A critical reflection of how Music Technology can enhance and develop engagement for pupils within an SEND provision

PE7914: Examining Professional Practice

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CONTENTS

1. Glossary

SEND – Special Education Needs and Disability

PMLD – Profound and Multiple Learning Difficulties

SLD – Severe Learning Difficulties

MLD – Moderate Learning Difficulties

MT – Music Technology

ICT – Information and Communication Technology

CPD – Continuing Professional Development

SDIP – School Development and Improvement Plan

MIDI – Musical Instrument Digital Interface

DAW - Digital Audio Workstation

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2. Introduction

Context

I am the subject leader for Media and Music Technology in a large SEND school consisting of pupils (ranging from 3-19 years of age) with a comprehensive range of additional needs. These needs include both physical and cognitive needs, including global delay, dyslexia, dyspraxia, autism and Asperger's syndrome amongst others. Pupils are further categorised according to their needs and the school supports pupils who fall under the categories of PMLD (profound and multiple learning disabilities, SLD (severe learning disabilities) and MLD (moderate learning difficulties).

For the last two years I have been able to focus on the subject of Media and Music Technology as I now explicitly teach these subjects across the school to a wide range of pupils with a broad spectrum of needs. I have been fully supported by my school to develop my own subject knowledge of the use and application of Musical technologies in SEND provisions including both the leading, attending and participating in a variety of Continuing Professional Development (CPD) opportunities. This has included becoming a stakeholder in an action research project at a neighbouring University and developing practical skills work at schools within the local teaching school alliance. My professional focus has been carefully developed through professional discussions with the schools Senior Management Team. There is a clear understanding that my own CPD should support, and have an impact, on the whole school objective for this academic year as detailed in the School Development and Improvement Plan (SDIP). The whole school target is:

'To further improve the use of ICT within teaching and learning, including e-Safety, in order to secure the best possible outcomes for pupils'

My own personal appraisal targets have also been clearly defined and are relevant to this assignment as they reinforce my rationale for the project.

'To enhance the use of music technology to support a variety of areas of learning across the school'

'To prepare for and establish the Open Up Orchestra 2018-2019'

Rationale

This assignment aims to explore how Music Technology can be used within an SEND setting to enable access to a greater range of music making devices, resources and systems and how pupil engagement can be increased and developed through its use. My professional appraisal targets come from observations and reflections made when I was asked to teach Music to MLD pupils in Year 9, 10 and 11 where I noticed a lack of engagement and enthusiasm for both the content and delivery of music at that time. Several pupils were able to articulate their thoughts about their music lessons verbally and shared that they found some of the material taught to be 'patronising' and very similar to learning they had experienced in either the Primary phase at the school or in a previous mainstream setting. Other pupils mentioned that playing traditional percussion instruments was 'getting boring' and that it was 'too easy' (despite that, for some, physically this is not always the case and that there is technical progression to be had within the use of percussion). When talking to pupils about their musical preferences there appeared to be a broad stylistic gap between what was being taught at school and the music pupils *chose* to listen to at home. Having taught several MLD classes for concurrent years it had become clear, through on-going dialogue, that the majority of pupils enjoyed popular music in their free time with many of these pupils vocalising a desire to emulate similar sounds and beats. Dance, rap and hip-hop were musical genres of particular interest to a large percentage of this MLD demographic and ones which, when considering potential pupil composition, can be poorly resourced for in educational settings. Many of the pupils demonstrated an awareness of Music Technology but only a notable minority had it to make music of their preferred genre. I felt motivated to explore whether enabling access to Music Technology would promote pupil engagement and if so, to what extent.

My key questions for this assignment are as follows:

Key Questions

1. What is Music Technology and what does it look like in an SEND provision?
2. What are the potential benefits of using Music Technology within an SEND provision?
3. What are the barriers to using Music Technology with MLD pupils?
4. How can Music Technology be used to increase pupil engagement in learning?

I was approached to participate alongside a research team at Bournemouth University who had secured funding for an action research project entitled '**Increasing access to Music: Music Technology in Special Educational Needs (SEN) settings'.** The project aims were:

1. To support and broaden the use of Music Technology in SEN/D schools.
2. To increase inclusivity of Music Technology in SEN settings
3. To help develop the skill base of staff delivering sessions that requires Music Technology in their provision.
4. To develop a series of software and hardware technologies that are easy to use and customisable to individual student's needs (Davis, 2018)

I wished to consider whether the experiences encountered as part of this research project could help me to explore the key questions within this assignment. As a stakeholder in the research project, I was given the opportunity to work alongside a research assistant (with significant subject knowledge as a sound engineer) in my school, with a focus group comprising of pupils I had identified within MLD classes. This research project provided a platform in which to explore technology collectively with the pupils, teacher(s) and engineer; make observations and adaptations whilst collectively designing a new informed pedagogy to support the needs of our learners.

Success Criteria

By writing this assignment I aim to:

- Gain clarity and self-assurance in the exploration and testing of musical technologies with SEND pupils, beyond the initial assessment.

- To critically reflect on outcomes of experiences testing musical technologies and analyse their role in increasing engagement in the classroom and beyond.

- To use the reflections and research within this assignment to help inform and formulate future plans for an inclusive SEN orchestra which is due to begin in September 2018.

3. What is Music Technology and what does it look like in an SEND provision?

Perceptions of Music Technology in Education

Defining Music Technology in education is acknowledged to be a challenge (Brockhouse & Swingler, 2009, Farrimond *et al* 2011) and such definitions are broad. Definitions may differ depending on the role of the learning facilitator, with a music therapist considering anything powered electronically as being a 'technology' whereas a music teacher working within a mainstream setting may view Music Technology (MT) as the use of software packages, providing pupils with the means to arrange pre-recorded sounds and loops and/or record sounds through sampling (Brockhouse & Swingler, 2001). It has been identified that in special education music technology is usually understood to involve interfaces of various kinds (e.g. switches, movement sensors) which enable pupils to create and articulate an increasingly wide variety of musical sounds (Brockhouse and Swingler, 2001). However, my experiences have shown me that, in larger SEND provisions, Music Technology does not *always* look this way. This assignment will also argue that the use of Music Technology is less documented and possibly less understood when considering its benefits for those who attend a SEND school but fall under the demographic of having moderate learning difficulties (MLD). Farrimond *et al* explores the complexities of careful selection of MT when considering an individual's cognitive or physical need(s) and states that:

> For those whose barriers to participation are more physical than cognitive, the emphasis of provision, whilst primarily meeting the creative preferences of the musician, should aim to maximise individual physical abilities. For musicians that experience more cognitive barriers, the provision of musical tools and interfaces that are matched or adaptable to individual cognitive ability might warrant more primacy. (Farrimond *et al*, 2011:5)

Therefore, perhaps it is reasonable to suggest that for those with MLD, using MT may not always involve the use of physical switches and/or sensors but instead the use of adaptable technologies that are in line with a pupils cognitive ability have greater potential to breed more effective results in terms of engagement, enjoyment and increased motivation in the music making process.

'School Music' and its relationship with disengagement

Studies undertaken regarding pupils motivation to learn music within the school environment indicate that pupils' perception regarding the value of the subject tends to decrease throughout secondary education when compared to other subjects (Sanz & Orbea, 2014). Hallam (2002) suggests that there is a lack of research which explores pupil engagement in music but acknowledges that there is a wealth of environmental and personal factors to consider. This chapter attempts to analyse some of the issues which could potentially lead to pupil disengagement.

Campbell _et al_ researched pupil perspectives regarding their music education. Findings from this study highlighted that some pupils found the classes 'boring', and reported that the music being selected to study was often not of a genre or style preferred by the pupil(s). This view is supported by initial discussions undertaken with the focus group pupils where it became clear that they also felt that 'school music' and 'other music' to be two separate entities and had contrasting views of these experiences. The term 'school music' refers to the musical experiences of learners within the educational context of school, but is also a term which I believe is loaded with negative connotations. Pupils used words such as 'traditional', 'percussion based' and 'old' to describe 'school music', but were animated and enthused when talking about their musical experiences outside of the school, using vocabulary such as 'fresh' and 'exciting' to describe contemporary music of their liking. Campbell _et al_ (2007:235) claims that music teachers would gain great insight from listening to and acting on the expressed values of pupils, furthering to establish a sustainable presence of music. He continues to suggest that this will in turn, offer greater development to the music curriculum itself.

When the focus group were asked whether they had considered making music of their preferred genre(s) at school they was a notable rise in their levels of motivation and engagement, prompting questions about how this might be achieved within their setting. According to Sanz and Orbea (2014), by the teacher reflecting the musical tastes of the students, engagement, participation and sustainable interest has the potential to increase engagement. North _et al_ (2000:256) echoes this argument suggesting that practitioners should 'focus on the disjunction between music at school and music at home' and that this discrepancy widens _rapidly_ during early adolescence. Rudduck _et al_ (2000) urges teachers to take into account pupil perspective and experience on a deeper level and highlights the potential for the discovery of new experiences and learning pathways for both the pupil and practitioner. Saunders (2010:3) provides cautionary insight when suggesting that there can be a risk of pupils feeling as though their 'personal territory has been invaded' when integrating pupils own choice of music into their 'school music' experience and I was certainly mindful of this

when beginning work with our focus group. However, our focus group pupils reported that they appreciated their preferences being integrated into their musical learning at school and were enthused by the possibility of making music that emulated the sounds that resonated with them. In truth, this was the reaction I had predicted. As a music teacher I have believed that popular music of social relevance to the pupil was an obvious 'hook' but that engagement often remained on a passive and somewhat superficial level – listening to and discussing why a particular style of genre resonates personally. Whilst this initial dialogue serves as a good introduction to deeper learning, I had long felt unequipped to support pupils in composing music of their preferred style due to lack of resources, technical understanding and how this fits within what we have learned to know as 'school music. Hanley and Oehler (2009: 2) state that 'If educators simply use popular music as an attention-grabber and fail to engage students in the music itself, a student's connections remain limited'. Moving past this initial peak of interest is paramount to developing a deeper, self-sustaining involvement with music, and certainly vital if pupils are going to move from the position of listener towards that of musician.

Saunders (2010) believes that some teachers may feel reluctant to integrate a pupil's choice of music (genre) into their music lessons, especially when unfamiliar to them. Saunders suggests that one reason for reluctance could be that teachers usually feel most comfortable teaching the music they are most familiar with and importantly, most confident in delivering. Another reason could be that pupil ownership over specific musical genres has the potential to make some practitioners feel both professionally and personally insecure. Love (1991:46) states, 'For most teachers, the biggest question about popular music is not why should I teach it, but how should I teach it' and this is certainly still a question of value and one that warrants further research and investigation in education today. This idea will be explored in greater detail in the chapter 'what are the barriers to using Music Technology with MLD pupils'.

Prior to introducing MT to the focus group, it seemed relevant to further explore pupil feedback regarding their personal experiences of music in education. Each pupil within the focus group had a different pathway through education before joining the Senior Phase of our SEND provision. Several pupils had previously been in mainstream Primary schools, one pupil had recently moved from a Secondary mainstream provision and one had moved up through our SEND provision, beginning in Key Stage 1. Through discussion it became evident that those who had previously attended a mainstream provision had a degree of negative association with the act of reading traditional music notation. Hunt (2004) and Richmond *et al* (2016) share the belief that there is a certain amount of negative association that comes with specific, and often more formal, 'types' of music and that the

more disciplined methods of learning (sometimes incorporating traditionally 'technical' aspects of music, such as reading music) can be off-putting to young people which consequently leads to disengagement. There is also evidence to suggest that the technical complexity of the Western music notational system is believed to have potential to restrict an individual's meaningful engagement with music (McLachlan *et al* 2011, Hayes 2016). Gaare (1997) and Sloboda (2005) (as cited in Richmond, 2016) have all argued that the detailed symbolic nature of Western notation requires considerable cognitive processing and working memory to learn and read music. It may be fair to suggest that this should be considered when exploring the potential challenges this may present for learners with a profile of SEND. One pupil within the focus group expressed that he had experienced feelings of frustration when learning to read music and had consequently dismissed his potential to make music of any kind, believing that understanding the Western music notational system was fundamental to his future success in the subject. It may be of some importance to consider the prior educational experiences of learners in our care and consider how to navigate through self-assumptions and barriers built on negative experience.

4. What are the potential benefits of using Music Technology within an SEND provision?

Musical identity and self-efficacy

Saunders *et al* (2010:75-76) explores the idea that having a desire to 'demonstrate a personal relationship with music or identity in music would seem more likely to foster access and engagement and through this, creative behaviours, processes and outputs'. All pupils within the focus group demonstrated the initial desire to engage with previously unknown Music Technologies and were curious as to how they could be used to make music of their preferred genre. This movement from 'indifference to interest' is a shift identified by Ellis (cited within Brockhouse and Swingler 2009) who observed, and later identified 'shifts' of progression when observing PMLD pupils experiences when using MT. The subjects using the MT in these videotaped examples were given the opportunity to take independent control of both the instrument and learning situation where possible and these outcomes were not pre-prescribed, but stemmed from genuine internal motivation on the part of the participant (Ellis, 1997). Many of these shifts would be those observed by myself and the research team when working with our MLD focus group and will be referred to throughout this assignment.

Lamont (2011) explains that different types of motivation come into play at different times when beginning to engage in the practise of music with extrinsic motivation (involving external rewards and the verbal praise of others) being more prominent during the early stages and intrinsic motivation taking a larger role later on once a stronger self-concept and ability to reward oneself have been more strongly established. Richmond (2016) believes there are key ingredients which are assimilated by an individual (and in a similar order) to which sustainable motivation is built. Richmond shares his belief that once a sound *base* of self-efficacy has been established, intrinsic motivation followed by enjoyment can establish both longevity and sustained interest to pursue music making. If these ingredients are in place there is potential for immersive states of music which are both enjoyable and also progressive in the way that thought patterns and ways of thinking can be enhanced and progressed.

When considering self-efficacy, it may be worth taking into consideration the potential effect that the views of others could have on an individual's sense of self. The 'Social Model of Disability' (Scope: 2013) was designed to empower disabled people to challenge society when removing barriers to access. Whilst the UK model has been shown to have had a notable impact on political change, with it 'succeeding in tackling discriminatory social structures and demonstrating the need for civil rights legislation' (Barnes and Mercer, 1996:55) there are those (Owens, 2014) that believe

that the model is an out-dated ideology which needs to be reconsidered. MacDonald & Miell (2002:169) state that this model suggests 'the degree to which any impairment impinges on everyday life depends *more* on the physical context and the views and reactions of others with whom the person is interacting than on the nature of the impairment itself'. The perception of others is notable when considering one focus pupil in particular who shared an experience whereby a family member had said that he was unlikely to become a 'real musician' as he attends an SEND school where 'proper' music is not taught. The pupil was able to reflect on this conversation and was able to understand how this had affected his view of self and self-efficacy in terms of his engagement and motivation in the subject of music. Despite having a strong interest in MT, he had never been encouraged to pursue it, neither at home nor school. It may be worth considering the research of Richmond (2016:145) who states that 'engagement is not a simple unitary construct' but one that includes both cognitive and emotional factors and that pupils he encountered within his study had opportunities to reflect on their own levels of intrinsic motivation, self-efficacy and enjoyment. Ensuring pupils had opportunities to reflect on these aspects of their learning experience with MT would become a vital element of the research project.

The social and emotional benefits of an engaging music education

At this point within the assignment it seems relevant to critically reflect upon the social and emotional shifts that occurred within the MLD focus group when beginning to engage with MT as part of the research project. Hallam (2010) states that music making experiences have a wide range of health, cognitive, educational and social benefits and to a degree; some of those benefits were observed within the focus group.

When presented with the Soundbeam 6, and the Digital Audio Workstation (DAW), in this instance Magix Music Maker Premium there was in instant rise in engagement for all focus pupils (more detailed information regarding these technologies can be found within the appendix of this assignment). These technologies were introduced to the pupils by the research assistant who had already undertaken training on their use and how they could be adapted to further meet the needs of pupils. My role was that of facilitator, using my existing knowledge of pupils needs, abilities and interests in order to ascertain which technology (if any) would best suit each pupil within the group. The new technologies were quickly and practically explored by pupils with little intervention from staff and it is important to highlight the notable rise in conversation and communication between focus group members. Pupils were keen to show one another what they had discovered and what sounds they were able to make and without prompting, pupils began to support one another in using some of the more complex features of the MT. One pupil stated that he felt like he could

make music in this way for a 'long time' which he felt was unlike how he sometimes felt when involved in other school based learning experiences. Gazziniga (2008) explores this idea when investigating how interest can lead to increased motivation which in turn produces *sustained attention*. This increased focus is then transferable to other areas of learning. These areas include the skills involved in geometrical representation, the acquisition of reading skills and sequence learning. Although the pupil may have been unaware of these benefits, I felt hopeful that as a by-product of this *sustained attention* these benefits would become prevalent far beyond the sphere of 'school music'.

One pupil talked about how he could use the sounds he was creating to support his learning in other curriculum areas which prompted the facilitation of an idea that the pupils work within the research project could be integrated into a whole school project; in this instance, creating a modern remix of classic songs from Broadway Musicals for the upcoming Senior Phase Performance. Here, other progressive 'shifts' were observed as previously cited by Ellis (cited within Brockhouse and Swingler 2009). The use of MT within the focus group was moving from 'random to purposeful' as they could see their contribution within a larger context. Pupils' work within the research project also had potential to now move from 'isolated to integrated' as each pupil began to find agreed roles within the group, using the variety of MT available to work collaboratively. With time and continued practise using the MT, pupils' technical operation of the equipment was becoming increasingly refined and the shift from 'exploratory to preconceived' was observed. Several pupils were vocalising their intentions and consequently technically executing these actions using the MT. Research by Gazziniga (2008) suggests strong links between musical training, practise and repetition; and its influence on being able to manipulate information in both the working and long term memory with greater fluidity and accuracy. This would certainly be an interesting avenue for future research and enquiry.

Merrick (2018:314) states that 'as educators in a digital world, it is essential that we continually remodel our learning intentions and assessment processes to accommodate the creative and collaborative approaches to learning that are emerging almost daily'. He continues to advocate the idea of 'shifting roles' and enabling pupils to bring their knowledge of technology into the classroom, demonstrating that it is valued. This was certainly evident during the research project when one pupil brought in a MIDI keyboard from home and suggested that it could be used in conjunction with the DAW we were learning to use within the research project. Moving from the role of teacher to that of facilitator was not one that was preconceived, but occurred organically and without resistance on my part. Being flexible in our approach as researchers enabled potentially rich and

unpredicted possibilities to occur which was exciting and motivating to both practitioner(s) and pupils.

It may be fair to suggest that pupils are often empowered and further motivated when they have taken a role in the organisation, design and execution of their musical experience within school. Ross (1995:196) holds the belief that 'when pupils are allowed to organise their own learning they usually make out pretty well' and that [pupils] 'already know the kind of sound they are interested in'. They listen to their mentors and try to emulate them, running into problems of sound production and control, figuring their own way through them...' This is certainly true in this case of this research project in the sense that pupils took on a greater role within technical problem solving aspects of music making with MT than I had possibly anticipated. However, this may not have occurred if the technology had not been sufficiently modelled by the engineer during initial project stages. Renwick & Reeve (2018) suggest guidance be given to practitioners who wish to heighten and increase pupils' feelings of freedom and choice. Thus, further sustaining and supporting the motivation of pupils. Guidance includes providing a rationale for the task, or research project and suggesting its value. Pupils' motivation to continue engaging with MT during the course of the research project improved upon knowing that their product would have a wider purpose and be heard by an audience comprising of parents, carers and peers. After several weeks of engaging in practical work using both the Soundbeam and DAW, there were clear roles and identities within the focus group beginning to emerge and this is potentially a consequence of having a degree of autonomy over the design of their learning and our collective research experience.

States of creative experience

It could be suggested that the use of MT with our focus group was successful in enabling pupils to access equipment and technologies that were previously unknown to them, providing practical skills and guidance in terms of its use and introducing a context in which their work could be showcased. However, the very nature of MT is also worthy of further discussion. Merrick (2018) asserts that technologies often cater for a wide range of learning styles, containing elements of audio, visual and kinaesthetic experience. For our focus group, which comprised of pupils with a range of different learning styles; the means to adapt technologies to meet their own preferences was hugely beneficial. These adaptations could be made using the addition of MIDI instruments such as keyboards to use with in conjunction with the DAW, the removal of certain features from the visual workstation on our selected software or, in the context of the Soundbeam, having the means to remove or add switches as well as creating a personalised sound sets. One pupil within the focus group said he felt a sense of ownership regarding the organisation of his personalised sound set on

the Soundbeam, sharing that he choose each different instrument for a specific reason and that playing the instrument made him feel free – forgetting where he was in time and place. Csıkszentmihalyi (cited within Pelliegrino, 2011:80) examined hundreds of 'artists, athletes, musicians, chess masters, and surgeons ...people who seemed to spend their time in precisely those activities they preferred' and the findings of these studies formed his 'theory of flow'. This 'flow experience' is described as almost 'magical'. Pellegrino's critique of Csıkszentmihalyi describes flow as:

> Flow is a psychological state of intense interest, a time when someone becomes fully engaged in a challenging activity that causes them to lose sense of time and self and results in feeling of satisfaction and well-being. In this state, concentration is so intense that there is no attention left to think about anything irrelevant, or to worry about problems. Self-consciousness disappears, and the sense of time becomes distorted. (Pellegrino, 2011: 80)

Observations of the MLD focus group indicated that whilst using different forms of MT there were moments whereby pupils entered this 'flow' like state. One pupil who is often conscious of how he may be perceived by others and sometimes lacks belief in his abilities to compose music shared that he felt accomplished at the end of the session, having improvised, rehearsed and then recorded a phrase of music using the Soundbeam. This reduction or potential eradication of self-consciousness is appealing when considering building self-efficacy in pupils and increasing their willingness to engage in the music making process. Studies with PMLD pupils have also identified a similar immerse state called 'aesthetic resonance' when observing their musical experience when using MT – in this case, the Soundbeam technology. Ellis (cited within Swingler, 1998:2) describes 'aesthetic resonance' as the moment in which [the pupil] 'achieves total control and expression in sound after a period of intense exploration, discovery and creation'. The state described as a product of this work could be likened to that of 'flow state' and it is one I strive to obtain with the pupils I teach.

5. __What are the barriers to using Musical Technology with MLD pupils__

Magee (2014) claims that technology can be a big attraction for clients or pupils who are difficult to engage. This view is echoed by Hunt *et al* (2004) who shares the experience of a Yorkshire based music therapist; the use of a music computer was the only resource that engaged the pupil to a level whereby they wished to stay in the room, despite the environment containing a wide range of acoustic instruments. However, professional experience and research indicates that there are a range of potential barriers to consider before embedding MT into the SEND context. I will endeavour to explore these barriers within this section of the assignment.

Logistics

On a practical and logistical level, the space in which music can be created needs to be considered. The research of Farrimond *et al* (2001:7) states that a 'sizeable minority of schools [were] lacking a dedicated music room.' During the academic year in which this project took place, there was no dedicated music room in our setting due to building work. Instead, we worked within a small meeting room with limited access to physical instruments. This made it difficult to further explore pupils' ideas regarding technical aspects of their music making. Likewise, the pupils were initially reticent to explore ideas in a space which was not built for the purpose of creativity. This is perhaps understandable as the space itself felt like it had another use which was altogether more formal. In the context of the research project, the issue of space was relatively minor when compared to the complexities of issues such as training and subject knowledge.

Selecting appropriate Music Technology

When considering the instrument choice itself, Swingler (Director of 'Soundbeam') explains that traditional, conventional instruments are usually designed for those with 'average or above-average physical, mental and sensory functioning' and 'the time gap between musical imagination and musical realisation takes years to develop' (1998:7). He continues to suggest that MT can significantly reduce this gap as the focus moves from the technical skills of instrumentation towards the freedom of improvisation. It could be argued that this freedom could potentially enhance engagement. However, financial constraints can also be considered a barrier when investing in MT and it remains essential that the technology purchased fits the bespoke needs of the pupil(s). Perhaps understandably, MT with the potential for adaptation proves popular for this reason.

When considering the access needs of pupils, choice of technology can affect potential levels of engagement. Farrimond *et al* (2001:7) describes the choosing of a 'contemporary digital music instrument' as an 'act of self-expression in itself'. When recommending technology to an individual,

Farrimond explains that a deep knowledge of the pupils' musical preferences, needs and abilities is as essential as the working technical knowledge of the MT itself. Magee (2014:84) believes that this comprehensive knowledge of the individual is key and will leave the facilitator better placed to practise 'an evidence-informed way, even in the absence of research evident'. She states that music technology and its use in therapeutic settings must 'stem from client need'. Once this need/needs have been identified a working knowledge of the MT available is essential. I would argue that this is similar for work undertaken within SEND educational settings whereby a balance of technical knowledge and extensive knowledge of pupil need would need to be deployed in order support the learner when learning to use initially unfamiliar MT.

Farrimond *et al* (2001:7) suggests that the music technologies present within schools 'are not being used, possibly owing to a lack of knowledge and training' with parallels also observed within Music Therapy where the majority of music therapists reported that they were 'not aware of how to use music technology in their clinical work'.

Staff development, training and CDP

'As technology continues to develop and a new generation of clinicians that were raised with MP3s and smartphones join the workforce, technology will change the field for everyone. Therefore, keeping apace of changes in technology and understanding the implications of these changes is absolutely crucial to maintaining one's competence as a practitioner'. (Knight & LaGasse, 2012:188)

Research reflects that both Music teachers and Music therapists recognise this need for continuing professional development within the areas of Music and MT. Working within a setting that is part of a teaching school alliance proved valuable to me in providing me with links with schools in the area who were further ahead with their implementation of MT. Training from a neighbouring school enabled me to learn how to use the Soundbeam equipment that was already owned by our school but not being used by *any* current members of staff. This is possibly due to lack of training and subject knowledge. It could be suggested that in some cases, a 'fear, dislike or indifference to technology' on the part of the practitioner creates further barriers which prevents MT being used effectively in both educational and healthcare settings (Farrimond, 2001:7). The integration of new technology in teaching can arguably be daunting; however I question whether the reluctance observed within some practitioners to engage with MT actually lies more within issues surrounding

our pedagogical understanding than in obtaining the technical skills and knowledge required to work with MT. Opportunities to discuss thinking around the integration of MT to support learning in SEND settings with colleagues can be provided in the form of subject specific network meetings or 'hubs'. It is through the participation of professional discussions as part of such network meetings that I have been introduced to new theoretical ideas and examples of practise that illustrate how MT can be used to support learners with a profile of SEND.

6. How can Music Technology be used in increase pupil engagement in learning?

I was introduced to the TPACK model whilst at a recent Music Network Meeting when in conversation with a SEND Music Advisor. This framework resonated when considering the work of our MLD focus group and raised questions for me in terms of where my own knowledge is strongest, and in contrast, where it could be further developed.

Pedagogy: creating a new order of experience

The TPACK model is a conceptual framework for the use of technology in educational contexts. According to Mishra and Koehler (2006: 1017) the framework 'attempts to capture some of the essential qualities of teacher knowledge required for technology integration in teaching, while addressing the multifaceted, and situated nature of this knowledge'.
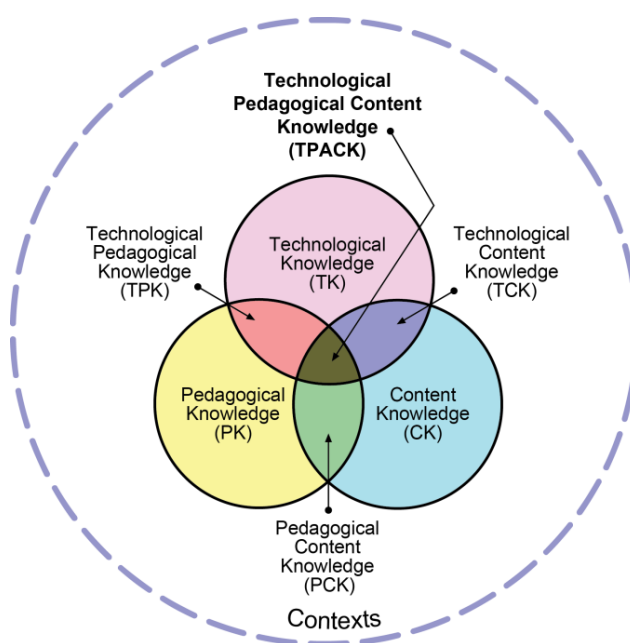

Figure 1 - (tpack, 2012)

The TPACK model illustrates the three main bodies of knowledge that are central to the development of effective teaching when using technology. These areas of knowledge are defined as 'technological', 'content' and 'pedagogy'. One of the key features of this model is the emphasis of the overlap and interrelation between bodies of knowledge. The crossover between pedagogical knowledge and content knowledge highlights the significance of knowing which teaching approaches fit the content being taught, and how these can be arranged to encourage the best possible teaching outcomes (Mishra and Korhler, 2006). Technological content knowledge is the knowledge of the technology itself and the understanding of how teaching might change as a result of its use.

Technological pedagogical content knowledge (TPCK) is an 'emergent form of knowledge that goes beyond all three components'.

> TPCK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones. (Mishra and Korhler, 2006:1029)

To summarise, this model supports the view that 'there is no single technological solution that applies for every teacher, every course, or every view of teaching' (Mishra and Korhler, 2006:1029). Although the successful and effective use of technology in educational settings can be complex, it could be suggested that by taking into account the relationship between the three main bodies of knowledge (technological, pedagogical and content) and deploying these when planning and teaching, shifts in understanding can be created which could ultimately create a new order of experience for both the learner and practitioner. It may be worth considering whether the TPACK model could be of benefit to those undertaking initial teacher training as the overlap between types of knowledge in stimulating rich educational discussion could be beneficial in learning contexts beyond MT.

7. Conclusion

Reviewing the key questions and success criteria

A recurring theme throughout this study is that MT differs considerably between settings and is entirely dependent on the need of the pupil(s). Farrmond *et al* (2001:7) states that 'the most appropriate solutions would be highly dependent on the needs, abilities of each individual musician with no single method being suitable for everyone'. This was a key finding as part of the research project, as the development of software and/or hardware to meet pupils' needs was a project aim. However, our MLD focus pupils did not demonstrate a need for a custom built technology, but instead required an increasing range of opportunities to explore the use of MT within their educational experiences. Consequently, the focus of the project leaned towards that of developing the skill base of staff delivering sessions as this would invariably enable further opportunities for pupils to engage with MT.

Having obtained newly acquired technical knowledge (for both myself and the focus pupils) I was able to observe a variety of benefits derived from using MT, which in turn caused shifts in my contextual and pedagogical thinking. Magee (2014) advised that caution should be taken when considering whether to use technology at all, and that its choice must stem from client need. I made assumptions when I introduced pupils to the variety of MT available, particularly in the case of one pupil who verbalised a wish to use software to create a drum and bass style baseline. I instinctively guided this pupil towards the DAW software, underestimating his physical needs for expression and failing to consider his preferred (kinaesthetic) learning style. After a short period of time, this pupil became somewhat disengaged and gravitated towards the Soundbeam, which was originally designed for pupils with limited physical abilities. However, the Soundbeam by its design requires movement in order to produce sound and can prove useful in reducing levels of anxiety (Magee, 2014). This consequently engaged the pupil in a much more immersive music making experience. States of 'flow' or 'aesthetic resonance', I believe, are possible for all musicians engaged in the process of music making when the conditions to do so have been well considered. The TPACK model is useful when designing such experiences for pupils of all abilities as it encourages links between technical, contextual and pedagogical pockets of knowledge. Through the consideration of these elements, musical composition and performance experiences can enhance creative outputs and foster self-efficacy and assured identify as that of a 'musician'. This feeling of musicianship and identity within a collective can be further nurtured when pupils take on specific roles within the group.

Before deploying MT within an SEND setting it may be fair to advise that financial and logistical issues surrounding space are addressed. The testing of MT during the research project enabled pupils to trial a variety of technologies before investing. As a result of the project, a successful bid for external funding resulted in our provision receiving a grant which in turn enabled us to obtain a site licence for Magix Music Maker (DAW) and the Soundbeam 6 with a range of adaptable features. Adaptability of technology is an area worthy of consideration, especially for pupils within an SEND setting where the range of pupil abilities can be diverse. Ward (2016) suggests that the addition of microphones to explore use of voice can be an avenue to further explore communication. She continues by advocating technology which allows the users to add their own content, consequently gaining greater ownership over instrument design. I am mindful of such suggestions when considering how our MT can be adapted for our wide demographic of pupils, considering the needs of those with SLD or PMLD, with differing needs. When considering the place of MT in within the music curriculum, prior to writing this assignment, I held a belief that MT should be an additional assessment strand within formalised tracking of the music curriculum. However, my own thinking has moved towards an understanding that MT is not a separate entity, but is instead essentially another instrument or tool in enabling pupils to make progress in a way that is engaging, enjoyable and potentially relevant to their own (and often emerging) musical identities. For the purpose of the action research project I focused purely on increasing pupil engagement, motivation and sustained interest without the need for formalised 'tracking', but feel it is worth considering when teaching in whole class contexts.

The benefits of collective music making and the potential to use MT to aid inclusivity and engagement have been instrumental in my thinking when considering the establishment of a school orchestra in the upcoming academic year. Open Up Orchestra is a project whereby pupils of all ages and abilities have the opportunity to participate in an inclusive orchestra within our SEND setting. The gradual build up from one to one tuition, to small groups and eventually rehearsing as an ensemble is a three year process which begins with instrument selection. Having engaged in the research project and this assignment, I am increasingly aware that technology is simply another resource within the choice of instruments. It would be unwise to make the assumption that MT will automatically raise engagement.

Future implications of the research

I am increasingly aware of the power in allowing pupils to have an element of control regarding the design of the learning experience. I appreciate there is a balance to be obtained in terms of learning content and the roles of those within it. During the research project, I found that my role of MT practitioner is one which changed over time; moving from the position of 'teacher' (contributing teaching knowledge, pupil knowledge) to that of 'instructor' (providing technical knowledge) to that of facilitator. Having set a context for which their MT *product* could be shared with others in the form of a performance was a strong motivator and one which I will consider when designing future learning experiences.

One of the largest barriers I have encountered within both the research project, my own day to day practice and within the academic research itself is the lack of staff knowledge and CPD opportunities when using MT as a teaching tool. A teacher or practitioners' reluctance to engage with MT could be a consequence of a lack of confidence regarding their technical and pedagogical knowledge. I would argue that most teachers understand their school context well, but the other two areas (as identified on the TPACK model) are worthy of time spent developing further. Educators must first initially be willing to engage with new technologies (Baduley et al, 2009) followed by the support embedded within rich CPD opportunities. It is at local music network meetings, hub meetings, and through research project engagement that I have met likeminded practitioners whose technical knowledge is far above my own. Consequently, opportunities to observe good practice, and time to acquire new skills continue to help me become an increasingly skilled practitioner. Professional dialogue with colleagues and experts in the field of MT made me conscious of the TPACK model which, when considering the use of MT, has provided me with increased clarity and confidence. The model provokes reflection as to areas which need to be further considered for the technology itself to have an impact, putting the pupil's needs first. Sometimes the area needing the most development relies on action on behalf of the practitioner and this can be obtained within a supportive professional network.

Using MT in a whole class context is something I was determined to achieve, however, this research has encouraged me to be more mindful as to *how I think* when planning the potential integration of MT within my teaching. I have gained a greater understanding that MT is another choice of instrument, and one that is worthy of exploration if it serves a true purpose for the pupil. Considering the establishment of the Open Up Orchestra, I am mindful of such demands and will use the TPACK model to structure my thinking regarding each potential participant, especially when initially exploring instrument choice. A thread running throughout much of my own teaching practise

has been that I can motivate pupils through demonstrating enthusiasm for the subject of MT and that, through a dynamic teaching style; I could be successful in further motivating and engaging pupils. Whilst this might be true to an extent, there is the danger that such an assumption can leave the weight of responsibility fully on the practitioner (Brookfield, 2017). Through this research I am further aware of the wider social conditions that make ideas such as engagement so complex. I would like to believe that, in terms of future practise, that I will not see lack of engagement as a personal reflection of my teaching style, effort or energies but rather look at the complete 'picture' for the pupil, considering areas of knowledge that demand further investigation. Feeling better placed in knowing *where* to obtain knowledge, whether technological, pedagogical or contextual continues to support me in feeling more confident when supporting pupils who are attempting to, or are already engaging in the subject of music.

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9. Appendix

Current popular music technologies in education

Soundbeam

Soundbeam is an instrument in the family of MT, often used with pupils or clients with physical challenges (Magee, 2014). The Soundbeam uses sensors to detect movement (of varying size) and translates these into sounds. Pre-loaded banks of sounds span a range of genres, providing pupils with opportunities to explore soundscapes and engage in the improvisation process.

Ipad Apps

Hillier *et al* (2016) explains that MT apps on Ipads and tablets have logistical benefits for those with physical needs due to their versatility in being able to be laid flat, propped up or viewed from a variety of angles. The potential to have multiple users using the device simultaneously also supports collaborative working thus encouraging social interaction. Potential Apps for use include 'Garageband' which allows the user to create multiple tracks layers of sounds, using additional MIDI instruments or pre-recorded loops. 'Launchpad' is a predominantly loop based application which provides a vast bank of 'loops' from a wide range of genres.

DAW's and loop based software

Digital Audio Workstations (DAW) vary in their complexity of interface and breadth of pre-recorded loops available to the user. Magix Music Maker is a largely loop based piece of software, but has the potential to incorporate MIDI instruments (such as keyboards, or even the Soundbeam) as well as video. Being able to customise the complexity of the interface itself makes Magix an attractive option to those working within SEND settings.