures in daily life and views of how gestures could help with musical discovery, aptitude, and quality of output. The pre-interview questionnaire contained eight questions, six closed and two open. Information was gathered on individual participant views. The data also provided insights on the impact of music sessions on individual creativity and on opportunities to develop new skills. Further questions related specifically to the participants' expectations of an original gestural system to be used in music improvisation sessions and performances specifically for and by ID individuals. The questions also allowed for natural progression in group discussions, critical to the data collection.

'It is the open-ended responses that might contain the 'gems' of information that otherwise might not have been caught in the questionnaire.' (Cohen et al. 2000, p.255).

The sequencing of questions is critical in a questionnaire. It is vital not to establish a perspective at the outset. Clear and favourable questions at the beginning will yield prompt responses, and the progress to more complex and functional questions will be reasonable.

The purpose of the post-intervention questionnaires (Appendix I) was to gain detailed insight into the participants' experiences of the music improvisation workshops and specifically: enjoyment levels; potential development in skills; difficulties (or lack of) with music improvising; group dynamics; the impact of *Conductology* in group improvising and quality of output. The post-intervention questionnaire contained ten questions, eight closed, and two open. Responses provide in-depth understanding of participants' opinions and views of the music improvisation workshops; the quality of the product, creativity enhancement, and enjoyment. The post-intervention questionnaire was crucial in that participant responses determined the impact of the original gesture system.

The author's preliminary literature review and research plan identified important areas for investigation. Questions were designed and written with the view to achieving the set objectives. The author made several attempts at designing and writing the questionnaires. Such effort was made in order to: confirm the question type and the ability to classify and analyse responses; ensure the participants' understanding of each question; and, to remove jargon and ambiguity. Questionnaires were piloted with Something Special students, who were not involved in the study, to check that participants fully understood what each question was asking and if instructions were clear, and how long the process took to complete. Pilot testing went smoothly, and no changes were made.

The pre-questionnaires were administered to the participant group in the music room at the Something Special premises the week prior to the initial individual MCTM-II. The post-intervention questionnaires were administered to the participant group in the music room at Something Special premises the week after the final individual MCTM-II. Both pre- and post-intervention questionnaires were administered by the author. Each question was clearly

read out aloud by the author, and repeated, if necessary. Participants provided oral responses to each question which was recorded on a Sony voice recorder. These responses provide useful indicators to the types of opinions worth following up at semi-structured interview stage. The author carefully listened to the respondents' answers post-questionnaire administration and scanned responses for recurring themes. Responses were incorporated into a simple summary sheet and coding was used for each response. Descriptive data was presented in addition to bar charts clearly illustrating intervention and control group participant responses in Chapter 6.

3.3.3 Semi-structured interviews

The semi-structured interviews followed on from the questionnaires and focused on the participants' preferences for a gesture system for use in real-time music improvisation sessions. The interviews also explored participants' expectations and opinions of traditional methods frequently used within the Something Special music environment. Watts and Ebbutt (1987, p.287) explain that group interviews and discussions are useful 'where a group of people have been working together for some time or common purpose, or where it is seen as important that everyone concerned is aware of what others in the group are saying.' Lewis (1992) however refers to the difficulty in organising the coding of group interview data. Moreover, Lowe (1992) claims that ID participants' opinions are vital in terms of intervention adaptation and considering the participants as inactive services beneficiaries (cited in MacDonald et al. 1999, p.237).

The semi-structured interview questions were piloted with Something Special students who were not involved in the research study to check that participants fully understood what each question was asking, if instructions were clear, and how long the process took to complete.

Pilot testing went smoothly, and no changes were made. The pre-intervention semi-structured interviews took place in the music room at Something Special premises with the intervention and control group participants after the pre-intervention questionnaires. The post-intervention semi-structured interviews took place in the music room at Something Special premises with the intervention and the control group participants immediately after the post-intervention questionnaires. Each question was clearly read out aloud by the author, and repeated, if necessary. The semi-structured interviews lasted between 30 to 45 minutes and were audiotaped. Recordings were transcribed verbatim by the author as soon as possible after the interview. The author also took written field notes of observations during and immediately after each interview, noting facial expressions and non-verbal communications linked to responses. The author colour-coded the data and identified emerging themes. The Chief Investigator checked the data to ensure validity of the themes.

3.3.4 Co-creation of, and participation in, the gesture system *Conductology*

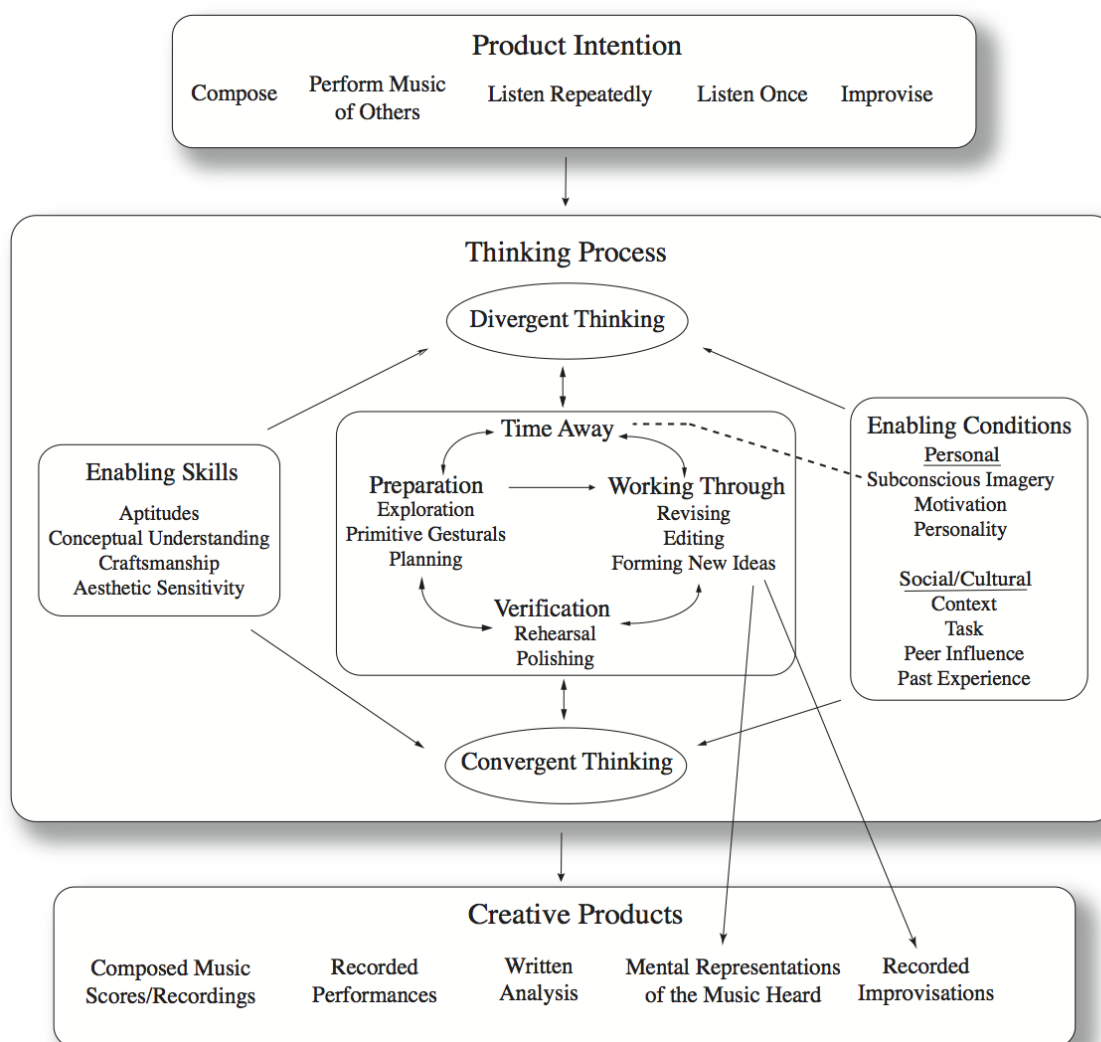
This study allowed ID musicians to co-create an original gesture system for use in real-time music sessions. The co-creation of the system offered the co-creators opportunities to evaluate, assess, develop, refine, and expand on directives. The collaborative development was a crucial component in the study's methodological approach. Further detail is provided in chapter four.

3.3.5 Measurement and Assessment of Creative Thinking in Music (MACTM)

This research allowed the co-creators to collaborate in the study design and methodological approaches. This participatory approach has received little attention in the literature. The MACTM is a hybrid of MCTM-II and CAT. By adapting Webster's MCTM-II and

hybridizing it with Amabile's Consensual Assessment Technique, the author could investigate the impact of a co-created gesture system on participants' creative thinking in music, while experts in the field of music improvisation could assess the quality of output. This hybridized design approach is an innovative tool which garnered robust and significant data.

Webster's MCTM-II was selected for this study (Appendix Ji). An accurate measurement in creative thinking in music domains is central to understanding the ID participants' capabilities within musical extensiveness, musical flexibility, musical originality, and musical syntax. This creative thinking in music test is relevant to creativity theory and to adult creative behaviour as well as being attractive to all ages and adaptable to the whole educational range. Webster's MCTM-II was used to determine the effects of *Conductology* for use in real time music improvisation with respect to participants' Musical Extensiveness (ME), Musical Flexibility (MF), Musical Syntax (MS), Musical Originality (MO), and quality of creative output. Webster (1987) has written about creative thinking in music extensively. Webster (1987) cites Wallas (1926) who documents four stages of creative thinking as: preparation, incubation, illumination, and verification. Webster states that creative thinking in the music process commences with intention and progresses through divergent and convergent thinking processes, and finally to, creative products (the outcome) (see Figure 5).



Webster, P. (2002). Creative thinking in music: Advancing a model.
 In T. Sullivan, & L. Willingham, (Eds.), *Creativity and music education* (pp. 16-33).
 Edmonton, AB: Canadian Music Educators' Association. (revised 2004)

Figure 5 Webster's Model of Creative Thinking Process in Music

Webster's MCTM-II, a thoroughly researched tool for assessing creativity in music, is designed to evaluate an individual's musical creativity and expressivity by engaging in a ten-task guided improvisatory session and measuring divergent and convergent musical syntax factors. Reliability and validity data have been collected in a number of studies (Webster 1987, 1988, 1990 and Swanner, 1985). MCTM²¹ has also been used in a study of cognitive style by Schmidt and Sinor (1986). In terms of inter-scorer reliability for the factors of MO

²¹ Webster's MCTM was first produced in 1987, followed by a revised version MCTM II in 1994.

and MS, coefficients range from .53 to .78 with an average of .70. Internal reliability measured in the form of Cronbach Alpha coefficients range from .45 to .80 with an average of .65 (.69 for the most recent version). Test-Re-test reliability indicates a range between .56 and .79 with an average of .76. Content validity was established with a panel composed of music educators, composers, and psychologists which met on four different occasions to review the measure, audit pilot tapes, critique scoring procedures, and offer suggestions for improvement. Factor analysis showed each factor significantly contributed to two global factors which represented the theoretical existence of convergent and divergent thinking.

Amabile's Consensual Assessment Technique (CAT) is used extensively and is a standardized instrument in creativity research (Kaufman et al. 2008; Amabile, 1996; Runco, 1989). The central principles of the CAT and their application in this study's methodology can be contextualized as follows:

- *The judges should have the knowledge and experience of the domain- music improvisation.* The assessors in the investigative study have substantial experience in music improvisation across various music genres.
- *The judges should not be presented with explicit criteria for assessing the dimensions, nor should they be allowed to exchange opinions with each other while making their assessments.* The assessors in this study were given a proforma in the form of an assessment table (see Appendix Kii) outlining the areas to be assessed- originality, technique, interaction, and quality of output. The assessors were advised to select a score (0-5) based on their knowledge and experience with a maximum of 20 points given to a recording.
- *The judges should be advised to classify products relative to one another, rather than rating them against listed principles.* In this study, it was made clear to the assessors that the sixteen improvisations should be assessed relative to each other. Clear

information for the assessment procedure was given to each assessor via letter (Appendix Ki) and followed up with verbal correspondence with the author.

- *The judges should be given the products in random order and should also contemplate the various judgment elements in a random order.* The sixteen recorded improvisations were presented to each assessor in random fashion. The random order of the recordings differed for each assessor. Assessments for each of the four strands were made using a five- point scale, in which a rating of five indicated excellent quality, exceptional interaction, secure and expressive playing, and excellent levels of originality and imagination in the generation and development of ideas.

The methodological approach used as the basis for testing and assessing the effect of the original gesture system, *Conductology*, is MACTM. Hybridizing the MCTM-II with the CAT is a novel approach to a comprehensive analysis of empirical investigations in the field of ID and music. The pre- and post MCTM-II results blended with evaluative assessments of music improvisations by expert improvisors offered a unique, in depth, triangulated, and innovative method which addressed the research questions.

MACTM provided data on ID participants' musical extensiveness, flexibility, originality, and syntax, in addition to a complementary bond of assessing quality of output based on *Conductology* intervention and control group music improvisation products.

An overview of the methodology is observed in The Four Stages (see Table 1) outlining the crucial components involved in the study's methodological approach.

The Four Stages

Stage One

- a) Musicians selected for co-creating team (n=4)
- b) Musicians completed assent to participate in study.
- c) Musicians completed group questionnaires, and semi-structured interviews.
- d) Musicians co-created the gesture system, *Conductology*.

Stage Two

- a) Participants selected for intervention and control groups.
Control group A (N=5), **Control group C** (N=5), **Intervention group B** (N=5), **Intervention group D** (N=5).
- b) Phase One and Phase Two Participants completed assent to participate in study.
- c) Phase One Participants completed group questionnaires, and semi-structured interviews.
- d) Phase One Participants completed MCTM-II.
- e) Phase One Participants took part in the twelve-week improvisation workshops.
- f) Phase One Participants recorded the music improvisations. **Control group A** recorded four improvisations. **Intervention group B** recorded four improvisations.
- g) Phase One Participants completed MCTM-II.
- h) Phase One Participants took part in exit group questionnaires and exit semi-structured interviews.

Stage Three

- a) Phase Two Participants completed group questionnaires, and semi-structured interviews. (Similar to those administered to Phase One participants).
- b) Phase Two Participants completed MCTM-II.
- c) Phase Two Participants took part in the twelve-week improvisation workshops.
- d) Phase Two Participants recorded the music improvisations. **Control group C** recorded four improvisations. **Intervention group D** recorded four improvisations.
- e) Phase Two Participants completed MCTM-II.
- f) Participants took part in exit group questionnaires and exit semi-structured interviews. (Similar to those administered to Phase One participants).

Stage Four

- a) Assessors (music improvisation experts, n=3) measured the quality of the sixteen-recorded music improvisations (products).

Table 1 The Four Stages

3.4 Chapter Summary

This study investigated a population that has been extensively researched, however, empirical music interventions are lacking. The hybridized, triangulated methodological approach presents innovative and infused testing and assessment blends that robustly interrogated the effects of *Conductology* on ID participants' creative thinking in music and quality of output. The MCTM-II individual pre- and post-intervention tests combined with expert music improvisation product analysis provided detailed data. Furthermore, qualitative data from the questionnaires and semi-structured interviews supported vigorous data gathering.

Chapter 4 Development of the Gesture System, *Conductology*

4.1 Introduction

This chapter's focus is on the co-creation process and development of the gesture system entitled *Conductology* for use during real time music improvisation. It presents an overview of the methodological approach used. The investigative research examines current music improvisation practices through reflective discussion and exploratory gesture directives. This chapter describes the following areas:

- Exploration: Questionnaires and semi-structured interviews
- Reflective Evaluation of current real-time music improvisation sessions;
- *Conductology*- the development of the gesture system;
- Qualitative assessment of capability and preference via semi-structured interviews;
- Extensive review and refinement of twelve gestures by design team.

4.2 Overview of the co-creators

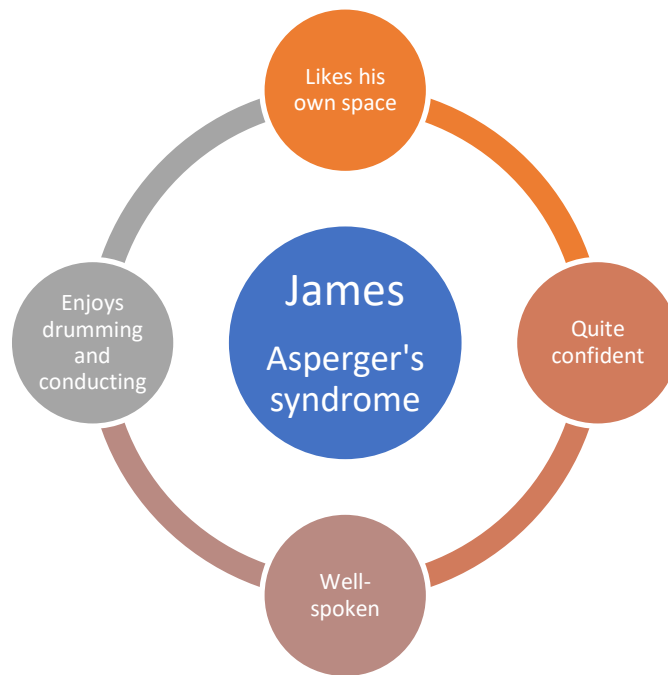
The co-creating team was made up of the author and four ID musicians: Molly, Darren, James, and Simon. The Co-creating Team was responsible for creating, developing, trialling, and refining the original gesture system for use during real-time music improvisation sessions.

The Team: Simon, James, Molly and Darren.

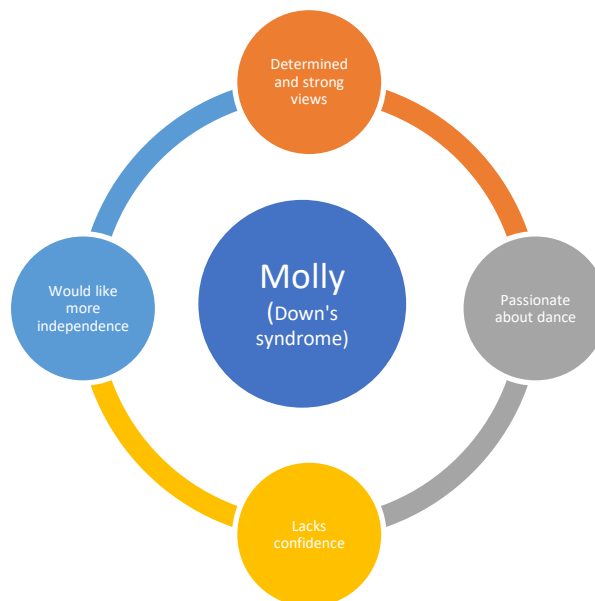
Simon, who has global developmental delay, is passionate about music and enjoys music-making with friends. He lacks confidence and has limited reading and writing skills yet has very good communication skills. Simon likes routine, new opportunities and challenge.



James, who has Asperger's syndrome, is quite confident, mannerly, and well-spoken. He enjoys his own space yet also likes to make music with others. He particularly enjoys playing drums, music technology, and conducting ensembles.



Molly, who has Down's syndrome, is passionate about music and dance. She is a confident and experienced performer with strong and direct views on what she would like to achieve. Molly needs consistent reinforcement as she lacks confidence and self-esteem.



Darren, who has global developmental delay likes routine and music activities. He particularly enjoys song writing and solo performing. Darren needs consistent reassurance and support.



Prior to the evolution and refinement of the gesture system, the four individuals in the creation team had experience in music making and performing. For approximately five years, the team have attended music workshops, working with gamelan, vocals, music technology, piano/keyboard, guitar, and various tuned and untuned percussion instruments. Workshop delivery styles were conventional and instructional, leaving no room for creative exploration or challenge. In recent years, the co-creators appeared static during music workshops, and performances. They wanted to be challenged and expressed the desire to be on a par with professional musicians.

4.2.1 Musical capabilities: musical assessment of co-creators (see Appendix L)

Assessments of the team focused on their understanding of and familiarity with the following seven elements: timbre, pitch, texture, tempo, structure, duration, and dynamics (Table 2).

Co-creator	Timbre	Pitch	Texture	Tempo	Structure	Duration	Dynamics
Darren	Unsure what this means	Unable to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Lacks understanding	Attempts repeating a two-bar phrase but has difficulty accurately counting note values	Associates loud with low and quiet with high
Molly	Unsure what this means	Unable to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Lacks understanding	Attempts repeating a two-bar phrase but has difficulty accurately counting note values	Associates loud with low and quiet with high
Simon	Unsure what this means	Able to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Some understanding	Able to repeat a two-bar phrase in 4/4 time with small errors	Associates loud with low and quiet with high
James	Unsure what this means	Able to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Some understanding	Able to repeat a two-bar phrase in 4/4 time with small errors	Associates loud with low and quiet with high

Table 2 Baseline Assessment of Co-creators' musical capabilities

Following the baseline assessments, co-creators completed initial questionnaires, and semi-structured interviews relating to their dependence on, and use of music in daily life. The introductory questions allowed the author to capture relevant and detailed information on the co-creators' involvement in: listening to music, playing, and performing, social interaction, development of new skills, and overcoming negative experiences of disability. Subsequent questions focused on the use of gestures in everyday life, the potential use of gestures in music improvisation sessions, and, the quality of music output. (see Appendix H)

4.2.2 *Conductology: the gesture system*

The four ID co-creators met for two hours each week over twenty-four weeks to improvise. Their improvisation was reflected upon and the co-creators made suggestions as to how improvements in quality of output could be made by using co-created gestures. By week eighteen, twelve gestures were co-created. The final two weeks explored the use of a combination of the gestures in music improvisations (Table 3, and Appendix M ex.1 and ex.2).

CONDUCTOLOGY -THE GESTURE SYSTEM

- 1 **Prepare mode** - two clenched fists displayed at shoulder level indicating prepare to perform.
- 2 **Shine** - showcase biceps proudly, indicating empowerment and solo playing.
- 3 **Create** - right hand displays wave motion which indicates free improvisation
- 4 **Bounce** - index finger of right hand taps the palm of the left hand indicating staccato playing. Performer must pay attention to the requested speed.
- 5 **Follow** -index finger creates movements in the air which the performer should carefully follow.
- 6 **Return** - right arm points straight up and then moves to lie on a straight left hand indicating to return to the original melody.
- 7 **Blast** - right hand clenched fist swiftly moving forward similar to a bowling motion, indicating for a performer to play a single loud beat on their instrument.
- 8 **Echo** - right hand cups the right ear indicating to the performer to play what another performer has played.
- 9 **Silence** - two hands cover mouth representing silence.
- 10 **Glide** - right hand gradual ascension with fluttering fingers indicating a moderato ascending glissando.
- 11 **Soar** - right hand fist pump vertically indicating a rapid ascending glissando.
- 12 **Panic** - one hand open at each ear with a shaky movement indicating fast repeated notes.

Table 3 The Gesture System

Following the co-creation and testing of *Conductology*, the co-creators participated in exit questionnaires, and semi-structured interviews. The objective of the post-intervention questionnaires was to gain detailed insight into the music improvisation workshops and specifically; enjoyment levels, potential development in skills, difficulties (or lack of) with

music improvising, group dynamics, the impact of the original gestural system in group improvising and quality of output (Appendix I).

4.3 Co-creation process and development of *Conductology*

Figure 6 below provides an account of current music improvisation practices, the co-creation and trialling of gestures, evaluation and effects of gesture directives, assessment of musicians' capabilities and preferences and refinement of the gesture system, *Conductology*.

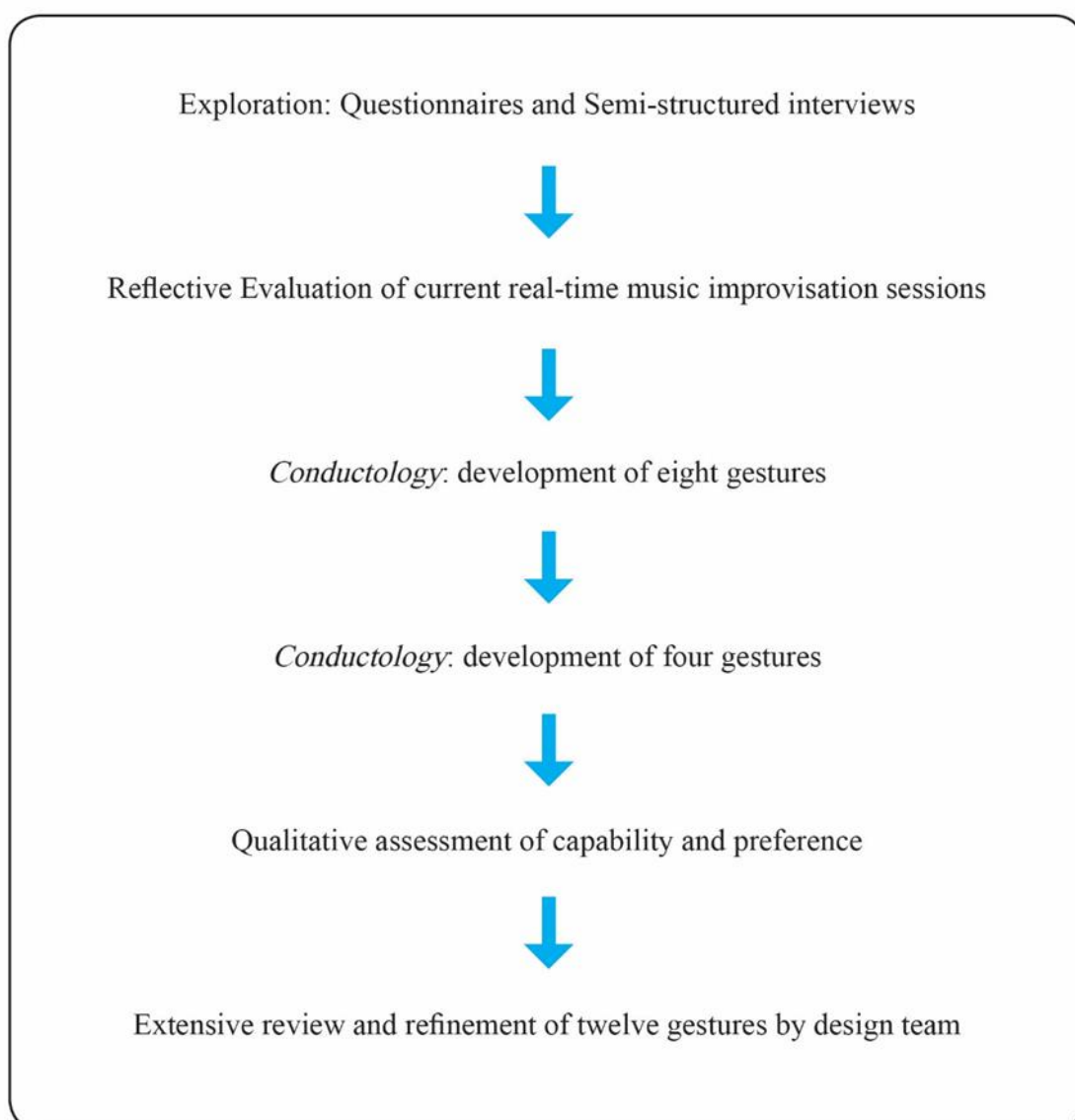


Figure 6 Creation Process and Development of *Conductology*.

4.3.1 Exploration

Questionnaire and semi-structured interview responses supplied by the co-creators exposed a heavy reliance on music in everyday living. The four co-creators all have mobile phones with a variety of downloaded music which varies according to individual preferences, such as Gareth Brooks, One Direction, Rock/Pop, and Westlife. The co-creators furthermore agreed that they listen to music whenever they have free time. For example, both Darren's and James' response to the question 'Do you encounter music a lot in everyday life?' was 'All the time'. This response highlights the value of music in Darren's and James' lives.

Darren: *'Music means everything to me because I've always wanted to be a singer since I was about 16...and I'm very good at writing music and I'm a great singer...music is a great part of me and I don't want it to end.'* (Appendix M, ex.3)

Darren: *'it's [music] changing my life. I'm learning so many new things and meeting so many new friends.'* (Appendix M, ex.4)

Burrowing further into specific music elements, Simon indicated that he particularly enjoys performing as it gives him a sense of achievement. Similarly, Molly expressed her views on the audience claiming, *'audiences love to see me perform.... I love performing and the audience loves to see my talent.'*

Responses to the question 'Has music helped you overcome negative experiences of disability and, if so, how?' revealed a desire to perform more and develop as a musician. Molly claimed that through performing, in particular with the gamelan ensemble, she has more social interaction opportunities:

Molly: *'I love gamelan and playing with friends, and I dance to the beat. It's joyful, and just wonderful'* (Appendix M, ex.5).

Darren repeatedly states, *'music has saved my life.'* Furthermore, he refers to his own anxiety and behaviour issues over the years, claiming that music, listening to and playing an instrument, has helped him greatly in numerous situations:

Darren: *'It's [playing music] has changed me for the better and made me more confident and made me start trusting people* (Appendix M, ex. 6).

In relation to using gestures during music sessions, all four musicians were open to, and excited by the suggestion. Both James and Simon, keen to explore their musical capabilities asked if they would be able *'to perform amazing and weird music'* as they were getting tired of current music improvisation practices. Molly, excited at the idea of creating, developing, and refining gestures that would provide set directives for the ensemble claimed, *'Bring it on'* while Darren, on the other hand, albeit excited, was anxious. Further discussions progressed to music experimentation and output. The four co-creators agreed that although it is important to please the audience, it is of equal necessity to please oneself and other ensemble members, as the music (output) is a real-time creation of each musician's skill, capability, creativity, and preference. Molly insists on the importance of pleasing herself, *'I make myself happy when I perform. The audience usually like my performing but it's their problem if they don't.'* Moreover, the co-creators expressed their joint boredom of the 'token gesture applaud' by audiences and expressed a desire to be recognised as a 'proper' musician. James notes, *'I just hate it when the audience gives us a dull round of applause. It makes me so angry, and I feel no good. I want them to treat us like proper and professional musicians.'* Furthermore, the co-creators were open to create, develop, trial, and refine an original gesture system that could aid this ambition. James further states,

James: *'If I want to be like a good conductor- I listen to influence of different musicians'* (Appendix M, ex.7).

James: *'I want to hear the people...to see our music build a better future for ourselves'* (Appendix M, ex.8).

It must be stressed that although the four co-creators are keen to progress their musical skills and capabilities, they nonetheless, enjoyed all types of music performances. They further claimed that if their musicianship was enhanced through the consistent use of a developed,

original, and co-created system, there is the potential for audience's perception to be challenged.

Simon stated: *'imagine what the audiences would say if we played amazing and complicated music? They might just think we are normal musicians with no disabilities. That would be just amazing.'*

In relation to their expectations of an original gesture system, the co-creators clearly stated their desire to have increased control over some creative directives. James requested *'as many [musical] elements as possible'* while Simon requested *'strange and weird music, the weirder the better'*. Molly and Darren both suggested their interest in solo sections during a piece while Simon gave explicit detail in requesting to experiment with an original system that could potentially challenge his capabilities as a musician, which would also create vibrant and unusual output in timbre, pitch, tempo, complex rhythms and unusual combinations of instruments and music environments.

Simon: *'It's [early stages of the gesture system] really entertaining...all the weird stuff you can do and create with all the music gestures you can use to see what comes out of things'* (Appendix M, ex. 9).

The co-creators were agreeable in allowing the author to oversee this domain, and to let the finer details emerge through experimentation.

The initial exploratory examination into current music improvisation practices experienced by the co-creators provided the author information on the co-creators' desires and expectations for an original gesture system. Current real-time music improvisation sessions which the co-creators have participated in during their twice weekly music sessions over the past two years at Something Special, was then extensively reviewed, identifying gaps and detailing the co-creators' opinions (Table 4).

4.3.2 Reflective evaluation of pre-existing real-time music improvisation sessions

Issues with Music Improvisation sessions pre- gesture system	Description of issues	Co-creators' opinions
Conductor led	Musicians were not given the opportunity to play when they would like to as the improvisation is purely conductor led by invitation to play and pre-existing gestures (Figure 7).	James: <i>'I'm bored and tired with the same old thing. I want to learn something new, more challenging for myself...'</i> (Appendix M, ex. 10a) Simon: <i>'I'm getting fed up with the same old thing-the conductor pointing at me, telling me when to come in and when not to come in...I'm ready to do more interesting stuff about music'</i> (Appendix M, ex.10b).
Little challenge for musicians	Musicians played a set musical phrase repeatedly or were invited to play set rhythms depending on what the conductor asked for. Such directives in addition to pre-existing gestures offered little challenge to the musicians.	Simon: <i>'I want to be more challenged in music. I want to explore music more...I want to be an actual conductor'</i> (Appendix M, ex. 11).
No free improvisation during a performance	Musicians have never gained the chance to freely improvise during music improvisation sessions. This is an area which could alert the author to the musicians' creative musical ability.	James: <i>'...I need to do ...more challenging'</i> (Appendix M, ex.12).
Limited music knowledge development	The musicians had basic comprehension of music theory however this was static.	All musicians have expressed a hunger for learning music theory and putting this into practice during music improvisation sessions. Simon: <i>'I want to get credit more in my music. I want to be a true inspiration in music'</i> (Appendix M, ex.13).
Bored of utilising visual cues	Regular use of visual stimuli has been a huge part of generating ideas in music improvisation sessions.	James (Appendix M, ex.14a) Molly: <i>'I'm bored of the pictures-no creative and no challenge'</i> (Appendix M

		ex.14b) Simon: <i>'I want to learn more and more and more'</i> (Appendix M, ex.14c).
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Table 4 Reflective Evaluation of pre-existing practices

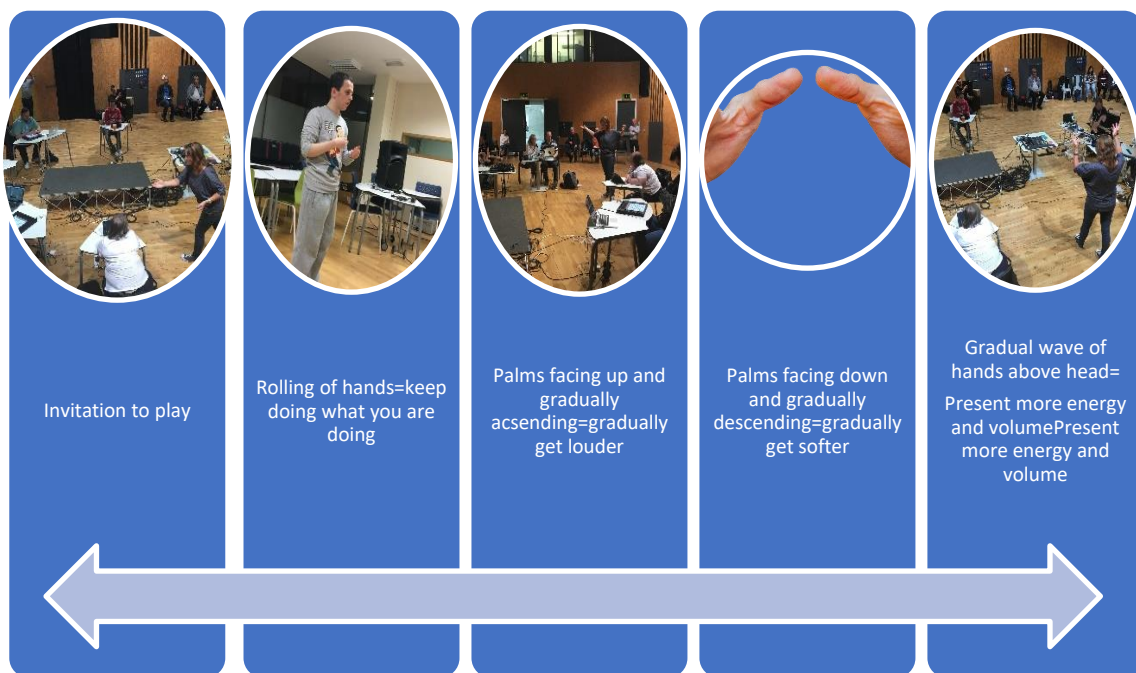


Figure 7 Pre-existing gestures

In summary, based on the first two stages of this action research there was clear and unanimous agreement from the co-creators that:

- current practices did not challenge them
- desire to develop more musical knowledge and create more colourful, vibrant and unusual pieces

- a static leader/conductor who merely invited musicians to play set tasks was boring and passive

The co-creators and the author then attempted to co-create a repertoire of gestures that extended musical technique and capabilities (Table 5).

4.3.3 Conductology (Part A)- development of eight initial gestures (See Appendix N for demonstrations of each gesture).

GESTURE	REASON	GESTURE MEANING	ADDITIONAL INFO
1 Prepare mode	This gesture was a definite requirement by the four co-creators as they expressed a need for a clear indication on when the performance was going to start. During the refinement period, the gesture progressed from both arms resting on each side of the conductor to two clenched fists displayed at shoulder level. The progression to this arose from the desire for a definite, clear, and elaborate statement.	Two clenched fists displayed at shoulder level <i>indicating prepare to perform.</i> (Appendix M ex.15)	The co-creators agreed that a gesture would alert musicians to be ready to perform. James suggests <i>'We all need to be ready and alert at the same time. A definite clear gesture from the conductor will make that happen.'</i>
2 Shine	This gesture originated with the proposed need and desire to incorporate solo performing within the ensemble performance. The co-creators agreed that such a platform	Highlight biceps proudly, <i>indicating empowerment and solo playing.</i> (Appendix M, ex.16)	Simon and Darren proposed the need for a gesture that would indicate a solo performer to take centre stage and 'Shine'. This gesture was originally known as 'empowerment' however all co-creators agreed that

	<p>empowers the performer and highlights musical capabilities. The <i>Shine</i> gesture originally took the form of the conductor pointing with an index finger to the desired musician, however, the co-creators agreed that such a gesture was too subtle, and that a clearer and more dramatic directive was required. Simon suggested the current gesture, a statement of pride, success, and capability.</p>		<p>'Shine' was more appropriate.</p>
<p>3 Create</p>	<p>This gesture was born from the co-creators' desire to be challenged and stretched as music improvisers. Favouring the concept of no negativity, surprise and excitement, all four co-creators spent many hours trialling this fun gesture. <i>Create</i> transitioned from the conductor presenting two open palms to a musician to a wave motion by the right hand. Returning to the need for elaborate and dramatic gestures that the musicians cannot miss, or misinterpret, the co-</p>	<p>Right hand displays wave motion which <i>indicates free improvisation</i> (Appendix M, ex.17)</p>	<p>All 4 co-creators expressed their desire to be challenged musically. Thus, the create gesture allows musicians the freedom to be creative, exploratory, and play without boundaries. NO NEGATIVITY is a bonus for the participants and the surprise of not knowing what the output will sound like.</p> <p>Fear of failure can lead to a desire to play safe and avoid presenting music that is new and original. Robinson (2009, p.74) states that, 'If you are not prepared to be wrong then you will never produce anything original.'</p>

	creators concluded that an exuberant right-hand wave motion represents this musical directive clearly.		
4 Bounce	This gesture emerged from James and Molly's metallophone playing. They wanted to achieve a variety of articulation and therefore suggested bouncy sounds that could be repeated at a speed indicated by the conductor. The gesture began as a cupped right hand bouncing on the left hand's palm and progressed to a straightened index finger clearly bouncing on the left palm at a set tempo. The co-creators saw this as a bold and clear directive.	Index finger of right hand taps the palm of the left hand <i>indicating staccato playing</i> . Performer must pay attention to the requested speed. (Appendix M ex.18)	Molly expressed the need for variation in sound output from gamelan, vocals, and music technology. James suggested this gesture, which could garner various rhythm, tempo and texture complexities indicated by the conductor.
5 Follow	FOLLOW - this gesture brought familiarity to the co-creators, as in sessions prior to the development of the gesture system, the conductor mainly used the index finger to lead the improvisation. However, more specifically, the co-creators wanted a directive that could achieve complex musical output	Index finger creates movements in the air which <i>the performer should carefully follow</i> . (Appendix M ex.19)	Darren, Simon, and Molly are keen to have a familiar indication as in previous music improvisation sessions, that is, to follow the conductor's finger in order to produce a desired sound. This can be transferred across the three environments.

	<p>within mixed music environments. Here, the musician must intensely follow the conductor's dramatic pointed right- hand index finger at the requested speed with the appropriate pitch.</p>		
6 Return	<p>RETURN- wanting to return to original melodies throughout a real-time music improvisation was a specific request by the co-creators. Reinforcing the need for an elaborate directive enhanced the discussion on devising an appropriate and relevant gesture. The gesture transformed from two outstretched arms palms facing upwards and then slowly turning face down, to right arm pointing straight up, elbow bent, then slowly moving down to stomach level, to finally, right arm points straight up and then moves to lie on a straight left hand.</p>	<p>Right arm points straight up and then moves to lie on a straight left hand <i>indicating to return to the original melody</i>.</p> <p>(Appendix M, ex.20)</p>	<p>All four co-creators are aware of returning to an original melody in a piece of music, however, during a music improvisation session, they admit it would be beneficial to have a gesture that would indicate this.</p>
7 Blast	<p>BLAST- the co-creators explored various dramatic sounds within mixed music environments and from this the <i>Blast</i> gesture emerged, fun and</p>	<p>Right hand clenched fist swiftly moving forward similar to a bowling motion, <i>indicating for a performer to play a single beat on their</i></p>	<p>Simon, Darren and James advised on the creation of a gesture that would produce a definite and clear sound to a piece of music.</p>

	<p>dramatic, yet bringing an element of surprise/fear/shock to the improvisation depending on the severity of the conductor's directive. The gesture began as a right hand clenched fist moving forward towards a musician although transformed into a more dramatic left-hand palm facing towards musician with right hand clenched fist moving towards musician at various speed and aggression depending on the desired dynamic output.</p>	<p><i>instrument</i> (Appendix M, ex.21)</p>	
<p>8 Echo</p>	<p>ECHO- the co-creators recognize the importance of listening to each other and assessing the sound output. The <i>Echo</i> gesture was suggested as adding extra colour, complexity, and vibrancy to an improvisation. The co-creators also agreed that such a gesture would keep musicians alert as the conductor could ask for this directive at any time during the performance. This gesture matured from the conductor's right- hand index</p>	<p>Right hand cups the right ear with head nodding from one musician to another <i>indicating to the performer to play what another performer has played.</i> (Appendix M, ex.22)</p>	<p>Molly implied the desire for a gesture that would indicate repetition of a melody/note/sound/phrase played by another performer. Simon further suggested the Echo gesture.</p>

	<p>finger pointing to a musician- then to the conductor's right ear- then to another musician who would repeat the excerpt. This directive was confusing and therefore a few more signs were trialled and negotiated which resulted in the final <i>Echo</i> gesture: right hand cups the right ear with head nodding from one musician to another.</p>		

Table 5 The Gesture System- Conductology Part A

Following the informal evaluation of the gesture system's eight gestures, the consultation and assessment exploited a distinct approach, namely artistic evaluation, and refinement of the eight gestures in terms of musical output with a focus on seven elements of music: pitch; structure; tempo; timbre; texture; duration; and, dynamics. The purpose of this approach was to:

- refine and consolidate eight gestures
- identify further gaps in musicality
- if necessary, create and establish further gestures
- formalise a detailed and concrete set of gestures and validate the repeatable dynamism of such a system in music improvisation workshops. This procedure allows the co-creators an opportunity to review gesture directives in more informal creative environments rather than through questionnaire and semi-structured interview.

4.3.4: Conductology (Part B)

Each of the eight gestures was taken in isolation and applied. The co-creators discussed how effective the gesture directive was. There was consensual agreement that each directive needed to be dramatic and widely expressive for all musicians to clearly execute the instructed gesture. The co-creators claimed that it was crucial for the conductor to deliver elaborate and magnified gestures as this would make it easier for the musicians to follow. Refinement and consolidation of each gesture occurred after numerous trials and evaluation of the directive's output. After intense refinement and consolidation of the eight gestures, regular implementation during improvisation workshops, the co-creators agreed that four more gestures would be necessary to incorporate additional musical directives allowing for further musical challenge and output (Table 6).

GESTURE	REASON	GESTURE MEANING	ADDITIONAL INFO
9 Silence	Quietness/silence/resting was discussed frequently in addition to the importance of space in music. The co-creators realized that a gesture for silence was vital to allow effective space within an improvisation.	Two hands cover mouth representing silence. (Appendix M, ex.23)	The co-creators recognize the need for space during a piece and all agreed that the <i>silence</i> gesture would be useful.
10 Glide	The co-creators furthermore desired extra colour and challenge that would enhance their musical output. Informal discussions highlighted the yearning for decorative, fluttering movements that would add to an improvisation. The co-creators recalled ascending scale and	Right hand gradual ascension with fluttering fingers indicating a moderate ascending figure. (Appendix M, ex.24)	The co-creators are all keen to add colour to improvisations and thus want a flowing sound which enhances complexity.

	arpeggio technical exercises and suggested that a gesture for a similar output on gamelan, vocal, and music technology would be of musical value.		
11 Panic	Further discussions and evaluations of the existing gestures led the co-creators on to the topic of the audience. All four agreed that the public audience enjoys a panic element during a performance. The co-creators frequently referred to the pop-up parts of horror movies which stand out vividly in minds and have memorable music phrases, such as the screeching violins of <i>Psycho</i> to the crashing chords of <i>Jaws</i> .	One hand open at each ear with a shaky movement indicating quick repeated notes or clashing chords. (Appendix M, ex.25)	The co-creators claim that harsh, unexpected and discordant sounds will create panic within the audience, and fun for the performers.
12 Communicate	Darren states <i>'Imagine what it would be like if two of us had a musical conversation on our instruments?'</i> After lengthy discussion about how this could be executed, the co-creators agreed such a directive would be an interesting, challenging, and complex part of any music improvisation. The co-creators discussed the potential for additional gestures to be used within it.	Two performers have a musical conversation indicated by two index fingers directed at the requested musicians followed by two hands facing and making open and closed movements as if talking. (Appendix M, ex.26)	The co-creators, in particular Darren, is eager to trial such a directive. The co-creators agreed that such a gesture could bring animated fun, complexity, and decorative elements to an improvisation.

Table 6 The Gesture System- Conductology Part B

Twelve newly co-created gestures with specific directives were now in place. The co-creators had extensively explored the directives of each gesture. Some of the gesture directives were more complex than others and required prolonged assessment and refinement. Assessment of the co-creators' preferences and capabilities came next.

4.3.5 Assessment of co-creators' preferences and capabilities

It was necessary at this stage to assess the co-creators' preferences and capabilities prior to refining the gesture system. This was the crucial phase where the co-creators demonstrated understanding and knowledge of the specific directives and musical requirements of each gesture. This stage also offered the opportunity for the co-creators to evaluate the processes and output of the original co-created gesture system *Conductology* (Appendix N).

Video recordings of the gestures in action demonstrated the co-creators' understanding and execution of each directive. The recordings further established how the gestures progressed and developed into dramatic and elaborate commands understood by the co-creators. Throughout the development of *Conductology*, the co-creators were allocated time and space to assess and evaluate the improvised music during workshop sessions. Keen to provide their opinions and suggestions, Simon noted that *'before our gesture system the music sounded messy, like a conversation where no one would let anyone speak.'* With a similar view, James described music without the gesture system in use as *'one big block the whole way through'* (Appendix M, ex.27).

The four co-creators admitted to 'playing around'²² on their instrument when the gesture system was not in use (Appendix M, ex.28a and 28b). In addition, three of the co-creators

²² This refers to discovery playing and exploration on the instruments.

confessed to daydreaming and not fully concentrating on the music improvising. This frequent behaviour often arose as a result of boredom, passive participation, and lack of challenge. In addition, Molly and Darren both agreed that they were ‘slightly lost’ or ‘didn’t have a clue what to do’, while James and Simon revealed that they feared a negative reaction or if they played something wrong (Appendix M, ex.29). Hall (2015) claims that being prepared to be wrong requires a learning environment in which a high level of trust and mutual respect between student and educator exists. As the trial period progressed and the gesture system matured, the co-creators demonstrated enhanced concentration, appropriate execution of directives, and were focused on the real-time music (Appendix M, ex.30). Referring to a workshop led by Simon during the initial stages of the gesture system, Darren described the improvisation output as *‘actually very good, it sounded different and different is good’* (Appendix M, ex.31). James affirmed that *‘these gestures really give us musicians a focus and it is amazing what we can produce’*, while Simon admitted to finding the **Create** and **Panic** gestures the most challenging, fun, and rewarding.

Simon: *‘It [the gesture system] learns me all different parts of music and what way to describe it and...explore everything’* (Appendix M, ex.32).

The co-creators further discussed the best way to utilise the gestures during real-time music sessions. Simon was keen to use the full system during an improvisation session, while James and Molly recommended using five or six gestures at any one session (Appendix M, ex.33).

4.3.6: Review and refinement of initial repertoire by co-creating team

Following the initial consultations on the effectiveness of *Conductology*, all twelve gestures were informally assessed via demonstration by the author and discussion among the co-creators. The emerging system was then refined through an extended period of revision,

implementation, and testing by the author and co-creators, based on data gathered to date, including photo and video demonstrations, group discussion audios, and execution of gesture directives in music environments. As *Conductology* matured and developed into an established repertoire of twelve gestures, the co-creators willingly used the directives in mixed music environments. In the repeated usage of the gestures in 20 music improvisation sessions over 14 weeks, the co-creators executed the directives with remarkable consistency and refinement (Appendix M, ex.35, ex.36, ex.37).

4.4: The Final Six

During the testing of the gesture system (see Chapter Five- The Main Investigation) the intervention group gained the opportunity to experiment with the twelve co- created gestures during the music improvisation workshops. Furthermore, they were given the freedom to add to the system, albeit, within reason and with sound musical logic. The ten intervention participants recognised the need to further add to the system, identifying drama, tension, comedy, surprise, and texture as neglected musical directives (Table 7).

The Final Six gestures:

- Tension
- Thin-Thick-Thin
- Soar
- Joker
- Colour
- Fe/Male

GESTURE	REASON	GESTURE MEANING	ADDITIONAL INFO
<p>13 Tension</p>	<p>While Phase one intervention participants were actively engaged in utilising the gestures, one participant suggested during the 'Nightmare' theme that it would be a good idea to develop tension. Participants trialled various sounds on the instruments across the three combined environments which led to the choosing of a monotonous drone sound on an iPad app. Participants further trialled this on gamelan and vocals. Careful exploration and manipulation of the instruments achieved effective tense output. The participants played around with this effective sound and decided on an accompanying gesture of two facing clenched fists.</p>	<p>Two clenched fists indicating a monotonous drone sound. (Appendix M, ex. 38)</p>	<p>Intervention group participants proposed that there should be an opportunity during the music to create a strained ambience.</p>
<p>14 Thin-Thick-Thin</p>	<p>Whilst working on the 'Love' theme, Phase Two Intervention participants referred to the dramatic build up and fade segments in romantic movies. With a yearning to create similar colours, the participants experimented with</p>	<p>Texture moving from thin to thick and back to thin again demonstrated by two hands palms facing close then gradually distancing and returning to close again. (Appendix M, ex. 39)</p>	<p>Participants were keen to re-create sound space sequencing similar to that found in romantic movies. The desire for lightness building to a heavy texture was of great importance to the entire group.</p>

	<p>sound sequencing across the three environments. After much discussion and demonstration, the participants agreed on an appropriate gesture that would effectively execute this directive.</p>		
15 Soar	<p>Although participants in Phase One Intervention were satisfied with the '<i>glide</i>' directive, they expressed an eagerness to incorporate a more dramatic and energetic figure which would bring an air of trepidation and furor. This came about during the 'Nightmare' theme were participants agreed on adding further opportunities for startling, unsettling and exciting sounds.</p>	<p>Right hand fist pump vertically indicating a rapid ascending figure. (Appendix M, ex. 40)</p>	<p>Participants agreed that a dramatic, high energy, rapid ascending glissando was essential in the system.</p>
16 Joker	<p>Phase Two Intervention participants enjoy comedy. This output therefore was high on their agenda. Participants longed for a directive that would produce a comical phrase or a decorative figure which the musician personally finds whimsical, or by using an elaborate and comical vocal laugh.</p>	<p>Musician plays a comical phrase indicated by two hands resting on the stomach area. (Appendix M, ex. 41)</p>	<p>Participants enjoyed experimenting with wacky and humorous sounds. They recognized that this directive could add further animation to an improvisation.</p>

17 Colour	Phase Two Intervention participants suggested using colour coded cards as a directive to play a certain instrument in a certain way. One example of this is playing an iPad app, where multiple sounds and combination of sounds can be played. Participants suggested that the conductor displays a certain coloured card which would correspond to the coloured symbol on their instrument. A few rehearsals using the cards and symbols concluded that such a directive is highly beneficial during improvising	A variety of coloured cards for music technology use. (Appendix M, ex.42)	Participants coveted a directive that would ease their playing of a correct sound/loop/motif. Corresponding colour cards and symbols made such directives easy to execute.
18 Fe/Male	A Phase Two Intervention participant, while improvising on the 'Love' theme, randomly declared his interest in finding out what the music would sound like if only the ladies play, and likewise, how the music would sound if men only play. The entire group found this suggestion hilarious and were excited to discover the output. Through the enthusiastic	Female musicians only perform represented by a curtsy movement while male musicians only perform represented by a bow movement (Appendix M, ex.43 and ex.44)	Adding to the surprise and unpredictable output of this directive, participants found this to be a popular and fun gesture.

	playing, participants were more than pleased with such a directive and were insistent in keeping it in the system.		
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Table 7 The Gesture System- Conductology Part C

4.5 Chapter Summary

Chapter Four considered areas of research related to the development of an original gesture system, *Conductology*, for use in real-time music improvisation sessions by ID musicians. The transition from instructional playing, evaluation of current music improvisation practices, then to desired musical preferences, and transitioning to a system of musical directives which challenge, engage, empower, and stretch the musician has led to several insights regarding the role of music improvisation in the creative development of ID individuals. The co-creators explored a variety of music elements and attentively assigned a corresponding gesture to a directive, to be executed during real-time music improvisations. Consistent usage of the gestures realised a refined system which the musicians were comfortable with and could use effectively. Upon refinement and review of the gesture system, the co-creators collectively expressed their desire to share their system with others. The intervention group participants enjoyed making music using *Conductology*. They understood the system and executed each directive accordingly. The participants did however request to add several more gestures to the system as they perceived that a few musical commands were missing. The co-creators agreed with the need for a few more gestures and particularly favoured the

novel 'FeMale', 'Joker', and 'Tension' gestures. The final six gestures were created, trialled, and refined, providing a final repertoire of eighteen directives (Appendix N).

Chapter 5 Main Investigation: Testing *Conductology*

5.1 Introduction

Conductology is an original co-created gesture system for use in real-time music improvisation for and by individuals with ID. The system comprises 18 gestures. Each gesture is specific, and the conductor elaborately displays a gesture request to an ensemble musician which he/she will then execute. The gestures involve the music elements of timbre, pitch, tempo, texture, dynamics, and duration. Chapter Five presents the main investigation, the testing of *Conductology*.

5.2 Assessment Instruments in the Study

There have been numerous tests that focus on assessing musical aptitude over the latter half of the twentieth century (Appendix O). The current study implements the MCATM, a hybrid of Webster's MCTM-II and Amabile's CAT to measure creative thinking in music and quality of output.

5.2.1 Webster's MCTM-II

Many different criteria were taken into consideration when selecting Webster's MCTM-II (see Appendix Ji for full details) as the instrument used in this study. According to Torrance (1975), a creative thinking test must fulfil the following criteria:

- relevant to creativity theory
- relevant to adult creative behaviour
- samples different aspects of creative thinking
- attractive to all ages
- open-ended in order to respond to individual experiences
- instructions and response demands- *adaptable to the whole educational range*

- collects data that can be scored reliably for fluency, flexibility, originality, and elaboration
- feasible for the test materials, instructions, time limits and scoring procedures to be used in schools
- variations of the setting of the testing room when required
- variations in time limits when required
- applicable to different cultures
- statistical infrequency as the basis for the scoring of originality

Webster's MCTM-II is:

- designed to evaluate an individual's musical creativity and expressivity by engaging them in a ten-task guided improvisation session lasting 20-25 minutes
- a thoroughly researched tool for assessing creativity in music.
- able to measure divergent and convergent factors of musical syntax.

Based on the factors of extensiveness, flexibility, originality and syntax, the participant's creativity is measured through test exercises. These factors 'derive from theoretical literature and from content analysis sessions with a panel of experts from the fields of music composition, music education and psychology' (Webster, 1994). The definitions of the above measures, as given by Webster (1994), are:

- Musical extensiveness (ME): The length of time involved in a musical response (in seconds).
- Musical flexibility (MF): The range of musical expression in terms of three musical parameters: dynamics (soft to loud), tempo (fast to slow), and pitch (low to high).
- Musical originality (MO): The way in which musical phenomena is manipulated in a unique fashion.

- Musical syntax (MS): The extent to which musical phenomena is manipulated in a logical and inherently musical manner, according to patterns of musical repetition, contrast, and sequencing.

Regular correspondence between the author and Webster confirmed the suitability of utilizing MCTM-II with the suggested sample size of ID students, albeit with a few minor adaptations by the author. My adaptations of Webster's original MCTM-II incorporated more visual stimuli and less verbal instruction. The language was also slightly changed to ensure relevance, age- appropriateness (non-childlike) and appeal to the participants (see Appendix J ii for full details).

5.2.2 Amabile's CAT

Creativity is a concept that is difficult to define and challenging to measure. (Hennessey and Amabile, 1999). The CAT is a technique used to assess product creativity, relying on the autonomous subjective assessments of individuals familiar with the realm in which the products were made. The CAT is based on the hypothesis that a group of independent expert assessors are best able to make such assessments.

5.2.3 Measurement and Assessment of Creative Thinking in Music (MACTM)

The MCTM-II fused with CAT is the innovative hybrid assessment tool applied to measure and assess *Conductology*. By hybridizing these measurement and assessment instruments, plentiful and robust data was collected and triangulated adding impact and significance to findings in this neglected research area.

5.3 The Testing of *Conductology*

The main investigation encompassed the twelve-week music improvisation workshops with the intervention and control groups. This investigative section employed *Conductology*, the original gesture system, in the intervention group music improvisation workshops from week six through to week twelve.

5.3.1 Investigative Approach

Participants were selected for intervention and control Groups A, B, C, and D.

As mentioned previously, to meet the experiential criteria, participants:

- had an intellectual disability
- were registered at Something Special for at least one year
- had a keen interest in music and performance
- had experience in music making for at least one year
- had experience in music making in mixed music environments for at least one year

Ten participants were randomly selected from amongst those who met the criteria from the Something Special register to form the intervention groups. The selected sample of twenty participants was grouped into two cohorts and purposefully matched as closely as possible according to gender, age-range, and disability. Matching was carried out by the experienced staff at Something Special who have access to the relevant personal data, which provided internal reliability as a form of cross checking. Students from the expression of interest list were to be used if there were any drop-outs in the first few weeks of the study. This however was not necessary. Participants who were newly recruited to Something Special were excluded from the study as the investigation focused on raising quality standards and output for music improvisation by ID performers.

The twenty participants were divided into two groups; Phase One containing ten participants and Phase Two, containing a further ten participants. Phase One was further divided into two distinct groups, control group (**Group A**) and intervention group (**Group B**), each containing five participants. Phase Two also contained five participants in the control group (**Group C**) and five in the intervention group (**Group D**) (Figure 5a).

Based on the previous experience of the author and the Chief Investigator, and in discussions with colleagues such as Webster, this was an ideal and manageable number of ID participants for a music improvisation workshop with the potential to deliver enough quantitative and qualitative data to draw meaningful conclusions (Gold et al. 2006).

As detailed in Chapter Three, participants gave assent to engage in the study and completed group questionnaires, and semi-structured interviews. They then completed the pre-intervention MCTM-II. Participants then took part in twelve-week improvisation workshops. The music improvisation workshops were undertaken in two stages: (Figure 8a)

- Stage 1: both the intervention and control groups participated in six weeks of guided music improvisation workshops; two hours each week using visual cue stimuli in mixed music environments.
- Stage 2: both the intervention and control groups participated in six weeks of guided music improvisation workshops; two hours each week.

It is important to note that throughout *stage two* the control group continued using visual cue stimuli whilst the intervention group used the original gesture system, *Conductology*, developed during the trial period, with NO visual cue stimuli.

Project Design for Phase 1

Original gesture system in place for use in music improvisation sessions.

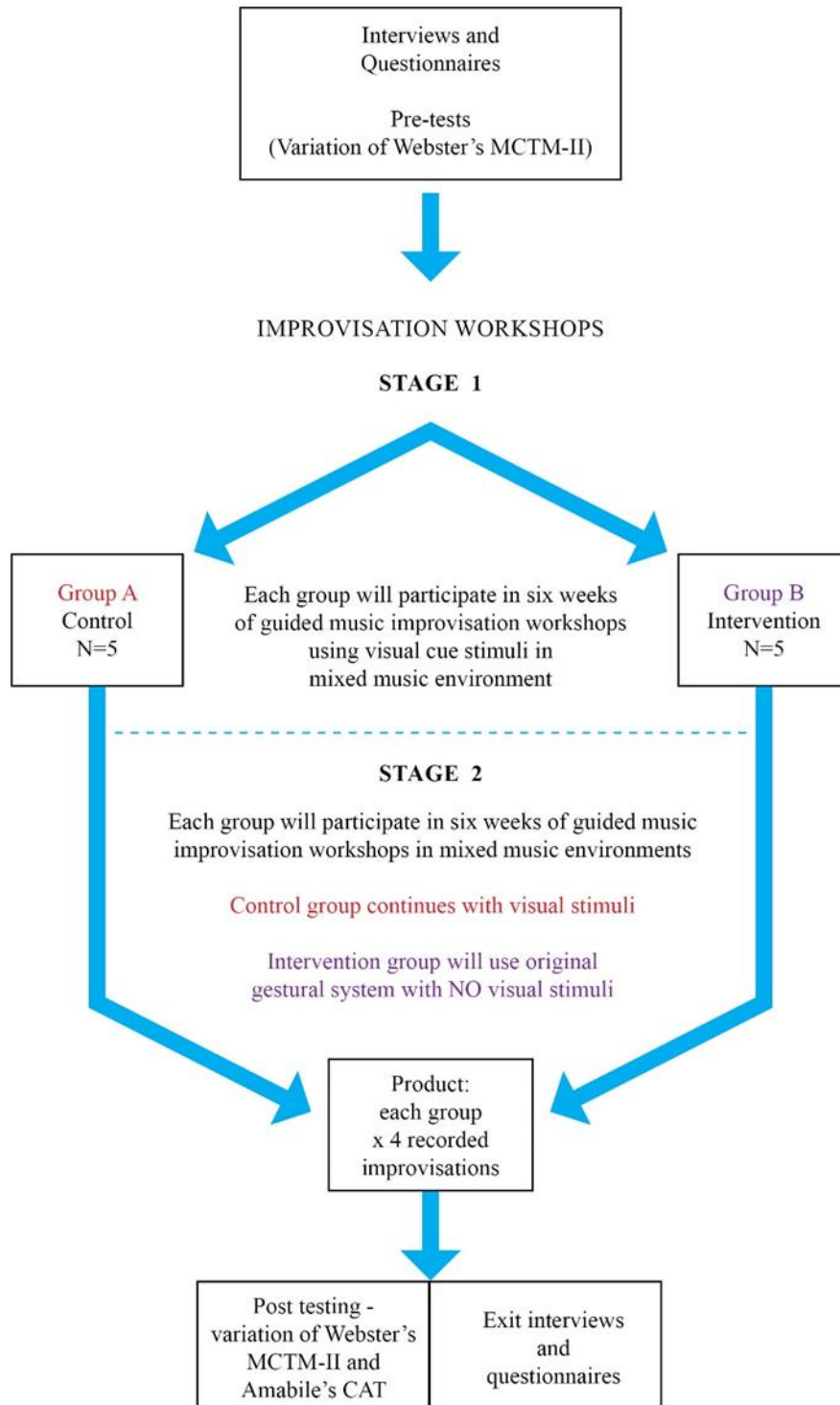


Figure 8(a)

Project Design for Phase 2

Original gesture system in place for use in music improvisation sessions.

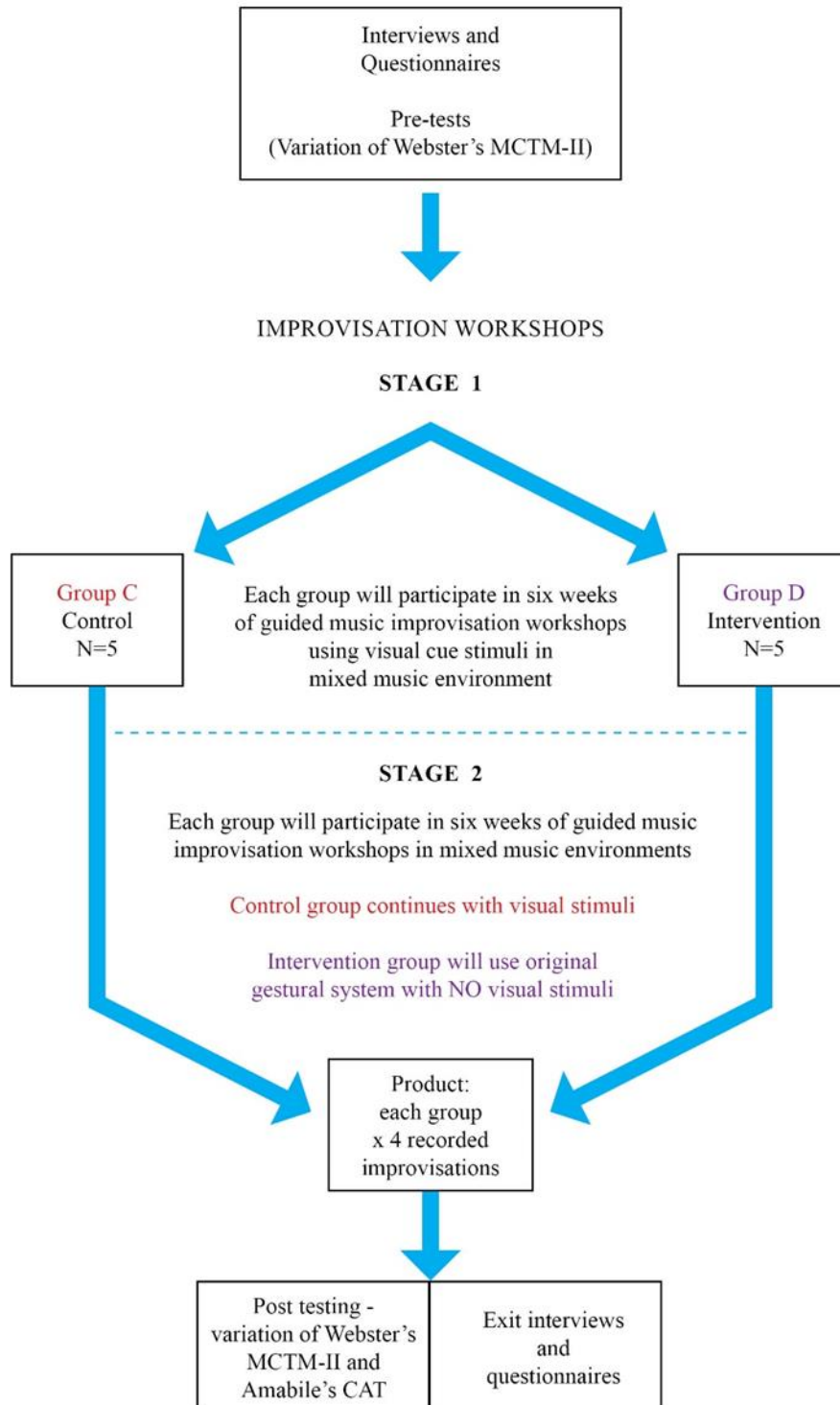


Figure 8(b) This repeat procedure was used to gain a larger volume of data.

5.3.2 The Music Improvisation Workshops

Both the intervention and control groups attended weekly workshops for twelve weeks in the same music space. The workshops had a relaxed and fun atmosphere which helped with cohesive group dynamics. The workshops also had a strict focus with an introduction to the session, followed by the main development stage and finally a concluding activity. The workshops lasted two hours and began with the sharing of ideas in relation to the participants' chosen topics of 'Love' and 'Nightmares'. This initial brainstorming session allowed the participants to communicate ideas within the group in addition to developing concepts from the previous weeks' workshops. The development section of each workshop focused on exploration of sound and rhythm in a mixed music environment. The author merely guided the participants through the workshop sessions while they took responsibility for the improvisation. The final stage of the workshops took the form of a concluding activity where the participants demonstrated and shared their musical ideas and highlighted their likes and dislikes. This format continued throughout the investigation until week seven when the gestures were introduced to the intervention group. Weeks seven-twelve were the crucial stages in the research as *Conductology* was trialed and tested by the intervention group while the control group continued as before, using visual stimuli (Appendix P).

5.3.3 The Products

Participants in the intervention and control groups recorded the music improvisations, sixteen in total. Control groups A and C and Intervention groups B and D produced four recorded improvisations at the end of the twelve-week period: two based on the theme of 'Love' and two based on the theme of 'Nightmares'. All improvisations were recorded on an Apple 'voice memo' device and transferred to a private dropbox file. The author led control

groups A and C, displaying the visuals at key points, and the intervention groups, B and D, using a range of gestures from the original gesture system, *Conductology*. As the study aimed to develop the gesture system and test it, it was important for the author to lead the workshops. The group participants, however, got the opportunity to experience leading the groups, if they desired, after the testing was complete. These recordings were assessed for indicators of creativity and quality in music using Amabile's Consensual Assessment Technique (CAT), with the aim of comparison and contrast between the intervention and control groups.

5.3.4 Scoring and Analysis Procedures:

Tests were scored according to the MCTM-II Administrative Guidelines (Webster, 1994). A summary of the scoring procedures can be found in Appendix (Jii). Analysis of musical extensiveness (ME) and musical flexibility (MF) was quantitative, while analysis of originality (MO) and musical syntax (MS) combined quantitative analysis (use of rating scales for scoring) and qualitative analysis (video observations). The final analysis of all test results was attained by statistics, thus quantitative in nature.

The sixteen recordings were presented to a group of 'assessors' (selected experts in the field): in this case experienced music improvisers (N=3). A consensual assessment rating form was provided to the assessors to record musical improvisation assessments. The scoring form had four categories, each being marked out of a maximum of five points. The four categories included: technique, interaction, originality, and quality (Appendix K).

The assessors were informed that the improvisation recordings were by ID musicians. Assessors, on a separate basis, listened to and analyzed each music improvisation recording. Assessors provided detailed feedback on each recording to the author.

5.3.5 Post Intervention Procedure

Each participant in Groups A, B, C and D was re-tested using the MCTM-II measurement.

Participants then completed group exit questionnaires, and semi-structured interviews.

Phase One and Phase Two control group participants were given the opportunity to experience the gesture system.

Assessors (music improvisation experts) assessed the sixteen recorded music improvisations (products).

5.4 Chapter Summary

Most research on musical creativity, special music interventions, and music as a therapeutic tool, has adopted qualitative approaches and has attempted to explain the various effects and achievements. Although considerable emphasis has been placed on these approaches, no previous empirical studies have hybridized MCTM-II and CAT as an innovative assessment blend which measures participants' musical extensiveness, musical flexibility, originality, and syntax before and after a music improvisation intervention (*Conductology*) and assesses quality of output. The study's hybridized measurement and assessment of creative thinking in music (MACTM) has provided a clear insight into ID participants' levels of creative thinking in music and the effects of *Conductology* for use in real-time music improvisation sessions and allowed for quality of output to be examined. Chapter Six will present the analysis of results and will include data from the main investigation.

Chapter 6 Analysis of Results

6.1: Introduction

This chapter presents the results in relation to each research question. The study engaged twenty-four participants: four co-creators; ten intervention group participants; and, ten control group participants. Dependent measures in this study include: Webster's (1994) MCTM-II and Amabile's (1982) CAT. Independent variables included: intervention group and control group. Pre-and post-intervention questionnaires and semi-structured interviews were also completed.

6.2: Qualitative Analysis- questionnaires, and semi-structured interviews pre- and post-intervention

This section of the study focused on Research Question One; results are presented using a composite of findings drawn from pre- and post-intervention questionnaires and semi-structured interviews.

Can the co-creation of, and participation in, an original gesture system be used to encourage ID musicians to explore their creative ability?

6.2.1 Co-creators

When asked if they encountered music often in everyday life, all four musicians agreed that they did. Simon demonstrated his passion for music, '*Music is in my blood...it's part of who I am...it's my life and journey, and my path*' (Appendix M, ex.47).

Two musicians said they enjoyed listening, one enjoyed solo performing and one enjoyed group performing. All four musicians agreed that music has helped them overcome negative experiences of disability, through making new friends and building confidence (Appendix M ex.48). Furthermore, all four musicians acknowledged that music has given them new opportunities to meet people, has helped raise confidence levels, and has assisted with acquiring new skills. Darren commented, *'I would be lost without my music. It has helped with my bad moods and anger. I love writing my songs, it really helps me.'*

When asked to specify what gestures they find helpful in everyday life, if any, two co-creators both particularized 'hello' and 'goodbye' gestures, one musician highlighted 'come here', while the other musician stated 'telling off'. Furthermore, all four musicians claimed that they would be interested in using gestures in current music sessions. Moreover, three of the musicians considered that by using gestures in the current music sessions, they might learn more music. Two of the musicians expressed a keenness in using gestures as they were bored with current techniques which involved a conductor merely inviting them to play by pointing directly at them. James wanted to be challenged more, *'It [music] gets boring when the conductor keeps pointing at you...'* (Appendix M, ex. 49).

In response to the questions, 'Would you like to develop creativity through music sessions using gestures?' and, 'Would you like greater freedom to experiment with music in real time and do you think gestures could help you achieve this?', all four musicians positively agreed. However, when asked if they enjoyed performing, there was a fifty/fifty split; two musicians enjoyed it, while two did not. Of the two musicians who enjoyed performing, one enjoyed group performing while the other preferred solo performance. Furthermore, all four musicians agreed that the product should be of good quality and that it was important to please the audience. Moreover, Darren recognised that it is impossible to please everyone, *'I would like to please the audience but...there's going to be people out*

there that doesn't like our music. It's just the way it has to be at times' (Appendix M, ex.50 and ex. 51).

The four musicians agreed that they had enjoyed the music improvisation sessions. Two musicians claimed that they enjoyed developing their expertise, while the other two musicians savoured creating gestures and directives that they could relate to. Moreover, three musicians also found the workshops to be a positive experience with great sound combinations. Molly affirmed that *'the music sounds weird but really good.'* All four musicians agreed to having enjoyed making music in a group. They further believed that audiences would enjoy their improvised music. Simon believes that *'audiences will think we are spectacular, I can't wait for them to hear our music.'* Furthermore, James stated, *'Disability people who say they can't do- they can! And the audiences love it...they have big reactions'* (Appendix M, ex. 52). James further expressed his belief in audiences' desire to be musicians like him, *'Audiences have different tastes, but also we want to give them the experience that they want to be like musicians like ourselves'* (Appendix M, ex. 53).

The four musicians claimed that the music improvisation workshops have helped them 'greatly'. In addition, they all 'absolutely' agreed that *Conductology* has made music improvising better, stating that the system should be used during all music improvisation sessions. James claimed, *'I've got the hang of it now. I'm more powerful'* (Appendix M, ex.54). Furthermore, he emphasised the desire to share his expertise with others, *'I would love a bigger audience'* (Appendix M, ex. 55). The four musicians declared that the system has 'very much' helped them develop creativity, while 'absolutely' offering them greater freedom to experiment with real time music. The four musicians affirmed that the quality of the improvised music has increased due to the use of the gesture system. Molly claimed, *'It's*

[Conductology] getting better, every day, every week...more challenge for myself (Appendix M, ex. 56), while Simon stated, *'You can play about and see what comes out- I think my music could be broadcast'* (Appendix M, ex.57).

The *Conductology* development period identified the following aspirations for the co-creators: enhanced musicianship; equality; creativity; raised quality of output; inclusivity; performance opportunities; challenging audience perceptions. In addition, each of the four co-creators highlighted specific areas or opportunities which had the most impact on them as a musician throughout the development of the gesture system (Figures 9-12)

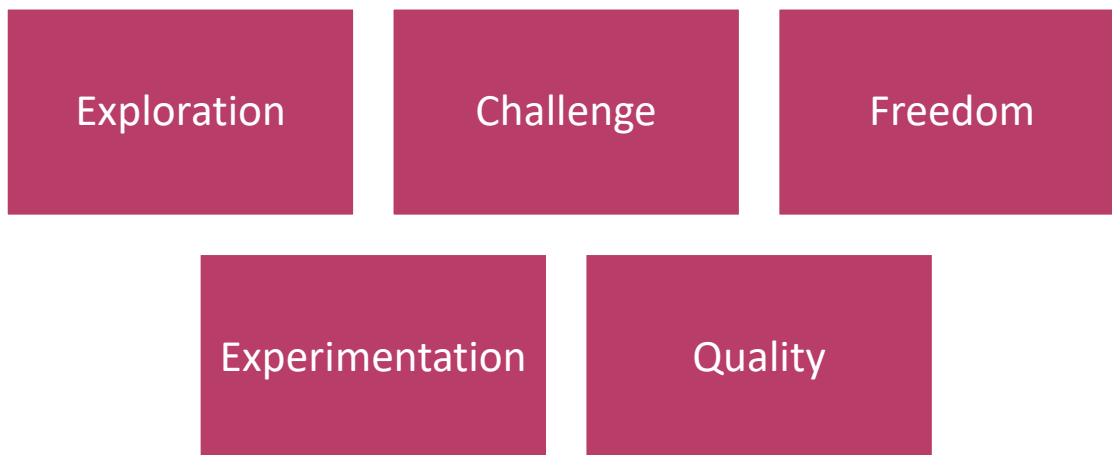


Figure 9 Darren



Figure 10 Simon

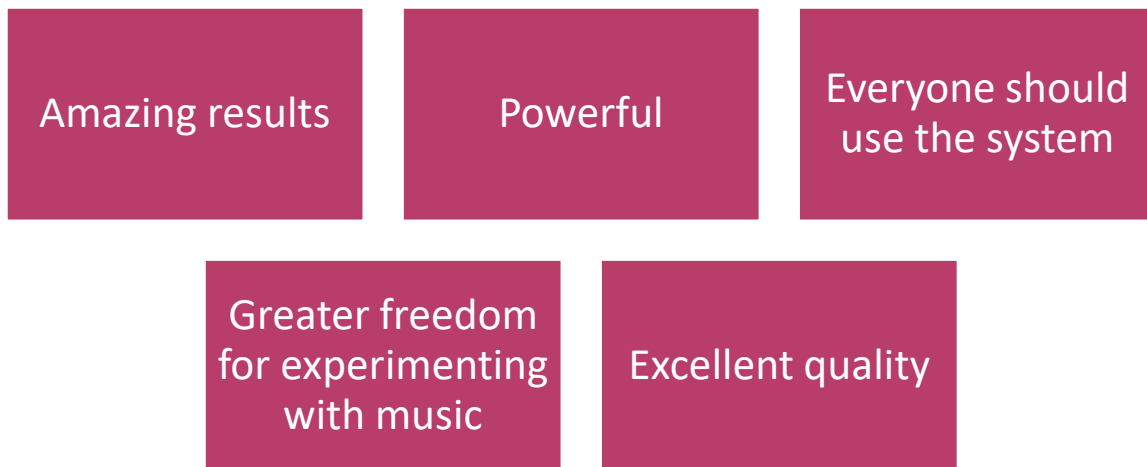


Figure 11 James

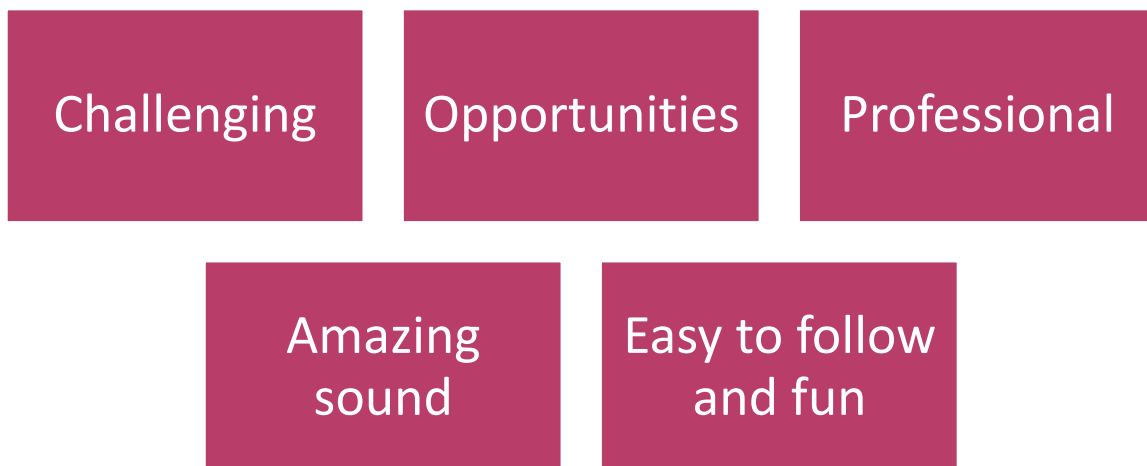


Figure 12 Molly

6.2.2 Intervention and Control Group participants

The question, ‘Do you encounter music a lot in everyday life? For example, iPods, radio, CDs, performances, play an instrument?’ yielded mixed responses. While all the intervention and control group participants agreed to liking music, listening to music was the most

common activity, while music classes were preferred by two control group participants and one intervention group participant, and singing was the favoured activity by one intervention group participant (Table 8).

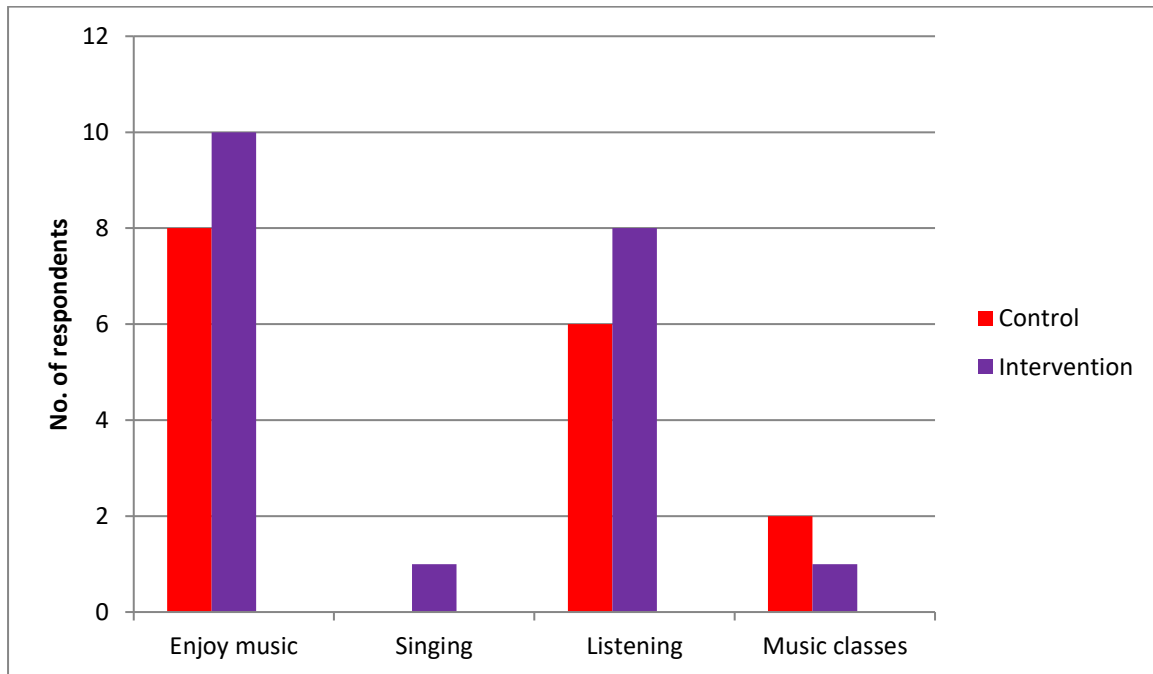


Table 8

When asked what elements of music they enjoyed, control group respondents preferred to either listen to music or learn to play a range of instruments. All control group participants have taken part in musical performances with one claiming '*I like performing in front of big audiences.*' Further discussion on this topic revealed some respondents' uncertainty on their interest in further performances with four claiming that they were unsure if they would like to perform anywhere due to shyness, lack of confidence or lack of musical expertise, two expressing an interest in performing at venues where they had previously performed, and a further two declaring an enthusiasm to perform at locations close to family and friends suggesting comfort zones, friendly faces and known territories.

While eight of the ten intervention group respondents preferred listening to music, two favoured music classes, with one respondent keen to learn new things and the other enjoying singing and writing, *'I love singing with my cousin and I love writing my raps.'* Moreover, eight claimed to play an instrument while two stated that they did not play anything. As regards performing, eight of the respondents had experience in performing, with one stating, *'I feel great performing in front of an audience, the bigger the better'*, while one was not interested in performing, and a final one has never performed but would like to. In addition, the types of venues the respondents admitted a desire to perform at, four were unsure, two suggested schools and colleges, one proposed *'all different places'* and a final one recommended the USA, *'When younger I felt scared when my friends watch me sing. I prefer to sing at home by myself. I am a good singer. I want to perform in Los Angeles, Las Vegas, and everywhere. I practice at home with my piano'* (Table 9).

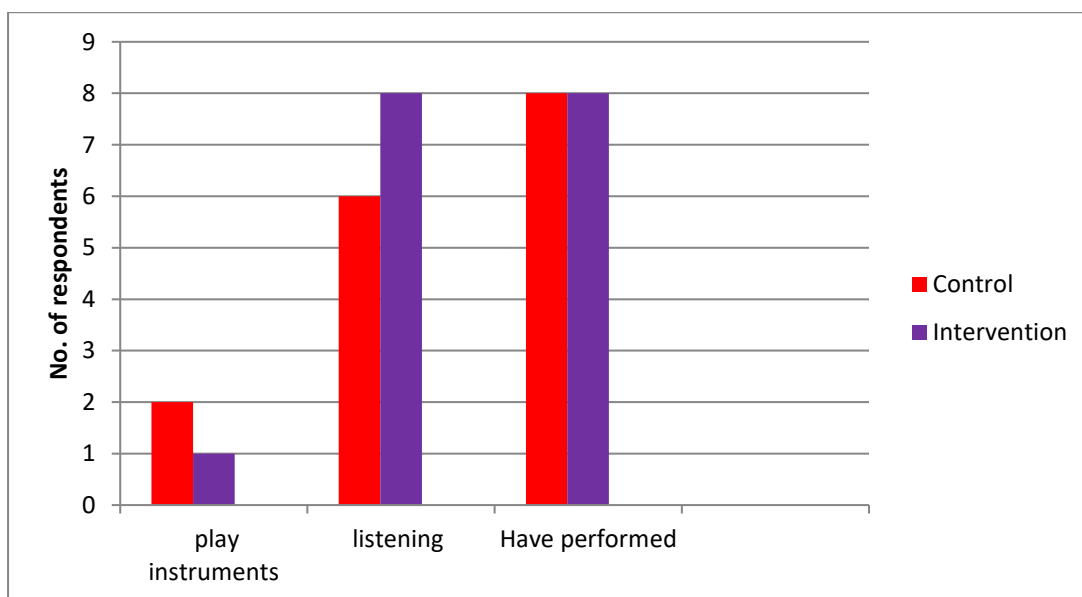


Table 9

When asked if music had helped them to overcome negative experiences of disability there were mixed responses among the young people. All control group participants acknowledged that although music has helped them to calm down, distract them or cheer them up, their

disabilities prevented them from being creative. All participants also admitted to enjoying making group music. In contrast, four of the intervention group participants felt their disability prevented them from being creative, five were unsure and one suggested it had a marginal influence. *'I am so jealous of my sister...she is much better at singing than me'*; *'Music cheered me up when my Grandad died'*; *'I like listening to music in my mummy's car and when I go to the doctor to get jags...music calms me down.'* (Table 10).

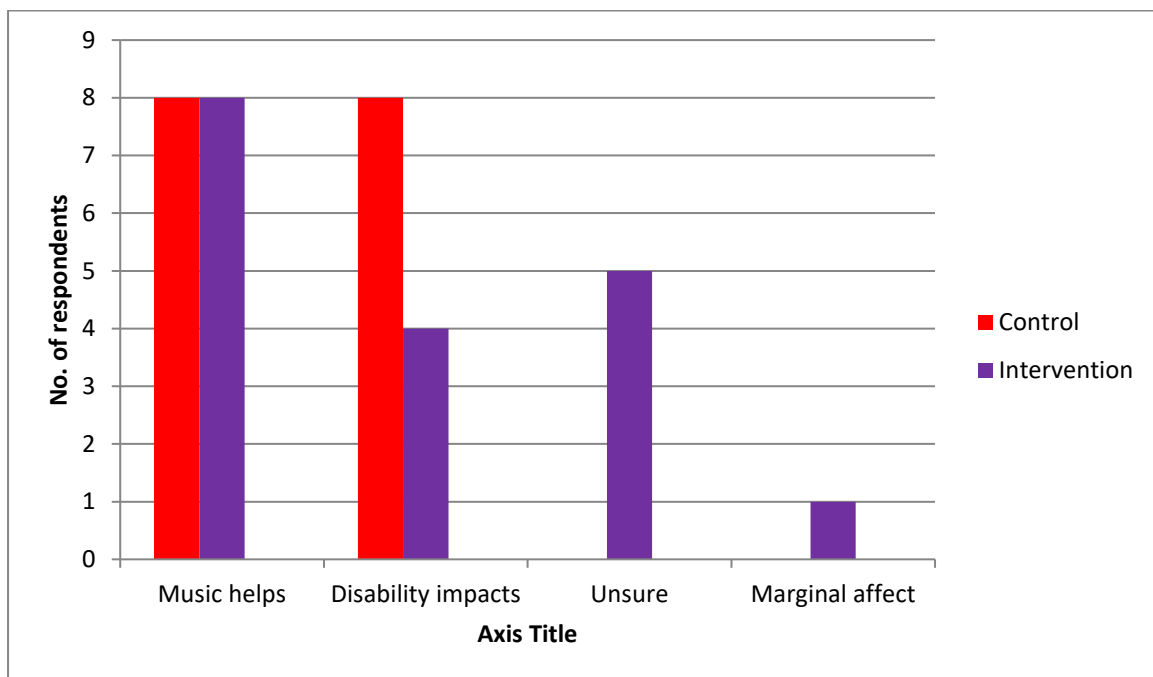


Table 10

When asked what gestures they found helpful in everyday life, there was a range of interesting responses among both the control and intervention groups. Five out of the eight control group participants were unsure of any helpful gestures in daily life, while three referred to specific helpful gestures such as 'hello', 'goodbye', 'thumbs up', and 'thumbs down'. Similarly, eight of the ten intervention group participants acknowledged their uncertainty regarding helpful gestures while two specified helpful examples such as 'pointing' to gain someone's attention, 'hello' and 'goodbye' (Table 11).

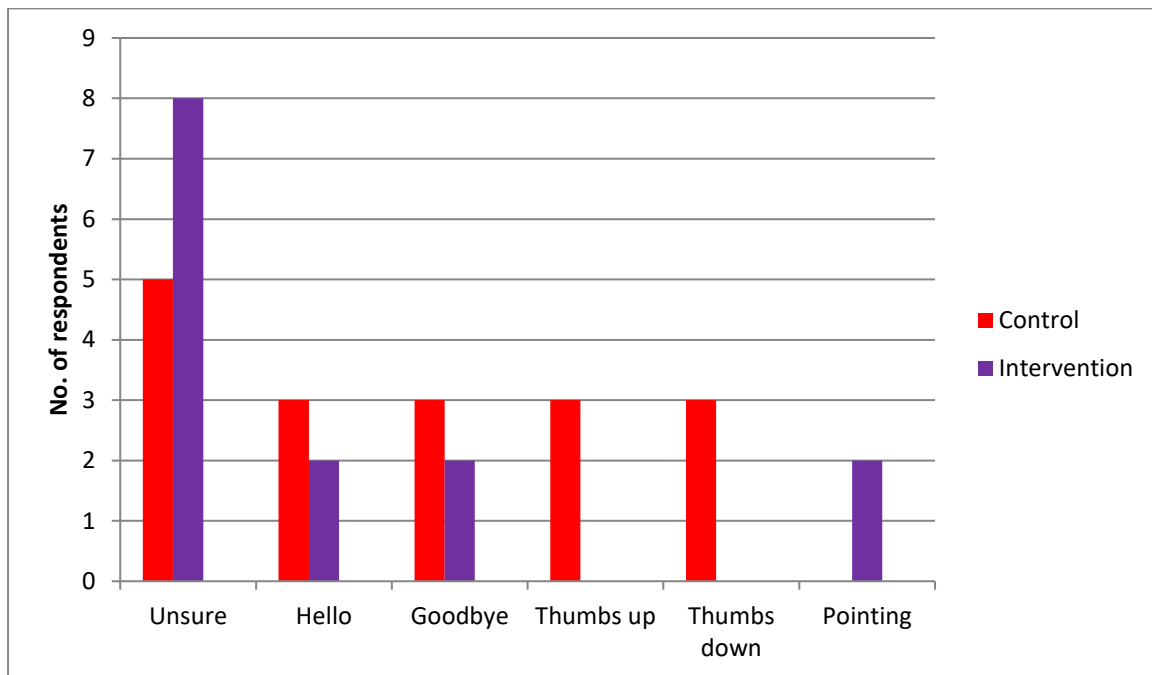


Table 11

In addition, when asked if they would be interested in using gestures, six out of the eight control group participants said they would like to try using gestures in music sessions, while two were uncertain stating, *'I think using gestures could be fun'*; *'Perhaps we would be able to follow gestures easily'*; *'I would love to try something new that could help our music'*; *'I'm not sure if I would be able to understand what gestures mean'*; *'It might be too hard.'* Similarly, while seven out of the ten intervention group participants were interested in trying utilizing gestures in music sessions, three were dubious as this was unknown territory and they did not know what it might involve, *'I think this will be great fun'*; *'Maybe our music will sound awesome'*; *'How cool would it be if we could conduct, I would just love that'*; *'Will this help us learn more music stuff cause that would be brilliant...and we can show off our talents to lots of audiences and they will not believe their eyes'*; *'I am scared of getting it wrong'*; *'I enjoy what we do already'*; *'I don't know many gestures...I don't know if I would be able to learn new ones'* (Table 12).

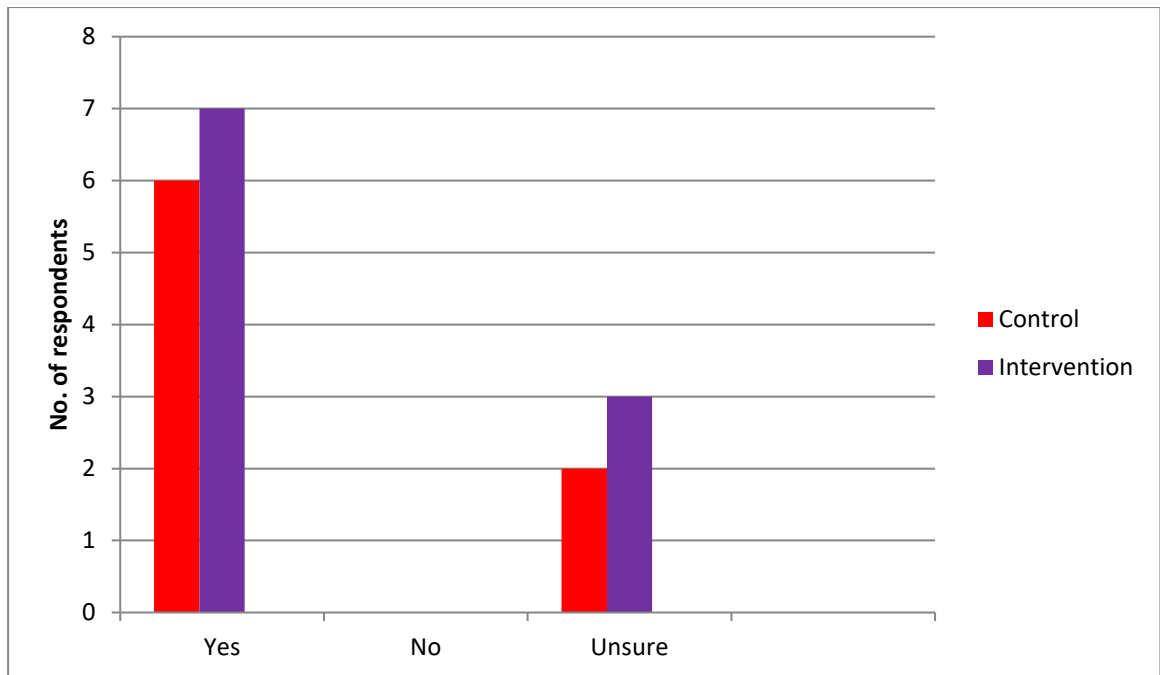


Table 12

When asked if they would like to develop creativity through music sessions using gestures, seven out of the eight control group participants agreed with four stating that more music sessions could help them develop their creativity. The remaining respondent claimed a high level of creative ability and therefore did not require further assistance. Eight out of the ten intervention group participants expressed an interest in developing their music creativity through gestures, *'I am up for it'*; *'This is going to be so much fun'*; *'We are going to learn so much music...maybe we can sound like proper musicians'*; *'I would love to be creative, bring it on'*. The remaining two respondents stated that they would not like to develop their creativity through music sessions using gestures, *'I am a superstar, I am already so creative'*; *'I am the most creative ever'* (Table 13).

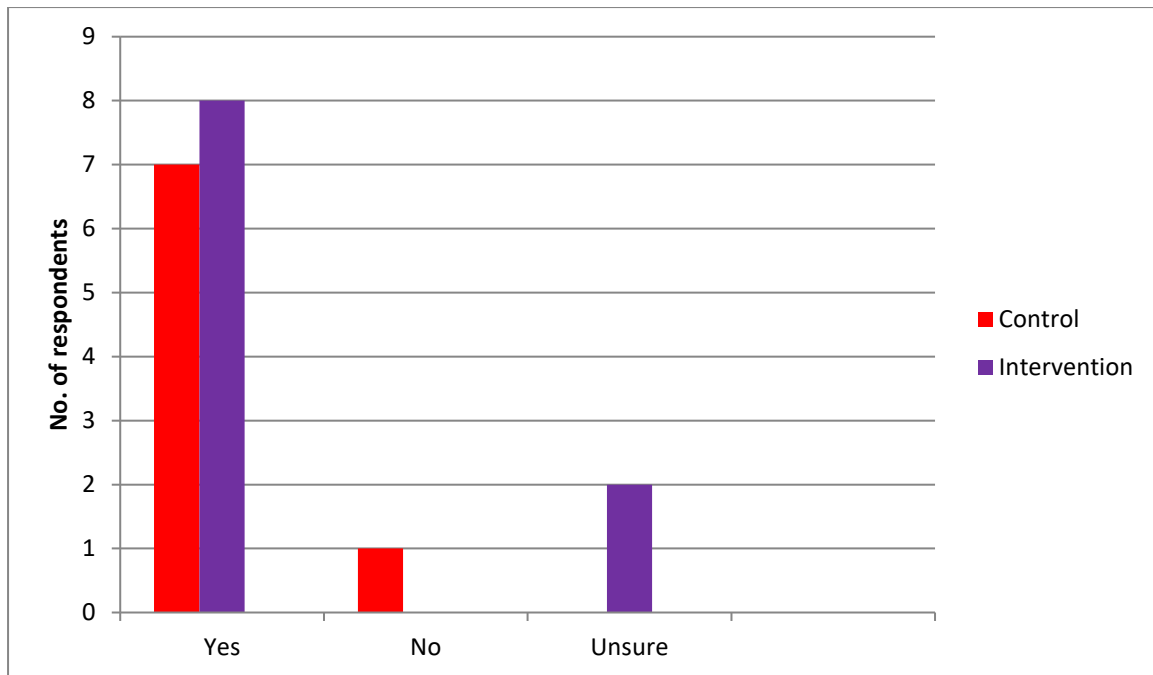


Table 13

All control and intervention group participants agreed they would like greater freedom to experiment with music in real time and thought gestures could help achieve this. The participants collectively implied their eagerness to be challenged, *'I think we can do so much more, we are fed up at the minute and I think gestures might be our answer to experimenting with music'*; *'I am a bit scared of having freedom to experiment with music but if I learn the gestures it might be easy'*; *'I can't wait to make weird music, it'll be fun'*; *'I have always wanted to conduct a group, the idea of using gestures to make music is exciting. It will be like one giant experiment'* (Table 14).

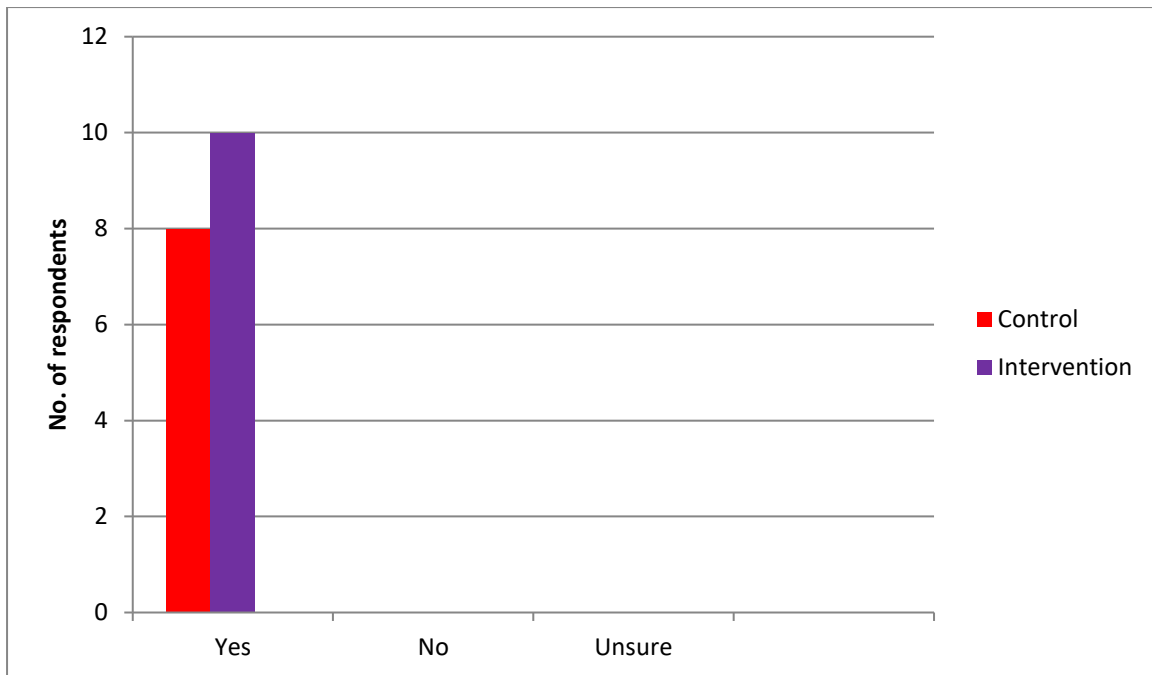


Table 14

When asked about their enjoyment of performing, quality of the output and impression on the audience, there were mixed responses. Seven out of the eight control group respondents enjoyed performing. Furthermore, five concluded that the music they performed was great, whilst three were unsure of the quality. In addition, five respondents recognised the importance of pleasing the audience claiming, *‘I think the audience will like us anyhow’*; *‘I love it when the audience claps, that means that they like the music, doesn’t it?’*; *‘The best part of performing is getting claps at the end, that means the audience always thinks we are brilliant’*, although three did not believe this to be essential stating, *‘As long as we enjoy ourselves, that’s the most important thing’*; *‘I don’t care if the audience enjoys it. I am proud of myself’*. Moreover, eight out of the ten intervention group participants claimed to enjoy performing, however, one did not due to shyness, and a further one had no experience in performing. In contrast, all intervention group respondents acknowledged that quality of output matters, as well as pleasing the audience, *‘The audience will love us’*; *‘I think audiences enjoy performances no matter what’*; *‘Audiences always think we are excellent’*;

'It matters that we should impress the audience...it could make them happy'; 'The audience could dance more'; 'It could cheer the audience up'; 'The audiences might be shocked and think how can they do that?' (Table 15).

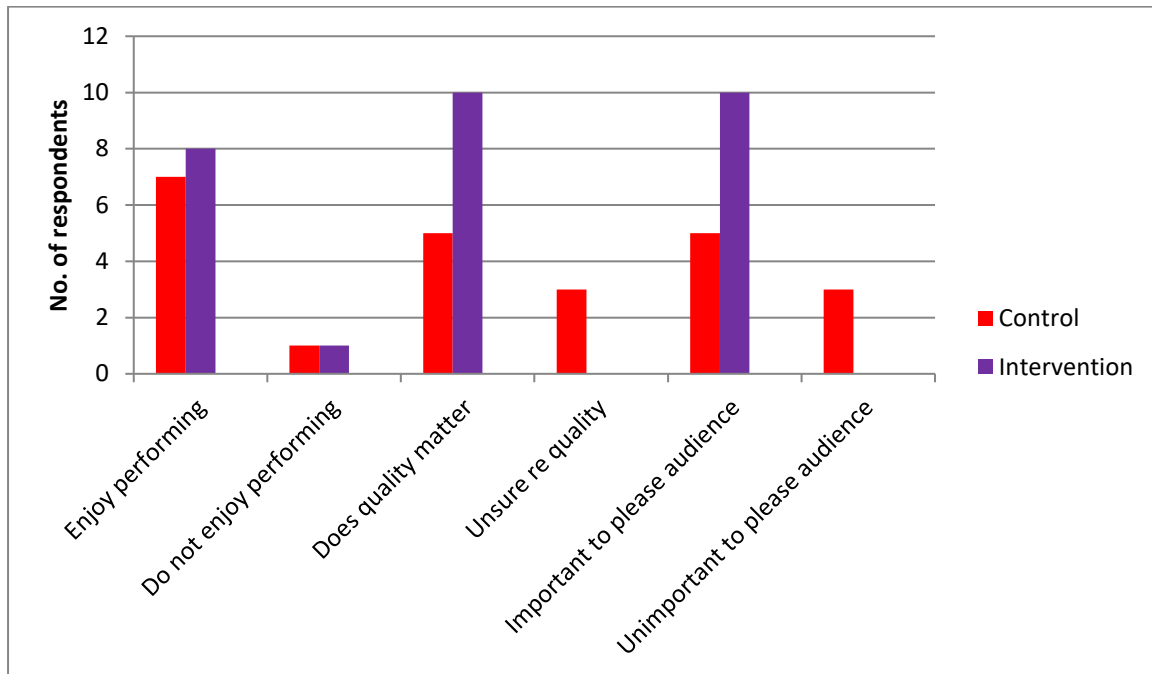


Table 15

While all the control and intervention group respondents stated that they have enjoyed the music improvisation sessions, the main highlight for control group participants was having fun with friends (seven), while two claimed to enjoy the 'craziness' of the workshops and a further one was uncertain. *'I love the fun and all the crazy sounds we try on the instruments, it makes me happy'*. The agreed highlight for all the intervention group participants was utilizing, and in some cases, developing further gestures that would add to the system. The intervention group participants noted their enjoyment of learning something different, *'I loved learning the gestures, it made it easy for me'; 'The gestures helped me to remember things'; 'The sounds were exciting, fun and weird...we didn't know what was coming next, that was the best bit'*. Furthermore, the control group participants reported their enjoyment of

the improvisation workshops, albeit with no change in current practices (using visuals), ‘*I love music sessions and the pictures help us make up the story when we improvise*’; ‘*I enjoyed the topics Love and Nightmare ...we had so much fun developing the stories from the pictures and trying out sounds*’ (Table 16).

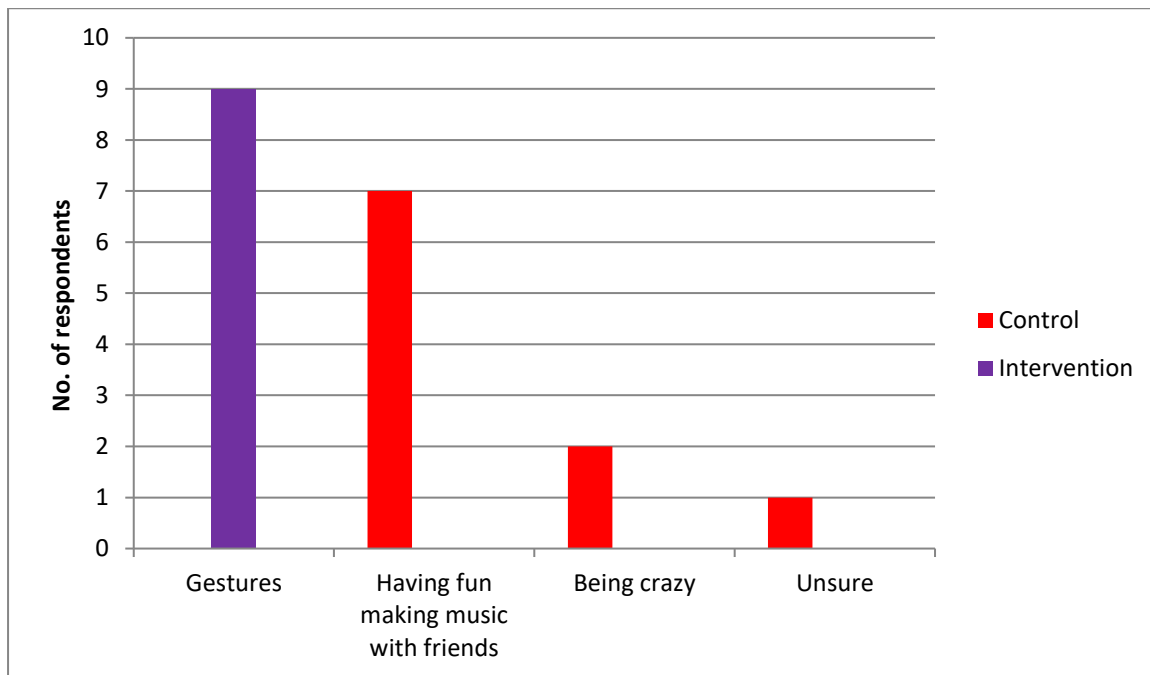


Table 16

Whilst eight of the control group have enjoyed making group music, two respondents disclosed their lack of enjoyment as they preferred solo instrument playing and composing as they felt under pressure and stressed in the group. In contrast, all of the intervention group enjoyed making music in a group as they were given opportunities to meet friends, build confidence, share and create music collaboratively. A noteworthy response from an intervention group participant indicated that the improvised music, led by the gesture system, created a ‘*bigger and better sound*’ (Table 17).

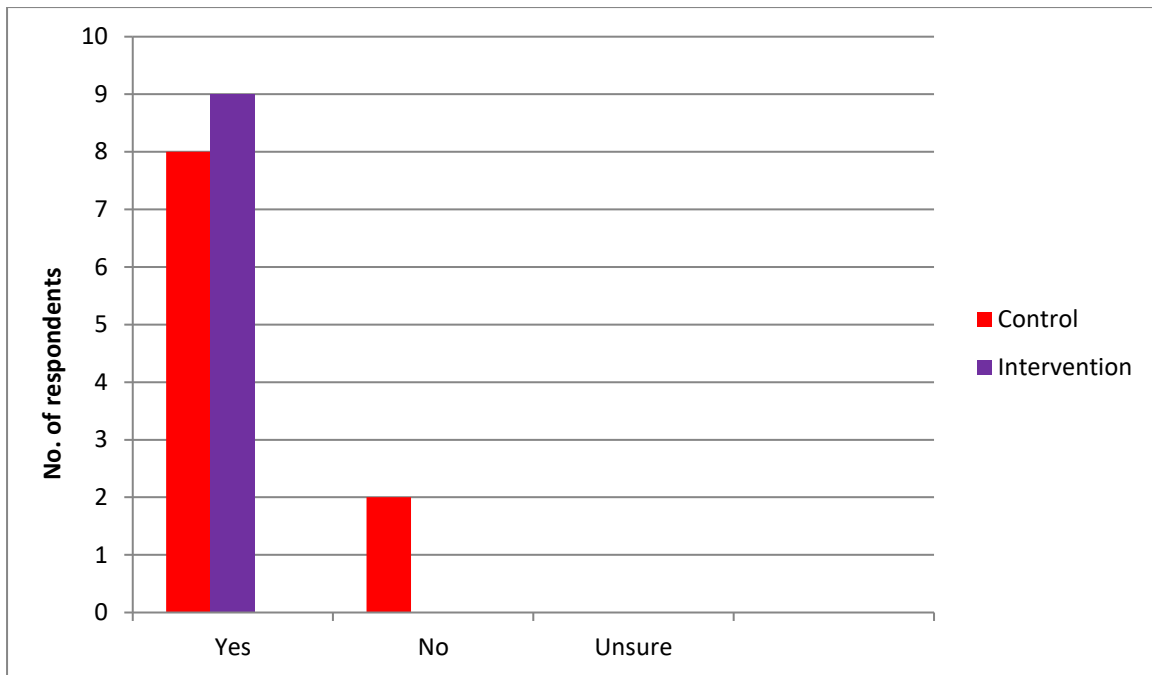


Table 17

Furthermore, seven out of the ten control group participants claimed that audiences would enjoy their improvised music, while two felt that the audiences would not enjoy their music due to it perhaps not being good enough. The remaining one respondent was unsure, *‘Maybe the audiences won’t understand what the music means. We know in our heads that we have the story that was made up by using the pictures, but the audience probably won’t get it’*. All of the intervention group participants felt that audiences would enjoy their improvised music with one claiming, *‘Yes, they would definitely enjoy the improvised music as it is different...they can see how well we can do’* (Table 18).

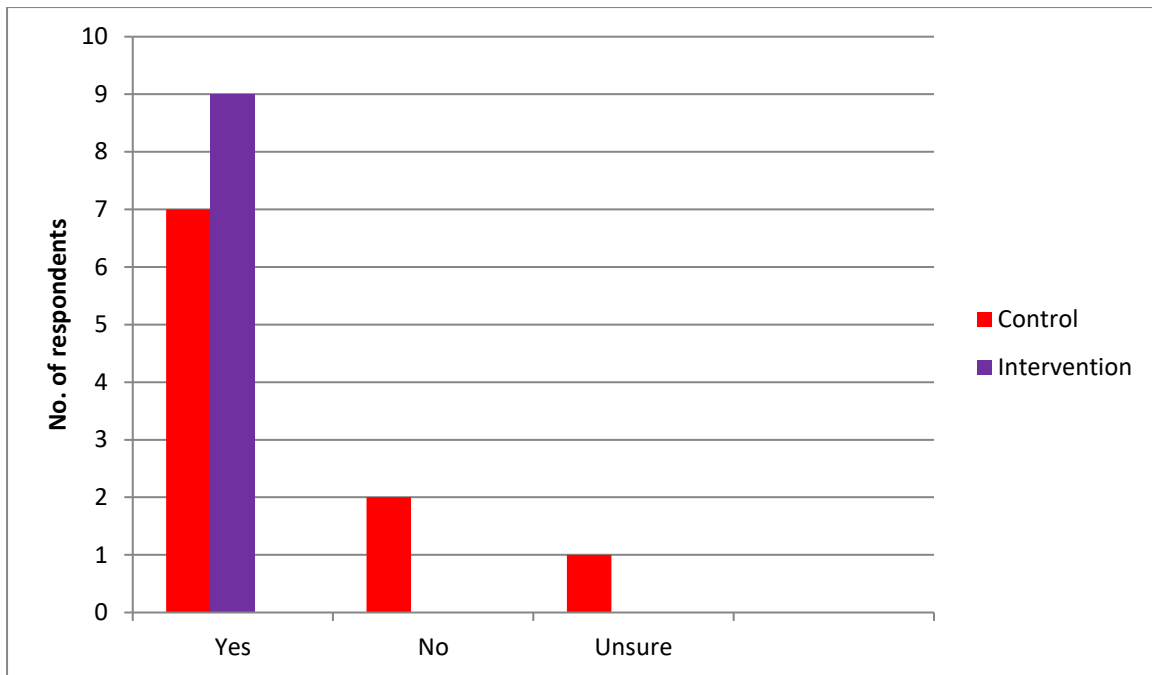


Table 18

In response to ‘Have the music improvisation workshops helped you?’ eight out of the ten control group respondents admit that these had helped them with social interaction, confidence and self-esteem and two were unsure. All of the intervention group participants agreed that the workshops have helped them. Key areas of development included learning new music skills, organisational skills, communication skills, and listening skills. *‘We really have to pay attention as the conductor could use any gesture from the system at any time. I get butterflies in my tummy I am so excited and a bit nervous. The music is so great, and we have to be like professional musicians. I am really proud of myself for learning and understanding the gesture system Conductology (Table 19).*

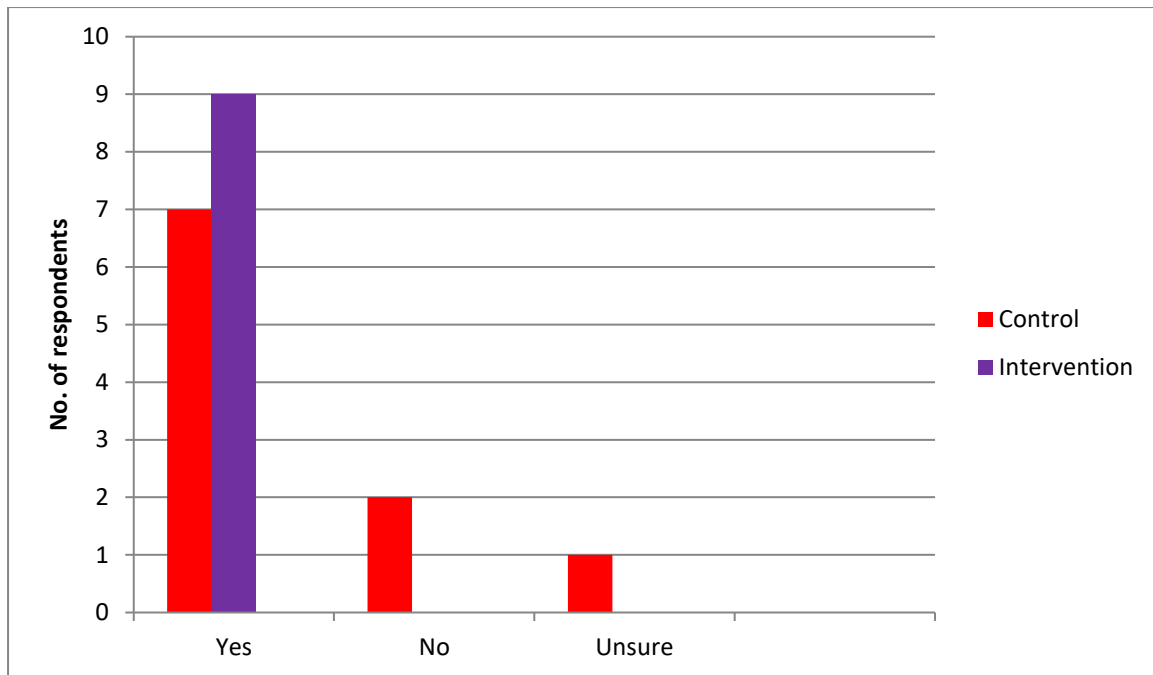


Table 19

The following responses relate to gesture specific questions and so only apply to the intervention group.

When asked if the gesture system had made music improvising better, the response was generally positive, with eight out of the nine intervention group participants acknowledging that the system had improved music improvising, although one participant was unsure. The findings suggest that participants felt they had advanced music skills and knowledge and were keen to freely experiment with sounds (Table 20).

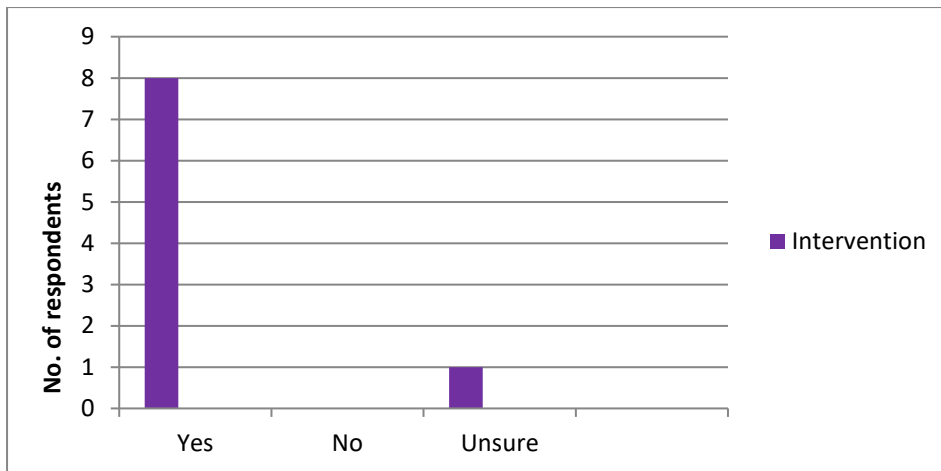


Table 20

Moreover, in response to the question, ‘Do you feel that the gesture system should be used during all music improvisation sessions?’, eight out of the nine participants agreed that it should, while one was unsure.

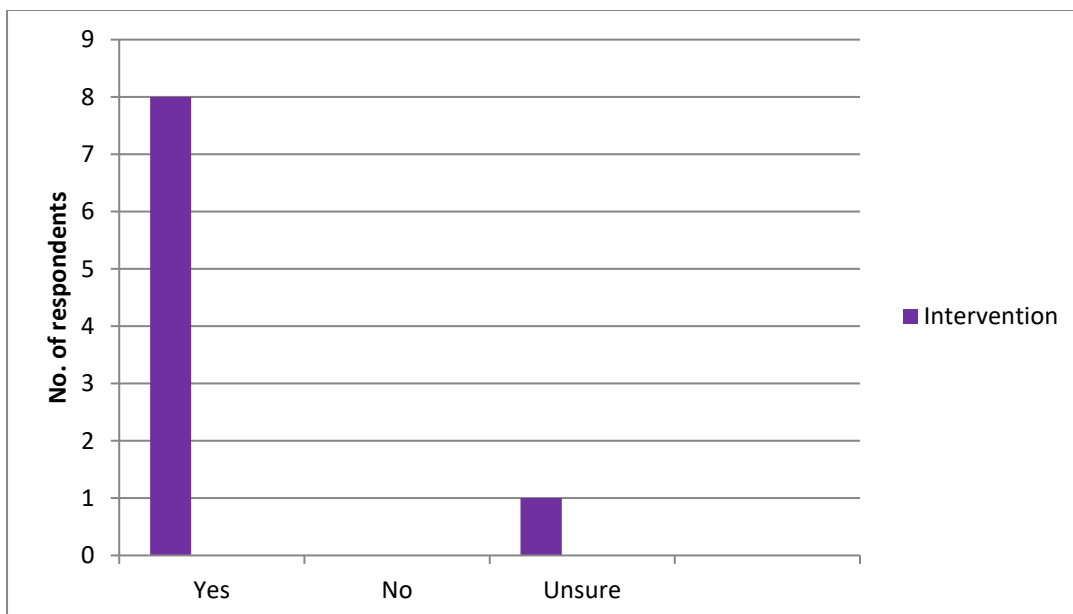


Table 21

The final two questions concerning the gesture system offering freedom to experiment with music, and opinions on the quality of the product provided positive feedback by all intervention group respondents who all agree that the gesture system has given them increased opportunities to experiment with music in real time. They also claim that the

quality of the improvised music has increased due to the use of the system, *‘For the first time ever I can now create something at the top of my head and there is really no wrong response, which I love...the Create and Shine gestures are my favourite’*; *‘Prepare mode is great. It makes everybody pay attention and be professional. We dare not take our eyes off the conductor’*; *‘I love the way you can experiment with all the instruments using the gesture system...I need to always pay attention and I am always excited to hear what the music sounds like’*; *‘I really feel like a proper musician who has a conductor and gives me instructions to make all different sounds. I know about things like texture, dynamics, melody, and duration. I am proud and great’*.

In response to the research question:

Can the co-creation of, and participation in, an original gesture system be used to encourage ID musicians to explore their creative ability?

The co-creators and intervention group participants fully agreed that this was possible.

6.3: Quantitative Analysis- MCTM-II tests pre- and post-intervention

This section addresses research question two:

Can such a system be utilised in order to enhance ID musicians' creative ability?

This section presents the quantitative results of the MCTM-II scores for the intervention group (n=10) and control group (n=10) detailing four sub category accounts of musical extensiveness (ME), music flexibility (MF), musical originality (MO), and musical syntax (MS). ME is the length of time involved in a musical response. MF is the range of musical expression in terms of dynamics, tempo, and pitch. MO is the way in which the test-taker manipulates musical phenomena in a unique way. MS is the extent to which the test-taker manipulates musical phenomena in a logical manner in terms of repetition, contrast, and sequencing.

A mixed between-within subjects analysis of variance was conducted to compare scores on each of the four subscales of the MCTM-II. The between subjects factor (group) had two levels (intervention group, control group) and the within subjects factor (time) had two levels (pre-test scores, post-test scores). The effectiveness of the intervention was indicated by a significant group by time interaction. Reliability of the MCTM-II was examined by the scoring of a sample of test components by the Chief Investigator, Professor Frank Lyons. Also, inter-scorer reliability was assessed for MO and MS scores by the study's Chief Investigator, as these involved qualitative video observations and were less objective. ME and MF scoring criteria were unambiguous and unbiased. ME was determined by calculating the definite number of seconds a participant was engaged in a task while MF was appraised by a 0-2 structure which gives clear guidance about points that should be awarded for tempo, dynamics, and pitch. The reliability test exposed a strong conclusive correlation between the scores of the two examiners.

Prior to the experiment, it was hypothesized that both intervention and control groups would progress in creative thinking in music after the twelve-week period, but the intervention group was expected to demonstrate a higher mean score of creative thinking because of the intervention of the independent variable (*Conductology*)- fostering further creative music knowledge and understanding. The intervention group scored significantly higher in the ME, MF, and MO post-tests. Otherwise, the control group exhibited progress, but to a lesser degree in ME, MF, and MO. This could be explained because of the consistent visual stimulated approach and the participants' limited consolidated musical knowledge.

Although there was a significant main effect within the MS subscale, the group x time interaction was not significant. Musical syntax refers to the structure of music, and in this case the participant was assessed on how he/she manipulated musical phenomena in a logical and inherently musical manner, according to patterns of musical repetition, contrast, and sequencing.

Musical Extensiveness:

There was no significant main effect for group ($F(1, 18) = 2.09, p > .05, \eta^2 = .10$), the main effect for time was not significant ($F(1, 18) = 2.88, p = .11, \eta^2 = .14$), and **the group x time interaction was significant** ($F(1, 18) = 5.76, p < .05, \eta^2 = .24$) (Figure 13 and Table 22).

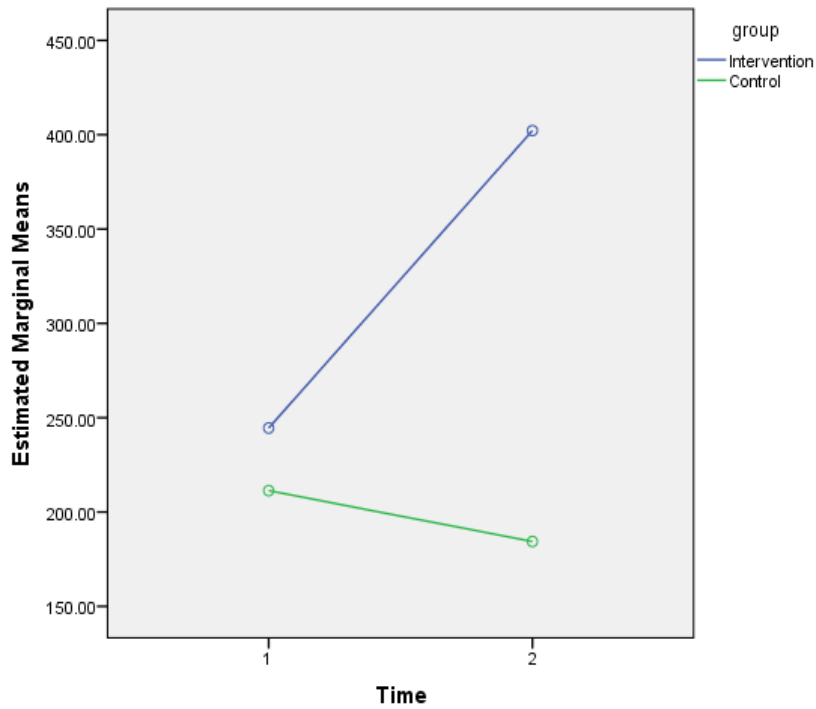


Figure 13 Musical Extensiveness

	Group	Mean	Std. Deviation	N
ME Time 1	Intervention	244.52	206.45	10
	Control	211.33	236.92	10
	Total	227.92	216.95	20
ME Time 2	Intervention	402.23	261.29	10
	Control	184.37	113.88	10
	Total	293.30	225.77	20

Table 22 Statistics for Scores on the ME Subscale.

Musical Flexibility:

There was a *significant main effect for group* ($F(1, 18) = 105.96, p < .05, \eta^2 = .85$), the main effect for *time* was *significant* ($F(1, 18) = 30.50, p < .05, \eta^2 = .63$), and the *group x time interaction* was *significant* ($F(1, 18) = 8.86, p < .05, \eta^2 = .33$) (Figure 14 and Table 23).

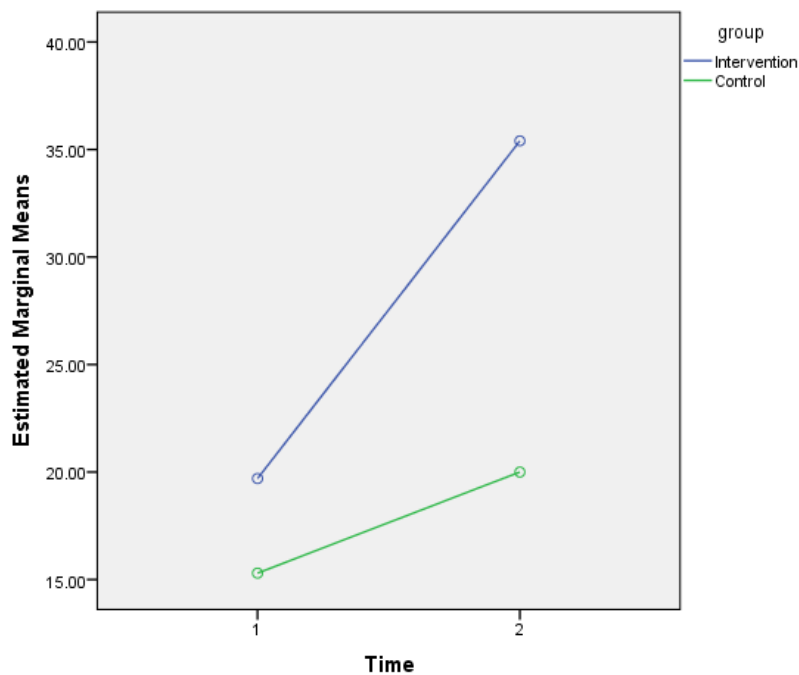


Figure 14 Musical Flexibility

	Group	Mean	Std. Deviation	N
MF Time 1	Intervention	19.70	10.52	10
	Control	15.30	9.85	10
	Total	17.50	10.17	20
MF Time 2	Intervention	35.40	10.89	10
	Control	20.00	11.28	10
	Total	27.70	13.37	20

Table 23 Statistics for Scores on the MF Subscale.

Musical Originality:

There was no significant main effect for group ($F(1, 18) = 2.58, p > .05, \eta^2 = .12$), the main effect for *time* was significant ($F(1, 18) = 105.66, p < .05, \eta^2 = .84$), and the *group x time* interaction was significant ($F(1, 18) = 29.27, p < .05, \eta^2 = .62$) (Figure 15 and Table 24)

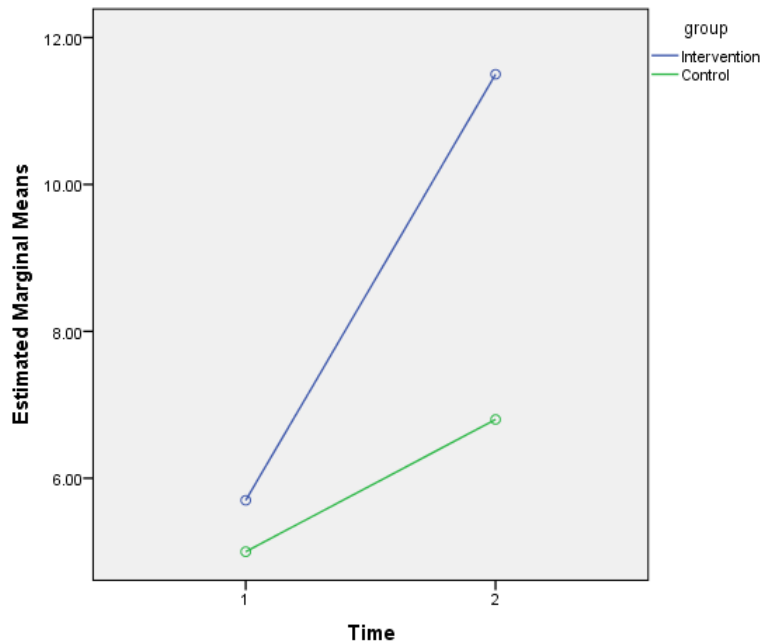


Figure 15 Musical originality

	Group	Mean	Std. Deviation	N
MO Time 1	Intervention	5.70	4.39	10
	Control	5.00	3.49	10
	Total	5.35	3.88	20
MO Time 2	Intervention	11.50	3.56	10
	Control	6.80	3.85	10
	Total	9.15	4.34	20

Table 24 Statistics for Scores on the MO Subscale.

Musical Syntax:

There was a *significant main effect for group* ($F(1, 18) = 5.68, p < .05, \eta^2 = .24$), the main effect for *time* was *significant* ($F(1, 18) = 24.84, p < .05, \eta^2 = .58$), and the group x time interaction was not significant ($F(1, 18) = 1.79, p > .05, \eta^2 = .09$) (Figure 16 and Table 25).

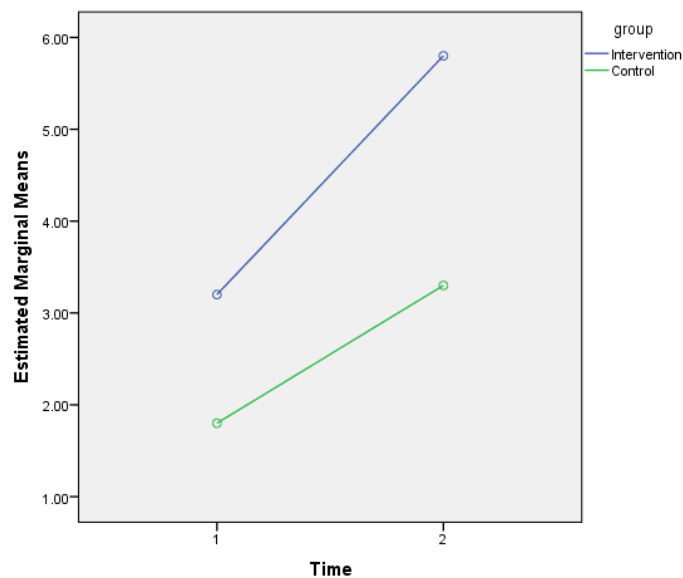


Figure 16 Musical syntax

	Group	Mean	Std. Deviation	N
MS Time 1	Intervention	3.20	2.20	10
	Control	1.80	1.47	10
	Total	2.50	1.96	20
MS Time 2	Intervention	5.80	2.34	10
	Control	3.30	2.05	10
	Total	4.55	2.50	20

Table 25 Statistics for Scores on the MS Subscale.

Musical extensiveness (ME) scoring was quantitative and it increased among the participants of the intervention group (Appendix Q, ex1 and ex.2). ME concerns time duration and was measured in seconds. During the post-tests, participants commonly demonstrated an advanced ability to proceed with a task in a prolonged manner. It should be noted however that the extensiveness was principally similar repeated patterns with slight variation. The control group demonstrated no advancement in the post-test. Extensiveness may be understood to be a strength or failing in an impromptu creative product (Koutsoupidou & Hargreaves, 2009). Kratus (1994) exemplifies the array of compositional mechanisms utilised by students, and which can influence the extensiveness of the musical response:

‘Sometimes the sound appears random without structure or focus. Sometimes a child will hit upon an idea, which may be a melodic pattern or a rhythm, and repeat it many times over. Sometimes a child will grab an idea, change it in some ways and then discard it. Sometimes she is simply trying to figure out which combination of movements on an instrument will produce a particular sound or pattern. Sometimes a child will stare at the instrument as if silently rehearsing the sounds inwardly’ (p.130)

Musical flexibility (MF) scoring was quantitative and it increased among the participants of both the intervention group (Appendix Q, ex3 and ex4) and the control group (Appendix Q, ex5 and ex6). The MF task focused on three musical parameters: dynamics (soft to loud), tempo (fast to slow), and pitch (low to high). The intervention group produced significantly improved outcomes than the control group, although this group did progress well. This could be interpreted as the effect of freedom, challenge and exploration of dynamics, tempo and pitch on a combination of instruments across the three set music environments through the use of the gesture system. Allowing opportunities to experiment within the three parameters could have reaped enhanced understanding of music theory and progressed putting theory into practice.

Musical originality (MO) is measured in terms of musical uniqueness such as: large and/or frequent dynamic contrasts; unusual use of sounds or words; unusual use of instruments; rhythmic complexity; and, unusual interchange between instruments. MO increased among the participants of both the intervention group (Appendix Q ex. 7 and ex.8) and the control group (Appendix Q, ex.9 and ex.10). Music originality is the way in which a student manipulates musical phenomena in an exclusive manner. This factor, considered to be the most idiosyncratic facet of creative thinking, increased significantly among the participants of both intervention and control, albeit lesser in the latter group. Intervention group participants demonstrated enhanced willingness to trial new sounds and create unusual combinations and sequences during the post-tests (Appendix Q, ex 11). The control group participants advanced somewhat in the post-tests. This could be interpreted as participants being aware of and repeating a set of tasks they were previously privy to in a more confident and determined manner. Eddington (2017) documents results of research studies which investigated the creative process of music composition. The creativity measures included quantifying musical originality, musical syntax, and artistic sensitivity. The results indicated that creativity in both the process and product was higher for students working with graphical notation as opposed to traditional Western notation. Such results confirm the existing study's findings that where creative musical processes are implemented enhanced originality is produced.

Musical syntax (MS) among both groups increased although advancement was not significant. MS is the extent to which a student employs musical phenomena in a coherent and systematic musical style, according to musical contrast, repetition, and sequencing designs. This includes: repetition of a musical idea; complementary melodic or rhythmic motion; dynamic sensitivity; awareness of structure and shape; awareness of tone quality; and, a sense of overall form. The post-test results indicated that although progress was made in these musical parameters, no significant advancement was made. It could be suggested that

by extending the duration of the experiment and with further exposure to *Conductology*, a more significant effect may become evident.

In response to the research question:

Can such a system be utilized in order to enhance ID musicians' creative ability?

This study undoubtedly affirms that *Conductology* enhanced ID musicians' creative ability.

6.4: Quantitative and Qualitative- assessment of output (Appendix R)

This final section of the results chapter will address the final research question:

- *Can this system generate high quality of output?*

The procedure used for assessment of the recorded music improvisations was Amabile's (1982) Consensual Assessment Technique (CAT). Using the CAT to assess improvised music proved feasible and successful, and the moderate to high levels of inter-rater agreement confirmed the reliability of this method (Eisenberg and Thompson, 2003), however, Kokotsaki and Newton (2015) claim it is impossible to assess musical creativity.

In the current study, the Assessing panel comprised three music improvisation experts.

1. Larry 2. Teresa 3. Brian²³

The 'experts' role in the assessment process was to:

- assess each of the sixteen music improvisations
- make individual and independent assessments
- generate evaluations on the basis of their own musical improvisation experience
- assess the improvisations relative to each other

²³ Assessors are given pseudonyms to protect their identity.

- conduct assessments for *originality/creativity, technique, interaction/communication, and overall quality of output* using a five-point scale

Each assessor marked each recording out of a maximum of 20 points: a maximum of five points for each of the sub categories of originality; technique; interaction; and, quality of output. Detailed feedback was provided by the assessors on each recording.

The recorded improvisations (see Table 26)

The chosen topics were Love and Nightmare. The author led each improvisation workshop. The Intervention groups used visual stimuli in Stage One and *Conductology* in Stage Two. The Control groups used visual stimuli in both Stages (Appendix P).

Phase One intervention group participants:

This group comprised five participants including two females with global developmental delay, one male with global developmental delay, one male with Down's syndrome and one male with autism. This intervention group was energetic and enthusiastic. From the outset the group collaborated well and brainstormed ideas relevant to the two topics. Interestingly, when asked which recording was the group's favourite, all participants chose 'Turquoise Paradise' as it *'sounded brilliant and professional', 'I found it so relaxing...I think my mum and friends would like to listen to it'* and *'it made you think of a real story in your head while listening to it.'*

Phase One control group participants:

This group comprised five participants including two females with global developmental delay, one male with global developmental delay, one male with Down's syndrome and one male with autism. This control group was excitable and motivated. This group

particularly enjoyed the music technology and the ‘Nightmares’ theme. They quickly brainstormed ideas and shared views with ease. This group participants felt ‘The Maize Maze’ was the best recording as *‘it was exciting and scary’, ‘it was about my birthday’,* and *‘it was so cool at the end I almost jumped’*. The Maize Maze was rated eleventh out of sixteen by the assessors.

Phase Two intervention group participants:

This group comprised two males with global developmental delay, one male with Down’s syndrome, one male with autism and one female with global developmental delay. This group was quiet and generally lacked confidence in music-making. It took a few weeks for the group to feel at ease collaborate effectively. They all had an interest in the ‘Love’ and ‘Nightmares’ topics and were therefore able to contribute ideas and suggestions. This group particularly enjoyed combining music environments and responded effectively to gesture directives. Two of the group participants felt ‘Alone’ was the best recording as *‘it was creepy and exciting’* and *‘we had to watch the conductor all the time as we did not know what gesture was coming next.... I loved the sounds.’* The assessors rated ‘Alone’ fifth out of sixteen. The remaining three participants agreed that ‘Craigbrack Nightmare’ was their favourite and it sounded the best as *‘it had a lot of different and exciting sounds’, ‘all of the ideas that we talked about were sounded in the music’* and, *‘it felt like something you would hear on a horror movie.... wow’*. The assessors rated ‘Craigbrack Nightmare’ second out of sixteen.

Phase Two control group participants:

This group comprised one male with global developmental delay, one male with Down's syndrome, one male with autism and two females with global developmental delay. This group was quite shy yet excited. They enjoyed using the visuals throughout the workshops and had fun making music with each other and particularly enjoyed creating romantic music. Four participants regarded 'Romance under the stars' to be their favourite recording as '*I enjoyed playing the iPad*', '*I love romantic stuff*', '*It reminded me of my girlfriend*' and, '*the music was relaxing to play.*' The assessors rated 'Romance under the stars' as bottom, scoring seventeen marks out of a total sixty. The remaining participant preferred 'Crazy Stars' as '*I felt I was at a disco with my girlfriend and I asked her to marry me...I like fast music.*' The assessors rated 'Crazy Stars' ninth out of sixteen (see Tables 27 and 28).

It is evident that the participants enjoyed the music improvisation workshops and claimed their preferred recordings. Interestingly, the intervention groups nominated 'Turquoise Paradise', 'Craigbrack Nightmare' and 'Alone' as their favourite recordings which assessors have allocated in the top three rank order for quality of output. However, on the contrary, the control groups nominated 'The Maize Maze', 'Romance under the stars', and 'Crazy Stars' as their favourite recordings, all within the bottom fifty per cent of the assessors' rank order for quality of output.

The assessments of the recorded improvisations (products) indicated that *Conductology* was effective.

Assessor Scores

Improvisation Title	Assessor 1 (T)	Assessor 2 (L)	Assessor 3 (B)	Total Score
Phase 1 Intervention				
Funked Up	17	13	15	45
Turquoise Paradise	20	17	12	49
Payback	17	12	18	47
Bosco	17	14	11	42
Phase 2 Intervention				
Ora Beach	9	9	11	29
Love on the Dancefloor	8	16	13	37
Craigbrack Nightmare	16	15	17	48
Alone	16	13	14	43
Phase 1 Control				
EVOL	12	14	16	42
I Do	5	10	16	31
Scary Crew	4	13	9	26
The Maize Maze	4	11	14	29
Phase 2 Control				
Crazy Stars	4	15	16	35
Romance Under the Stars	1	7	9	17
Nightmare at Something Special	12	11	6	29
Scary Beats	0	8	12	20

Table 26

Seven out of the eight group interventions garnered the highest scores from the assessors. Four of these improvisations were Phase One, and three were Phase Two.

Rank Order

Position	Title	Phase	Group	Score
1	Turquoise Paradise	One	Intervention	49
2	Craigbrack Nightmare	Two	Intervention	48
3	Payback	One	Intervention	47
4	Funked Up	One	Intervention	45
5	Alone	One	Intervention	43
6	Bosco	Two	Intervention	42
7	EVOL	One	Control	42
8	Love on the Dancefloor	Two	Intervention	37
9	Crazy Stars	Two	Control	35
10	I Do	One	Control	31
11	The Maize Maze	One	Control	29
12	Ora Beach	Two	Intervention	29
13	Nightmare at Something Special	Two	Control	29
14	Scary Crew	One	Control	26
15	Scary Beats	Two	Control	20
16	Romance Under the Stars	Two	Control	17

Assessor T's top three scores were given to Phase One Intervention group.

Assessor L's top three scores were assigned to Intervention groups in both Phases.

Assessor B's highest scores were presented to the Intervention groups in both Phases with a third place allocated to the Control group.

Table 27

‘Turquoise Paradise’ and ‘Funked Up’, both Phase One Intervention music improvisations, were awarded the maximum number of points for ‘originality’. ‘Turquoise Paradise’ and ‘Payback’, both Phase One Intervention music improvisations were allocated full points for ‘technique’. ‘Turquoise Paradise’, ‘Payback’, and ‘Bosco’, all Phase One Intervention music improvisations were granted maximum points for ‘interaction’. ‘Turquoise Paradise’, ‘Payback’, ‘Craigbrack Nightmare’, Intervention groups over both Phases, and ‘EVOL’ Phase One **Intervention** group, achieved the highest marks for ‘quality’. Referring to ‘Turquoise Paradise’, assessor Larry states:

‘The start suggests there is a compositional thought process engaged with...a slow start creating opportunity to build, add, or layer musical interventions. As in almost every case, the percussive contributions are in time with themselves. In this case though, there is order and dynamics which makes the improvisatory process seem controlled and significant. Compositionally this is the strongest track, with development of musical ideas, layering, significant identifiable tonality, time and rhythmic consistency. Improvisation happens to a form. Approaches to unison and harmony with time adhered to for new melodic entries and dynamics are apparent throughout. Very good.’

Second place ranking was awarded to Phase Two **Intervention** group music improvisation

‘Craigbrack Nightmare’. Assessor Larry further comments:

‘Definite order to the introduction of the musical ideas. Also, signs of approaches to form and appropriate musical intentions to match the title. Definite use of dynamics, call and response techniques and a more developed range of musical ideas available in this one. More of the feeling of a piece with the ideas linked and connectivity between sections.’

Although Third place ranking was allocated to Phase One **Intervention** group music improvisation ‘Payback’ one assessor, awarding an overall score of 12 out of a maximum 20 points, notes:

‘Single line instrumental intro with sporadic vocal sounds and speech. Introduction of the drum beat doesn’t assist conformity with the rest of the track until the electronic quaver line comes in. The vocal lines that offer limited connectivity or any significant creativity or interaction. The drum beat doesn’t assist the improvisation although the acceleration of the track does suggest compositional overview.’

Phase Two **Control** group music improvisation 'Romance Under the Stars' ranked last place.

Assessor Brian comments:

'Intro is somewhat chaotic, unordered and overloaded with unconnected noises. This continues with limited structure and space to signify effective contributions.'

Assessor T :

Rank Order 1-4

1. Turquoise Paradise* Score 20
2. Payback*, Bosco*, Funked Up* Score 17
- * Intervention group Phase One.

Assessor L :

Rank Order 1-4

1. Turquoise Paradise Score 17 Intervention Phase One.
2. Love on the Dancefloor Score 16 Intervention Phase Two.
3. Craigbrack Nightmare Score 15 Intervention Phase Two.
4. Crazy Stars Score 15 Control Phase Two.
- * Intervention group phase 1.

Assessor B :

Rank Order 1-4

1. Payback Score 18 Intervention Phase One.
2. Craigbrack Nightmare Score 17 Intervention Phase Two.
3. EVOL*, Phase One, Crazy Stars*, Phase Two, I Do*, Phase One Score 16.
- * Control Group

Scoring factors: Originality, Technique, Interaction and Quality.

Improv Title	Phase	Group	Assessor	Originality	Technique	Interaction	Quality	Total
Turquoise Paradise	One	Intervention	T	5	5	5	5	20
			L	4	4	4	5	17
			B	2	3	4	3	12
Craigbrack Nightmare	Two	Intervention	T	4	4	4	4	16
			L	4	4	3	4	15
			B	4	4	4	5	17
Payback	One	Intervention	T	4	4	5	4	17
			L	3	3	3	3	12
			B	4	5	4	5	18
Bosco	One	Intervention	T	4	4	5	4	17
			L	4	4	3	3	14
			B	2	3	3	3	11
EVOL	One	Control	T	3	3	3	3	12
			L	3	3	4	4	14
			B	4	3	4	5	16
Funked Up	One	Intervention	T	5	4	4	4	17
			L	4	3	3	3	13
			B	4	3	4	4	15
The Maize Maze	One	Control	T	1	1	2	0	4
			L	3	2	3	3	11
			B	3	3	4	4	14
Love on the Dancefloor	Two	Intervention	T	2	2	2	2	8
			L	4	4	4	4	16
			B	3	3	4	3	13
Crazy Stars	Two	Control	T	1	1	1	1	4
			L	3	4	4	4	15
			B	4	3	4	4	16
I Do	One	Control	T	1	1	2	1	5
			L	2	2	3	2	9
			B	4	3	4	5	16
Ora Beach	Two	Intervention	T	2	2	3	2	9
			L	2	2	2	3	9
			B	3	2	3	3	11
Nightmare at Something Special	Two	Control	T	3	3	3	3	12
			L	2	2	4	3	11
			B	2	1	2	1	6
Scary Crew	One	Control	T	1	1	2	0	4
			L	3	3	4	3	13
			B	2	2	3	2	9
Scary Beats	Two	Control	T	0	0	0	0	0
			L	2	2	2	2	8
			B	3	3	3	3	12
Romance Under the Stars	Two	Control	T	0	0	1	0	1
			L	2	2	1	2	7
			B	2	2	3	2	9
Alone	One	Intervention	T	4	4	4	4	16
			L	3	4	3	3	13
			B	3	4	4	3	14

Table 28

In answer to research questions 3:

Can this system generate high quality of output?

Conductology can improve quality of output.

6.5 Post Assessment of co-creators' musical capabilities

The final assessment of musical capabilities (Appendix L) was administered to the co-creators as a concluding part of the study (Table 29).

For ease of reference I have included the original baseline assessments for the co-creators for comparison. Assessments focused on the following seven elements: timbre, pitch, texture, tempo, structure, duration, and dynamics (Table 2).

Co-creator	Timbre	Pitch	Texture	Tempo	Structure	Duration	Dynamics
Darren	Unsure what this means	Unable to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Lacks understanding	Attempts repeating a two-bar phrase but has difficulty accurately counting note values	Associates loud with low and quiet with high
Molly	Unsure what this means	Unable to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Lacks understanding	Attempts repeating a two-bar phrase but has difficulty accurately counting note values	Associates loud with low and quiet with high
Simon	Unsure what this means	Able to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Some understanding	Able to repeat a two-bar phrase in 4/4 time with small errors	Associates loud with low and quiet with high
James	Unsure what this means	Able to distinguish between high and low sounds	Unsure what this means	Associates fast with high	Some understanding	Able to repeat a two-bar phrase in 4/4 time with small errors	Associates loud with low and quiet with high

Table 2 Baseline Assessment of Co-creators' musical capabilities

Co-creator	Timbre	Pitch	Texture	Tempo	Structure	Duration	Dynamics
Darren	Able to describe some sounds in basic terms, such as loud, fast, slow, heavy, light.	Able to distinguish between high and low although sometimes confused between the two.	Able to describe the various sounds in a piece of music. Occasionally needs prompting.	Able to distinguish between fast and slow	Realizes the difference between start, middle and end but has some difficulty putting this into practice	Able to identify which note is the longest.	Able to play loud notes followed by high notes
Molly	Able to basically describe the timbre of a piece of music. Needs occasional prompting.	Able to distinguish between high and low sounds.	Able to describe the texture of a piece but sometimes needs help in associating the correct description with the sound.	Able to distinguish between fast and slow	Able to play a piece with three distinct sections, however it is always brief.	Able to identify which note is the longest.	Able to play loud notes followed by high notes
Simon	Can relate in detail the timbre of a piece of music	Able to distinguish between high and low sounds	Detailed awareness of texture and able to describe sounds	Able to distinguish between fast and slow	Can easily play a piece on the piano having a clearly defined start, middle and end.	Able to identify which note is the longest and repeat a two-bar phrase in 4/4 time correctly	Able to play loud notes followed by high notes
James	Able to describe in detail the timbre of a piece of music, noting specific aspects that stand out.	Able to distinguish between high and low sounds	Detailed awareness of texture and able to describe sounds.	Able to distinguish between fast and slow	Can easily play a piece on the piano having a clearly defined start, middle and end.	Able to identify which note is the longest and repeat a two-bar phrase in 4/4 time correctly	Able to play loud notes followed by high notes

Table 29 Final Assessment of co-creators' musical capabilities

The comparison of results between baseline and post-study co-creators' assessment of musical capabilities has shown an increased level of musical awareness and knowledge in the four co-creators in seven elements of music that is transferrable to practical playing.

6.6 Triangulation of Findings

Using a mixed methods approach, the study conducted investigative research in order to answer the main research question. The process generated findings that indicated that ID musicians' creative ability can be enhanced, and quality of output raised when *Conductology* is used in real-time music improvisation. The triangulation of the findings reinforced the significant effects that *Conductology* has on ID musicians' creative thinking in music and quality of music output (Figure 17).

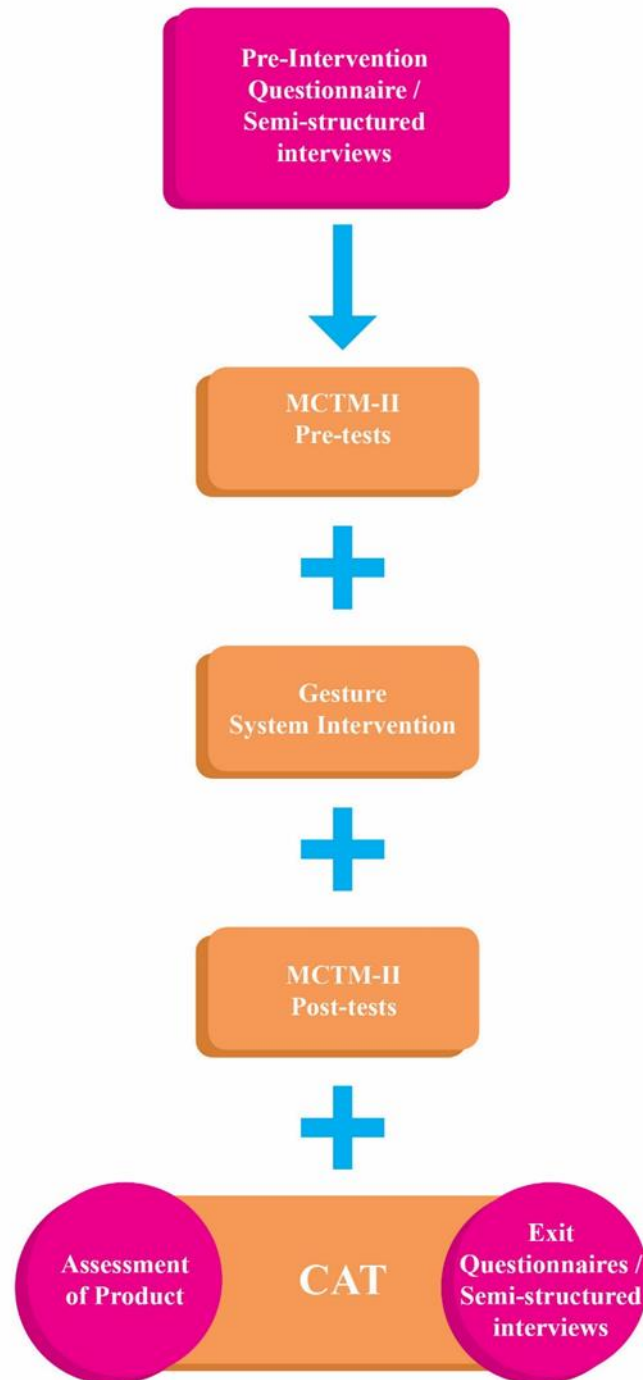


Figure 17 MCATM: White's Hybridized Test Process for Creative thinking in Music and Quality Output Assessment

The development of an original gesture system for use in real time music improvisation sessions has evidenced a transformation among the four co-creators. Each co-creator brought ideas, opinions, experience, and desires forward with the view to developing an original

gesture system that would enhance musicianship and raise quality of output. The intensive creative workshops progressively recognized gaps in the co-creators' music knowledge and experience and addressed these areas through the co-creation of an original system that is meaningful, impactful, and significant to the ID population.

The *Conductology* development process has highlighted the unique capabilities of the four co-creators. Furthermore, their involvement in the methodological approach has generated an innovative system which makes a significant contribution to knowledge (Figure 18).

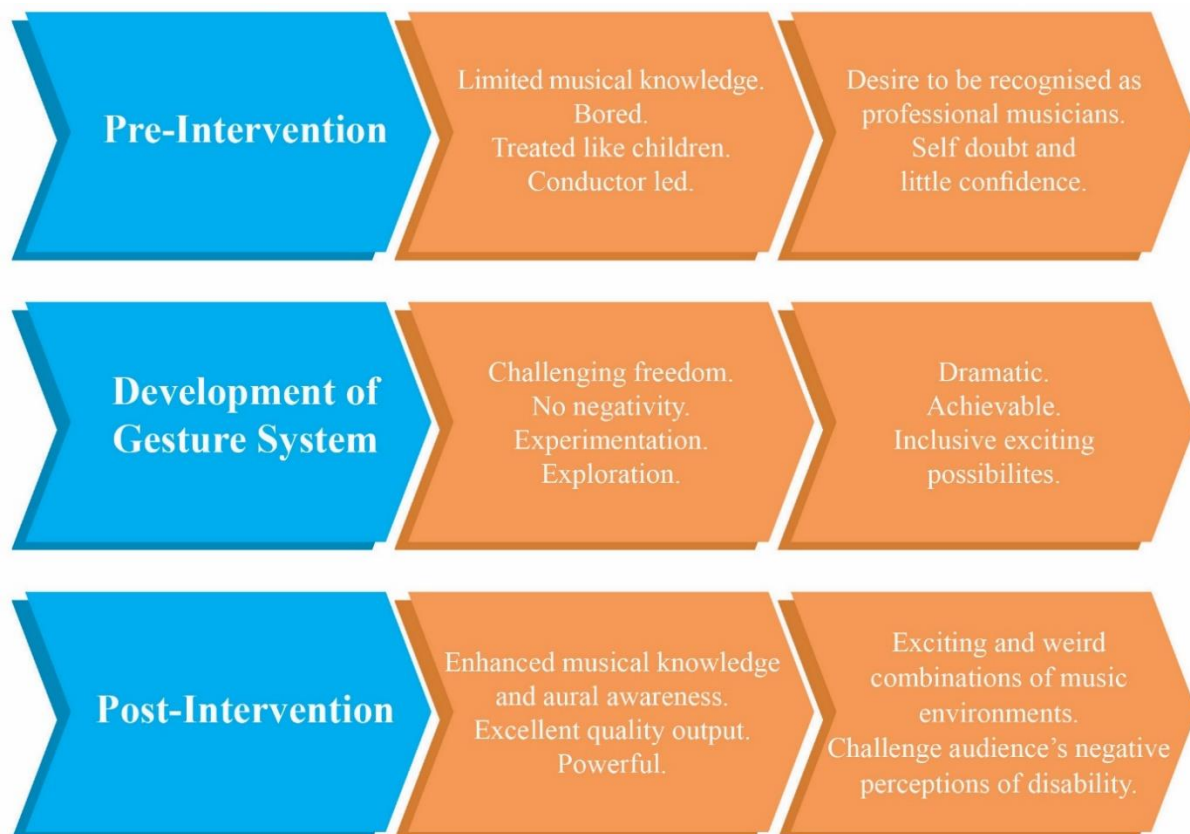


Figure 18 *Conductology Process.*

This study highlighted the surplus value on several dimensions of improvisation as a worthwhile activity for those with ID. The value of these findings is ratified by the fact that the current study meets scientific principles (Slavin, 2008) concerning:

- randomized assignment: participants who met the criteria were randomly allocated to the intervention and control group;
- duration: the study lasted six months. Furthermore, the study applied a hybridized measurement and assessment tool (MACTM) which generated robust and triangulated data which proved significant findings.

The overall results of the study showed the following. First, the qualitative approach in the study highlighted the important role that music plays in the lives of those with ID, presenting wide ranging views and opinions on current music improvisation practices, audience perception, quality of output, and personal musicianship. Second, the study demonstrated positive effects on participants' engagement in both types of music improvisation, that is, gesture-led (intervention groups), and visual stimuli-led (control groups). The effects were greater in the gesture-led condition, confirming that the original gesture system enhances creative thinking in music, and significantly improves musical extensiveness, musical flexibility, and musical originality. Thirdly, the Consensual Assessment Technique data provided by the three experienced assessors indicated that the original gesture system-led music improvisations were of a higher quality than those without implementing the gesture system and only using the visual stimuli.

Furthermore, results from the analysis revealed important findings in the following key areas: collaboration, confidence and self-esteem, self-efficacy and challenge, novelty, creativity, and output. These are discussed in detail in Chapter 7.

6.7 Chapter summary

The results and findings of this mixed methods study have indicated that the use of *Conductology* in real-time music improvisation can enhance ID musicians' creative thinking in music and raise quality of output. Based on the data analysis of the qualitative and quantitative approaches which included the post-intervention questionnaires and semi-structured interviews, along with post-intervention MCTM-II tests and CAT assessments, the results and findings demonstrated a robust conclusion that *Conductology* has significant effects on creative thinking in music and quality of output, namely, enhancing musical extensiveness, musical flexibility, and musical originality, as well as raising the quality in music improvisations. Other noteworthy findings focused in areas of collaborative music environments, raised confidence and self-esteem, enhanced self-efficacy and challenge embracement, novelty, creativity, and output.

Chapter 7 Conclusions and Further Research

7.1 Introduction

Chapter Seven examines *Conductology* as an innovative and impactful gesture system for use in real-time music improvisation sessions with ID musicians. Furthermore, it discusses the key findings in more detail and offers suggestions for further research.

7.2 Key findings

Key findings from the study are focused on six main areas:

1. Collaboration
2. Confidence and self-esteem
3. Self-efficacy and challenge
4. Novelty
5. Creativity
6. Output.

7.2.1 Collaboration

While the study participants have enjoyed making music together, they particularly savoured time spent with friends. Whitener (2016) indicates that students gain effective social skills and enhanced self-esteem when learning and playing in a collaborative manner. In the current study, it was important to the participants to have fun making music with their friends. Sawyer (2011) claims that collaboration is a critical component of improvising. Miell and McDonald (2000) claim that when students collaborate with friends, higher quality compositions are produced. They further suggest that the collaborative music-making environment allows students to demonstrate their abilities to the group. However, there are advantages and disadvantages to collaboration. Advantages include; the development of

music, language, thinking and social skills, opportunities to learn from each other, stimulated thought processes encouraged by other student's opinions and ideas, benefits to students with low self-esteem who might be unwilling to contribute in front of others. Disadvantages include; certain students may take over, some students within the group may not get along, students lacking in confidence might feel pressurised to contribute, and students learn at varying paces.

Most of the study's participants enjoyed making music with friends. The collaborative music-making workshops allowed the participants to promote their individual abilities and strengths. The workshops offered participants opportunities to explore, create and perform together. It was an opportunity to socially interact with others in a fun, creative, practical and familiar environment. Creative music making took an exploratory theme where the musicians effectively communicated music ideas in a collaborative manner. Individual musicians were allowed freedom to experiment, explore, create, and share musical ideas.

Pellitteri (2000) indicates that when participants play music collaboratively they gain opportunities to express their individuality. This aligns with the co-creators' belief that they have each developed significant musicianship through the development of *Conductology*, allowing for expression of individuality. Social interaction played a large role in the group music making in real time as the communicative, disciplinary, and collaborative elements of carrying out directives of *Conductology* was key to the quality of output. The overall highlight for the control group participants from the music workshops was having fun and making music with their friends.

7.2.2 Confidence and self-esteem

The co-creators have indicated that music improvising has helped them overcome negative experiences which has led to increased confidence and self-esteem. The co-creators further recognised that the new opportunities arising from the study have allowed them to collaborate inclusively which has positively affected their confidence and self-esteem levels. Furthermore, all intervention group participants and most control group participants recognised that their confidence and self-esteem increased during the study.

There is extensive research suggesting that the behaviours involved in music improvisation practices can improve self-esteem and confidence, and enhance well-being and social skills (Abramo, 2015; Laird, 2015; Darrow, 2014; and Rickson, 2014). Moreover, there are indications that ID students frequently perceive themselves as inferior and face challenges to participation in daily life (Hen et al. 2014; Rickson, 2014). This study found that the confidence and self-esteem of the co-creators increased through the music improvisation workshops and development of *Conductology*. This is consistent with Hallam's (2010) findings where group music activities led to social cohesion, satisfaction, self-esteem and intrinsic motivation, which in turn leads to raised confidence among music students. Furthermore, the co-creators claimed acquisition of new skills, namely, communication, social, and organisational, aligning with Koutsoupidou and Hargreaves's (2009) claim that music improvisation applies decision-making skills and imagination in order to create original music. For many of this study's participants, individual confidence and self-esteem was raised. This was due to the comfortable and positive environment, familiar faces, the preferred topics of Love and Nightmare for music improvisation, and the fun, easy-to-use workshop stimuli (intervention group-*Conductology*, control group- visuals) suggesting that location and setting are important along with a programme that is designed by participants for participants.

The study's participants enjoyed the music improvisation workshops where they trialed and tested a variety of sound combinations. At the end of each workshop, most participants felt a sense of achievement- effectively playing a chosen instrument, contributing to the overall output, offering suggestions, and sharing ideas.

7.2.3 Self-efficacy and challenge

Self-efficacy reflects confidence and is the optimistic self-belief in competence. Challenge is often associated with self-efficacy. The co-creators fully embraced the challenge of co-creating and refining *Conductology*. They were consistently challenged and stretched throughout the study and in turn demonstrated enhanced self-efficacy. Moreover, the intervention group participants welcomed the challenge of utilizing *Conductology* and exhibited control over both the creative process and product. Their self-efficacy increased as the study progressed due to the familiarisation of the *Conductology* directives and their optimistic self-belief. Although the control group participants continued to use the familiar visual stimuli during the music improvisation sessions, they were challenged but to a lesser extent. They appeared comfortable within the environment and demonstrated a willingness to learn and explore.

ID musicians face challenges when improvising in real-time. These include creating and appraising melodic and rhythmic progression in a group, listening attentively to sounds and sound combinations, sustained concentration, control of instrument, understanding and executing directives and working collaboratively to achieve an appealing output. Appropriately pitched challenge can encourage and develop greater self-efficacy amongst ID musicians. Furthermore, high expectations of ID musicians are crucial. Realistic, specific, and achievable goals should be set which allow for the development of self-efficacy.

When the co-creators began to develop *Conductology*, they were keen to be challenged. They had a high level of interest in co-creating an original system that would be meaningful to each other and ID musicians. Barrett and Smigiel (2007) found that a desire to be challenged in music education was a main reason for students to take part in elective music activities. Some research has demonstrated that experiences of challenge have a positive impact on situational interest (Chen et al., 1999), while there have been contradictory findings (Chen et al., 2001), proposing that initial success with a novel activity may be necessary to encourage initial interest and thus challenge should occur later. For the participants in the current study, challenges that appeared achievable enhanced interest in their immediate learning experience. This is consistent with North and Hargreaves (2008) and Ritchie and Williamon's (2007) proposition that challenging music activities, balanced with individual ability, are likely to increase self-efficacy.

7.2.4 Novelty

Novelty can also be interpreted as original. *Conductology* is an original co-created gesture system for use in real-time music. The co-creators and intervention group participants embraced this system and developed and refined it appropriately to their needs and desires.

Maher and Fisher (2012) assess creative designs with novelty, surprise, and value criteria while Tafuri (2006) suggests that a musical novelty should deviate from common practice in order to be original and creative.

In this study, novelty is the shared experience of an original co-created gesture system, *Conductology*. Prior to the main investigation (the testing of *Conductology*), all intervention group and most control group participants were unsure of gestures, yet Lindsay (2005) claims

that ID persons rely on informal gestures in addition to facial expression and vocalization in everyday life. In addition, Taylor-Dileva (2011) states that ID students realize tremendous gains when they are taught to use sign language as they learn best visually, claiming that gestures are used to symbolize meanings for words or phrases with the aim of improving language acquisition, knowledge retention, and social skills. The co-creators of *Conductology* found the process of developing an original gesture system for use in real-time music exciting, challenging and appropriate. They liked the participatory approach of creating, trialling and refining gestures in conjunction with their level of musical awareness and understanding. The intervention group participants enjoyed using the gestures, and in some cases, creating additional gestures to the repertoire. They found the repertoire of gestures easy to understand and easy to use, preferring this original system to previous practices. This aligns with DeYoung and Ramaswamy's (2008) claim that gestures can be easily learned and picked up by almost everyone. They further suggest that music generation with gestures could become a common mode of interaction in the future. Repeatedly, the intervention group expressed interest in the gesture-led music improvisation workshops describing the sessions as, *'fun because we never did anything like this before'*, and, *'great fun and really exciting and full of surprises.'*

7.2.5 Creativity

Most of the study's participants have suggested that their disability prevents them from being creative. The study's participants recognised that the music improvisation workshops have helped with their individual challenges and difficulties.

Torrance (1998) refers to creativity as almost infinite, involving every sense with much of it nonverbal, unseen, and unconscious. Creativity is when something is formed or invented that is valuable. Creativity is also an evolutionary and interrogation process which has a

worthwhile purpose. Koutsoupidou and Hargreaves (2009) claim that the importance of creativity has been acknowledged in many different fields and state its relevance in music appraisal.

Creative thinking has become a favoured topic within educational establishments across Northern Ireland and within the Northern Ireland Curriculum (CCEA, 2017). Creativity and aspirational thinking were amongst the themes of the Council for the Curriculum, Examination, and Assessment's (CCEA) first committed 'Special Educational Needs Conference' in August 2017.

'Creative thinking is essential for SEN learners to develop the skills and capabilities for lifelong learning. All learners, regardless of the setting, should have the opportunity to achieve their own potential and for that to be recognised.' (CCEA Chief Executive, Justin Edwards)

Creative thinking *in music* however seems to be an area of neglect in literature and practice for those with ID. Within the special school setting, and in many music focused ID organisations, music therapy and music used as a therapeutic tool appears to take precedence. Although this is the case, the music specialist and /or music therapist aims to develop students' listening, composing, and performing skills. As listening, composing, and performing involve exploring, combining, evaluating, and responding, it is evident that there is an alignment between the Northern Ireland curriculum and MCTM-II, since both place importance on the advancement of students' creative thinking. Webster's MCTM-II has proved a popular test among researchers whose interests lie in creative thinking in music.

In the current study, all co-creators and participants expressed a desire for greater freedom to experiment with music in real-time from the outset. Hairston (2014) claims that ID students have limited opportunities to experience creativity. Koutsoupidou and Hargreaves (2009) regard creativity as a means of expression for anyone, while Plucker et al. (2007) suggest that

creative potential can be realized and magnified in anyone. All control group participants and some of the intervention group participants have felt that their disability has prevented them from being creative, yet Hargreaves' (1989) claims that creativity can be enhanced and developed with appropriate environmental conditions and stimulation in place. Koutsoupidou (2008) investigated how various teaching styles impact on primary school children's musical creativity. Findings revealed that pupils who experienced improvisation as part of their music lessons scored higher than those who did not in Webster's MCTM- II. Interviews with music specialists were then conducted, revealing that the didactic/teacher-led style and the creative/child-centred style have differing impact on pupils' musical development. Koutsoupidou claims that a creative teaching approach could assist pupils' creative progression in addition to their social and cognitive development.

Creativity is at the core of all disciplines. It is a collaborative process involving curriculum, teaching, and learning, assessment, and education culture. Creativity can flourish when the appropriate conditions are cultivated thereby allowing skills, knowledge, and attitudes to develop. The co-creators and study participants have felt that their creativity was enhanced through the music improvisation workshops. Moreover, the co-creators and intervention group participants agreed that their creativity was *greatly* enhanced through the development and use of *Conductology*. This is reflected in the results where intervention group participants scored significantly higher than control group participants in the ME, MF, and MO subgroup post-tests.

Koutsoupidou and Hargreaves (2009) present findings of a quasi-experimental study of the impact of music improvisation on the development of children's creative thinking in music. The MCTM- II (Webster, 1987, 1994) was carried out pre-and post a six-month teaching programme in order to assess the children's thinking in terms of extensiveness, flexibility, originality, and syntax. The results of this experimental study revealed that improvisation

promotes musical flexibility, syntax, and originality in children's music making. Furthermore, the assessments of the sixteen recorded improvisations indicated that the majority of the assessors' highest scores were allocated to the intervention group. This further aligns with Burnard's (2012) claim that there is the potential for creativity to be taught if students are given appropriate support, reinforcing the need for liberated teaching methods (Boon, 2015).

7.2.6 Output

The co-creators were determined to co-create an original gesture system that would raise the quality of output. Through the development of *Conductology*, the co-creators created, executed, trialled, and refined an easy-to-use, yet appropriately challenging, system that produced interesting and unusual sound combinations.

Research into a means of quantifying an individual's creative value is vital to the understanding of what creativity is and how it can be developed (Running, 2008). Amabile's (1982) Consensual Assessment Technique (CAT) has been used as a credible and valid creativity measure for more than three decades and is regarded as the most favoured assessment method for creative outputs (Kaufman, et al., 2008) being described as the 'gold standard' of creativity assessment (Baer & McKool, 2009). Amabile has proposed that the most valid way to measure creativity is by using experts' subjective assessment of creative products—a technique she has labelled 'consensual assessment.'

The assessment of output results in the current study clearly reinforces the positive impact of *Conductology*. Using a consensual assessment technique, the assessors' scores reiterate that quality of output was raised by the intervention group participants.

While Lubet (2009) claims that ID students have grim prospects, most participants in the current study had previous performing experience. Furthermore, Hairston (2014) indicates that ID students rarely gain opportunities to create, produce, and share their music performances while Rickson (2014) claims that for most part, audiences are predominantly made up of family members and friends. *All* intervention group participants and *most* control group participants agreed that it was important to please the audience. At the end of the music improvisation workshops, most control group participants and all intervention group participants felt that audiences would enjoy their music. Ritchie and Williamon (2007) claim that belief in one's musical abilities is paramount to performance success. The study's co-creators insisted that audiences *need* to hear their music. This aligns with Kaaikkonen et al. (2014) claiming that students with diverse abilities are increasingly emerging as artists, and thus diversity in music is becoming more widespread. However, research predominantly focuses on music improvisation processes (Rickson, 2014; Hullick, 2013), while investigation on both processes and quality of output is limited.

Assessments of the current study's sixteen improvisations indicated that highest scores for quality of output was allocated to the intervention group.

7.3 Recommendations

The scrutiny of the participants' responses highlighted several areas that should be noted. Most participants demonstrated confusion between 'high' and 'low' in music, frequently identifying 'high' with 'loud' and 'low' with 'soft'. Participants' responses disclosed that ID students do not have a clear appreciation of what the various terms associated with pitch mean. Although all participants have been consistently taught pitch, this does not significantly advance their understanding of musical terms. The post-test results did show an

increase in understanding by some intervention group participants. This could be attributed to the ease of, and repeatable use of *Conductology*, in this instance, the utilization of 'follow', 'glide', and 'soar' gestures. Task responses also demonstrated unusual findings in both pre- and post-tests. In relation to musical syntax (MS), most participants found it difficult to create an overall sense of form including a beginning, middle, and end. Although some improvement was made in the post-tests with the intervention group, most participants found logical structure problematic. This was highlighted in both the space story and free improvisation tasks (Appendix Q, ex.12 and ex.13). Not all participants clearly performed distinct and separate sections and appeared to be confused when they were told they could play all three instruments in any way (keyboard, woodblocks, voice in mic). Most participants welcomed the visual stimuli to assist with creating the space journey story and for some, a similar composition was played for the 'free improvisation' task. When asked to describe the three sections of the free improvisation task, the participants referred to the three elements of the space story, i.e. the space pictures. Wigram and Gold (2006) claim that music improvisation methods used in music therapy sessions can facilitate motivation, social interaction, communication skills, in addition to sustaining and developing attention. Perhaps, participants completing the MCTM-II free improvisation task require further clarification or additional user-friendly explanation on what is required of them. Furthermore, it may be worth considering placing the free improvisation task at a different point in the measurement.

Questionnaire and semi-structured interview responses implied that *Conductology* should be used during all music improvisation sessions. This could be due to the excitement and challenge of a novel system in which directives can be effectively understood by many. Further longitudinal research would be worthwhile here.

In the MCTM-II, the musical extensiveness responses were noteworthy. Some of the study's participants repeatedly played a melodic pattern. It is common for those with ID to

consistently repeat tasks or activities as most like routine as reassurance and comfort. It could be contended that the quality of a response, in terms of creativity levels, is not associated to its duration. It is therefore worth reconsidering including this measure or incorporating a cut-off point to any further MCTM- II administered to persons with ID.

The MCTM-II can be administered to children from five to ten years old; however, with regular correspondence with the Test's author, Peter Webster, the decision to proceed with this test to measure creative thinking in music would be suitable and appropriate, if slight changes were made (Appendix Jii). Perhaps the criteria for assessing the aspects of musical syntax was misjudged in terms of what might be customary for participants with ID. A further difficulty which became evident during testing was the reluctance for many of the participants to use their voice in the microphone. Although this did improve in the post-test stage, particularly with intervention group participants (Appendix Q, ex.14, 15, 16), it was a problematic exercise. Many non-western civilizations incorporate singing into their everyday activities, unlike western society, where vocal expression is restrained (Blacking, 1973). This reluctance was surprising as participants regularly took part in choral activities and vocal ensembles. Perhaps this disinclination could have emerged because the participant was expected to vocalize in a solo capacity or use the microphone to express themselves vocally in an unrehearsed manner. Usually, vocal activities were undertaken in a group format where the participant felt secure and protected. Only a small number of participants have had experience or desire in solo singing/vocalization. However, the participants' interest and desire to experiment with the other available instruments may have been more attractive to them. This may be a noteworthy area for subsequent research.

7.4 Conclusions

According to many researchers, students with disabilities are less likely to be included in music education practices as equal to their peers (Matthews, 2015; Darrow, 2014; Dobbs, 2012) let alone considered as future music professionals (Laes & Schmidt, 2016).

7.4.1 Key Findings

The findings affirmed by the current study can be summarised as follows:

Problem:

- Existing music improvisation practices for ID musicians are largely therapeutic and process-orientated
- A small number of gesture-based systems for use in real-time music improvisation exist, however, are inappropriate for ID musicians due to high-level complexity
- Very little attention has been given to participatory practice-based innovative approaches

Solution:

- An original gesture system, *Conductology*, created, developed, refined, and tested

Innovation:

- The study employed an innovative, participatory practice-based approach
- The study used a hybrid assessment tool to examine the effect of *Conductology* on participants' musical extensiveness, flexibility, originality, syntax, and overall quality of output

To justify the contribution of this research study to the larger field of music improvisation and ID, I argue that music improvisation interventions with the aim of enhancing creative thinking in music and raising quality of output have been neglected. I have aimed to address the need for challenging ideas, discourses and conceptualizations within music improvisation practices and ID through: participatory-led practice-based research; an original co-created, innovative and significant intervention that enhances creative thinking in music and raises quality of output; and a robust hybridized measurement and assessment tool. For music improvisation practices with ID persons, participation is not enough. These practices must entail purposeful and realistic yet challenging processes that will enhance music creativity and skills. Furthermore, these practices must include risk-taking, communication, and fostering of ideas, in a positive, familiar, participant-led environment. I believe that music improvisation practices with ID persons demand new thinking, more challenge, and original interventions that demonstrate significant impact to facilitate the disruption of the passive and sometimes ineffective structures that currently dominate the ID field.

ID musicians

As previously stated in the literature review, ID musicians do not get the same opportunities as their peers. They continue to be a neglected population who face social inclusion challenges in addition to barriers to learning. The current study has demonstrated that ID musicians have the potential and stamina to be involved in an innovative, original, and impactful co-created music improvisation system that not only assists in enhancing creative thinking in music and raising quality of output but also heightens confidence, self-esteem, self-efficacy, and creativity, and develops a range of skills including music, social,

communication and turn taking. The current study has demonstrated that ID musicians can acquire the knowledge and skills that are essential to high quality creative thinking and output.

Innovative, participatory and hybrid design methodology

ID musicians were at the centre of this participatory practiced-based study. The co-creators collaborated, co-created, evaluated, developed, and refined an appropriate and effective original gesture system for use in real-time music. Placing ID musicians as prominent innovators is largely neglected in research. This study presents ID musicians at the forefront of co-creation and participation in an innovative invention which has demonstrated significant results. Furthermore, the author's fusion design MCATM has yielded compelling data on ID musicians creative thinking in music and quality of their improvisations.

Music improvisation

Music improvisation is widely regarded as important in the ID field. It often places importance on the process rather than the product. This study has shown that both process and product are critical to enhancing musical extensiveness, flexibility, originality, and syntax, and raising the quality of output. Moreover, by implementing a participatory approach with appropriate challenges, this study has demonstrated that novel empirical inventions can have significant effects. Perhaps it is time to re-evaluate and renovate existing music improvisation practices and move towards creative, collaborative, challenging and novel systems like *Conductology* that place ID musicians at the core.

7.5 Future Research

The possibilities for future research in this area are extensive. Further development of the original gesture system could be explored, where consolidated music knowledge may lead to further music directive challenges. It could be possible to investigate the effects of *Conductology* on certain individuals within the general ID group, for example, autism, global developmental delay, Down's syndrome, and perhaps within a different age range. A further study might look for the effects of *Conductology* as a cross disciplinary intervention. Applying *Conductology* in different music environments, such as inclusive ensemble groups and orchestras, as well as early years music, teacher training, university modules, and mainstream music students are also noteworthy areas for further investigation.

The author plans to publish papers and speak at relevant conferences with the co-creators. Several schools, colleges and organisations have asked the author to demonstrate the system.

Conductology, a model based on creativity and quality, can open new teaching and learning perspectives. It is the author's hope to further train the co-creators as *Conductology* 'generals', by designing an accredited training course specifically for ID musicians which will give them a platform to train others in this innovative and highly accessible system. The author also hopes to develop *Conductology* education programmes as well as workbook manuals and teacher/facilitator certification masterclasses. This is to ensure a high level of proficiency.

It frequently takes more exertion to contain creativity, talent, and innovation than it does to free it. I recommend further innovative research which will continue to release and promote

the abilities, talents and creativity of this marginalised group and align them on an equal par with non-ID musicians.

‘...Fail, try again, fail better, succeed, achieve, FLY...’

Professor Lizbeth Goodman

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