THINKING ACROSS MUSIC LEARNING CONTEXTS:

DEVELOPING A NEW RESEARCH METHODOLOGY FRAMEWORK BY WHICH TO RETROSPECTIVELY EXAMINE MUSICIANS' CUMULATIVE LEARNING STRATEGIES

Steven Loomes
B. Mus (Deans Scholar)

A thesis submitted to Western Sydney University
in partial fulfilment of the requirements for the degree of
Master of Research

2019

Statement of Authentication

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Steven Loomes

Acknowledgements

There are many people that have encouraged and inspired me over the course of the last two years. Without these people, I most certainly would not have managed to complete this work at all.

Thank you to my supervisor, Diana Blom. Your gentle guidance and direction to what must seem a dramatic sequence of "I don't know what I'm doing" instances were thoroughly appreciated. Thank you for pushing me to present my ideas at the International Symposium on Performance Science - I learnt more about myself in that week than I could ever have imagined.

To Alex Norman and Jack Tsonis, the most incredible lecturers. The ways in which you push us to strive for greatness in our endeavours is inspiring. I read your feedback regarding my first assessment task every day before commencing my work.

To each of the participants who gave their time to help a stranger, and the few who helped a friend, thank you. I'm glad you found personal benefits in participating.

Thank you to the legends at the GRS - the sanity-saving, prank-pulling, idea-inspiring friends without whom I would have felt so alone.

To James Arvanitakis, who helped me solve a logistical nightmare and ended unnecessarily long commutes, I spent every minute saved either at my desk or getting some much-needed exercise. Thank you.

Thank you to Heather Loomes – my unpaid, untrained editor who read the current thesis for Standards D and E of the Australian Standards for Editing Practice (2013).

And thank you, most of all, to my wonderful wife. Kassee, you are, without a doubt, the biggest reason I did not give up. You were my sounding board when I needed to talk through ideas, my amanuensis when ideas arrived at inopportune times, and the artist behind the image that represents my whole thesis. My appreciation of your patient encouragement and support is beyond what words can express.

Abstract

Musicians often learn music from combinations of available music learning contexts (MLCs). Little is understood about how musicians relate content from one MLC to content from another/others to form cohesive understandings of musical concepts. Research into the ways in which we combine learning from multiple MLCs is required, but first, groundwork to develop an appropriate methodology to investigate musicians' cumulative learning strategies is necessary. This propaedeutic study, framed by cumulative learning theory, implements constructivist grounded theory to refine a research framework for the retrospective investigation of music learning across contexts. Central to this framework is the use of mind maps and interviews as key forms of data collection. This study seeks the optimal combination of these two data sources to provide insights into the ways in which musicians relate content from one MLC to content from another/others. The research framework developed may be useful for application across a wide range of disciplines and, in music, understanding the learning strategies of musicians may facilitate further work into how to improve formal institutions' curricula as well as teaching strategies employed in various MLCs.

Table of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER 1

INTRODUCTION

The present chapter explores the background of the study, the study's aims, research questions and objectives. A brief exploration of terminology pertinent to the study is provided as well as a summary of the following chapters.

Background of The Study

Today's musicians have the greatest variety of learning opportunities in history. It is highly unlikely that a musician would be able to navigate through their learning journey without encountering multiple contexts in which they have the opportunity to learn more about music. These music learning contexts (MLCs) offer various perspectives of music and its elements. Students learning from a combination of available MLC's must develop skills of comparing, consolidating and/or partitioning information from multiple sources. This involves metacognitive skills – skills of thinking about and regulating one's own thoughts and learning behaviours. The study seeks to refine the methodology by which we may better understand more about the metacognition processes of undergraduate musicians learning across multiple learning contexts. That is, how do musicians engage consciously, or subconsciously, in the act of negotiating these multiplicitous perspectives on musical and music-related concepts? To paint a picture of the phenomena this investigation aims to retrospectively learn more about, consider the following examples, which have been adapted from conversations as part of pilot interviews.

Example Scenario 1: A student learning piano through one-to-one lessons has a basic grasp on the use of root position triad chords. They hear a song on the radio and would like to play it. Searching YouTube for a tutorial on how to play this song, they come across one which includes a C major in first inversion, though the chord is simply labelled 'C major'. Supposing the student is paying close attention and notices the difference, the student has a negotiation to make: Will they replace their understanding of the C major triad (root position) with a C major in first inversion? Or perhaps ignore the YouTube tutorial regarding *how* to play C major and use their known shape (root position) to play the song? Alternatively, they may seek information about the difference between the two, either in their next lesson, discuss it with friends/family or seek help online, for example in the YouTube comment section below the video they have watched.

Example Scenario 2: A student learning guitar from their sibling is concurrently attending compulsory music classes at school and has a basic understanding of harmony through playing chords on the guitar. A task in class requires students to demonstrate parallel harmony on the keyboard. The student finds the activity familiar - they remember playing a duet with their sibling where they both seemed to play the same phrase, but on different strings. The experience solidifies the concept of parallel harmony in the mind of the student. The student makes a connection between the informal and formal learning experiences, and obtains a new label to describe the activities they have taken part in.

These situations, which feature students either consciously or subconsciously making negotiations between learning which has occurred, or is occurring, across formal, informal and non-formal MLCs, are at the heart of this investigation.

Aims of The Study

This study aims to facilitate future endeavours into these questions of how learning occurs across contexts whilst also recognising their complexity. As such, this study aims to develop an appropriate methodology for the purpose of retrospectively investigating the metacognitive processes of in such learning experiences of musicians. By refining existing approaches in other areas of research, this project aims to present a methodology framed by constructivist philosophy which details an effective combination of the use of interviews and mind maps as the primary methods of data collection to maximise the quality and quantity of data collected in the area of music learning. This propaedeutic study aims to pave the way for a subsequent PhD study by providing a strong methodological framework for investigations into learning as it occurs across contexts.

The study aims to broaden the scope of investigation by examining a holistic account of musicians' learning experiences, across all MLCs. In examining a more holistic understanding of music learning experiences and in doing so aims to facilitate the investigation of questions such as: how does an electric bass player learn their role within the context of a funk band after years of tuition in heavy metal music? What is a musician who is interested in electronic dance music able to transfer from the classroom music lesson to their composition process? What are the metacognitive skills necessary for transferring learning across learning contexts? What are the effects of learning across contexts on musicians' abilities to develop metacognitive skills? How can lifelong learning skills be developed through the use of multiple learning contexts?

Research Question

How might we optimise retrospective investigations of undergraduate musicians' efforts to relate understanding from one music learning context to another and/or others?

Research Objectives

The research objectives are:

1. To identify the various learning contexts in which undergraduate musicians learn music;
2. To determine the boundaries of retrospective investigation into music learning experiences;
3. To refine a method with which to implement the use of mind maps and interviews as tools for reflecting on one's own learning;[1] and
4. To develop a methodology for retrospectively investigating the cumulative learning strategies of musicians within the constructivist framework.

This propaedeutic study will interrogate the hypothesis that reflective practices are an effective tool for exploring one's learning experience. In order to focus the scope of a subsequent PhD investigating the learning strategies of musicians learning across contexts, boundaries of investigation must be identified in this retrospective investigation of cumulative learning. Potential boundaries may be drawn around the temporal limit in discussing past learning, distinctions of learning contexts and the role of multi-instrumentalism in the process of transferring learning from one MLC to another.

[1] The third objective was included subsequent to conducting the literature review, which notes the use of mind maps as a viable tool for self-reflection.

Terminology

In investigating music learning it is important to understand the use of language within the research field. Central to this investigation are the terms learning, education and context. Additional terms of online and offline are also discussed.

The terms learning and education are inter-related, and in the field of music education research, have taken on nuanced usages worth noting. Whilst terms have at times been used somewhat interchangeably (for example, Folkestad, 2006; Mak, 2006;), it should be understood that, broadly speaking, learning describes the acquisition of new skills and knowledge, whilst education describes the process by which these skills and knowledge are disseminated.

The relationship between learning and learning contexts is important and somewhat difficult to navigate. Learning contexts can be described based on the types of learning that occurs within them (Jaffurs, 2004). For example, a garage space where a group of friends play music together often facilitates informal learning including understanding group dynamics. Such a space can be described as an informal music learning space. Conversely, the type of learning likely to occur within an MLC can be understood based on understandings of typical learning to occur within that context. Within the confines of a school, an observer is far more likely to witness learning that follows a predetermined curriculum and much of the teaching is tailored to do so in a formal manner. However, other learning practices can also take place within the school environment. Green (2008) demonstrated the ways in which informal learning practices may be introduced into formal education settings alongside the introduction of popular music. This causes yet more confusion when attempting to categorise music learning. Any attempt to categorise is merely a broad generalisation and does not consider the nuances of individual

experience. Nevertheless, these generalisations serve to facilitate our understandings of broad practice norms. Within the current thesis, the term music learning context (MLC) broadly describes any context in which learning about music may occur. This ought to be understood as individual to each learner, primarily considering the social and physical attributes (Wosnitza and Beltman, 2012).

As this study explores the combination of mind maps and interviews, sessions with participants included both elements of interviews and mind maps in a single meeting. The term meeting is used to refer to the entirety of the session whilst interview refers primarily to the discussion between researcher and participant.[2]

Summary of Chapters

This thesis is organised into five chapters. Chapter 1 outlined the background and aims of the study, provided the research questions and objectives and explored key terminology pertinent to the study. Chapter 2 gives an overview of the relevant literature in two main areas: music learning as studied across contexts and how this phenomenon has been researched; and metacognition in music education and the methods employed in researching metacognition. Chapter 3 details the methodology of the current study and describes the iterative nature of methodological refinement employed. Chapter 4 outlines the findings and Chapter 5 responds to research objectives and outlines limitations, impact and future research.

[2] As will be evidenced in Chapter 4, two meetings did not feature the creation of the mind map. For clarity, these are still referred to as meetings rather than interviews.

CHAPTER 2

LITERATURE REVIEW

As the nature of this study is to refine a methodology for investigating music learning across contexts, the following discussion has been organised into two sections. The first section reviews the available literature on findings pertaining to learning music across contexts and subsequently investigates the methodological decisions made by researchers. The subsequent section addresses the cognitive functions heavily involved in the process of learning across multiple contexts - metacognition, or thinking about thinking, and findings from the literature regarding metacognition and music education. The methodological decisions of these studies are then explored.

Music Learning Across Contexts

Both learning and education can be categorised as either formal, informal and/or non-formal with learning contexts typified by the kinds of learning that takes place within them (Mak, 2006). Each learning context a student musician encounters favours a particular style of learner (Green, 2002). Learning can be understood as existing on a continuum - 'pure' informal learning sits at one end of the continuum and 'pure' formal learning at the other (Folkestad, 2006, p. 138). Non-formal learning exists at some point between these two poles. A heuristic framework of context presenting each context on a 3D plane was proposed (Wosnitza and Beltman, 2012). It presents contexts as being viewed from different perspectives, comprised of different types of content with varying degrees of proximity to the learner. Perspectives include

subjective and objective. Content may be social, physical and/or formal. Levels of proximity to the learner may be described as existing on the micro-, meso-, exo- and macrolevel.

Formal learning/education

The formal education system is understood as inclusive of classroom music, school-based instrument tuition, band programs, as well as higher education (Green, 2002). Formal learning adheres to strict curricula with outcomes pre-determined by such education providers (Lonie and Dickens, 2016). Students learning in formal contexts may have an opportunity to choose a small number of the elements of the curriculum they wish to engage with, though much of their learning path is decided for them systematically. Jenkins (2011) made clear, however, the distinction between learning and education, suggesting formal education may occur outside of formal institutions.

Informal learning/education

Informal learning is typically engaged in by students in a self-directed manner. Learners seeking to improve their skills may search for resources to gain understandings they feel necessary, or to be able to perform skills. Informal learning occurs unguided and may occur accidentally. Learning informally may not feel like learning at all. Green (2002) noted that informal learners tend not to associate the concept of 'learning' with their everyday activities. Instead, to them learning was fundamentally associated with being taught. 'Picking-up' skills and knowledge formed another category of acquisition completely within their perceptions (Green, 2002, p. 5).

Non-formal learning/education

Non-formal learning sits in between the poles of the continuum of informal and formal learning (Folkestad, 2006). Non-formal education is best described as instruction/learning which follows loosely predefined curricula featuring a teacher/student dynamic that exists outside the formal education system (Mak, 2006). Goals of non-formal music learning may be appointed collaboratively by both parties, but often remain only spoken.

A common example of non-formal learning is guitar tuition. Whilst it is possible to seek formal guitar instruction and follow strict guides such as Australian Music Examination Board (AMEB) Classical Guitar Syllabus (2020), more commonly, teachers and students negotiate learning goals including elements such as which styles of music are to be learned, the style of notation (if any) to be used, and milestones to work towards. Mak (2006) describes non-formal learning as highly contextualised and adaptable to the needs of individuals. Mok (2011) claimed the term came from Coombs and Ahmed (1974), who described it as "any organised, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children." (p. 8)

In their work investigating the MLCs musicians are likely to inhabit, Cremata, Pignato, Powell and Smith (2016) claim:

> Music learning occurs in countless other areas including church music, community music, private tuition, open mic sessions, jam sessions, peer listening sessions, social exchanges about music, in recording or production studios, on bandstands in clubs and venues, in DJ booths, in homes, basements, garages, and, increasingly, in distributed, self-guided, asynchronous ways mitigated by social networks, streaming media, and other Internet based platforms. (p. 56–57)

While Cremata et al. (2016) do not identify which types of learning context is at play in each example, evident here are formal (private tuition) and non-formal (church music, community music and private tuition) learning contexts situated amongst an array of informal learning contexts to depict a learner's wider music learning experience. Cremata et al.'s holistic aggregation of MLC is representative of many musicians' experiences learning music. This perspective challenges the long-standing predilection for formal music education and begins to push forward the idea of learning across contexts as impactful in the learning experience.

Context-specific research

Investigations into the use of multiple learning contexts in other disciplines are gradually increasing in numbers (Kim, Hung, Jamaludin and Lim, 2014). However, in music education, the use of one-to-one tuition in the conservatory continues to be the focus (Stevens and Stefanakis, 2014). Studies into the use of new technology in formal music education have begun to reshape our understanding of effective MLCs (Macedo, 2013). The internet as a resource, and as a learning context, has become increasingly the object of investigation. Facilitating students seeking additional information, fuelling curiosity and developing understandings of the multiplicity of perspectives have been identified as benefits of this combination of learning contexts (Cremata and Powell, 2017).

Most studies which investigate the transfer of learning across contexts do so on the micro-level (Wosnitza and Beltman, 2012). By investigating the relationship between two MLCs only, these studies have not yet accounted for a holistic understanding of the process of stimulus generalisation. An account of this research is provided here. Implications of such research are then discussed.

Across formal education contexts

An abundance of literature exists investigating the relationship between elements of the formal education system. Classroom education and the one-to-one tuition often feature congruent curricula and teaching styles. Within higher education, one-to-one instrument tuition is a formal music education approach under heavy scrutiny for its high cost-intensity (Carey, Grant and McWilliam, 2013). Conservatories are being forced to demonstrate the efficacy of its inclusion within their teaching model (Daniel, 2006). In doing so, researchers not only demonstrate the efficacy of their use of the one-to-one model, but the impact this learning context has on learners (Carey et al., 2013). Conservatory teachers have been found to employ 'transfer' pedagogy – a more rigid form of instruction-based teaching that uses mimicry and is geared toward assessment which often restricts the development of learning skills (Carey et al., 2013). This mode of transfer pedagogy fits the traditional 'script' in one conservatory tuition approach. It is possible in this approach, for students to lose motivation due to not understanding the object of lessons.

Kennell (2002) noted some of the earliest research into private music instruction centred around the value of group tuition and its impact on learning. Distinctly different from classroom learning, group tuition was described as a strategy for engaging learners in learning together. In the 70 years since this initial research, a shift has occurred in these understandings, however Kennell (2002) claimed "we have come to a new conceptualization. Group instruction is not a teaching strategy; it is a teaching context." (p. 245) Formal institutions, most prominently at the tertiary level, have increasingly begun to implement group tuition into their model (Carey and Grant, 2015). There is continual pressure on educational institutions to decrease ineffective spending and as a result, some conservatories are exploring the impact of

group lessons (Carey and Grant, 2015). Benefits of the group lesson within the formal education system are reported to include increased aural skills, improvisation skills and contextual judgement skills (Ilomäki, 2013). However, negative impacts on the group lesson as a substitute for one-to-one lessons include lack of personalised teaching and reduced focus (Carey and Grant, 2015). Gaunt, Westerlund and Welch (2016) noted the inclusion of group tuition alongside formal education will best produce results when learning strategies, curriculum and assessments are "constructively aligned" (p. 113).

Formal group and one-to-one tuition have been combined to better facilitate the progress of aspiring musicians toward collaborative music making (Daniel, 2006). Daniel (2004) posited the need to reconsider the value of one-to-one tuition with the rise of evidence supporting group tuition models. No correlation was found between group size and individual achievement in beginner piano classes (Jackson, 1980). Comparatively, Riester found a range of benefits to individual achievement through smaller classes (Riester, 2018). Findings differ for various reasons, most impactful of which was the greater student numbers (two-eight in Jackson study, 28-42 in Riester study). Secondarily, the experience level of students in the latter study were greater than the beginner level found in the former. As such it may be understood that considerations of the benefits of individual tuition and group tuition must be individual to the specific learners involved.

The use of small group lessons alongside one-to-one tuition has been found to increase student interaction. Daniel (2006) proposed there may be a correlation between the development of students and the benefits of each learning context. Many benefits were found in combining individual, small group and master class lessons in one Norwegian music school – primarily increases in self-reflection and sense of responsibility for one's own learning (Bjøntegaard,

2015). Enthusiasm for teaching and learning was found to be a key benefit of group lessons over one-to-one tuition, accompanied by economy of time in explaining technical and musical concepts (Gaunt, 2008).

Across formal and informal learning

The formal education system has developed over time. Most prevalent in the 21st century in the area of formal and informal music learning is the work of Green (2002). The formal education system's inclusion of popular music is limited predominantly to the content rather than learning techniques. Green (2002, 2006) made a strong argument for the inclusion of informal learning practices within formal education systems, namely classroom music. Jaffurs (2004) found methods to "counter mechanisms of dominance inherent in many formal environments" (p. 189) by investigating the practices of a garage band. A shift in understanding of the dichotomy of formal and informal learning contexts was encouraged.

Perceptions of online learning have been explored to inform the design of online learning contexts in formal education (Johnson, 2017). Online music collaboration occurs informally across continents seamlessly. Involving peer-to-peer feedback as a method of boosting motivations has been facilitated through integrating social media site, Edmodo, whereby a teacher requested students supply recordings of ideas/performances and comment on other students' work online (Mifsud, 2013). Cremata and Powell (2017) explored the impact of incorporating features of this learning context into the formal education system to broaden understandings of what constitutes musical ensembles and musical venues. The role of formal instrumental music tuition in the process of creating computer-based compositions was explored in the context of school music classes (Seddon and O'Neill, 2003). The development of an app for music composition in the primary classroom has the potential to gamify the

composition process, changing the way music learning is incentivised (Hart, 2017).

Across non-formal and informal learning

Common threads between non-formal and informal learning contexts are the process of learning by doing, grounded, most often, in the typical context in which the skills learnt are to be employed (Mak, 2006). For example, Wheeler (1993) investigated the role of context in defining flamenco music. Central to findings were differences between what could be learnt in non-formal learning contexts, such as the guitar lesson, and performance-based informal learning contexts. Arguing against claims by Green (2002) and Bennett (1980), Guest-Scott (2008) suggested that music store guitar lessons do not resemble that of formal education. By defining popular music and rock music as both separate from each other, as well as separate from the MLC of music store guitar lessons, Guest-Scott demonstrates the impact of context on the learning process.

Informal learning has been facilitated and transformed by the advent and development of the internet. Web 2.0 dramatically shifted the possibilities for interaction between internet users (Cremata and Powell, 2017). In the realm of music education, this had two large impacts. Providers of early Web 1.0-based music education were now able to facilitate back-and-forth discussion between teachers and learners, as well as between learners and other learners. This created a new method of music education, as those interested in seeking information about a certain topic could find chat groups, discussion boards and other platforms designated for use by like-minded curious musicians. Within minutes of asking a question it was possible to expect an answer. Those musicians who felt shunned by formal education, such as electronic dance musicians, truly found a home here (Fraser, 2012). An online community formed to facilitate self-directed learners struggling to achieve goals (Schmidt-Jones, 2017) and an

intersect was found between informal and non-formal learning whereby participants set their own broad curricula which was to be facilitated by the researcher. The researcher labels the study as an inquiry "between formal music concepts and informal music learning" (p. 621), however the involvement of the researcher shifts the paradigm of instruction. Implications for the continued informal music learning journeys of participants are not discussed.

Non-formal education is being experimented with by using new technologies which take advantage of informal learning processes. The use of augmented reality promises to shift the paradigm of music instruction by allowing learners to learn timing and finger positions on the guitar through a system of lights built into the fretboard of a guitar (Keebler et al., 2014). This technology has the potential to blur lines between informal and non-formal learning. Learning across formal, informal and non-formal contexts requires the transfer of learning, a process explored below.

Transfer of learning

The transfer of learning, sometimes known as generalisation, is a complex process and is at the heart of this study. Broadly speaking, transfer refers to "the tendency for the effects of a learning experience to spread" (Chance, 2014, p. 314). It can occur across time (response maintenance), people (vicarious generalisation), behaviours (response generalisation) and across situations (stimulus generalisation) (Cooper, Heron and Heward, 2014, pp. 623-629). Stimulus generalisation of learning occurs when a learner applies a concept learned in one context to their learning in another/other contexts (Chance, 2014).

As learners begin to read notation in class, for example, they may benefit from this skill later in private instrument tuition. The transfer of learning is central to this research. However, the

antithesis of transfer, stimulus discrimination, also plays an important role in the experience learning across contexts. Stimulus discrimination describes the process whereby a learner recognises that concept 'A' applies only in MLC 'X' and not MLC 'Y' (Passer, 2013). One example of this is the concept of improvisation. A learner who engages in the act of improvising on drums may find the garage rehearsal context to be an ideal setting in which to do so. The same improvised drum solo, however, is not likely to be well-received in the context of a concert band rehearsal.

The transfer of learning can also be described by its level of complexity. Low road transfer is described as the automatic application of a previously learned skill (O'Donnell et al., 2016). This may describe the process of playing a new model of guitar. A guitarist will likely not engage actively with the transfer of skills involved in playing a Gibson guitar instead of their Fender guitar, both of which have unique design features, rather it should feel second nature. Low road transfer is taken for granted, and functions beneath the conscious level. High road transfer requires the active deliberation of the learner to assess the potential for and success of transfer of knowledge and/or skills from one context to another. If our example guitarist were instead to pick up a mandolin, certainly some skills may be transferred automatically (such as the positioning of fingers relative to the frets) but others would require more active engagement. How might a guitarist construct a chord on an instrument such as the mandolin which does not feature the same relationship between strings? Certainly, it would demand the ear of the guitarist to recognise the incorrect sound of a chord if they were to play a familiar chord shape on the mandolin. It would follow that the guitarist might need to investigate whether each string is the same 'distance' from neighbouring strings as they are used to on the guitar. A strong knowledge of chord construction would also be required to facilitate the transfer of chord playing from guitar to mandolin. This transfer of learning process can give

both positive and negative results. If a learner were to mistakenly generalise the concept of sharps and flats in learning the musical alphabet, they may believe there exists a note one semitone between the notes B and C, for example. The result of negative transfer is the impairment of knowledge/skills learned.

Transfer of learning is considered a fundamental goal of education, Forrester (2018) claimed. The current NSW Board of Studies K-6 Creative Arts Syllabus alludes to this concept, suggesting creative arts should build lifelong learning skills (NSW Board of Studies, 2006, p. 7). This syllabus also heavily focuses on the development of cultural understanding through the creative arts, which might be described as a combination of vicarious generalisation, response generalisation and stimulus generalisation as well as positive discrimination. In order to ensure successful transfer of learning from one context to another and/or others, a learner must actively engage in the process of stimuli discrimination. Understanding whether information learnt in one context may apply to other contexts requires consideration of the similarities and differences between contexts and can be facilitated by skills of metacognition or thinking about thinking (McCormick, Dimmitt and Sullivan, 2012). Such skills as self-reflection and self-assessment may build a learner's ability to make such judgements.

Broadening the scope of investigation

The transfer of learning across contexts is a common phenomenon in the realm of music education. The danger of focusing investigations on a combination of just two MLC is in creating an artificial environment whereby these two contexts are all a musician has experienced. In reality, this is likely not the case. A common music learning experience would see a student learn through formal school classroom music lessons in early years, as well as by interacting with music in informal learning environments - clapping or singing along with

music in the car for example. Having shown a keen interest in these experiences, the opportunity may arise to join a school band. Often in tandem with this, the student will be encouraged to seek one-to-one instrument tuition, as well as regularly engage in individual rehearsal. Between band rehearsal, individual rehearsal, instrumental tuition, a range of informal and non-formal learning experiences are all present. Such a variety of learning contexts for a novice musician is likely to provide many examples of overlapping information. These overlaps in information from various sources necessitates a negotiation on the part of the learner as to how to interpret the value of information from each source. Luckily for the novice musician, many of these various sources often concur, resulting in confirmation of previously acquired information: the school band conductor and instrument tutor both deliver the same instruction as to how to remember the names of each note on the treble clef stave, for example.

Researching Learning Across Contexts

The previous section demonstrates the wide variety of research into music learning across specific contexts and the process of transferring learning. The current section aims to explore how this research was conducted.

Wosnitza and Beltman (2012) claimed the context to be researched dictates the methodological approach. This is congruent with the status quo among researchers which states the research question ought to dictate all research decisions (Agee, 2009). For Wosnitza and Beltman:

> the methodology for a study on context has to be chosen based on the type of context that is the focus of one's research. For example, while a subjective perception of the

> quality of teacher-student interaction could be researched with self-report questionnaires, an examination of the extent of teacher-student interactions could require an observation study. The implication is that research approaches focusing on multiple contexts must adopt multi-method as well as mixed method heuristic framework. The proposed heuristic framework . . . highlights the necessity of approaches to examine and understand multiple contexts. (2012, p. 188-189)

Philosophical and theoretical perspectives

Investigations which explore the idea of learning across contexts do so framed by various philosophical and theoretical perspectives. Burnard (2006) demanded music education researchers make explicit their philosophical and theoretical perspectives as the basis for understanding more about research being conducted. Six years later, Miksza and Johnson (2012) investigated music education research published in the Journal of Research in Music Education between 1979 and 2009 for theoretical frameworks. Findings indicate only 32% of all music education research cited any form of theoretical framework. This literature review finds that the demands of Burnard have not been adhered to. Similar to findings of Miksza and Johnson, a summary table of the current study's literature review (see Appendix A) found roughly 30% of sources explicitly acknowledge a guiding theoretical perspective. A similarly low number of sources identify a philosophical perspective. Another finding of the literature review was roughly 30% of sources did not give details as to the type of analysis employed within the study. Constructivism was the most commonly employed perspective, though researchers did not often distinguish whether they were referring to constructivist philosophical and/or theoretical perspectives.

Yarbrough (2003) described research methodologies in music education as being framed by two overarching philosophical bases. *A priori* knowledge precedes experience and allows the mind to know some truths about the universe which experience cannot provide. An opposing

viewpoint presents everything one may come to know about the universe as having come from experience. Yarbrough claims these opposing philosophical perspectives guide understandings of the basis of music learning as 'learnt musicality' or 'innate musicality' (2003, p. 6).

Bernstein's (1996) theory of the pedagogic device, a sociological perspective, claims the main function of education is the reproduction of norms and values condoned and propagated by dominant societal groups. In this view, instructional practices are not personal predilections alone, but also the result of socio-political mandates and demands. In applying this theory to music education, Wright and Froehlich (2012) claimed that formal education provides re-contextualised knowledge as opposed to primary knowledge, which is originally generated (a process of informal learning).

The concept of learning hierarchies (formerly conceived as cumulative learning [Lee, 2012]) presents learning as a sequential process, dictated by instruction (Gagne, 1973). Complex concepts can be learned so long as a sufficient sequence of appropriate prerequisite concepts or rules have been learned (Kazimi, 1984). Developmental learning theory suggests, however, that the process of learning complex concepts depends on the cognitive maturity of the learner (Kazimi, 1984). It suggests there are two types of response to new information: assimilation – whereby new information is stored within existing schema (organised/categorised perceptions of the world) without modifying it, and accommodation – whereby new information forces the learner to change their 'schema' (Piaget, 1964).

Constructivist learning theory mirrors this understanding of experience-based learning, presenting the learner as actively creating new knowledge in response to stimuli (Bada, 2015). Students are understood to incorporate emotional and cultural knowledge into the learning

process. Inherent in the process of education is the contextualisation of concepts for dissemination (Mak, 2006). Teachers often like to teach concepts free from context however, students require instruction appropriate to their learning styles (Green, 2002). Teaching a concept embedded in context may allow students to understand practical applications of the concept, although it facilitates segmented learning whereby information is only understood within the specific context in which it was learned and attempts at generalisation of concepts are prevented (Maton, 2009). It is essential to facilitate abstraction and generalisation of concepts for cognitive development (Larsen and Boody, 1971).

Contemporary conceptions of cumulative learning see new knowledge incorporate and build on old knowledge (Lee, 2012). This differs from Gagné's conception of cumulative learning by rejecting the assumption that learning must be sequentially ordered in hierarchy, instead suggesting that learning "lies within the individual and that external organization cannot ensure internal organization." (Lee, 2012, p. 39). It aims to allow students to strip concepts of the 'semantic gravity' – that which ties concepts to the context in which they were learned (Maton, 2009, p. 46). This allows the transferral of knowledge across domains, preparing students for the 'knowledge economy' (Maton, 2009, p. 44). A student learning music is likely to encounter each of these types of learning and this transferral of knowledge across domains is key to this study.

The basis for knowledge is contested (Yarbrough, 2003). Different foundational understandings give rise to a plethora of philosophical and theoretical perspectives concerning the nature of learning. Modern conceptions of learning which occurs across context often do so based on constructivist philosophical foundations, though a variety of theoretical foundations appeal to researchers.

Data collection methods

The idea of learning across contexts centres around the concept of cumulative learning. The question of how to collect data regarding this concept is at the heart of this investigation. The following investigates methods of data collection employed in the relevant literature. Research conducted on cumulative learning in music education can attempt to collect data on the cumulative learning process in three ways, each offering insight to serve different purposes. On-line studies explore learning as it occurs in the moment. Off-line studies investigate learning as it has occurred over time. Reviews of available literature attempt to gain insight about trends found in research across time and context.

On-line methods

'On-line' evaluations of learning explore the phenomenon as it occurs. Participants may be asked to complete a learning task with observations, measures of performance and self-reporting decisions being key methods of data collection (Treglia, 2018). Seminal works in the areas of learning, especially those responsible for formative theories of learning, primarily employed on-line studies (Ausubel, 1960, 1980; Flavell, 1963; Gagné, 1970, 1973; Piaget, 1964). Similarly, in other areas of education research on-line study methods offer a less distorted view of learning as it occurs. Veenman (2011) argues heavily for the benefits of on-line methods of data collection involving self-reports over off-line methods in validity of data. In the area of learning across contexts, however, such methods are less effective. On-line studies of learning across contexts in the strictest sense are rarely conducted. This is due to the inherent difficulty in identifying meaning behind the actions of participants. Researchers more often employ on-line studies of learning in one context and relate it to experiences in other contexts through off-line methods (Bjøntegaard, 2015; Carey and Grant, 2015; Creech and Hallam, 2003; Egolf, 2018; Kim, Hung, Jamaludin and Lim, 2014; Green, 2002, 2008;

Renwick, 2008; Schmidt-Jones, 2017; Tobias, 2015).

Off-line methods

'Off-line' investigations explore the phenomenon of learning after it has occurred. Distinctions are not made between retrospective studies conducted five minutes after learning has occurred and those conducted many years later. Veenman (2011) suggests the greater the amount of time between learning and retrospective investigation, the greater the risk of distortion of self-reports. In the case of investigating learning across contexts, however, a significant role is played by memory in connecting experiences. Veenman recommends the use of task-specific prompts to support the reconstruction of memory. Retrospective methods of data collection include the use of questionnaires, diaries, focus groups and interviews (see, for example, Blom and Poole, 2015; Lamont, Hargreaves, Marshall and Tarrant, 2003; Linsin, 2016; Lonie and Dickens, 2016; Lowe, 2012; Maton, 2009; Salavuo, 2006; Wosnitza and Beltman, 2012).

Reviews of literature

A third, indirect method of gaining insights about the process of learning across contexts employs the available literature as the primary and/or sole form of data. Literature reviews, meta-analyses and theoretical papers build on understandings of previous research. These works often report on the history of research around the area of learning across contexts, and often give guidance for research that ought to be conducted in the future (see, for example, Burnard, 2006; Creech and Hallam, 2003; Folkestad, 2004, 2006; Forrester, 2018; Mak, 2006). A study of note to this study proposed the collection of data with the intention of providing reports which give an overview of individual learning experiences (Cremata et al., 2016). Such a body of works may provide researchers with the opportunity to conduct a meta-analysis of available 'flash studies' to generate new ideas on the ways in which musicians learn today.

These methods of data collection may be loosely associated with those defined by Yarbrough (2003), who demanded that graduate students must develop skills in historical, quantitative and qualitative research methods, suggesting a mixed method research design provides a holistic understanding of phenomena.

Data analysis

A great body of literature exploring music learning across contexts employ qualitative data analysis methods. Most sources employ thematic analysis, often framed by constructivist/interpretivist perspectives. Most commonly employed analysis techniques include thematic analysis (Carey et al., 2013; Carey and Grant, 2015; Jaffurs, 2004; Johnson, 2017; Green, 2002; Hart, 2017; Wheeler, 1993), descriptive analysis (Cremata et al., 2016; Daniel, 2004; Kennell, 2002; Mifsud, 2013; Riester, 2018), text analysis (Folkestad, 2006; Forrester, 2018; Ilomäki, 2013; Jenkins, 2011; Mok, 2011; Wosnitza and Beltman, 2012), and grounded theory (Calissendorff, 2006; Callaghan, 2002; Koziel, 2018; Seddon and O'Neill, 2003).

In exploring the role of these analysis methods, descriptive and thematic analysis are responsible for describing the details of a phenomenon. These methods greatly resemble grounded theory, however grounded theory facilitates the development of a new theory (Clarke and Braun, 2019). As this is the aim of the current study, studies which employed grounded theory are most pertinent to this study, as suggested by Callaghan (2002). Works have employed grounded theory to explore: the ways in which music teachers are trained to reproduce societal norms (Koziel, 2018); instrumental music training's impact on computer-based composition processes (Seddon and O'Neill, 2003); and pre-school children learning violin across group tuition and individual rehearsal contexts (Calissendorff, 2006). As such,

grounded theory has been demonstrated to be effective in exploring learning across contexts.

Metacognition in Music Education

The current study aims to refine a methodology to use cumulative learning theory in investigating reflections on one's own learning. The object of investigation as well as the process of reflecting on this both employ metacognitive skills. As a result, an awareness of current metacognition research is of importance to the current study.

Music education is becoming more thoroughly examined by engaging in qualitative inquiry (Lane, 2011). However, Stevens and Stefanakis (2014) found the areas of motivation and cognitive development within music education lacking scholarly attention. The process of accumulating knowledge across domains necessitates a level of metacognition (Benton, 2014), which has been described as "the knowledge about and regulation of one's cognitive activities in learning processes" (Veenman, Van Hout-Wolters and Afflerbach, 2006, 3). Jabusch (2016) found a limited number of studies had been published in self-regulated learning and metacognition in musical practice, despite being more prevalent in academic disciplines. Metacognition has been considered valuable in classrooms, choir rehearsals, one-to-one vocal and instrumental and ensemble contexts (Benton, 2014) and has been linked as a precursor for academic performance (Coutinho, 2007). These skills are distinctly separate from, but function in tandem with, intellectual ability (Veenman et al., 2006). Benton provided an overview of research on metacognition situated in specific MLCs.

Metacognitive awareness has been found to be just as effective as employing particular metacognitive strategies in improving learning within tertiary music education (Egan, 1995).

Egan suggested that metacognition is developmental and teachable. Findings suggest particular metacognitive skills were not identifiably more valuable than others, but that an awareness of one's own thought process and learning strategies was instrumental to improving learning. The NSW Board of Studies K-6 Creative Arts Syllabus (2006) encourages various engagements with metacognitive strategies. Self-reflection is most commonly recommended in composing and appreciating music, "central to artmaking is the need for students to development self-reflection and judgement, which will affect the choices and actions they make in developing their artworks." (Department of Education, 2006, p. 11). The developmental nature of metacognition is also noted, "older students seek to represent subject matter in more interpretive and self-reflective ways. They are more conscious of the relationships between the form of their work and the representation of their ideas" (Department of Education, p. 79).

Metacognitive thinking has been linked to increased frequency and length of individual instrument rehearsal (Greer, 2013). Greer suggests metacognitive skills developed in music education are widely applicable to all learning experiences. Irwin (2014) explored the role of metacognition in bringing informal learning practices into the music classroom:

> Ergo, by recognising this process of learning as situated in social, cultural, historical, and technological contexts we may also facilitate metacognition (Flavell, 1979). By metacognition, I mean the ability to be reflexive as a learner or teacher; understanding the way that learning works, our beliefs about learning, and how those beliefs affect one's own learning and thus agency. (Irwin, 2014, p. 6)

Learning metacognitive skills was demonstrated to positively impact content knowledge, performance skills and attitudes in choral singing setting among seventh and eighth grade students (Benton, 2002). Thinking-aloud activities, self-assessment tasks and self-reflection on learning were demonstrated to positively impact participants' ability to sight-sing within the choral music class more effectively than the exclusion of such experiences. Benton later

follows up research by providing a how-to article for music educators on 'promoting metacognition in music classes' (Benton, 2013). Included in the article are suggestions of teacher modelling as an effective method to encourage students' engagement with metacognition. Merrick (2007) identified high ability performers as employing sophisticated practice strategies, thinking skills and self-regulatory behaviours. These findings were congruent with research conducted by Bathgate, Sims-Knight and Schunn (2011). Metacognitive practices are suggested to signify expertise amongst musicians which is linked to efficiency in rehearsal (Bathgate et al., 2011). In engaging novice music students in metacognition (controlling for practice times), learners were noted to developed at faster rates when implementing metacognitive strategies including explicitly verbalising and reflecting on learning processes.

A microanalysis of rehearsals based on three phases of the self-regulated learning process of forethought, performance and reflection aimed to find ways to optimise rehearsal efficiency (McPherson, Osborne, Evans and Miksza, 2019). Mapping behaviours, cognition and affect which focus musicians' practice may be possible using this technique. In doing so, educators may "encourage musicians to become more behaviourally, metacognitively and motivationally involved in their own learning" (McPherson et al., 19). A distinct difference between metacognitive teaching and metacognitive learning was explored in the one-to-one tuition context. Colombo and Antonietti (2017) noted the difference between metacognitive strategies employed by teachers and those employed by their students. Further, a difference was noted in teacher's implementation of metacognition strategies based on student ages and expertise. Recommendations were provided for use of self-monitoring strategies for both teachers and students. This aligns with findings of Merrick (2007).

A popular resource for researchers of metacognition in music education is Gardner's Theory of Multiple Intelligences (2011), originally published in 1983. Gardner outlined a set of six types of intelligence and argued that each individual possesses varying levels of each which ought to be recognised. The process of identifying one's own form of intelligence involves a great deal of metacognition and prepares the way for more effective learning. Linguistic, musical, logical-mathematical, spatial, bodily-kinaesthetic and personal intelligences are explored.

Researching Metacognition

Research investigating the process of thinking about one's own thinking is framed by our understanding of how individuals obtain knowledge. Ernst von Glaserfeld (1995) claimed the Empiricist, John Locke, was first to use the term 'reflection' in the same way that is now fundamental to developmental theorist Piaget's cognitive constructivism. This 'reflection' forms a fundamental component of the process of metacognition. For Bennet,

> …the other fountain from which experience provides ideas to the understanding is the perception of the operations of our own mind within us. This yields ideas that couldn't be had from external things—ones such as ·the ideas of·[3] perception, thinking, doubting, believing, reasoning, knowing, willing, and all the different things that our minds do. (2017, 18)

Metacognition has been an increasingly popular object of investigation for approximately fifty years. In that time, various methods of investigating the phenomenon have arisen, depending on the paradigm of the research (Anderson, Nashon and Thomas, 2009). Central to discussions about methodological decisions in researching metacognition is the notion that whilst the

[3] "Small dots enclose material that has been added, but can read as though it were part of the original text." (Bennett, 2017, p. 1)

presence of metacognitive activities can be inferred, it cannot be directly observed (Thomas, 2012). Anderson, Nashon and Thomas (2009) examined the various research methods used to probe metacognition. They broadly categorised research into two categories - positivist-decontextualist and relativist-contextualist.

Moritz and Lysaker (2018) warned that investigations into metacognition ought to identify and examine the efficacy of specific components of metacognition in order to reliably determine the effects of metacognition. Further, Anderson et al. (2009) argued for researchers to remain constantly cognisant of their own practice:

> researchers can benefit from being themselves metacognitive (as we were) in relation to their knowledge, control and awareness of their thinking processes regarding research methods as they use and reflect on the nature and use of those methods. (p. 193)

Positivist-decontextualist

Positivist-decontextualist research seeks simple answers to complex real work problems by creating a simpler artificial world. Zimmerman and Pons (1986) noted a large body of 'laboratory-based' research on self-regulation strategies, though not much in 'naturalistic settings' (pp. 615-616). They are characterised by elaborate research designs and complex statistical analyses. These studies are commonly executed in the discipline of psychology and feature on-line data collection methods of mid-learning verbal self-report and performance tests (see, for example, Bathgate et al., 2012; Benton, 2002; Bråten and Strømsø, 2011; Efklides, 2006; Egan, 1995; Josephsen, 2017; Radmehr and Drake, 2018; Schellings, 2011; van Donkersgoed, 2016).

Relativist-contextualist

Relativist-contextualist research considers the natural ecology of the learner's environment a vitally important aspect. They are more likely qualitative, or employ mixed methods, and interpretivist in nature. Off-line methods such as interviews and questionnaires are common in this body of research. Relativist-contextualist research facilitates aims to recognise the importance of the ecology of the learning environment and the impact on learning and metacognition (see: Anderson et al., 2009; Anderson and Thomas, 2014; Barley, 2012; Colombo and Antonietti, 2017; Coutinho, 2007; Efklides, 2014; Zimmerman and Martinez-Pons, 1986; Zimmerman, Bandura and Martinez-Pons, 1992).

Guiding metacognition research

Dunlosky, Bottiroli and Hartwig, (2009) discussed the ways in which understandings of ecological validity have been confounded with the concept of representative design in metacognition research. They claimed education researchers have failed to define the boundaries within which their findings may be generalised. In addressing this, education researchers "should begin by describing the environment to which they want their outcomes and conclusions to generalise." (Dunlosky et al., 2009, p. 436) A general trend can be noticed in research over the last thirty years toward this idea of representative design, an idea first signposted by Brunswik (1956). It posits that the research design ought to aim to better represent the ecology in which students naturally find themselves to produce more accurate, more generalisable findings.

Whether representative design is incorporated into research or not, Dunlosky et al. (2009) called for a clear distinction of the target ecology when presenting research findings. In doing so, researchers acknowledge their biases and provide a clear scope for the limits of

generalisability of our work. This aims to address both positivist-decontextualist and relativist-contextualist paradigms' shortcomings.

Metacognition and retrospection/reflection

The retrospective investigation of metacognitive processes, knowledge and skills has occurred in various ways. Immediate reflection in the form of interviews is common (McPherson et al., 2019). In exploring long-term retrospection of learning, however, these may not be sufficient (Veenman, 2011). The difficulties in researching learning which has occurred in the distant past, however, ought not to prevent research from occurring at all. Methods that have been implemented to improve the reliability of and ease in accessing memories of prior learning experiences include in-depth interviews (Veenman, 2011), learning journals (McPherson et al., 2019), questionnaires such as the MTSI of Bräten and Strømsø (2011) and mind maps (O'Neill, Geoghegan and Petersen, 2013).

Metacognition has been shown to be well-facilitated using mind maps. Various elements of metacognitive knowledge and metacognitive skills have been shown to be used in and developed through the creation of mind maps, including: recall (Merchie and Van Keer, 2016; Wheeldon, 2011; Wheeldon and Faubert, 2009), organisation of thought (Jones, Ruff, Snyder, Petrich and Koonce, 2012; Kotob, Styger and Richardson, 2016; Tanriseven, 2014), self-expression (Buitron de la Vega et al., 2018; Gelb, 2004), self-reflection (Gelb, 2004; Jones et al., 2012; Merchie and Van Keer, 2016; Tanriseven, 2014), self-assessment (Gelb, 2004; Merchie and Van Keer, 2016; Tanriseven, 2014), goal-setting/planning, (Gelb, 2004; Merchie and Van Keer, 2016; Tanriseven, 2014), connecting ideas (Jones et al., 2012; Kotob et al., 2016; Merchie and Van Keer, 2016; Wheeldon and Faubert, 2009), and more generally, self-regulation (Jones et al., 2012; Merchie and Van Keer, 2016; Tanriseven, 2014). The research

is clear that retrospectively investigating metacognitive skills may be facilitated by implementing the use of mind maps – tasks which employ participants' metacognitive skills.

Mind Maps in Research

Diagrammatic elicitation, an umbrella term which refers to "the data collection technique of using diagrams", was developed in an attempt to assist research communities to connect with each other, avoiding the confusion of discipline-specific jargon (Umoquit, Tso, Varga-Atkins, O'Brien and Wheeldon, 2013, p. 9). It embodies the use of diagrams such as mind maps, concept maps, spider diagrams, drawings, doodles and sketches. In 2011, these visual forms of data elicitation were described as nascent (Wheeldon, 2011). Since then, the available body of literature on their use in research has grown. Various forms of diagrammatic elicitation exist with varying degrees of applicability to given research methods. The notion of learning across contexts negates the use of drawings as the interest lies in the abstract and concrete concepts musicians learn (Varga-Atkins and O'Brien, 2009). Mind maps have also been demonstrated as effective tools for learning more about ones' own learning (Merchie and van Keer, 2016). Consequently, concept maps and mind maps are of great interest to the current study. These forms of visualising data combine the use of written text with concepts of visual spacing, symbols and colour to convey ideas (Buzan, 2018).

Defining mind maps

Inspired by visual thinkers including Porphyry of Tyros (c.232-303 CE), Leonardo Da Vinci and Sir Isaac Newton, Tony Buzan credited himself as the inventor of the mind map (Buzan, 2018, p. 70) and spent decades pushing mind maps as a money-making business. In doing so, he demanded a level of specificity as to what constitutes a mind map, and what does not. Whilst

Buzan's conception of a mind map certainly bests other diagrammatic models as a mnemonic technique, it does not accurately represent lay use of the term (Nesbit and Adesope, 2006). A more accurate understanding of non-specialists' use of language in discussing a variety of these diagram is to suggest that the term mind maps operates as an umbrella term for many forms of diagrams including spider diagrams, mind maps and concept maps (which Buzan would argue is a misnomer). More aligned with the lay-person's use of the term mind map, researchers using diagrammatic elicitation disagree with Buzan's ultra-strict 'Laws of Mind Maps' (2018, p. 60). In discussing the use of various types of diagrams, the concept of definitional elasticity regarding concept maps and mind maps has been addressed (Wheeldon and Faubert, 2009). Wheeldon and Faubert proposed the use of the term mind map as the most appropriate overarching term to encapsulate various forms of diagrams which employ a combination of drawings and written language. A partial explanation for this reasoning is the role of the participant in the process. Whilst a set of strict rules may be provided for participants, the resultant diagrams produced will often not accurately represent these rules (Wheeldon and Ahlberg, 2012). The current study embodies this understanding of the term mind map as evidenced by recent research (Burgess-Allen and Owen-Smith, 2010; Buitron de la Vega et al., 2018; Jones et al., 2012; Kotob et al., 2016; Wheeldon, 2011; Wheeldon and Ahlberg, 2017).

Implementing mind maps

Mind maps have proven useful in multiple ways within the framework of qualitative research. The use of mind maps in tangent with interviews have been shown to produce more meaningful data than the use of interviews alone (Wheeldon, 2011). Wheeldon demonstrated the use of mind map stage prior to interviews can be beneficial in facilitating future stages of data collection, as well as acting as a source of data standalone. In structuring multiple data collection phases of qualitative research, employing mind maps as a preliminary phase allows

participants, acknowledged as the experts of the topic being researched, to direct researchers' development of codes, concepts and categories (Wheeldon and Faubert, 2009). And as a result, "subsequent data strategies remain based on codes and concepts demonstrated through the participant-generated maps" (p. 73).

Various diagrammatic elicitation methods ought to be used for various purposes (Varga-Atkins and O'Brien, 2009). Some methods, such as network diagrams, are designed to focus participants on the themes of the interview. Stimulating thought on specific topics can help prime the participant (Tattersall, Powell, Stroud and Pringle, 2011). Similarly, mind maps can serve to prime memories of past events, and organise thoughts systematically (Wheeldon, 2011). Others, such as drawings, serve the purpose of gaining meaning that would not have been possible via purely verbal elicitation techniques (Varga-Atkins and O'Brien, 2009). Mind maps have been used to facilitate recall, as well as operating as a mode of data collection (Wheeldon, 2011). Mind maps have also been implemented to facilitate conversation (Umoquit et al., 2013).

Mind maps as data collection tools…

…through facilitating recall

Mind maps have been proven an effective tool in facilitating explorations of one's memories (Wheeldon, 2011). They offer a tool for visualisation of internal structures, allowing a new mode of communication between parties. Wheeldon and Ahlberg (2012) argued that mind maps "prime the pump for later interviews" and that grounded theory is able to "guide subsequent data collection by allowing researchers to see how participants connect various concepts, experiences and propositions" (p. 30).

...as thinking tools (participants)

In the creating a mind map, participants also participate in the process of analysing data (by the very nature of self-reporting on their own experiences). The use of mind maps has been demonstrated to aid in the process of analysis of complex case study data (Kotob et al., 2016). Of particular interest are findings which suggested the use of mind maps helps identify recurrent themes as well as facilitating the communication of ideas. Further, participants have been shown to benefit from the self-exploration involved in constructing visualisations of internal structures (Buitron de la Vega et al., 2018). The use of 'health mind maps' allowed participants of one Boston Medical Centre study to learn more about themselves, better understand their self-management plans and functioned as a catalyst for wanting to improve their illness (Buitron de la Vega et al., 2018).

Mind maps as data verification tools

Mind maps have been employed as a method of verifying data (Impellizzeri, Savinsky, King and Leitch-Alford, 2017). Following interviews with participants, Whiting and Sines (2012) sought the advice of participants on the mind map created to summarise the contents of the interview. Similar methods have been employed in efforts to reduce limitations of time in the research process by employing more time-effective data analysis methods involving mind maps (Burgess-Allen and Owen-Smith, 2010; Kotob et al., 2016; Tattersall et al., 2011; Wheeldon and Ahlberg, 2017).

Mind maps as data analysis tools

Much investigation into the benefits of mind maps in research centres around the idea of researchers creating mind maps as a method of thinking through problems. Providing overarching views of research data (Hipwell, 2017; Kotob et al., 2016), facilitating preliminary

analysis processes (Tattersall et al., 2011), presenting data (Wheeldon and Ahlberg, 2017), exploring complex areas of inquiry (Conceição, Samuel and Yelich Biniecki, 2017), and managing qualitative data (Burgess-Allen and Owen-Smith, 2010) were noted as benefits to researchers.

Limitations

There have been concerns with the use of mind maps in qualitative research. Limitations have been suggested as to their value regarding the type of information mind maps can elicit. Burgess-Allen and Owen-Smith (2010) noted that mind maps may be most useful in engaging with 'what' questions, rather than 'why' questions. Whilst Kotob et al. (2016) disagreed on this point, the current study was designed with this concern in mind. Researchers' interpretation of these individually constructed mind maps may also pose trouble (Wheeldon and Ahlberg, 2017). It is the responsibility of the researcher to acknowledge potential biases in assigning meaning to various elements of the mind map. In this way, the use of mind maps in qualitative research fits squarely within the constructivist framework.

Constructing mind maps

There exist many ways to construct a mind map. For the purposes of this research, it must be clear which type of mind map ought to be constructed and how.

Researcher-led mind maps centrally involve the researcher. They are responsible for creating the diagram either with or without active input from the participant. Whilst they are generated to depict information relating to the participant, the process of creating researcher-led mind maps may or may not include discussion with and/or edits made by the participant (Umoquit et al., 2013). These mind maps are useful as thinking tools for the researcher, as well as data

verification tools.

Participant-led mind maps are created by a participant based on guidelines or 'rules' provided by the researcher. They allow participants to communicate and record key experiences/perception/beliefs and connections between each of these. The resultant mind map may lead to interviews with participants to validate and expand on these ideas (Umoquit et al., 2013). This form of mind map may facilitate participants' efforts to think through objects of investigation (Wheeldon, 2009).

Summary - Chapter 2

In summary, this chapter explored the available literature on the areas of music learning across context and metacognition. Research into the former has predominantly been conducted in relation to just two contexts at a time. Constructivist perspectives are commonly employed in music education and the use of interviews and performance tests are among the most common data collection methods. The literature points toward the use of mind maps as an effective tool for retrospective investigation into learning experiences as it engages and facilitates participants' metacognitive skills and processes. Chapter 3 details the current study's guiding philosophical and theoretical perspectives and outlines the data collection and analysis methods.

CHAPTER 3

METHODOLOGY

The following chapter provides an overview of the philosophical and theoretical perspectives (constructivism and cumulative learning theory) which guide the current study as well as detailing data collection and analysis methods.

Philosophical Perspective: Constructivism

Constructivism suggests every individual constructs their own understanding of the world around them relative to their experiences of the world (Shively, 2015). These understandings differ between individuals and shape future interactions with the world. Ernst von Glaserfeld (1995) reviewed the history of epistemological dissent against the tradition of realism and its goal of objective knowledge, proposing that early signs of constructivist philosophy can be found as early as the pre-Socratics in Xenophanes. The review traces the development of questions surrounding the attainment of absolute truth. Throughout history, the development of conceptions of knowledge and understanding revolving around the process of metacognition has been related to the development of constructivist philosophy. Constructivist philosophy is built on a foundation of epistemological fallibilism, claimed Cobern (1993): "Ultimately, we can never know for sure how close our knowledge actually approximates reality. Rather, knowledge is a meaningful interpretation of our experiences of reality" (p. 109).

Human research, according to constructivism, should follow the hermeneutic/dialectic model

of disassembling and comparing various individuals' constructions of the world in order to draw new meaning from them (Lincoln and Guba, 2013). The constructivist research paradigm rejects the idea of objective reality and "emphasizes the subjective interrelationship between the researcher and participant, and the coconstruction [*sic*] of meaning" (Mills, Bonner and Francis, 2006, p. 26).

Constructivism in education

Constructivist philosophy presents learning as a process whereby each student creates their own understanding of concepts based on personal experiences (Cleaver and Ballantyne, 2014). Because no two people's understandings of any one concept will ever truly be the same, the hermeneutic/dialectic model of investigation is appropriate for allowing us to draw new meanings from individuals' personal experiences. Due to this, constructivism is a popular philosophical framework in education.

Von Glaserfeld (1995) identifies the link between education research into metacognition and constructivist epistemology, suggesting "any attempt to know how we come to know is obviously self-referential" (p. 148). Cobern (1993) documented the advance of constructivist philosophy and theory in the realm of science education and claimed constructivist thought "is applicable in any learning situation, including educational and psychological consultation." (p. 105). Constructivist philosophy embodies the idea of 'schemas' as an explanation of the operation of knowledge (Morford, 2007, p. 77).

Often the use of constructivist epistemology is accompanied by the use of the theoretical perspective of constructivism. Whilst the two are indeed the same, constructivist philosophy may serve as the epistemological home for other theoretical perspectives. It is important to

distinguish the difference between the two. Most broadly, philosophy influences the way one sees the world, whereas theory influences the way one interacts with the world. In research, philosophy guides the ways one understands the world and theory guides the ways one might conduct research. Constructivist philosophy understands the world as being an informant to the individual's perception of it. Informed by this understanding, constructivist learning theory understands learning as being individual internal perceptions of reality. One might learn more about the world, says constructivist learning theory, if one gain further perspectives about phenomena.

An abundance of education research exists in the realm of constructivist philosophy. Recurring areas of investigation include the nature of how meaning is made (Cleaver and Ballantyne, 2014; Cremata and Powell, 2017; Johnson, 2017; Mogashoa, 2014), how constructivism might be built into the classroom (Bada, 2015; Blom and Poole, 2015; Cleaver and Ballantyne, 2014; Doolittle and Camp, 1999; Johnson, 2017; Mogashoa, 2014; Morford, 2007; Pelech and Pieper, 2010; Scott, 2011; Shively, 2015), how learning may be encouraged through encouraging the construction of ideas (McGillen and McMillan, 2005; Nesbit and Adesope, 2006; Radmehr and Drake, 2018; Thorp, 2010), and the relationship between problem-based learning and constructing meaning (Faulkner, Davidson and McPherson, 2010; Renwick, 2008).

Constructivism in music education

Constructivism is heavily bent toward the interpretivist framework, which appeals to many music education researchers. The implementation of constructivist epistemology is, not surprisingly, common in music education research. Many of the ideas explored in education more broadly have also been explored in music education. More centrally to nuances of music education, explorations exist into the ways in which music learning across MLCs may be

facilitated by constructivism (Blom and Poole, 2015; Cremata and Powell, 2017; Johnson, 2017; McGillen and McMillan, 2005; Pelech and Pieper, 2010; Scheid, 2014). Of these, a handful explore online contexts as a developing breeding ground for constructivist learning practices (Cremata and Powell, 2017; Johnson, 2017; Pelech and Pieper, 2010; Schied, 2014). The process of learning online is heavily linked to self-directed learning. Self-directed learning continues to be a feature of 21st Century music learning, facilitated by the advent of the internet and associated technological resources (Gruzd, Paulin and Haythornthwaite, 2016). There exists an intertwined relationship between metacognition and self-directed learning, as well as between metacognition and constructivist philosophy which in turn dictates an interrelationship between self-directed learning and constructivist philosophy.

Theoretical Perspective: Cumulative learning

The current study embodies Lee's (2012) modern conception of cumulative learning as the basis for understanding. It is important to define cumulative learning theory, framed by constructivist philosophy, as separate from constructivist learning theory. Both constructivist and cumulative learning theories present learning as a process whereby knowledge is gained over time and across contexts and experiences. Constructivist learning theory presents learners as actively engaging in the process of learning, "knowledge is not passively accumulated, but rather, is the result of active cognizing by the individual" (Doolittle and Camp, 1999, p. 5). Cumulative learning theory delves one step further by exploring the cognitive and metacognitive processes responsible for learning, "in conclusion, the present study provides evidence for the assumptions of this study that learning is a cumulative as well as a structuring process" (Lee, 2012, p. 240). This emphasis on the cognitive processes of learning as critical to theory is shared with cognitive constructivism. Cognitive constructivism claims that "reality

is knowable to the individual" which is a distinctly separate claim from the rest of the constructivist continuum (Doolittle and Camp, 1999, p. 6). Cumulative learning theory does not embody this understanding, instead considering reality to inform the creation of mental models. In considering the structuring processes in cumulative learning, Lee employs the example of learning the concept of string instruments. In comparing a known string instrument to a new instrument, Lee suggested, "the learner only compares his/her *mental models* of the two objects but never compares their reality separately" (p. 53).

Cumulative learning theory is informed by the works of Gagné, Piaget and Ausubel. Each of these theorists' perspectives on the basis for learning differ. Gagné (1973) claimed learning complex concepts is a result of sequential learning, dictated by instructors. Piaget (1964) suggested the maturation of the learner dictates their ability to learn increasingly complex concepts. Ausubel (1960) claimed the use of advanced organisers and subsuming concepts facilitate the learning of unfamiliar content. In applying the theories of Gagné, Ausubel and Bruner to music learning, Sledge (1971) noted the work of Jean Piaget may aid "in understanding the processes by which music is perceived, and it follows, learned." (p. 85). Lee (2012) embodied the notions of perceptual psychology as suggested by Sledge in redefining cumulative learning theory. Dunning (2016) found a series of problems with the use of replication and extension of experimental design in investigating cumulative learning. These findings extend on those of Kazimi's (1984) work which explored the theories of Gagné and Piaget. Dunning concluded "the recommendations discussed include simple analysis, transparent reporting, third-party replication, and coordinated research" (2016, p. S17).

As conceived by Lee (2012), cumulative learning ought to strip content learnt of its semantic gravity. In doing so, content learnt becomes widely applicable to a variety of contexts. Lamb,

Mare and Doecke (2017) identified nine key skills for success in the 21st century, claiming "evidence suggests that most of these skills and dispositions can be transferred across contexts, although they are better considered as partly context- or content-dependent rather than purely generic" (p. 4). Success may also be facilitated through metacognitive strategies. Metacognitive processes responsible for identifying and categorising new information include: planning (advance organisation, organisational planning, attention, self-management); monitoring (self-monitoring, problem identification); and evaluation (self-evaluation), which facilitate the de-territorialisation of information in the learner (Lee, 2012, p. 93). It has been argued that:

> the investigation of metacognition in a qualitative and interpretivist manner can be enhanced by methods that permit increased participant control and autonomy over the metacognitive experience, selection and discussion of what is meaningful and important to them in their reflection of the learning episode. (Anderson, Nashon and Thomas, 2009, p. 193)

Skills which may develop through reflecting on learning music across contexts could prove invaluable in the future.

Cumulative learning theory in education

Little research has been conducted employing Lee's (2012) cumulative learning theory in the area of music education. Lee's seminal work was produced as recently as 2012. The likeness between cumulative learning theory and the vastly popular constructivist learning theory may also have contributed to the paucity of research in this field. Cumulative learning theory has been employed in the areas of mathematics (Muklis, Abidin, Pamangkas and Djalil, 2018), creative arts (Lilliedahl, 2018), accounting (Aldamen, Duncan and Ziegelmayer, 2018), and political sciences/social sciences (Dunning, 2016). Findings from one study investigating

cumulative learning in a higher education accounting course found performance gains resulting from engagement improved more quickly later in the semester, which the researchers claim is due to the cumulative nature of the subject matter (Aldamen, Duncan and Ziegelmayer, 2018). Another higher education study employed cumulative learning to develop a new didactic model to enhance the transmission and acquisition of knowledge in the area of physiology, rethinking the way one institution teaches the concept of the electric potential difference across the cell membrane (Baptista, 2015).

Cumulative learning theory in music education

Whilst the concept of the transfer of learning across contexts in the field of music education is commonly discussed (Benton, 2013; Blom and Poole, 2015; Forrester, 2018; Gordon, Fehd and McCandliss, 2015; Sala and Gobet, 2017), minimal work has been conducted implementing cumulative learning theory. Sledge (1971) applied the theories of Gagné, Bruner and Ausubel to tertiary music theory education, finding promising results in redesigning music theory curricula with these understandings of learning in mind. It appears, however, that these findings were not further explored by music education researchers. As such, this study aims to re-test the viability of cumulative learning theory in researching music education.

Wilkins (1977) completed a Bachelor of Arts (Honours) degree - the thesis explored music education and cumulative sequential learning. It used two programs of music education in New South Wales schools - the NSW Syllabus course and the Kodály Method. The author suggests the need for the implication existent in the NSW Syllabus – that cumulative sequential learning is important to learning – ought to be made explicit. Lee would argue, however, that the merit of Wilkin's work is compromised by its epistemological basis. The idea that learning must be sequential is central to this work and it fails to focus on the cumulative aspect of learning.

By building on the social and cultural context of learners, teachers may enhance the learning experience. Lilliedahl (2018) explored how cumulative learning theory can be used to augment learning experiences using the arts. Providing an example, Lilliedahl suggests period music may be a beneficial tool for teachers to contextualise a given text by clarifying its sociocultural context.

Drawing on successful implementation of Lee's theory in other disciplines, the current study aims to test the applicability of cumulative learning theory within the discipline of music education.

Research Design

This research project aims to implement an iterative process to refine the methodology for retrospective investigations into the music learning experience. The literature suggests that mind maps in conjunction with interviews are a very effective way of investigating memory and metacognition. This project seeks to find the most appropriate way to combine these data elicitation methods.

This iterative methodological development process has been documented as having two distinct stages. The first stage followed the role of many researchers - implementing the methods proposed by the literature reviewed. In doing so, notes were taken of successes and failures of the method, both in individual interviews and as a growing collection. The second stage tested a variation to the method of data collection to better suit explorations of music learning across contexts.

Participants

In order to facilitate this Master of Research project, current Western Sydney University Bachelor of Music students were invited to participate. These potential participants represented well-experienced musicians with more chance of experience learning music in multiple MLCs than seeking participants by more common means such as web-based recruitment, whilst also being most accessible for this short study.

The project failed to recruit the intended participants using on-campus posters (see Appendix B) in the designated Music buildings on the Kingswood campus of Western Sydney University (buildings D, C and F) for a period of two weeks as first proposed. An (ethics-approved) amendment to the recruitment method allowed for web-based recruitment in the form of emails, as well as allowing for graduates of the Bachelor of Music degree to participate.

A total of ten participants took part in the study, aged between 21 and 47 years (Table 1). All ten had completed the Bachelor of Music degree. Six participants are current Higher Degree Research candidates studying various facets of music, two are current music tutors and two participants are not currently employed in music-related vocation. This participant group were expected to represent musicians with advanced understanding of the technical jargon pertaining to their chosen instrument(s) such as names of techniques and skills involved in performing and composing for their instrument(s). This was expected due to their extensive learning as part of a Bachelor of Music degree and was hoped to aid the conversation and exploration of learning experiences. Throughout the course of the study participants will be referred to using pseudonyms to protect their identity and participant numbers to give insight into the iterative refinement process. All participants were asked to select a pseudonym for the study.

Table 1 – Participants of study

No.	Participant Pseudonym	Age	Formal Education	Primary Instrument(s)	Mind Map(s)
1	Sean	41	PhD candidate	Guitar, piano, electronic	Appendix C
2	Owen	38	PhD candidate	Piano, guitar	Appendix D
3	Sarah	37	Graduate	Vocal	Appendix E
4	Dr J	41	PhD candidate	Vocal, guitar, electronic	Appendix F
5	E	21	Graduate	Guitar, vocal	Appendix G
6	Jane	35	PhD candidate	Gayageum, jango	Appendix H
7	Mark	30	PhD candidate	Vocal, piano	Appendices I and J
8	Basil	47	PhD candidate	Piano, organ	Appendix K
9	Dante	39	Graduate	Guitar, piano, vocal	Appendices L and M
10	Colin	26	Graduate	Drumkit, guitar, vocal	Appendices N and O

Participants will be referred to throughout this study using both their chosen pseudonym and participant number to relate findings to the chronological position within the iterative refinement process, for example Participant (p1).

Two participants, Dante (p9) and Colin (p10), were known to the researcher. Colin had been known to the researcher for five years between educational, professional and personal contexts. It is not expected that this relationship impacted the data collection or analysis process in any way. Dante had been known to the researcher for eight years through professional and personal contexts. The researcher cannot rule out the possibility that this relationship may have positively impacted Dante's willingness to discuss a central element of their learning experience.

Data collection

This project employed the use of an online survey, one-to-one interviews and mind maps to provide the bulk of the data for analysis, along with researcher's field notes.

Online survey

A Qualtrics survey (Appendix P) was created both for data collection and participant-screening purposes. It was initially anticipated that a greater number of potential participants would volunteer for the study than would be necessary for the study. This was not the case and as a result, all potential participants who identified as having completed a Bachelor of Music degree were invited to participate.

Participants were asked questions regarding their practical music experience, focusing on performance-related interests. Each participant was asked to list the instrument(s) they play, how long they have been playing each instrument, and the ways in which they learned each instrument. These questions aimed to seek data relating to current learning experiences of musicians. This information also prepared this (very) early career researcher for their first interviews, providing some orientation and background information.

Interviews

Interviews have a long history in qualitative music education research (Charmaz, 2006). They have been demonstrated to provide a platform for in-depth investigation of phenomena in the field of metacognition studies (McPherson, 1997).

In this study, it was the role of the researcher to aid participants' attempts at connecting learning experiences across multiple MLCs. The researcher was seen to function as a peer alongside

participants wherever possible, though also enacting a role of educator. As a developing specialist in the field, the researcher was often able to provide further explanation of understandings and spark thought in participants. Playing a dual-faceted role required careful negotiations between providing insight regarding the learning process and current understandings of the learning experience without presenting to participants as an educator and shifting the relationship, potentially creating a power imbalance. Participants must still be viewed as the experts in the topic of discussion and were treated as such. Meetings included getting to know participants, brief recounts of music learning histories, the creation of the mind map and attempts to connect learning between learning experiences across contexts (Appendix Q).

Mind maps

Mind maps serve many purposes in data collection both for participants and researchers. As evidenced in the literature review, the primary benefit of the use of mind maps is reportedly the facilitation of conversation. This speaks to the use of participant-led mind maps as a visual aid, allowing the researcher an opportunity to fully immerse themselves in the participant's experience. Further, it may give the participant more confidence in the interview setting. This research initially implemented a mind map design that would focus on the former as the primary benefit. The facilitation of recall is also reported as beneficial. The research benefits directly as the participant can more fully engage with the topic and the participant benefits from struggling less to recall information upon request.

The resultant methodology implemented a mind map to be created by participants at home. Wheeldon's extensive use of mind maps as a data elicitation method employs mind maps before the interview which participants either bring to the interview or transmit a copy to the

interviewer before the interview (Wheeldon, 2009; Wheeldon and Faubert, 2009). Researchers ought to give little information as to how this mind map was completed beyond the central theme, in this case connecting music learning experiences. Participants should be encouraged to use their creativity in any way they feel may be of assistance. Attempting this task themself the researcher found the process strange and difficult. This concurred with findings of Wheeldon (2009). To make the process less alienating the researcher developed a more direct set of guidelines (Appendices R and S). In doing so, the researcher risked constraining participants' creativity. However, it was made clear within the guidelines that at any point as participants felt it beneficial, they could away with the guidelines and create a mind map in a way which best suited them.

Meetings were conducted on Western Sydney University grounds (Kingswood and Campbelltown campuses) and were audio recorded. Prior to conducting meetings, participants reviewed and completed a consent form (Appendix T). Meetings were structured around variations of a basic interview schedule (Appendix Q). This schedule included seven stages: participant information/consent, project information, getting to know participants, mind map, music story, connecting learning and wrap up.

In response to the concerns of Burgess-Allen and Owen-Smith (2010) regarding the trouble capturing contradictions and confusion surrounding topics, the current research aims only to seek answers to 'what' questions within the mind maps stage of data collection, to facilitate questions of 'how' and 'why' within the interview stage.

In the current research project, participants were asked to create one of two variations of a mind map. Both mind maps implemented as part of this project featured various combinations of

three common elements: Musical instruments, MLCs and musical/music-related concepts. Stage One tested the implementation of a more standard mind map, labelled for the purposes of this project a 'learning-centric' mind map. Stage Two tested the implementation of an experimental 'concept-centric' mind map.

Mind maps were created using pens (up to 10 different colours) and paper. Whilst there are emerging technologies facilitating the creation of mind maps online, Wheeldon and Åhlberg (2017) claimed that the physical act of putting pen to paper provided a variety of benefits over and above what this technology could offer. In comparing mind maps created using pen and paper against those created through the use of a Word document, Wheeldon and Faubert (2009) found those created using pen and paper to have "provided more depth, including detailed and personalized accounts of [participants] experiences" (p. 77). This may be worthy of review in the following years as technology continues to develop more intuitive interactions between human and machine, especially those implementing a more familiar interface using touch screen and digital pen/pencil technologies.

Instruments as intermediary

In designing both forms of mind map, the researcher made the decision to include musical instruments as an intermediate point between MLCs and the centre of each mind map, either 'learning' or a chosen 'concept'. This decision could easily be questioned, however, as not all music learning occurs in relation to an instrument. The reason this decision was made can be seen in the participants' responses to the opening request - to give a brief overview of their music learning experiences (Table 2).

Here, each of these participants presented their seminal musical learning experiences as central to a particular musical instrument. This speaks to the ways in which learners schematise information in our minds (Lee, 2012). In attempting to access memories of our music learning experiences, it's easy for learners to 'tie' them to an instrument, a process

Table 2 – Participants opening statements (four of 10)

Participant:	Opening statement:	Learning style:
Mark (pilot participant 2)	I started with the clarinet in primary school. I think we started year 3 or something.	Clarinet, primary school – formal
Sarah (p3)	My first bit to music was when I was about four…I started learning violin, but it was a preschool music program.	Violin, four years – formal
Jane (p6)	I've been studying learning music since I was in primary school. First I experienced learning piano, just like, private lessons, and within the school, like I have experience of learning, 'cause I was in Korea when I was learning, when I was young.	Piano – informal
Basil (p8)	My parents had noticed that I was interested in the piano at my grandparents' house and an example of that is when I was very young, one of the very first things I ever did when …I learned how to stand up on my own was to actually stand up and reach up to the keys on the piano just so I could make the sound of it.	Piano – primary school – formal

described by association (Kandel, Kupfermann and Iversen, 2000). A feature of implicit memory, which is often difficult to verbalise, is that it can be stored in motor and emotional circuits. This means the physical object of the instrument, which is extremely personal to a musician, has the potential to be heavily linked to memory and as such instruments are far more accessible for the purposes of a retrospective investigation (Kandel et al., 2000). Further, because musical instruments are a central part of learning music, and because the construct of 'musical instruments' is far more accessible than 'music learning contexts', discussing music learning experiences via the musical instrument route is both more efficient and accessible for participants. Implications of this decision are discussed in Stage One - Musical instrument-free

learning contexts (see p. 76).

Combining mind map and interview

Having reviewed the available literature from the fields of music education and metacognition, as well as investigating the use of mind maps in research, conflicting views were noted. The literature was divided on how best to combine mind maps and interviews in data collection. The main issue stems from differing perspectives of the role of the interview, either as a product of data, or a facilitator of research, most often by stimulating recall and facilitating conversation. Consequently, this research project aimed to investigate both perspectives.

In viewing the mind map as visual data, the literature points to strict adherence to a set of guidelines (Buitron de la Vega et al., 2018). The researchers also suggest that creating the mind map as part of the interview phase was necessary. In viewing the mind map as a facilitator of conversation, the literature guides researchers to allow participants to dictate the creation of the mind map (Wheeldon, 2009). This project tested the implementation of the mind map as either part of the interview or to be completed before the interview.

Most of the literature regarding the use of mind maps in the data collection phase promoted the use of the participant-led process whereby the participant was given guidelines which were not enforced. As the participant felt, they could follow or disregard rules to create a mind map which they felt best represented their music learning experience. This is discussed further in Stage One. Different methods of combining the interview and mind map were tested as part of this research project (Table 3).

Table 3 – Combining mind map and interview

Stage One Meetings	Mind Maps	Order	Guidance
1	Instrument-centric mind map	At Start of Interview	Written with examples given
2	Instrument-centric mind map	At start of interview	Written with examples given + some verbal guidance
3	Instrument-centric mind map	Before interview	Written without examples given
4	Instrument-centric mind map	Before interview	Written with examples given
5	Instrument-centric mind map	Throughout interview	Verbal
6	Instrument-centric mind map	At start of interview	Verbal
Stage Two Meetings	**Mind maps**	**Order**	**Guidance**
7	Instrument-centric mind map	At start of interview	Verbal
	Concept-centric mind map	At end of interview	Verbal
8	Concept-centric mind map	At start of interview	Verbal
9	Instrument-centric mind map	Before interview	Written
	Concept-centric mind map	At start of interview	Verbal
10	Concept-centric mind map	Before interview	Written
	Instrument mind map	At start of interview	Verbal

Further information related to the implementation of mind maps and interviews is explored in Chapter 4 providing contexts for the findings.

Researcher's notes

Research notes were recorded as part of the data collection and data analysis processes (both survey and meeting data). At the conclusion of each meeting, the researcher spent 30-120 minutes writing a report of events, focusing on key successes and failures. These reports were

up to 3400 words in length.

Data analysis

The analysis of data was guided by constructivist grounded theory (Charmaz, 2017b). The researcher, according to constructivist grounded theory, is to self-identify as a part-creator of data (Mills et al., 2006), a process which aids efforts of methodological self-consciousness (Charmaz, 2017a). Understandings of the role the researcher has in shaping meaning should guide each methodological decision. The process of methodological development through iterative refinement demands an additional layer of analysis: "This approach acknowledges iterative meaning-making in qualitative [research], and we recognized 'a third hermeneutic level [for] the imagined reader… trying to make sense of the researcher making sense of the participant making sense of X!' (Smith et al. 2009 41)." (Cremata et al., 2016, p. 57). The researcher aimed to transcribe and code each meeting before the commencement of the following meeting. The researcher's post-meeting reports were used as a source for the triangulation of findings in some cases. The process of coding in grounded theory requires data to be compared to data to generate codes (Charmaz, 2006). This process is known as open coding (Callaghan, 2002). These codes were then compared to the next interview data and the codes developed from it, known as axial coding. This would allow triangulation of data and saw outlying concepts stand out. These codes were compared to each other to create concepts which were compared to data and codes and concepts to create themes (selective coding). The final themes are reported in each of two stages below, which are used to generate a theory.

Ethics

The study was approved by the Western Sydney University Human Resources Ethics Committee. Various processes were put in place to ensure the study adhered to the highest

standard of ethics including: the use of pseudonyms to protect the anonymity of participants; secure storage of physical data in a locked draw within a secure building on Campbelltown campus; and the secure storage of digital data using CloudStor.

Summary – Chapter 3

This chapter outlined the philosophical and theoretical underpinnings for the current study of constructivism and cumulative learning theory. It then outlined the research design of the study, including details of the participants, data collection methods of survey, interview and mind map, and the data analysis method of constructivist grounded theory. The following chapter details the findings of both stages of the study.

CHAPTER 4

FINDINGS

The current chapter analyses and discusses findings from both stages of the research.[4] The findings of the current research project have been analysed and discussed chronologically. Findings from two pilot meetings precede those from Stages One and Two. Throughout Stages One and Two, iterative refinements were made to the methodology with each meeting giving further insights as to how best this may best be accomplished.

Pilot Interviews

Prior to conducting meetings in the current study, the researcher conducted two pilot meetings with family members. These were initially intended to provide the novice researcher with

[4] The present chapter has been framed for the reader so that it gives a strong understanding of the context in which interviews were conducted. The inclusion of guidance provided to participants here, rather than in the previous chapter, facilitates this aim. Findings from Stage One are prefaced by contextual information particular to this stage of the study including the guidelines for the creation of the learning-centric mind map as well as details about which participants received what form of guidance as the method was iteratively refined. Similarly, Stage Two prefaces findings with contextual information particular to the second stage including the guidelines for the creation of the concept-centric mind map as well as details of which participants received what form of guidance.

experience and confidence in conducting meetings, as well as test the feasibility of the research methodology. It should be noted that the researcher was well-known to pilot participants and that pilot participants did not represent the targeted demographic in that they had not attempted or completed a Bachelor of Music degree. Pilot studies play a role in determining sample size and the development of instruments for research (Johanson and Brooks, 2010) and the process was valuable for this study.

The first pilot meeting comprised a survey, interview and mind map in a one-and-a-half-hour meeting. The structure of the meeting gave the researcher more hints as to how this project may develop - it demonstrated that using the mind maps after the bulk of the interview was conducted did not effectively facilitate the investigation. This is due to the role of the mind map, discussed in-depth as part of findings of Stage 1 and Stage 2. The first pilot meeting also gave the researcher an 'aha!' moment regarding the exact situations in which negotiations of conflicting information from various MLCs occur. The example scenarios presented earlier in Chapter 1 are appropriations of experiences of the first pilot participant.

The second pilot meeting gave the researcher confidence in an ability to complete the task at hand of eliciting information from participants' musical experiences in order to identify moments such as the examples above. Retrieved from the researcher's field notes following the meeting is a comment on the strong discovery made regarding a connection between three separate learning contexts with which the participant regularly associated:

> Perhaps most notable discovery of the session was the connection made between the development of the participant's understanding of the role of their instrument(s) within the church group contexts and the development of the participant's exploratory behaviour in relation to crafting their 'sound'. It was noted that as the participant became more fully aware of their role in the group dynamic, that they felt freer to explore the sounds which their instrument was able to make, which

> manifested prominently in their experimentation of effects pedals [in solo rehearsal]. The participant concluded that their developed understanding of group dynamics facilitated their exploratory behaviour which in turn positively impacted the performance of the group as a whole. (Pilot stage, meeting 2, researcher field notes)

The pilot meetings provided a good starting point for research. The researcher gained confidence and preliminary insights into methodological considerations which could be further investigated throughout Stage 1 and Stage 2 of the study.

Stage One – Following the Literature

The first stage of data collection aimed to test the implementation of a mind map which was typical of those described in the available literature. Six in-depth meetings were conducted with graduate and post-graduate musicians. Meetings averaged 1 hour and 40 minutes in length and were audio recorded for transcription. This section details the findings from Stage One which, in employing constructivist grounded theory for methodological development, guided the iterative refinement of the methodology.

Learning-centric mind map

Aligned with the literature's advice, the mind maps in Stage One were centred around a relatively broad area of their life pertaining to the focus of the study – the participant's music learning experiences. Participants were asked to complete their mind map around the central word, 'learning', which represented each participant's music learning experience (Figure 1).

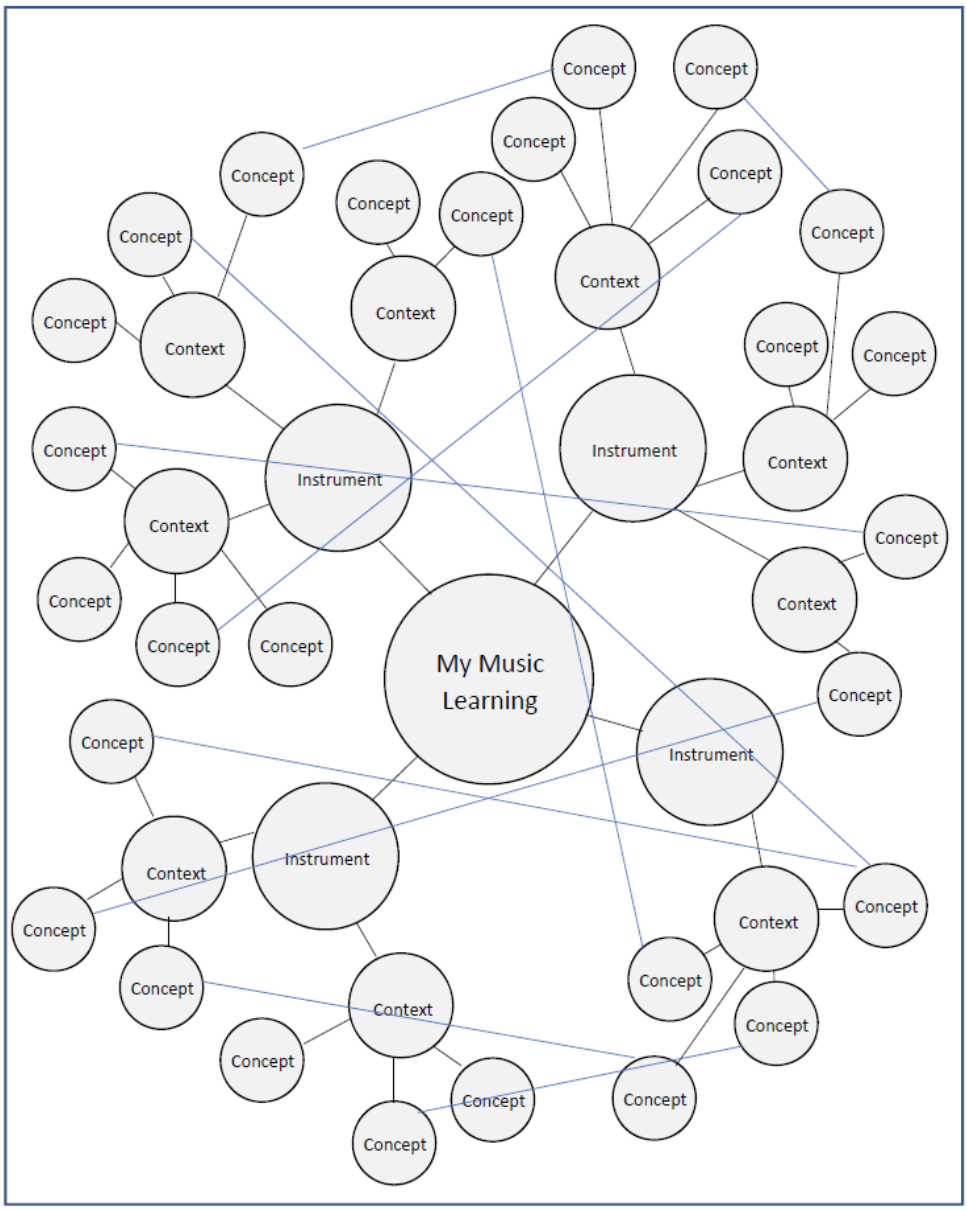


Figure 1 – Example of learning-centric mind map

Participants were asked to include musical instruments they felt able to play (which were significantly more numerous than those with which participants' identified as 'their' instrument[s]). Guidelines were provided to participants in relation to the aims of the mind map and a series of steps to complete (Appendix R). Most importantly, steps to complete the mind map included:

1. In the centre of the page write the phrase ‘My Music Learning’ and circle it.

2. Branching out from that circle, list the instruments you have played/learned and circle each of them.

3. Branching out from each of those instruments, list the contexts in which you have learned each instrument and circle each.

4. The fourth level outward from the centre represents the musical and music-related concepts you have learned from each context, related to the instrument on which you learned them.

5. Using another colour pen, draw lines to represent connections between concepts learnt in different contexts. (Appendix R – Mind map guidelines – learning-centric)

All participants were also provided with an example of how one might complete the mind map (Figure 2).

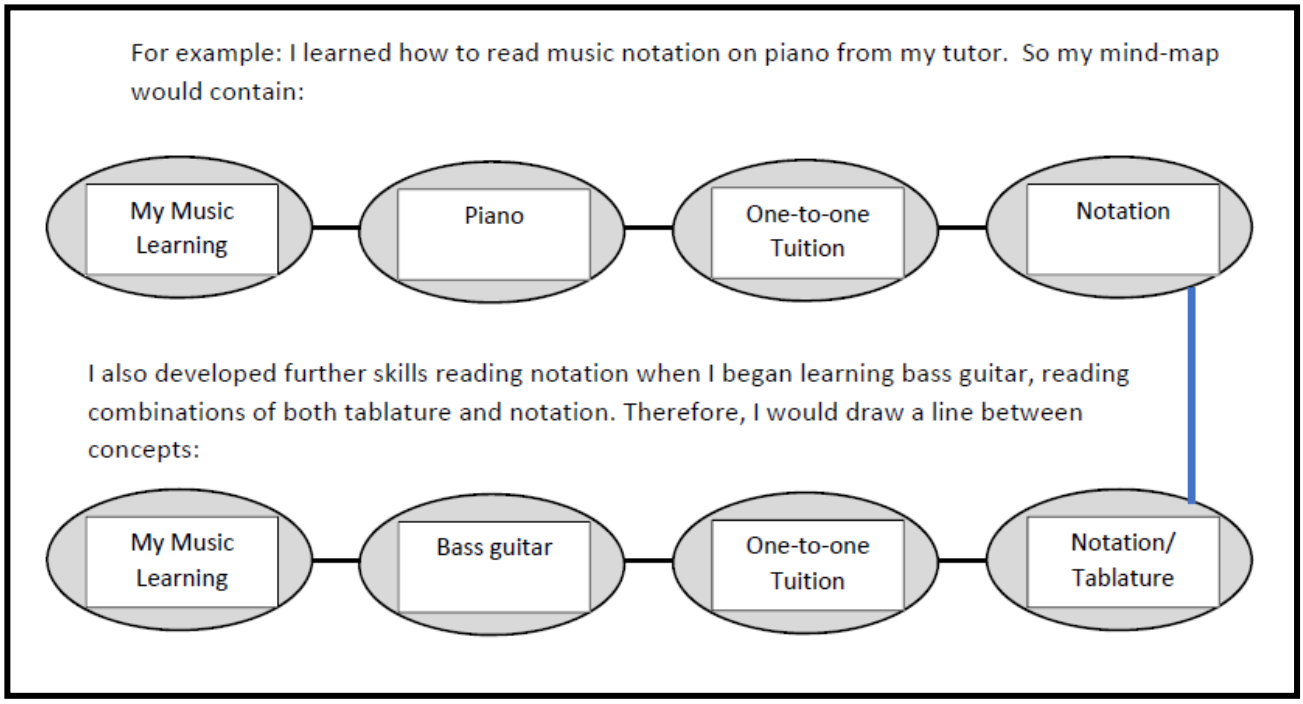


Figure 2 – Example of how to complete learning-centric mind map

All participants were provided with a definition of MLCs as any situation in which a person can learn more about music. All participants (except one) were provided with a definition of musical concepts as terms used to describe what it is the learner has learnt (Appendix R). Some participants were provided with examples of contexts (Table 4) in which music is commonly learnt.

Table 4 – Example contexts provided to some participants in Stages One and Two

In-school music class	Jamming session
One-to-one instrument tuition	Performances
Group instrument tuition	Music-related discussions
Band rehearsal	Using notation/tablature software
Solo rehearsal	Watching videos e.g. YouTube tutorials
Using an app	Reading music-related books

Some participants were provided with examples of musical concepts (Table 5) which are commonly learnt.

Table 5 – Example concepts provided to participants in Stages One and Two

Scales	Finger position	Notation	Chords	Group dynamics	Role	Accompaniment
Duration	Feel	Treble clef	Improvisation	Variation	Ostinatos	Recording
Pitch	Embouchure	Bass clef	Composition	Harmony	Mastering	Mixing
Dynamics	Tempo	Note Names	Genre	Monophonic	Rehearsal	Performance
Timbre	Beat	Rhythm names	Appreciation	Polyphonic	Lyrics	Downbeat
Texture	Accent	Melody	Key	Ensemble	Crescendo	Ensemble
Structure	Form	Spacing	Tonguing	Strumming	Picking	Plucking
Breathing	Riffs	Technology	Sight reading	Time signatures	Bowing	Measure
Intervals	Tuning	Syncopation	Bars	Pulse	Ornamentation	Expressive Technique
Accent	Melodic contour	Tonality	Instrument family	Counter melody	Chromaticism	Style
Triad	Movement	Cadence	Tonic	Serialism	Broken chord	Double stop
Unison	Tremolo	Glissando	Drone	Technique	Theme	Medley
Instrument	Octave	Canon	Upbeat	Waltz	Accompaniment	Lyrics
Capo	Syncopation	Vibrato	Effects	Listening	Counterpoint	Meaning
Practice	Examination	Echo	Reverb	Metre	Transcription	Vocalisation
Phrasing	Exploration	Register	Transposition	Drop	Variation	Dance

Table 6 shows a summary of which participants received other elements of guidance to test the value of including definitions, examples of contexts and concepts, and detailed and simplified examples of learning-centric mind maps.

Table 6 – Guidance provided to participants in Stage One

Participant	Definition of 'Context'	Definition of 'Concept'	Example Contexts	Example Concepts	Detailed Example Mind Map	Simplified Example Mind Map
Sean (p1)	Written	Not provided	Not provided	Not provided	Visual provided	Not provided
Owen (p2)	Written	Written	Not provided	Not provided	Not provided	Written
Sarah (p3)	Written	Written	Not provided	Not provided	Not provided	Written
Dr J (p4)	Written	Written	Written	Written	Not provided	Written
E (p5)	Verbal	Verbal	Verbal	Verbal	Not provided	W*/Verbal
Jane (p6)	Verbal	Verbal	Verbal	Verbal	Not provided	W*/Verbal

*Shown written guidance very briefly before being verbally guided. Did not use again.

Combining mind map and interview

Stage One implemented various combinations of the mind map and interview in meetings (see Table 7). In conjunction with adjustments to the elements included in the guidelines, it was hoped that participants could provide understandings about the value of each element both before the interview and as part of the interview. This was sought in the concluding stages of the meetings.

Table 7 – Combining mind map and interview in Stage One

Participant	Mind Maps Type	Mind Map Order	Guidance
Sean (p1)	Instrument-centric mind map	At start of meeting	Written with examples given
Owen (p2)	Instrument-centric mind map	At start of meeting	Written with examples given + some verbal guidance
Sarah (p3)	Instrument-centric mind map	At home before interview	Written without examples given
Dr J (p4)	Instrument-centric mind map	At home before interview	Written with examples given
E (p5)	Instrument-centric mind map	Throughout meeting	Verbal with examples discussed
Jane (p6)	Instrument-centric mind map	At start of meeting	Verbal with examples discussed

Iterative refinement

Constructivist grounded theory's iterative data analysis allows researchers attempting to develop a methodology an opportunity to do so incrementally (Charmaz, 2006). Throughout Stage One, various findings were made as to areas for improvement in the methodology. Each of these findings are discussed in detail below and findings were applied to the second stage of the data collection phase (except Vocabulary as Barrier, which did not reappear).

Example mind map simplified

The first participant of the current study concurred with the pilot study participants in a discomfort with the busyness of the example mind map provided. Sean (p1) suggested, "Awesome, so what you wanna do is when you show this to other participants, I would say simplify it. Less circles…" Whilst the researcher had intended on displaying just how fully populated a mind map such as this ought to become, the detailed example mind map created too much visual distraction and did not provide a clear understanding of how to complete the task. It was instead replaced by a simplified version (Figure 3).

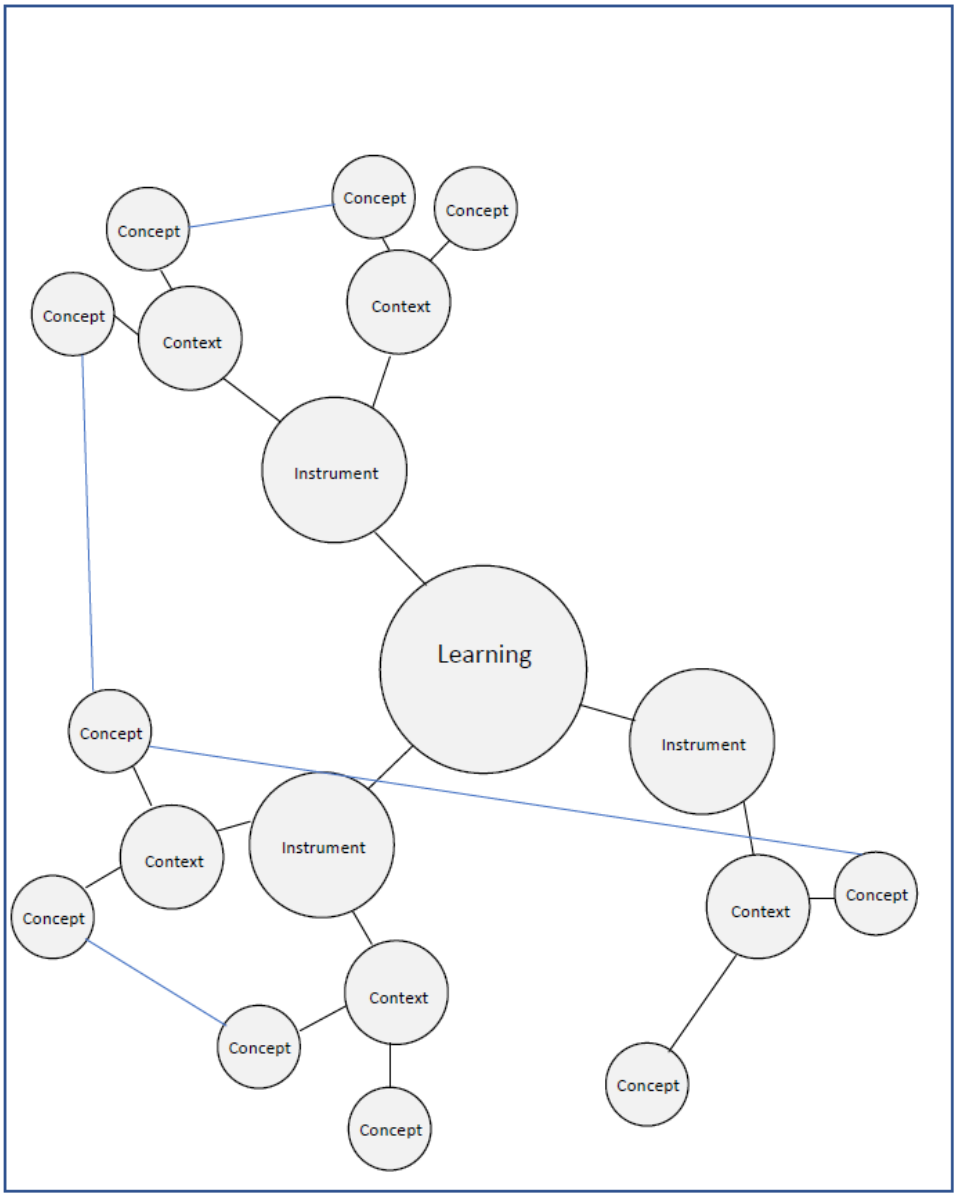


Figure 3 – Example learning-centric mind map (simplified)

Guidance by researcher

One of the first changes made in this stage was the freedom given to participants in creating the mind map. Sean (p1) was provided with a written set of guidelines including an example of the intended end-product (Appendix R). As explored above, this was not effective. The researcher made clear that creative freedom was the right of the participant, of which the participant took full advantage. Whilst the provision of guidelines was thought to be enough to

ensure participants would create a workable mind map (one which could facilitate conversation and function as data standalone) the first meeting suggested perhaps not. In considering the mind map as data, Sean's mind map (Appendix C) is not comparable to others in form, nor does it demonstrate a consistent level of detail. In this instance, it appears creativity may have disrupted productivity. The second meeting, with Owen, demonstrated that it may be possible for participants to create a workable mind map with the use of written guidelines through an increased level of unscripted, ad hoc guidance including answering questions and giving additional examples beyond what was provided. This pointed towards the role of the researcher as important in the creation of the mind map. The third and fourth meetings (with Sarah and Dr J respectively) featured participants creating mind maps at home, though Sarah (p3) took the opportunity in the interview to add elements to the mind map as ideas were brought up in the discussion. Both mind maps created at home contradicted the original hypothesis. Whilst it was thought that engaging participants in the process of creating mind maps at home would prove most effective, the mind maps developed did not represent the most effective tools in facilitating conversation, nor were they the most effective representations as standalone data. This was explored further in Combining Mind Map and Interview (see p. 73).

Further attempts to explore the role of the researcher in guiding mind map creation were made in meetings 5 and 6 in which participants E and Jane were verbally guided through the process of creating a mind map, rather than being given a written document. These meetings demonstrated the role reflexivity and responsiveness can play in developing a mind map. The researcher was able to provide more detailed guidance relevant to the points of concern/confusion of each participant. Over the course of the first six meetings, it was abundantly clear that the process of verbally guiding participants as to how to create a mind map produced mind maps with a more consistent structure than providing written guidance

(see Appendices G and H). Quantitatively, researcher involvement in the creation of the mind map also led to more points (both contexts and concepts) on the mind map. The first, third and fourth meetings, which all featured only written guidelines instructing participants, averaged five instruments, 13 contexts and nine concepts. During the meeting, the third participant, Sarah (p3), was able to add one instrument, two contexts and seven concepts to their mind map (Appendix E). The fifth and sixth meetings, in which the researcher guided participants through the process of creating a mind map verbally, rather than through written instruction, saw a dramatic increase. Participants averaged 5.5 instruments, 20.5 contexts and 82 concepts (Appendices G and H). Whilst it must be understood that to view such things qualitatively has the potential to be problematic, the researcher argues there is some value in doing so.

The second meeting functioned somewhat as an outlier - whilst Owen (p2) had listed over ten instruments as part of the survey, they chose to group instruments by family in the mind map (Appendix D). The use of instrument groups as the article of the mind map caused the quantitative data some trouble, as it is more difficult to compare families of instruments to individual instruments. However, the participant did note the benefits of the researcher clarifying concerns and probing for insights:

> I think facilitation is probably good, but sit back like you did, sit back a bit and then see… I thought you did well with the facilitating at a few different points where I was starting to get a bit lost in my own head. Yeah, I think do do some facilitation. (Owen, p2)

It must be noted that the learning experiences of each individual are vastly different, and that qualitatively analysing these experiences would not prove useful, the current project aims to investigate the methodology. It can be safely assumed, as many participants recorded, that many learning experiences are not recalled in the process of creating this mind map (Table 8).

Table 8 – Difficulty with recall

Participant	Quote
Sean (p1)	I would say 80% of my childhood I don't remember
Owen (p2)	I don't know – I can't remember… Twenty years ago, longer.
Sarah (p3)	…[violin] at 4, and I don't remember much, other than I learnt to play 'Twinkle, Twinkle, Little Star'.

The role of the researcher in guiding the creation of the mind map is to facilitate memory through educated guesses of other instruments, contexts, and concepts the participant may be yet to remember: "So like, for me personally, having someone be like 'oh but what about this, does this influence you?' I'm like, 'yes it does, good point'" – E (p5). These suggestions were informed by survey data provided by the participant as well as the recount of experiences participants are asked to provide at the outset of the meeting stage. The guidance of the researcher also goes some way to more clearly defining the boundaries of the investigation - what is and is not worth including in the mind map, as well as the fidelity of the information - how specific contexts and concepts ought to be defined, especially as separate objects on the mind map. Each participant will provide a guiding temporal boundary to investigation in noting an inability to remember certain moments. These difficult-to-remember moments should be assessed for their impact in the course of the investigation and dealt with accordingly. For example, Sean (p1) noted an inability to recall much from childhood. In this instance, Sean is self-reporting a lack of reliability which should be noted by the researcher and discussion of this period of Sean's life ought to be treated with caution. Studies such as this cannot hope to obtain recounts of every music learning experience, and as such, should be selective in those which are discussed within such short meetings. The direct correlation between increased facilitation by the researcher and increased quantities of instruments, contexts and concepts is not participant-dependent as may be first thought. It is expected that had the participants of the first, third and fourth meetings been primed through the process of co-creating the mind map with the researcher, that their mind maps would be more populated with information of (as yet)

forgotten experiences.

The information retrieved through increased guidance by the researcher was more on-topic. Whilst the first meeting explored various elements of Sean's personal development outside of music, subsequent meetings increasingly gave way to insights about the facets of music learning most important to participants. The second meeting explored sociological aspects of music-making which continues to be an important part of the Owen's engagement with music in music therapy. The fourth explored the entrepreneurial facets of becoming a musician which facilitated the Dr J's current context as post-graduate student, the product of which is increased understanding of music. The increased guidance of the researcher in defining what constitutes MLCs and musical/music-related concepts facilitated a better understanding of the scope of the research which in turn lead to more useful data.

In summary, Stage One demonstrated both quantitatively and qualitatively that dictating the steps taken to create a mind map is superior to providing a written copy of instruction in so far as research processes are concerned. Data resulting from the verbal guidance of the researcher was more accessibly comparable than data resulting from written guidance (for example, Appendices C and D were constructed via written guidance while Appendices G and H were constructed via verbal guidance), as well as being more numerously populated. The same cannot be said, necessarily, for the benefits of the process for participants. All participants appeared to report similar benefits from written and verbally guided mind maps.

Increasing engagement with mind map

The researcher's increased role in actively guiding participants through the process of creating mind maps had a direct correlation with the amount of time spent creating mind maps and the

quantity of elements produced on participants' mind maps (see Table 9). Whilst the first four participants had self-regulated the amount of time spent on creating the mind map, the fifth and sixth participants were more carefully guided by the participant.

Table 9 – Elements of the learning-centric mind map – Stage 1

Participant	Instruments from Survey Response	Instruments from Mind Map	Contexts - Mind Map	Concepts - Mind Map
Sean (p1)	2	4	13	14
Owen (p2)	10	5*	16	20
Sarah (p3)	3	5 + 1**	10 + 2**	28
Dr J (p4)	5	5	16	2
E (p5)	2	6	23	107
Jane (p6)	3	4	18	57

*Grouped instruments by families
**Elements added to the mind map as part of the interview

Active guidance by the researcher increases opportunities for connections to be made between learning experiences, presents a more valid and accurate document for presentation as data, and has the potential to boost the positive outcomes found by participants (detailed under Benefits of learning-centric mind map to participants, p. 78). The increase in quantity of elements on the mind map is evidenced by fifth meeting (Figure 4).

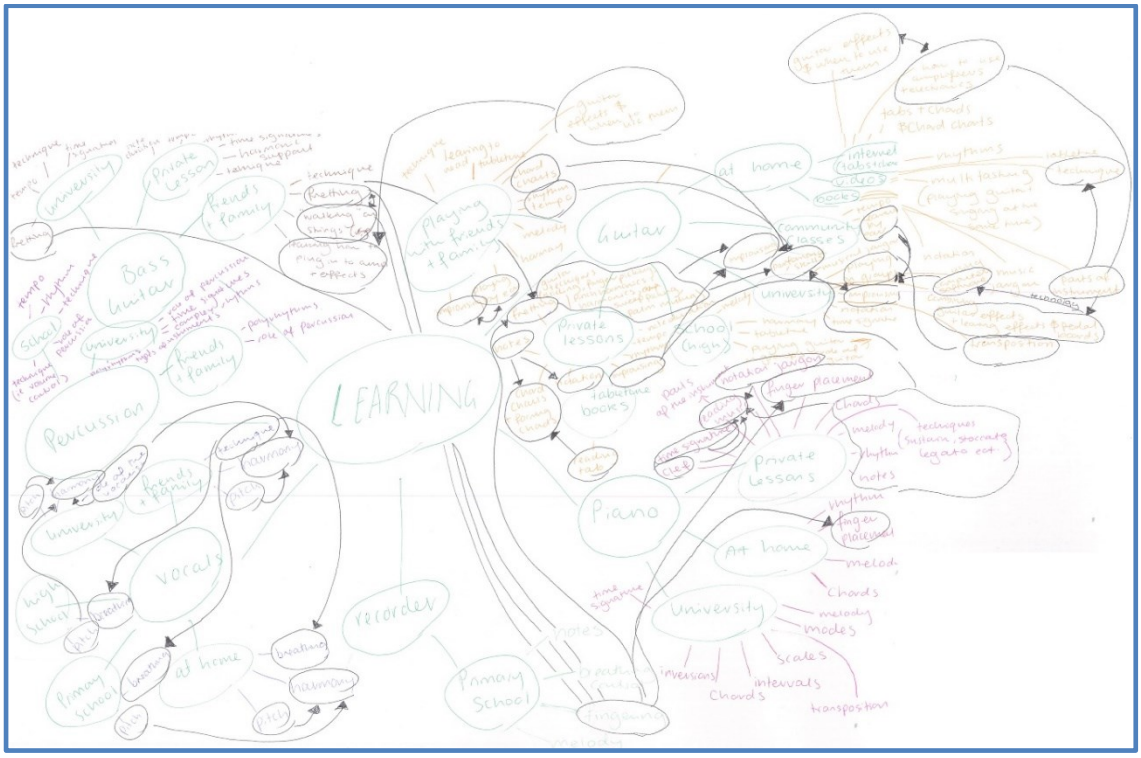


Figure 4 – Participant 5, E's learning-centric mind map (Appendix G)

The fifth meeting featured a 'rolling' mind map creation process throughout the meeting. The researcher asked E (p5) to explain the reasons for adding various elements on the mind map and describe the situations these elements represent. Further, E was asked to explain the motivation for drawing each connection made between learning experiences. Whilst this increase in engagement with the task of creating the mind map demonstrates a quantitatively more impressive mind map, the allotted time for the meeting had expired before the researcher was able to ask a comprehensive list of follow-up questions. This led to a decrease in the value of the meeting in diving deeper into the connections made between learning experiences. The time-consuming nature of the task also led to a difference in the number of connections drawn compared to the number of potential connections not drawn. E noted there were a still many other connections they could have drawn if they had more time.

Verbalising physical points of reference

The first meeting gave clear feedback as to a flaw in the current research design. Upon transcribing the recording of the meeting, the researcher noticed the vast amounts of data which were lost in the process of recording audio of two people discussing a visual document (the mind map). Many references were made to the mind map which were distinctly visual, most notably pointing, for which no audible reference had accompanied. For example, Sean (p1) spoke of 'this', 'that' and 'here' (Table 10).

Table 10 – Incomplete verbal references

Participant	Comment
Sean (p1)	"This was just the beginning."
Sean (p1)	"…this is where I started to compose."
Sean (p1)	"…that's an overlap of my guitar and piano learning."
Sean (p1)	"…then it kind of peaks here…"
Sean (p1)	"That's where it would overlap."

The act of pointing to the mind map which aided in communicating meaning in these statements was lost in the process of audio recording. This is a feature particularly pertinent to the combination of a visual media such as mind maps with the more sonic-based media of interview. Whilst some data could be recovered through contextual understanding, this is not ideal. The process of recovering visual data through contextualisation via audio is not guaranteed to solve all issues, and those which may be solved are done so with an added layer of researcher-bias. Two solutions may be found for this – recording the visual component or having more explicit conversations/instructions as to the task and how researchers and participants might have conversations as part of the meeting. A compromise may be negotiated by framing video recordings such that only the mind map is in shot, protecting the anonymity of participants by not capturing their faces. It is recommended, however, that researchers opt for a video-free option wherever possible. All subsequent meetings included a request from

the researcher that whenever a point on the mind map is pointed to, it be accompanied by a verbal description, such that information may be recorded accurately and free of researcher-bias. The transcriptions of the subsequent meetings contained minimal (n=0-2) instances of verbal references to visual stimuli that were not verbalised. Those references which lacked verbalisation were more easily identified through contextualisation.

More inclusive array of colours

Whilst the researcher had adhered to the literature regarding the inclusion of colour in creating the learning-centric mind map (using two colours), it was clear this was not enough. Owen (p2) suggested, “do you know what? I find the two colours limiting”. Sarah (p3) also noted a limiting factor in using a small number of colours, “the line’s not there ‘cause I couldn’t find my other coloured pen. And I went, ‘I can’t do them all in orange’.”. Following the second meeting a palette of 10 colours was offered to participants. As part of the third meeting, Sarah, who had already completed a learning-centric mind map before the interview, decided to use time in the interview to add forgotten elements and connections to the mind map (Appendix E). The available range of colours allowed a new method of representing these connections. Mark (p7) explained the use of complementing colours (Appendices I and J), “I'm quite visual in the way I learn, I don't absorb as much. I remember - it's easy for my brain to absorb if I see different colours.” As explained by Mark, colour can be an important visual thinking tool for participants in the process of creating a mind map. It may also function as a communicative tool in mind maps when facilitating discussion or acting data standalone. Whilst participants may opt not to fully employ the range of colours, it is important to make such a range of colours available in order to best facilitate the data collection process.

Combining mind map and interview

The first two meetings included time for participants to follow the written guidelines and create a mind map as part of the session. Sarah (p3) and Dr J (p4) completed mind maps at home based on the same guidelines, though Sarah took the opportunity in the interview to add elements to the mind map as ideas were brought up in the discussion. Both mind maps (Appendix E and Appendix F respectively) created at home contradicted the original hypothesis. This gave an opportunity to learn more about the impact different contexts had in the creation of a mind map. Whilst all participants reported nearly identical benefits (enhanced recall, a sense of pride and achievement, opportunity for self-reflection (see Benefits of learning-centric mind maps to participants, p. 78) the mind maps created prior to the interview presented difficulties for the researcher. Whilst it was thought that engaging participants in the process of creating mind maps at home would prove most effective, the mind maps developed did not represent the most effective tools in facilitating conversation, nor were they the most effective representations as data standalone. These mind maps were less complete, both in comparison to other mind maps, and in self-reports by the third and fourth participant. Sarah suggested the mind map created was "messy and it's not, it's not complete - it feels so incomplete." Similarly, Dr J noted "I've put a couple of little extra concept things in here, but then I realised even those ones are more just an extension of the context. So, I hadn't really gotten as far as thinking about anything more abstract than that, or, more theoretical."

This has the potential to negatively affect the process of research, both as points of data as well as in facilitating conversation. Both Sarah (p3) and Dr J (p4) cited various obstacles to completing the mind maps at home pertaining to their personal circumstances, yet independently cited the same benefits as participants who had completed the mind maps as part of the meeting. This study is unable to account for variations in levels of such benefits, however. While all participants claimed very similar benefits from completing the mind map,

there was a discrepancy between the benefits for the researcher and a theory developed regarding the role of mind maps as being dual-faceted. The mind maps developed by participants were identified as beneficial to their personal development, not simply facilitating the study. This notion continues to be explored as part of the iterative refinement process in Stage Two.

Example concepts and contexts as part of mind map guidelines

The pilot meetings, as well as the first meeting, indicated a potential benefit in providing participants with examples of the contexts in which musicians learn and the concepts musicians often learn. This was examined throughout the second to fifth meetings. Two of these four participants were provided examples of contexts and concepts whilst two were not (see Table 6). The two participants who were provided examples were asked to comment on the impact of these examples, both positive or negative. The two participants who were not provided examples were then shown these examples after completing the mind map and asked to discuss the impact of not having access to these examples, both positive or negative.

Personally important contexts/concepts

It was clear from all four participants that whilst initially these examples seemed tempting to access, that they may quickly become disruptive and/or constraining. Participants who had not been given examples prior to completing the mind map described the concepts that featured on their mind map as more meaningful to their experience and a better representation of what they held in high regard:

> and then I looked at this [example mind map], and I'm like 'alright, instrument - yeah I've got that', [I looked at] concepts and I went, 'I don't really know what you want from the concepts' and I struggled a little bit with that and so I will admit, I had a look online. I did a google search as we all do now and I went,

> 'alright, concepts' and I'm like 'oh it just says musical and music-related' so I went 'alright music concepts' and I'm like 'of course, I am so stupid'. (Sarah, p3)

When asked how they thought the use of example contexts and concepts might have affected the process of creating a mind map, E (p5) suggested the mind map may be more populous: "'cause I kinda put like, very general, learning how to play in a group, or like, notation jargon, but there's things like 'waltz' here and like, 'serialism'. Which, I know those things, but I didn't put them on my mind map." In response to a follow up question about the importance of waltz and serialism in E's music learning experience, they responded, "not really, I just know that they're there. I know what they are." E also suggested that the elements that did feature on their mind map were indeed important to them. The findings from this Stage One suggest that the written examples of contexts and concepts which may feature in a participant's mind map do not aid the process of creating the mind map. In combination with the exploration into the act of verbally guiding participants through the process, written examples were replaced with the discussions of contexts and concepts, whereby the participant was invited to provide examples of some which may come to mind.

Musical instrument-free learning contexts

Over the course of the first 6 meetings it became evident that music learning, whilst primarily occurring on or in relation to a particular instrument, also occurs in contexts where no instruments are found. One examples of this was identified by Sarah (p3):

> And there are, I guess certain aspects, too, that I didn't write in there, because it didn't relate directly to a musical instrument for me as such, you know. When I went to, umm, when I did year 11 and 12 in high school and also at university, we had to transcribe music, and we had to change keys…. it was under composition, but we had to take a simple piece of music and then create it as an orchestral piece. (Sarah, p3)

Subsequent to the third meeting, after participants had explored MLCs in relation to each of the instruments they had listed, they were explicitly asked to reflect on learning experiences which occurred away from an instrument that may have been important aspects of their music learning journey. It was noted that instruments had provided a vehicle by which thinking about MLCs was made easier. Stage One also uncovered another benefit in using instruments as a vehicle to explore MLCs, however, in that it divided otherwise identical MLCs by instrument. For example, one-to-one tuition is a very common MLC, though many participants had experienced one-to-one tuition for various instruments, and some for theory work. The use of instruments in defining these contexts as separate allowed for more detailed responses about the relationship between contexts.

Vocabulary as barrier

The role of participants' vocabulary was identified to be an area of concern within two meetings. Both participants had completed a Bachelor of Music degree and as such were included for participation. It became apparent in the course of the meeting, however, that this may not be wholly indicative of a person's ability to discuss music. Two distinct reasons for this exist.

One participant noted several years between the completion of their degree and the meeting. Further, this participant also noted some fewer years between the last time they had professionally engaged in musical activities, finding employment outside of music-related roles. Another participant reported having studied music predominantly in another language. As such, a decline in the participants' ability to recall/identify music-related terms resulted. This proved difficult as the process of writing down and discussing domain-specific concepts was greatly inhibited. Whilst the researcher and participants did their best to find mutual

understandings, working together to name concepts based on their description, the vocabulary barrier took agency away from the participants. This was not a major setback to the current investigation, though provides insight into difficulties which may be faced by researchers aiming to investigate learning experiences of people with limited domain-specific vocabulary such as beginner musicians, those who have studied in a different language and those who have not sustained engagement with the object of investigation.

The role of learning-centric mind maps

Over the course of the Stage 1, the role of learning-centric mind maps become somewhat clearer. The benefits to participants (described below) go some way to exploring the role of learning-centric mind maps, however more can be understood. Learning-centric mind maps request participants provide a wide-ranging overarching visual representation of their learning experiences. The process has the potential to quickly provide a comprehensive understanding of the variety of participants' experiences. The learning-centric mind map was seen to benefit participants' recall of music learning experiences as well aiding in the processing of thoughts/ideas.

The learning-centric mind map seemed to fail in some ways, however. The researcher hoped to delve deeper into the learning experiences and identify further connections between learning experiences. In the first stage the learning-centric mind map had failed to produce interconnected mind maps in the way the researcher had envisioned. With a primary hypothesis suggesting this was due to the constraints of time, the researcher opted to explore the possibility of a new form of mind map which shifted the focus of investigation toward a more in-depth view of learning. This is discussed in Stage Two (p. 80).

Benefits of learning-centric mind map to participants

The first 6 meetings saw many benefits to participants. These benefits were often associated by participants with the mind maps they created. For clarity, the benefits reported here pertain solely to participants' experiences of creating the learning-centric mind map and not the interview process. Responses from participants in Stage Two using this form of mind map have also been included here.

Participants reported benefits relating to self-reflection. Sarah (p3) noted the process acts as a "really good guide" for both the participant and researcher. Colin (p10) suggested "the learning-centric [mind map] definitely forced me to think back over many situations that I've found myself in music-wise." In reflecting on a career in music learning, Mark (p7) noted "sometimes you don't appreciate different…elements here that aren't strictly musical, but still influenced learning and how you take those concepts that you've learnt into…the musical learning environment." Dante (p9) noted a total interconnectedness between learning experiences and reflected on a large percentage of learning being autonomous.

Mark (p7) described the process as empowering, noting the visual of the mind map allowed him to incorporate a wide range of skills, "because you think 'oh, I've got a background, even if it's not strictly a musical one, I can bring my skills into a musical setting'." Colin (p10) similarly suggested it "really opens up my eyes to how much of a sponge I've been." Memory and recall were mentioned as being benefits of creating a mind map on the topic of one's music learning. Dr J (p4) suggested "…it's just an interesting exercise in memory."

Many participants also noted that the process of creating mind maps aids in processing thoughts. E (p5) noted the process "…helped me collect my thoughts." Dante (p9) noted a

newly-found clarity in retrospection, “everything I've just said to you there is something I haven't really thought about before… or at least in such a linear way.” Similarly, Mark (p7) suggested, “I never made those connections as much – [I had] to a point – but not as clearly articulated as today.” Jane (p6) suggested it gave an understanding of what to work on in the future, reminding her “…of what I need to be doing from now on. What I need to be focused when I'm performing and composing.”

In summary, Stage One went a long way towards refining the methodology for the retrospective investigation of participants’ music learning experiences. Refinements included: verbalising the guidance of mind map creation processes; simplifying the example mind map provided; increasing the role of the researcher/interviewer in guiding the creation of the mind map; verbalising physical points of reference for more robust transcripts; increasing the use of colour as a communicative/thinking tool; replacing written examples of contexts and concepts with discussions; identifying musical instrument-free MLCs; and understanding the limitations of the learning-centric mind map. Stage One provided a wealth of information for a more substantial change to the methodology. The researcher was concerned, however, that the attempts at covering the full breadth of a participant’s music learning history - attempting to gather every concept learnt across the span of their music learning career - was proving ineffective at gaining deeper insights into the connections made between MLCs. Participants spent such a great deal of time and thought into completing the first four steps of the mind map that perhaps the most crucial portion of the task, considering connections between learning experiences, was often neglected. Stage Two introduces a newly designed mind map, the concept-centric mind map, aimed at facilitating deeper investigations into learning across contexts.

Stage Two – New Design

The second stage saw a major change in the use of mind maps in an attempt to seek more meaningful information at greater rates. The first stage of meetings demonstrated that the 'learning-centric' mind map provided a clear benefit for the participant in recall, self-reflection and boosting confidence, though lacked an ability to facilitate deeper investigations of learning across contexts. The second stage aimed to remedy this by focusing investigations around a single concept of music which was of great importance to individual participants. This decision compromises quantity in the pursuit of quality. Four in-depth meetings were conducted with graduate and post-graduate musicians. Meetings averaged 1 hour and 20 minutes[5] in length and were audio recorded for transcription. This section provides contextual information of and details the findings from Stage Two, which guided the iterative refinement of the methodology.

Concept-centric mind map

Prior to the fifth meeting, the researcher devised a new form of mind map aimed at diving into the 'nitty gritty' of music learning, whereby singular concepts formed central nodes (Figure 5).

Whilst plans had been set for the fifth and sixth meeting which the researcher felt a need to follow through with, a decision was made to test the idea of a concept-centric mind map in the seventh meeting. The participant was first asked to complete the learning-centric mind map,

[5] A 20-minute discrepancy between average interview lengths between Stage One and Stage Two exists. This has two causes. Firstly, in the opening interviews, the researcher was very inexperienced and as such was less aware of monitoring time than a more experienced researcher, taking far longer to work through discussion points than necessary. The first three interviews average 1 hour 45 in length while the latter three interviews of Stage One average 1 hour 32. Secondly, the ninth interview was concluded after just 1 hour and 6 minutes due to unforeseen work-related matters that required the participant's attention. As this occurred before the interview started, the researcher was able to monitor their time and work through discussion points at an increased pace. The remaining three interviews of Stage Two averaged 1 hour and 35 minutes in length.

which was followed by the concept-centric mind map. Following a level of success in gaining deeper insights in connecting learning experiences between contexts, subsequent meetings tested a variety of methods to implement the concept-centric mind map.

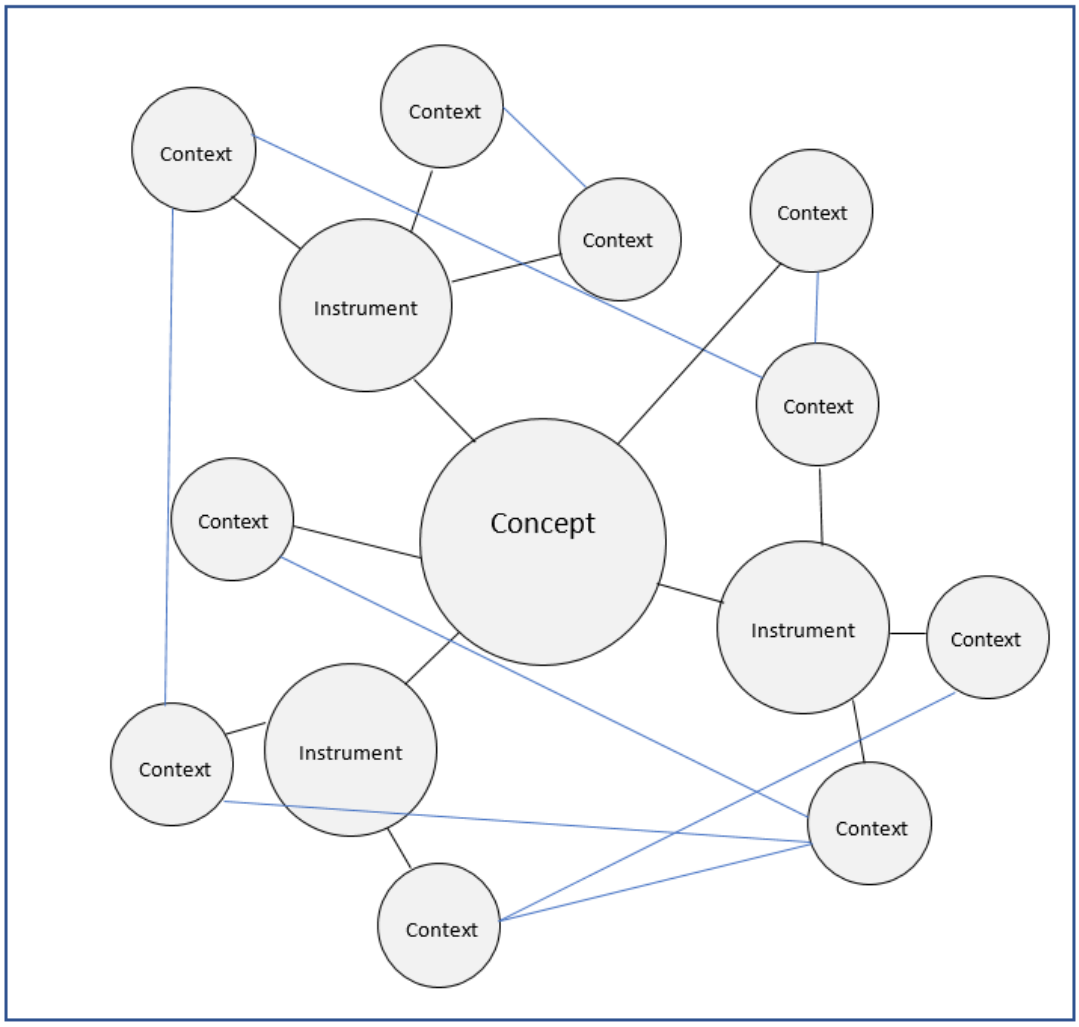


Figure 5 - Example of concept-centric mind map

The concept-centric mind map (Figure 5) inverts the elements of the learning-centric mind map to presents a single concept as the centre. The concept is to be of utmost importance to the participant. Outward from the concept, the instruments in relation to which the participant learnt about the concept are listed. Branching out from each of these instruments are the contexts in which the participant has learnt about the concept. Guidelines were given provided regarding the aims of the mind map and steps to complete a concept-centric mind map

(Appendix S).

Definitions provided to the participants of Stage Two matched those provided in Stage One. Participants were provided with an example of how to complete the concept-centric mind map (Figure 6). As was found in Stage One, there exists contexts in which music learning may occur not in relation to any instrument. Considering this, in the course of the meetings participants were asked to consider these learning contexts and include them in the mind map branching directly outward from the concept (as seen in Fig. 6).

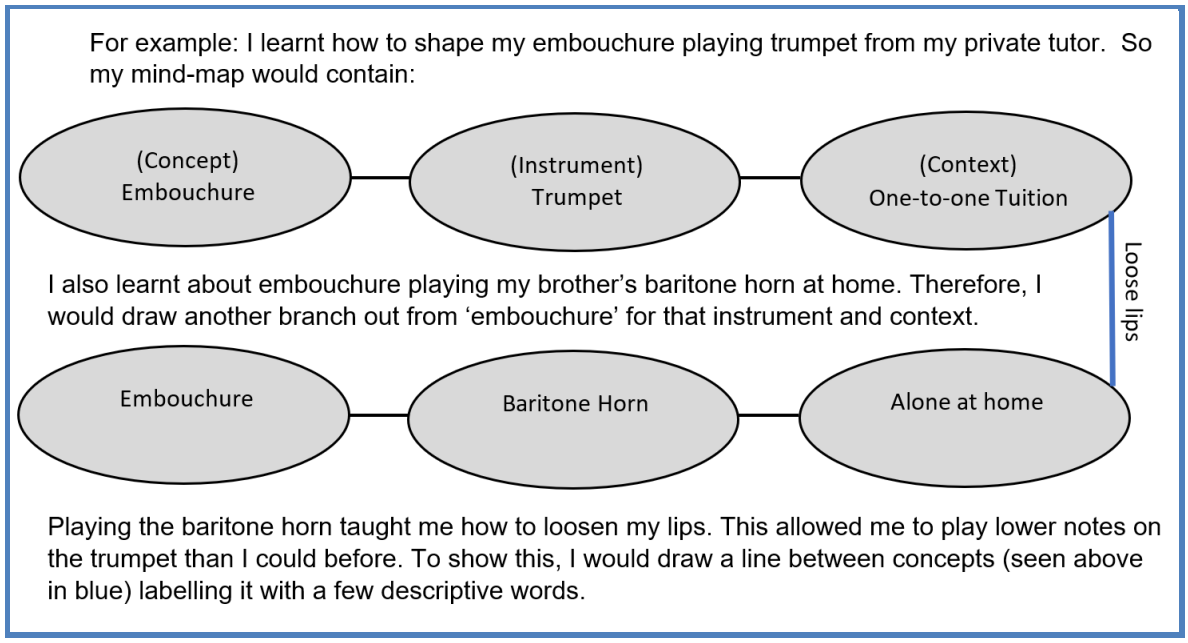


Figure 6 - Example of how to complete concept-centric mind map

Identifying a single music-related concept of importance to individuals is a critical element of concept-centric mind maps. In this study this task was accomplished in two ways: listening to the participant's recount of their music learning experience and identifying a recurrent theme before the completion of a mid-meeting mind map (meetings eight and nine) and by requesting participants identify for themself a critical concept (meetings seven and ten).

Combining mind map and interview

The mind maps created, and interviews conducted in Stage Two were done so in a variety of ways (see Table 11). In conjunction with adjustments to guidance provided by the researcher, it was hoped participants could provide understandings about the value of each element both before and as part of the meeting.

Table 11 – Combining mind map and interviews in Stage Two

Participant	Mind Maps	Order	Guidance
Mark (p7) (mind map7a)	Instrument-centric mind map	At start of meeting	Verbal with examples discussed
Mark (p7) (mind map 7b)	Concept-centric mind map	At end of meeting	Verbal with examples discussed
Basil (p8)	Concept-centric mind map	At start of meeting	Verbal with examples discussed
Dante (p9) (mind map 9a)	Instrument-centric mind map	Before meeting	Written without examples given
Dante (p9) (mind map 9b)	Concept-centric mind map	At start of meeting	Verbal with examples discussed
Colin (p10) (mind map 10a)	Concept-centric mind map	Before meeting	Written without examples given
Colin (p10) (mind map 10b)	Instrument mind map	At start of meeting	Verbal with examples discussed

Participants received various other elements of guidance to test the value of their inclusion (Table 12). The seventh, ninth and tenth meetings explored the use of both learning-centric mind maps and concept-centric mind maps. The seventh meeting verbally explored definitions of key terms, using examples to facilitate this conversation. Mark (p7) was verbally guided through the process of creating the learning-centric mind map with the use of the simplified example as visual reference. No such visual reference was used for the creation of the concept-centric mind map.

Table 12 – Guidance provided to participants in Stage 2

Participant	Definition of 'context'	Definition of 'concept'	Example contexts	Example concepts	Simplified example of learning-centric mind map	Example of concept-centric mind map
Mark (7a)	Verbal	Verbal	Verbal	Verbal	Visual provided	N/A
Mark (7b)	Verbal	Verbal	Verbal	Verbal	N/A	Not provided
Basil (8)	Verbal	Verbal	Verbal	Verbal	N/A	Visual provided
Dante (9a)	Written	Written	Not provided	Not provided	Visual provided	N/A
Dante (9b)	Verbal	Verbal	Verbal	Verbal	N/A	Not provided
Colin (10a)	Written	Written	Not provided	Not provided	N/A	Visual provided
Colin (10b)	Verbal	Verbal	Verbal	Verbal	Visual provided	N/A

Dante (p9) completed a learning centric mind map before the meeting, following the written guidelines provided to other participants including a definition of terms, however was not provided with examples of said contexts. The participant was provided with a simplified example of a learning-centric mind map (Figure 3). During the meeting, the researcher verbally guided the participant through the process of creating a concept-centric mind map, providing verbal definitions of terms, accompanied by examples. The participant was not provided with a visual example of the concept-centric mind map.

Colin (p10) was provided with a written set of guidelines to create the concept-centric mind map before the meeting (Appendix S). These guidelines contained a definition of terms, though no examples were provided. The guidelines contained a simplified example of a concept-centric mind map. In the course of the meeting, the researcher verbally guided the participant

through the process of creating a learning-centric mind map. This included definitions and examples of terms as well as a visual example of the learning-centric mind map.

Iterative refinement process

The second stage of meetings implemented the use of the concept-centric mind map. Over the course of the final four meetings, efforts were made to understand how best to implement this form of mind map, and the impacts of this form of mind map on researcher's ability to draw meaning and connection between learning experiences.

Identifying concepts

The first of Stage Two's meetings saw Mark (p7) create a learning-centric mind map followed by a concept-centric mind map. The process of identifying a central concept is critical to the creation of a concept-centric mind map. The process of selecting a single concept on which to centre an entire investigation is difficult, both for the researcher and participants. This study aimed to implement two methods for identifying an appropriately important concept.

1. Researcher-identified-concepts

At the opening of each meeting, participants were encouraged to become familiar with the meeting environment by giving a brief recount of their music learning history. Whilst this already served a secondary purpose in allowing the researcher to confirm/add to understandings provided through the survey, a third purpose can be recognised in instances where participants are to create a concept-centric mind map mid-meeting. The researcher can observe themes across music learning experiences and present these to the participant for potential use. This method was employed in the seventh meeting with Mark (p7). Over the course of the meeting, the researcher determined two overarching concepts which appeared central to the learning

experience of the participant and sought to use these as the basis for the concept-centric mind map. The researcher suggested two overarching concepts, which seemed present in the Mark's music learning journey - listening and culture. The participant, who had spent many years learning about Korean, Maltese and Polynesian cultures through various church groups, as well as working as a social worker, responded "That's me in a nutshell. As a human, not just a musician." (Mark, p7)

2. Participant-identified concepts

a) The written guidelines for the creation of the concept-centric mind map included a short paragraph regarding the selection of an important concept:

> We're looking to create a mind map that displays all the contexts in which you've learnt about one concept/idea. Take some time to reflect on your music learning – think about what music is to you, and what one of the most important things about music is for you. For example, embouchure is a central part of playing the flute. There are so many contexts in which a flautist may learn about embouchure and many musicians transfer understandings about embouchure across various instruments. (Appendix S – Mind map guidelines – Concept-centric)

This method was employed in the tenth meeting. Colin (p10) was asked to create a concept-centric mind map before the meeting and a learning-centric mind map mid-meeting. The result of selecting a central concept pre-meeting appears non-successful. Colin identified a shift in perspective after having completed the meeting and the mid-meeting learning-centric mind map. Colin created a concept-centric mind map around dynamics, noting their experience of music began by playing the drums: "I was just, you know playing in time - playing loudly, playing softly. Mostly loudly! But yeah so dynamics has been like a constant, right from day one, I guess." After completing the learning-centric mind map, Colin rethought this perspective, suggesting:

> I guess it also showed me, the learning-centric one, that - the other aspects of music are perhaps a lot more in balance than, you know, before I was more leaning towards dynamics being one of the top ones, well, they're - everything else is sort of, more evenly represented on this learning centric one. (Colin, p10)

b) For the creation of mid-meeting concept-centric mind maps, if the researcher feels unable to identify a recurrent theme/concept within the participant's experience, the researcher may ask participants to consider concepts which are central to their music learning. This method was employed in the eighth meeting. Basil (p8) initially identified heavily as a pianist, with experience in many different contexts, though felt they didn't identify with any other instruments. This contrasted with many other participants who identified as multi-instrumentalists. Considering this, the participant was asked to consider central concepts to playing piano:

> I want to build a mind map with you… and I want it to centre around some of the most, sort of, the most meaningful things in music to you, umm, so perhaps you might be able to tell me a little bit about what it means to be a piano player, and what are the central things in the experience of playing the piano? (Researcher, meeting eight)

An unintended third method of identification of a central concept arose naturally which straddles the border between participant-identified and researcher-identified methods. For the ninth meeting, the researcher requested Dante (p9) to create a learning-centric mind map at home and planned for Dante to create a concept-centric mind map mid-meeting. In discussing the process of creating the learning-centric mind map at the beginning of the meeting, the participant identified an important concept which impacted much of their music learning.

> The pivotal point with that is that he [high school music teacher] recognised that I had absolute pitch. Which is something - I always knew I could tune a guitar by ear didn't need a reference and could do that… but it's some sort of thing that from the mind map, you'll see - it's largely responsible for about 80% of everything I've done.

(Dante, p9)

The process of creating the learning-centric mind map acted as a thinking tool for Dante (p9) which aided in the process of clarifying a central concept in their music learning career. In this instance, the researcher need only pay attention to the process of self-identification to appoint a concept for the creation of the mind map.

Role of concept-centric mind map

The understanding of the role of the concept-centric mind map builds on understandings from Stage One in looking at the role of learning-centric mind maps. Many facets of these two approaches are similar, however the differences are worth noting here.

The process of identifying concepts for use in creating the first concept-centric mind map is discussed above. The first test of the concept-centric mind map produced encouraging results. When asked to comment on the role of the concept-centric mind map, the participant noted:

> I liked getting into the nitty gritty of what I've learnt… you look back and you thought, 'oh I forgot about that' or 'oh, I actually have those skills, but I don't, maybe, fully recognise where they come from, how they developed'. (Mark, p7)

Similarly, Dante (p9) completed a learning-centric mind map and subsequently completed a concept-centric mind map. In comparing the two, Dante noted the sequence of mind maps:

> gave me an understanding of something that I haven't previously given any thought to….I think one doesn't necessarily order their thoughts in a specific way, they just have them….the inside of my mind is quite an untidy place…. So there's a lot of information there but it's not very well ordered. And I think that this [process of completing mind maps] is something that has allowed me to order things around things. (Dante, p9)

The concept-centric mind map aimed to provoke a more insightful view into the music learning experiences of participants. Whilst the learning-centric mind map was able to provide an expansive overview of the participant's music learning experience, it failed to develop extensive understandings of the connections between music learning experiences. This may be due to the overwhelming population of concepts, contexts and instruments already present in learning-centric mind maps. The concept-centric mind map aimed to remedy this by narrowing focus on a singular concept, which acts as the anchor point between various MLCs. In theory, if a participant can recall learning about a specific learning music-related concept in multiple contexts, they should be able to suggest relationships between these contexts. In practice, the concept-centric mind map produced differing results. In two cases, this is resultant of time pressures. The seventh meeting (with Mark) attempted to complete both learning-centric and concept-centric mind maps in the same session (see Combining concept-centric maps and instrument-centric maps and interviews, p. 92). The ninth meeting (with Dante) was concluded prior to the intended time due to work-related matters. With more time, each of these concept-centric mind maps had the potential to produce more in-depth understandings of connections between MLCs than the learning-centric counterparts. Dante's (p9) concept-centric mind map demonstrates this claim strongly (Figure 7).

Figure 7- Participant 9, Dante's concept-centric mind map - Absolute pitch

Dante (p9) discussed the interconnectedness of the learning experiences. "But the interconnectedness of my learning... I'd probably not realised how limited the sources that I'd - I'd sort of had were, and umm, also how um, how interconnected they were." (Dante, p9)[6] Visually, the use of colour in Dante's concept-centric mind map (Figure 7) represents different connections between learning contexts. If it were not for the pressures of time, we might have been able to provide labels for these connections to provide a truly insightful understanding of the role of such a variety of MLCs in Dante's experience of learning about absolute pitch. Nevertheless, this produced an outstanding example of the potential of the concept-centric mind map.

[6] It's interesting to note Dante's use of the word 'sources' here. Whilst listing an impressive number of different MLCs, Dante refers to a limited number of sources. Sources of education, for Dante, are separate from learning contexts, discerned by the transmission of knowledge/skills from an authority as opposed to the autonomous learning to which Dante refers. This, however, is to form part of the subsequent PhD.

This potential for in-depth investigation was also displayed in the eighth meeting. The use of a single concept gave the participant ample time to consider the variety of learning contexts in which they had learnt about that concept. The process facilitated the introduction of two more instruments and associated learning contexts after having previously noted just two instruments.[7]

The current study demonstrates the concept-centric mind map as a research tool. The ways in which a concept-centric mind map may facilitate deep investigations of learning experiences across contexts by facilitating conversation has been made apparent. This form of mind map is also well-equipped to function as data standalone. Concept-centric mind maps present more extensive exploration of fewer aspects of a participant's learning experience which provides more opportunity to investigate the relationships between MLCs.

Further understandings of the role of the concept-centric mind map in relation to being used in tandem with the learning-centric mind map are discussed in Combining Concept-centric mind map, learning-centric mind map and interview (p. 92).

Role of learning-centric mind maps

Further understandings of the role of learning-centric mind maps were discovered in Stage two. Many of these occurred in tandem with discoveries relating to the concept-centric mind map discussed above. As well as gaining further understanding of the ways in which the concept-centric mind map facilitates deeper investigations into specific instances of transfer of learning across contexts, this study may also highlight that which the learning-centric mind map appears

[7] Whilst the eighth interview proved successful in exploring a single concept through the use of the concept-centric mind map, it too had issues. Data collection was inhibited by a faulty recording device. The latter half of the interview was not recorded and as a result must rely on field notes and the mind map as data.

more appropriate for.

The learning-centric mind map benefits participants in promoting and facilitating self-reflection, facilitating recall, empowering participants and giving clarity as to participants' future learning as well as aiding in the processing of thoughts as part of the meeting. The learning-centric mind map provides an extensive overview of a participant's music learning experiences. When completed thoroughly (best achieved through facilitation by researcher), the learning-centric mind map provides a strong basis for further investigation. In this way, it may best be viewed as a preparatory tool to facilitate deeper investigation of learning across contexts. Having completed a learning-centric mind map, a participant is optimally primed for deeper investigation of their learning experiences. Increased confidence, stimulated recall and greater clarity of thoughts are qualities which all researchers might hope for in their participants.

Combining concept-centric mind map, learning-centric mind map and interview

Whilst the concept-centric mind map may be created more quickly than the learning-centric mind map, attempting to create both in the seventh meeting proved difficult. The participant seemed to confuse the two tasks at hand, whilst the request was to record the contexts in which learning had occurred in relation to the central concept, listening, the participant reverted to recording the concepts learnt in each context by the end of the process. For example, the concept of listening was learnt in relation to 'synthesizer/production' in the following contexts: 'listening to demo songs on keyboard', 'coursework books on production, arrangement + orchestration (arranging musics)', 'playing the synth + experimenting w/ patches', 'sound tech sub major'. However, by the end of the process, the participant listed learning in relation to the tin whistle as: 'woodwind textures', 'difference between very forced/more gentle sound

production', 'overblowing + how to avoid it'. Attempting two forms of mind map in one meeting is evidently not appropriate. There is a need to break tasks up if they are to be used in tandem.

Concept-centric mind maps appear to provide participants with similar benefits as the learning-centric mind map (see Role of concept-centric mind maps, p. 88). The concept-centric mind map does not, however, serve the role of facilitating recall in the same way the learning-centric mind map does. The tenth meeting tested the implementation of the concept-centric mind map before the meeting. When asked about the effectiveness of this mind map, Colin (p10) reported, "it was a bit difficult. Trying to like, you know, try and remember exactly how things progressed." After having completed the learning-centric mind map, Colin was asked about the difference between the two: "Well the concept-centric one was a lot easier to conceive, to create. Umm, the, the umm learning-centric one definitely forced me to think back over many situations that I've found myself in music-wise" (Colin, p10). Colin notes the extensivity the learning-centric mind map which was lacking from the concept-centric mind map. This may be one of various factors which cause the learning-centric mind map to be a better facilitator of recall for participants, as opposed to the concept-centric mind map. Colin noted more benefits from constructing the learning-centric mind map. When asked why, Colin reported "It was a lot more comprehensive." This is in direct contrast to claim made by Dante (p9) in the previous meeting. Dante experienced the creation of a learning-centric mind map at home and a mid-meeting concept-centric mind map. The inverse relationship between findings from Dante and Colin suggests the function of the learning-centric mind map as preparatory for the completion of the concept-centric mind map. This also suggests that in the context of research, using the concept-centric mind map as preparation for completing and interview, with or without the learning-centric mind map, is not advisable. The role of the learning-centric mind

map in facilitating recall allows it to prepare participants for the task of completing the concept-centric mind map. The concept-centric mind map performs the role of facilitating deeper conversations around learning across contexts, though this function is performed best when supported using the learning-centric mind map.

Evaluating impact of reduced discussion time

Stage One identified the strong interaction between engaging with the task of creating a learning-centric mind map task and the quantity and quality of elements of the mind map. A meeting with a clearly defined end time (1 hour and 30 minutes) is required for the benefit of the participant. Having set a finite amount of time for the meeting, the impact of increasing the amount of time spent engaging in creating the mind map directly decreased the amount of time available for discussion of music learning experience.

The seventh meeting (with Mark) demonstrated the negative impacts of this well. Whilst Mark's learning-centric mind map (Appendix I) presents well as data standalone, the process of creating the mind map consumed a great deal more time than anticipated. Whilst in other meetings, the process of discussing the participant's music learning experience and creating a learning-centric mind map had taken between 30 minutes and 40 minutes, the process of furthering engagement to produce more plentiful and detailed elements on the mind map in meeting seven took 1 hour and 10 minutes and the final stage of representing connections between learning experiences visually through drawing lines was not completed. As such, the process could well have taken the full time of the meeting, which would have left no room for discussion section of the meeting which the mind map was conceived to facilitate.

The fifth meeting (with E) had attempted to merge the tasks of mind map creation and discussion together, however it was found that this resulted in less understanding of connections between music learning experiences and more information about instances of learning in each context. Whilst this information has value, it is not the object of investigation and as such the 'rolling' mind map creation process detracts from the research design.

The negative impact of spending additional time mid-meeting on learning-centric mind maps may point to a benefit of mid-meeting concept-centric mind maps. The ninth meeting (with Dante) attempted to create a concept-centric mind map mid meeting. The seventh and ninth meeting are worth comparing to understand this better. Both meetings featured the researcher guiding the participant through the process of creating a mind map. The seventh meeting (with Mark) featured a learning-centric mind map while the ninth featured a concept-centric mind map. Neither mind map was fully completed (for different reasons). Both were stopped by the researcher after the participants had completed the outer layer of elements of the mind map, before they were due to complete the task of connecting learning experiences. The process of creating the concept-centric mind map in the ninth meeting took 30 minutes to reach the same point which took the seventh meeting 44 minutes to create a learning-centric mind map. The impact of reduced discussion time negatively impacts the process of data collection. This may be avoided through the completion of a concept-centric mind map mid-meeting. An additional suggestion for conducting these meetings in the future is to plan for increased amount of time which may aid in the collection of quantitatively and qualitatively more useful data.

Increasing responsiveness and suggestions

Building on understandings in Stage One regarding revising participant-led vs researcher-led creation processes, Stage Two aimed to explore the researcher's ability to increase the

extensiveness of the mind map by increasing responsiveness to participants' recounts of music learning history and providing suggestions for missing elements on the mind map. Many notes from various participants regarded the incompleteness of the mind map they had created. Dr J (p4) noted surprise "that I forgot and left out some pretty important stuff that I have done and do." Similarly, E (p5) suggested "I think it would just take time for me to think of more things. But there's definitely more to all of this than can be brainstormed, I think, in one session."

The researcher attempted to remedy this by actively encouraging the addition of more elements on the mind map after participants suggested it was complete. The eighth (with Basil) meeting saw this probing for additional elements add two more similar yet different instruments to the participant's mind map. Having discussed the participant's experience playing piano and organ, the only instruments listed by the participant as part of the survey, the researcher noted the participant's hesitation to identify as an 'organist', preferring to see them self as a pianist, "I mean I don't consider myself an organist. And I've only - I only really had lessons for those few years in my later high school years. But I do, I do play the organ" (Basil, p8). This hinted to the researcher that perhaps there were other instruments which the participant may not yet have provided information about. In requesting the participant to complete the concept-centric mind map, the researcher noted they had discussed "…a few different instruments that you've learnt something about tonal control. Which I'd imagine, piano, organ are the two most obvious examples. Do you think that you've learnt…other instruments that..." (Researcher, meeting 8). To which the participant quickly responded with a third instrument, "Yeah, yeah, I played harpsichord a little bit, yeah that - I certainly learnt something because it's completely different, you know - they have different, ah the touch is completely different on the harpsichord." (Basil, p8). Shortly after, Basil also introduced electronic keyboard as an additional instrument of note.

An overlap between the active suggestions of the researcher and the process of redefining definitions of terms occurred in the final meeting. The participant noted experiences of music in school without mentioning the recorder, a common musical instrument employed in primary school. When asked about any experiences of playing recorder, the participant brought up an as-yet unmentioned instrument: “Umm, the closest I’ve gotten is the melodicas” (Colin, p10). In a similar fashion, the participant had noted experiences playing piano which led to the researcher asking questions about other similar instruments, specifically keyboard. The simple question of, “would you define keyboards as different to pianos?”, sparked a series of instruments to be presented by the participant and included in the mind map. This is further explored in Definitional Boundaries.

Exploring musical instrument-free learning contexts

Musical instruments may be the most accessible route through which researchers may explore MLCs, however, as identified in Stage 1, music learning does not always occur in relation to a musical instrument. Further, it can be said that there exists an amount of learning beneficial to the music learning process that seemingly does not relate to music when first learnt. Mark (p7) recounted the ways in which they learnt close listening skills from their father, paying close attention to the nuanced sounds a car engine makes.

> My dad was a mechanic, and before I start the car every single day, he was like, 'give it five minutes and listen'….And listening to make sure there's nothing wrong, and like, even though he's a mechanic, that sense of listening, checking…knowing how to pick out a sound that's not correct. (Mark, p7)

The research did benefit from the way in which it discovered the need to explore MLCs directly, unhindered by the constraints of musical instruments. The process of discussing music

learning experiences with participants first through association with musical instruments allowed the participants to build confidence and a strong understanding of the task at hand. They were able to present many MLCs in which they had learnt music as attached to specific instruments and were then better prepared to consider music learning experiences the occurred detached from their musical instruments.

It may be fair to suggest that the use of instruments as a vehicle by which to explore MLCs acts as a support for those who have not comprehensively engaged in self-reflection about their own music learning experiences, and a hindrance to those who have. Basil (p8) and Owen (p2), who both mentioned feeling somewhat confined by the use of instruments as a gateway to contexts, may best represent participants who had previously engaged in reflecting on their learning journey. Basil noted an amount of metacognitive knowledge, "my mind tends to go for more like looking for how do these fit into categories" and Owen noted having completed a S.W.O.T. (Strengths, Weaknesses, Opportunities and Threats) analysis on their own career, as well as regularly engaging with mind maps as a method of thinking through problems, also mentioning "I have reflected on this and written a little bit about it in my own work" (Owen, p2).

Temporal boundaries

Over the course of both stages of data collection, the researcher paid attention to the temporal boundaries of retrospective investigation. The aim was to identify trends which may guide the researcher to set a guideline as to how far back into a participant's music learning experiences to delve. This had the potential to decrease the amount of 'wasted' time discussing experiences which participants couldn't fully recall. It quickly became clear that attempting to set temporal limits regarding the exploration into a participant's music learning history was not useful.

Participants each recalled significant details about learning their first instrument to prohibit these experiences from being cut off by temporal boundaries. The seminality of these early experiences warranted their inclusion in the investigation and often led to strong connections between these early experiences which lay the foundation for music learning careers. Dante (p9) explained the seminal experience of listening to orchestral music as a child. Having no musical training, Dante was unable explain what was fascinating at the time:

> Whilst that was not a direct music learning experience, it was a massive exposure to it. And I remember being like, really attracted to the object of the score…. If you asked me at the time 'how many lines are there in a stave?' I wouldn't know. But I was still attracted to it. (Dante, p9)

Some years into playing guitar, Dante (p9) found a love of progressive rock music, which Dante likened to orchestral music:

> because I was a fan of quite complex progressive music, right from when I was a child, you know, like, orchestral music and then when I finally did discover rock music it was progressive rock because it already had a lot of the ideas that orchestral music had which was long form, it had lots of time signature changes, it had, you know, lots of layers and textures and dynamics, and all of the - it was very concept rich. (Dante, p9)

The initial exposure to music in Dante's (p9) childhood fused with later music learning to fuel Dante's passion for music and excite the learning journey further. Due to this, these seminal experiences were not difficult at all to recall.

Though the study does indicate that whilst temporal boundaries of retrospective investigation ought not to be set, and that participants' recall may set temporal boundaries independently, more consistently participants were able to dive deep into self-reflection on current learning experiences. Whilst participants showed a propensity to discuss their current learnings, they were very forthcoming when asked to consider the ways in which prior learning experiences

facilitated their current experiences. As such, stimulating further recall and retrospection may best be engaged through the lens of current learning experiences (where possible). This was exemplified in the fourth meeting. Dr J (p4) noted a host of transferrable skills which were developed in becoming a professional musician which are now useful as a researcher:

> having to be organised, having a lot of balls in the air,…being able to make sense out of disorganisation….I think that that's also like if you're booking a tour, or you're touring, organising rehearsals, writing songs, dealing with publicists, you know…it's all that kind of, same kind of stuff. (Dr J, p4)

Definitional boundaries

This study aimed to understand the temporal boundaries of investigation. It was expected that some music learning experiences may be so long ago in a participant's life that remembering details would be far too difficult. It was not expected that central terms of this investigation, instrument, context and concept – would function to limit the investigation. In the first meeting, responding to a question of how the process might be made easier for future participants, Sean (p1) suggested the use of other terms to replace the term context and concept. To Sean, these words were constraining and did not truly represent the ideas being explored. Whilst the researcher disagreed with the latter, the issue of definitional boundaries was raised. How two people understand a single term, or in this case a set of terms, can drastically impact the resultant conversation. After this, consistent efforts were made to come to mutual understandings with participants on what constituted an MLC, as well as what musical and music-related concepts might look like. Further, the investigation found interesting differences in various participants' understanding of the term musical instrument, especially when considering what to include on their mind maps. Colin's (p10) understanding of what a musical instrument is, and how musical instruments relate to each other demonstrates the need for researcher's increased engagement in facilitating the creation of a mind map. When discussing

musical instruments Colin had learnt, the researcher noted piano and asked if the participant had any experience playing keyboard. This reframed the participant's understanding of the specificity with which this investigation treated the term musical instrument. As a result, the participant also listed bass guitar and ukulele as separate to guitar.

Connections representing experience

There exist several ways in which connections can be made between elements on a participants' mind map (either concepts as per the learning-centric mind map or contexts as per the concept-centric mind map). Upon reviewing the collection of mind maps at the conclusion of the data collection phase, the researcher gained further understanding of the ways in which the process may best be facilitated.

As evident most prominently in mind maps created by Sarah (p3) and Dante's (p9) mind maps (Appendices D and M), participants may be bent toward connecting elements on the mind map in a strictly theoretical manner. Like elements on the mind map may easily be linked as they describe the same content being learnt. This form of connection between elements are capable of answer the 'what' questions, as identified by Burgess-Allen and Owen-Smith (2010). The research project aims to seek deeper understanding, answering 'how' and 'why' questions and theoretical forms of connections do not suffice. Instead, participants should be encouraged to explore connections between elements through experiences of learning. This was built into the written guidelines using an example:

> For example: I learnt how to read music notation on piano from my tutor… I also developed further skills reading notation when I began learning bass guitar, reading combinations of both tablature and notation. Therefore, I would draw a line between concepts. (Appendix R –Mind map guidelines – Learning-centric)

Examples in this vein were also given verbally, however the researcher did not pay close enough attention to ensuring connections were based around experience rather than conceptualisations.

Benefits of concept-centric mind map to participants

The process of creating a concept-centric mind map appears to provide many similar benefits to participants as the learning-centric mind map. While Colin (p10) was the only participant to engage in creating a concept-centric mind map prior to a meeting and reported a far more positive experience creating the learning-centric mind map mid-meeting, the researcher expects this is directly related to the findings of the role of each mind map. Those participants who experienced the mind maps in learning- then concept-centric sequence concurred on the benefits of being able to gain deeper insights into learning experiences. Mark (p7) noted the concept-centric mind map to provide a sense of validation:

> As someone not only just done a Bachelors, but a PhD, it kind of makes you feel like I've got a bit more skill, like 'oh I have something to offer' …you look back and you thought, 'oh I forgot about that' or 'oh, I actually have those skills, but I don't, maybe, fully recognise where they come from, how they developed'. (Mark, p7)

In Dante's (p9) case, the process of concentrating specifically on a central concept was a liberating experience:

> And it's only because we're talking about it now that I'm, sort of being quite free and open with the discussion of it because it's just something that I wouldn't normally have given that much credit to. And these [mind maps] have absolutely made me think about that. (Dante, p9)

Both participants claimed the concept-centric mind map positively impacted the process of providing data for the research project by facilitating deeper thought about the topic. This finding is congruent with remarks made by Basil (p8). The process of providing data for research ought to be facilitated as best as possible by researchers, and the use of a concept-centric mind map does this. Resultantly, participants may be more likely to leave the meeting feeling positive about their involvement in the project.

In summary, Stage Two of this investigation explored the use of the concept-centric mind map. Many refinements were made: developing the process by which to identify concepts pertinent to participants' music learning experience; evaluating the impact of reduced discussion time; increasing researcher responsiveness and suggestions; understanding the function of concept-centric and learning-centric mind maps and how they may best be combined; furthering exploration of musical instrument-free learning contexts; understanding temporal and definitional boundaries; and placing importance on the process of connecting learning experiences. Stage Two concluded by demonstrating the wealth of benefits to participants in constructing a concept-centric mind map.

Summary - Chapter 4

The fourth chapter was presented in three sections. The pilot meetings provided confidence to the novice researcher and gave insights into potential issues to be confronted in the current study. Stage One primarily discovered the benefits of the learning-centric mind map as facilitating recall and functioning as a tool for thought, though noted a difficulty in facilitating deeper investigations into learning across contexts. Stage Two identified the benefits of the concept-centric mind map as facilitating deep investigation into learning across contexts and uncovered the value of employing learning-centric mind maps as a preparatory task to prime

participants for the construction of concept-centric mind maps. Chapter 5 will review the objectives of the study, relate findings to the available literature and explore limitations, impact and future research of the current study.

CHAPTER 5

CONCLUSIONS

This study aimed to refine the process of retrospectively investigating music learning across contexts. Presented below are the conclusions of findings, related back to the relevant literature. A proposed method of data collection employing mind maps and meetings for research in music education is provided, as well as a methodology for future work in learning across contexts.

Research Objectives

Objective 1: To identify the various learning contexts in which undergraduate musicians learn music

This study failed to engage current undergraduate musicians. Participants were made up of graduate musicians and higher degree researchers in the area of music. Subsequently, the research may address an amended objective (below).

To identify the various learning contexts in which graduate musicians learn

This study's survey identified eleven broad categorisations of learning contexts employed by nine participants. These included one-to-one tuition, group tuition, in-school class, school music programs, community bands, playing with friends/family, self-taught, using a guide book, using notation/tablature software, watching videos (e.g. YouTube tutorials), and transferring understandings from other instruments. Further investigation with these ten

participants in the form of interviews/mind maps revealed another 11 context types including composing, recording, performing, arranging, improvising, teaching, music therapy sessions, choirs, sight-singing, listening and mucking around. On average, participants self-identified as having learned within eight different types of contexts, and often noted the use of many of the same types of MLCs across various instruments.

The collection of musicians which participated in this study unanimously reported experiences learning in formal, non-formal and informal learning contexts. This points to an idea present in emerging literature regarding the value of non-formal and informal learning contexts (Cremata et al., 2016; Kim et al., 2014; Linsin, 2016; Salavuo, 2006; Schmidt-Jones, 2017). Further work is required to investigate this, however the present study indicates the need for a focus on the impact of context in the learning experience, congruent with the work of Lonie and Dickens (2016) and Wosnitza and Beltman (2012). This is antithetical to Green's work in implementing non-formal and informal learning techniques into formal learning contexts (Green, 2002, 2008). Confluent with Cremata et al. (2016), the study proposes musicians learn across a wide array of MLCs with each presenting various aspects worth consideration as to their impact on the learning experience. Further, the wide array of learning experiences of graduate students concurs with Blom and Poole (2015) that education providers need to build an understanding of presage, that which musicians bring to a learning context, into their teaching styles.

Objective 2: To determine the boundaries of retrospective investigation into music learning experiences

The study identified that potential boundaries may be drawn around the temporal limit in discussing past learning, definitional boundaries involving distinctions of learning contexts and

concepts, and the role of multi-instrumentalism in the process of transferring learning from one MLC to another.

The temporal limits for retrospective investigations into learning across contexts is a grey area. Much research in the area of psychology appreciates the use of on-line self-reports of learning as it avoids the impact of memory in the way off-line tasks cannot (Veenman, 2011). The mind map and interview stages of the current study failed to provide as much assistance in guiding this as first hoped. This study found that in conducting the mind map and interview sessions, participants were readily able to recall important moments in their early music learning experiences, a feature which Wheeldon (2011) noted as a result of mind maps used before interviews. However, beyond these seminal moments, the clarity of participants' memory appeared to drop significantly. Researchers ought to heed messages of 'I can't remember' and focus on learning experiences which can be recalled more easily or implement alternative tactics in seeking this information such as through the use of current experiences. It should be made clear that the researcher identifies the set of challenges in promoting the retrospective investigation of learning involving the fallible nature of memory entangled with the recall of learning experiences from many years ago (Treglia, 2018; Veenman, 2011; Veenman et al., 2006). The proposed methodology could be viewed as a financially and temporally efficient alternative to longitudinal studies (such as: Evans, McPherson and Davidson, 2013; Faulkner, Davidson and McPherson, 2010; McPherson, 2005). Such studies which provide repeated self-reports would undoubtedly aid the clarification of learning as it develops across time and contexts. The proposed methodology provides a realistic alternative to the greater collection of researchers without the time and funding opportunities. Further work could explore comparisons between Cremata et al.'s (2016) work employing flash studies and the current studies implementation of mind maps as a data collection method.

Wheeldon (2011) argued mind maps "may provide one strategy to break out of conventional and linguistically limited representations of experience, rehearsed narratives, and canned responses (Hathaway & Atkinson, 2003)" (pp. 518-519). As with interviews, definitional boundaries of the investigation are as much a sociological issue as they are linguistic (Bolderston, 2012). Working together, researchers and participants need to negotiate an understanding of key terms to ensure the data from the interview is exhaustive and accurate as possible (Umoquit et al., 2013). This study found that internal consistency of studies implementing mind maps may be improved through discussing definitions, the use of examples and increased involvement in the mind map creation process by the researcher using educated suggestions. Wheeldon (2011) argued the biases of the researcher ought to be carefully considered, however.

The investigation sought to understand the role of multi-instrumentalism in the process of investigating learning across context. Various factors led to nil findings in this respect. Primarily, this study did not recruit any participants who identified as having played just one instrument, resulting in no control being available for comparison. To address the concern theoretically, however, it may be suggested that the instrument, just as the walls of a studio, form one aspect of the greater context of learning. Wosnitza and Beltman (2012) would frame instruments as making up part of the physical attributes of context, specifically that of the micro- and mesolevel. This may suggest that instruments perform a similar role as any other aspect of the context in which learning takes place. Conversely, the nature of implicit memory, as explored by Kandel et al. (2000), exploits a personal tie between musician and instrument, impacting the way in which musicians store memory. This may demonstrate differences between single-instrument musicians and multi-instrumentalists in the process of learning across contexts. Whilst the design of the mind maps presented in this study may have felt

limiting to a single-instrumentalist, an adjustment could be made in each to accommodate for this. Future work exploring this may benefit from considering replacing the central concept of learning with a single-instrumentalist's chosen instrument in the creation of a learning-centric mind map. Similarly, future use of concept-centric mind maps with single-instrumentalists may build the instrument into the definition of the concept, for example, 'finger positioning on acoustic guitar' or 'the use of samples in MIDI pad controller performance'.

Objective 3: To refine a method with which to implement the use of mind maps and interviews as tools for reflecting on one's own learning

This study employed an iterative process to develop a method of data collection with which to implement the use of mind maps and interviews as tools for reflecting on one's own learning. Whilst the literature made clear that combining mind maps and interviews was a viable method for data collection in investigating metacognition, the literature gave no clear guidelines as to how best this may be accomplished. Conceição et al. (2017), Burgess-Allen and Owen-Smith (2010) and Tattersall et al., (2011) recommend using mind maps to analyse data from interviews. Similar to Wheeldon (2011), however, the present study successfully demonstrates the use of mind maps as a data collection method. Concurrent with findings of Wheeldon (2011), this study suggests that implementing a sequence of mind maps and interviews may be most effective in retrospectively investigating music learning across contexts. Wheeldon (2011) proposed two stages whereby participants create a mind map in anticipation of an interview. The current study demonstrates, however, the benefits of cocreating mind maps with participants, congruent with O'Neill et al. (2013). Seidman (2006) recommended the use of three sequential interviews to properly investigate phenomenon with participants - the first to gain the life history of a participant, the second to explore the details of experiences in the topic area, and the third to reflect on meaning. Within the current study, the learning-centric mind

map was found to present a broad overview of a musicians' learning experiences. The concept-centric mind map was found to explore the more specific learning experiences related to a single concept. The interview was able to reflect on the meaning of the mind map. Consequently, the current study proposes a sequence of learning- and concept-centric mind maps followed by interviews as the data collection method for retrospective investigations of learning across contexts.

The first stage involves the creation of a learning-centric mind map. The current project identified the benefits to research of this being complete with the verbal guidance of the researcher. Participants ought to be directed to complete a mind map centring on their music learning experiences. The use of instruments as an initial branch out from this central topic gently introduces participants to the task without fear of alienation. Branching out from each instrument, the contexts in which participants have learnt music should be listed. The final branch outward from each context in which the participant has learnt represents the concepts which the participant has learnt. Connections can then be drawn between concepts to represent the relationship between learning experiences.

The second stage involves the creation of a concept-centric mind map, again, through verbal guidance of the researcher. The concept-centric mind map centres around a single concept which is most meaningful to the participant. This study found two ways to identify such a concept. First the self-identification method, whereby participants select the concept which is best facilitated by a series of questions by the researcher such as 'what does it mean to be a trombone player?', 'what are the central components in the role of a guitarist in your band?' The second method of identifying the central components is to have the participant recount the history of their music learning experiences and the researcher identify central concepts and

verify this with the participant. Branching outward from the central concept are the instruments in relation to which the participant has learnt about the central concept. Connections between these contexts can be drawn to represent connections between learning experiences.

The interview has been shown to explore the meaning uncovered using mind maps (Wheeldon, 2011). Seidman (2006) claimed the third session of interviews is best reserved for reflecting on meaning. The current study employed the creation of a mind map and the interview in one meeting. Negatives of this combination were noted, primarily finding the compromise between comprehensively creating a mind map and comprehensively reflecting on it. As such, the findings of the current study elaborate on findings of Wheeldon (2011) toward an approach grounded in phenomenological investigations. The dedication of considerable amounts of time, as suggested by the three-interview approach should be applied to the investigation of learning across contexts using mind maps. Reflections on experiences which negotiate between guiding influences across learning contexts are complex and cannot be rushed.

Guiding mind map creation

The following are recommendations for guiding the creation of a mind map using the developed method borne of this study:

- The researcher should provide simple visual examples which may guide participants as to how to structure the mind map;
- The researcher should provide encouragement and educated suggestions to prime the memory of participants;
- An understanding of the meaning and application of the terms ‘context’ and ‘concept’ should be agreed upon by researcher and participant from the outset;
- Examples of the terms ‘context’ and ‘concept’ should be explored in discussion with

the participant to further guide their understanding of the aims of the investigation;

- A full array of colours (pens/pencils/markers) should be made available for the participant as colour may function as both a communicative and/or thinking tool;
- Connections between elements on mind maps should represent the experience of the participant, not theoretical or conceptual connections; and
- For the benefit of audio recordings, non-verbal references to elements on the mind map should be accompanied by verbalised references for the integrity of the data.

In addition to the above, when creating a concept-centric mind map, the researcher can consider how to identify a central concept. This may be researcher-identified or participant-identified. Researchers may identify recurrent themes in participants' recounts of music learning experiences for verification by the participant or may request the concept be selected by the participant – most easily done through prompting questions by the researcher.

The time between mind maps and interviews is another impacting factor of this method of data collection. Wheeldon (2011) suggested an extended amount of time between creating the mind map and participating in the interview may have negatively affected the recall ability of participants. Seidman (2006) suggested the sequence of three interviews be conducted three-to-five days apart. In the present study, participants who created mind maps before the interview were given guidelines week in advance to find time for themselves. Out of these four participants, three noted completing the mind map the night before. The proposed method suggests multiple meetings between researcher and participant and as such, may benefit from the guidance of Seidman (2006) in this respect.

A distinction should be made by researchers as to how contexts will be defined. Whilst musicians have learnt in a great number of MLCs, the researcher needs to identify how these

will be represented on the mind map. Many guitarists have learnt from more than one one-to-one tutor, in which case the use of 'one-to-one' may not fully represent the learning context. Researchers should consider exploring the implications of the work of Mok (2006) and Wosnitza and Beltman (2012) in defining context. The current study employed broad categorisations of context as representative of a collection of similar yet unique MLCs. An increased fidelity in this respect may be achieved in exploring the physical, social and formal aspects of the concept of context on macro, micro-, meso-, exo-, and microlevels from subjective and objective perspectives.

Objective 4: To develop a methodology for retrospectively investigating the cumulative learning strategies of musicians within the constructivist framework

The current study has developed a methodology for retrospectively investigating cumulative learning strategies. Specifically, this study employed musicians as participants, however the methodology could have the potential to be widely applicable to all learners. Presented below is a detailing of the framework for such investigations.

The proposed methodology for retrospective investigation of cumulative learning across contexts

It is only fitting that the methodology which employs mind maps as a central component of data collection and, in many ways, data analysis, be presented using a mind map. In memory of Tony Buzan, an influential proponent of the use of mind maps as thinking tools who passed during the time this thesis was being written, this mind map has been presented in true Buzanian fashion.

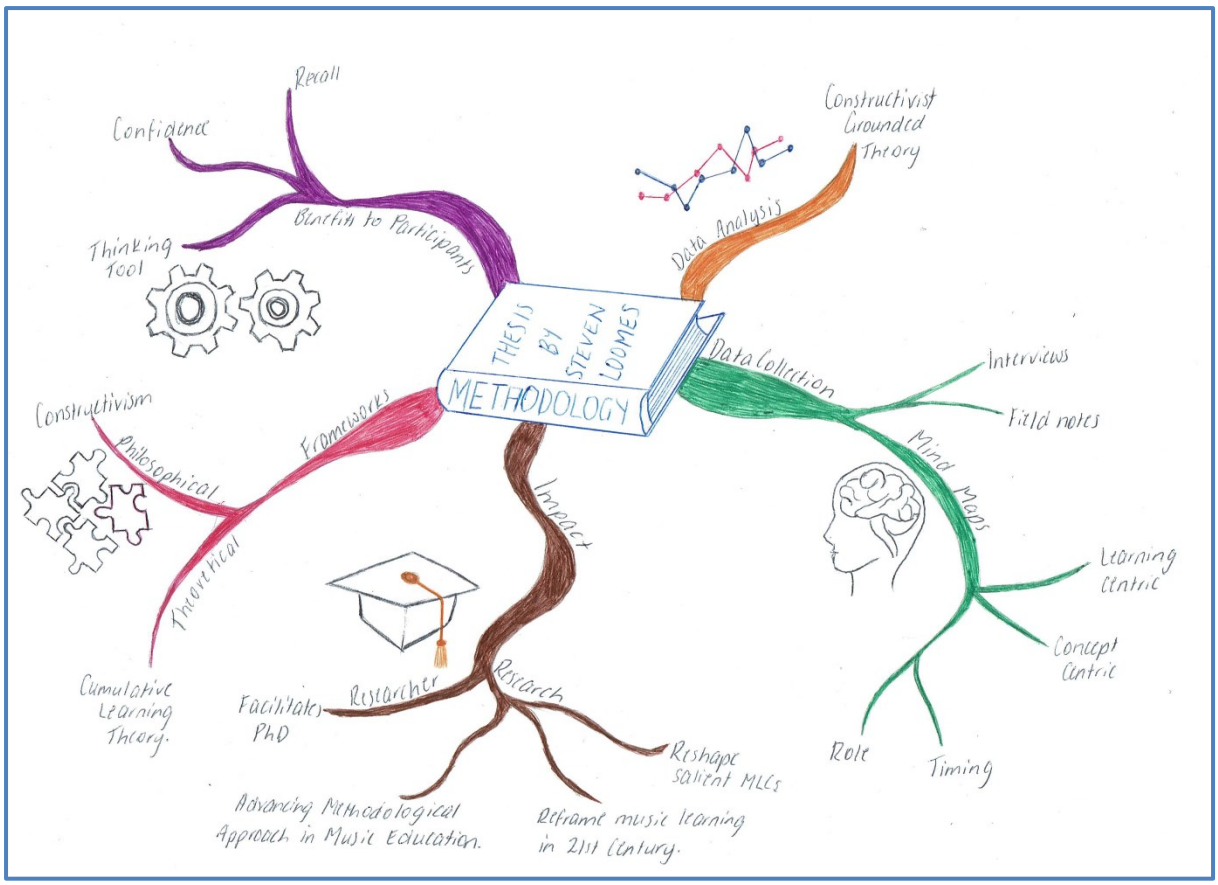


Figure 8 - The proposed methodology[8]

Philosophical perspective: Constructivism

The constructivist philosophy frames the research of learning across contexts well by understanding each individual's experience as unique (Shively, 2015). The use of the hermeneutic/dialectic model which disassembles and compares individuals' constructions of the world drew out new meanings (Lincoln and Guba, 2013).

Theoretical perspective: Cumulative Learning

Cumulative learning theory presents a lens for understanding learning as it occurs over time and across contexts. As conceived by Lee (2012), cumulative learning gradually builds

[8] This mind map was drawn by Kassee Loomes.

knowledge and skills based on prior learning.

Data collection method: Mind maps + interviews

The use of learning-centric and concept-centric mind maps in combination with in-depth interviews is proposed. Evidence found in this study suggests each stage ought to be conducted with researcher and participant. Influenced by phenomenological data collection methods, this work suggests three stages: first to gain broad understandings of the participants' experiences, followed by topic area-specific explorations and finally reflections on meaning (Seidman, 2006). This ensures the complex phenomenon of learning across contexts is thoroughly explored. The use of multiple meetings may also provide an opportunity to explore the internal reliability of this off-line data collection method. In the proposed methodology, mind maps function primarily as facilitators of conversation, and secondarily as data for verification purposes. They also offer an alternative method of dissemination of information. Guidance as to how mind maps and interviews are best combined is discussed under Objective 3.

Data analysis method: Constructivist grounded theory

Constructivist grounded theory presents researchers as co-creators of data (Mills et al., 2006). Data analysis should occur in tandem with data collection to allow developing themes to be explored. This is appropriate in the proposed methodology as it will allow the analysis of data to occur between each of three stages, provided opportunities for verification of the researcher's analyses by participants. The process of open coding, axial coding and selective coding ensure theories generated are data-driven.

A role for surveys?

Whilst the current study employed surveys to good effect, the proposed methodology excludes the use of surveys. Various reasons for this exist. The use of surveys, in part, was designed to provide an inexperienced researcher with background understandings of the participants' learning experiences to better facilitate the process. This is not necessary for experienced researchers. Some benefits may be found in participant-screening surveys however this was not explored in the current study. This study found increasing benefits in the use of mind maps as data collection method. The current study noted a discrepancy between self-report methods of online survey, interviews and mind maps, whereby participants were more engaged with the research in face-to-face meetings and data collected in the form of mind maps superseded that of the surveys and renders the role of the survey obsolete.

Limitations

This Master of Research project was limited in scope in three ways: in being able only to report on the methodological development (rather than learning across contexts), a limited sample size, and a group of participants which may not fully represent the greater collection of musicians.

Investigating learning across contexts

This study cannot provide anything more than auxiliary, anecdotal insights into the ways in which students combine learning from across domains. It merely illuminates the paths available for further research. The primary focus of the study is the refinement of the method of eliciting these insights from participant musicians. The current study presents a mind map which features musical instruments as a vehicle by which researchers may investigate learning

contexts. It should be noted that not all disciplines strictly employ the use of tools such as musical instruments. These tools, experienced in many facets of life, are facilitators of the process of making, and in turn learning, music. As a result, those retrospectively investigating learning across contexts in other disciplines might seek to understand the role of tools central to the area of investigation. Research into football might investigate learning experiences away from the football. Visual artists may consider experiences in which participants did not hold a pencil/brush. Similarly, the dichotomy of music-making and music-listening was disrupted by two additional contexts in which music learning may occur - music-related discussions and seemingly unrelated experiences (such as Mark's (p7) experience of listening to a car's engine). This implementation of tools, whilst central to the current study, needn't be so for other disciplines. Investigations around the cumulative learning of mathematics may more appropriately directly investigate the learning contexts in which participants have learnt, rather than using an intermediary tool.

Specifically discussed with music in mind, the focus of this investigation was often the learning of skills, commonly referred to as technical knowledge, rather than content or pedagogical knowledge. Further investigation may be necessary to understanding the types of knowledge and/or learning which this methodology best investigates, and how it may be tailored for various disciplines resultantly.

Research into music learning may also benefit from the overlap in the use of the term 'concepts'. This jargon functions similarly between research and the formal music education system and as such, many musicians are likely to grasp the use of the term in the context of creating a mind map and/or participating in interviews. This may not be the case for research in disciplines which do not make use of this term such as sports-based research. To avoid

alienating participants, research into learning across contexts in other disciplines ought to be well-grounded in the practices of the discipline to be studied to be understand how to communicate with participants.

There is a wealth of information not requested within the confines of the survey which may have provided a more detailed understanding of participants' history of music engagement. Questions were asked regarding extra-curricular engagements with music learning, though the focus of the investigation remains the performative aspects of music, over and above compositional, theoretical or musicological engagement. This decision was helpful in limiting the scope of the Master of Research study, though also impacts the comprehensiveness of the data collected at this stage.

Quantity of participants

The number of participants (N=10), whilst higher than anticipated, still cannot be a representative sample. This simply demonstrates the time and resource constraints faced by those embarking on short-term projects. Replications of this study in similar and diverse contexts would shed more light on the findings of the current study.

Participants' background

The study initially aimed to engage with current Bachelor of Music students from the Western Sydney University cohort. It was hoped that these musicians both displayed an apt grasp of the musical vocabulary, were of an appropriate age for the study (n=18+) and were still in the process of actively learning in multiple MLCs. Unfortunately, this cohort did not respond to advertisements for participation. The researcher and supervisor sought ethics approval to extend the criteria to accept participants who had completed the Bachelor of Music degree.

This allowed a collection of the supervisor's higher degree research students to engage, as well as their colleagues who had also completed the Bachelor of Music degree.

The total number of participants currently engaging in higher degree research (n=6) outweighed the number of participants who had not engaged in research after completing the Bachelor of Music degree (n=4). It is hypothesised that the ways in which participants engaged with the current research project was dictated, partially, by the participants' own experiences with research. Participants noted an understanding of the difficulties faced by researchers in finding participants, as well as finding 'good quality participants'. Beyond this empathy, the researcher believes these participants' involvement was guided by their own attempts at eliciting information from participants, and as such, often without prompting, gave complete, well-structured responses to answers (even closed-ended questions were often elaborated on).

It should also be acknowledged here, as was noted earlier (p. 47), that the pre-existing relationship between the researcher and the ninth participant may have positively impacted the research process. Dante acknowledged a greater willingness to discuss the topic of perfect pitch which they often felt more reserved about, noting that the forum of the meeting provided an inviting space to do so.

In keeping with Brunswik's (1956) concept of representative design, this study needs to consider the ways in which this group of participants does or does not represent the greater experience of musicians, and the applicability of this research methodology in investigating a wide range of musicians' learning experiences. Participants of this study, the majority of whom were higher education students, likely developed stronger metacognitive skills which may have proven beneficial to this study. Conversely, perhaps, the average age and breadth

of experience of the participants of this study did cause difficulties in recall. It is expected that participants of a younger age and with less music learning experience may struggle less with the process of recalling learning experiences, particularly those seminal experiences at the introduction of musicians' journeys. Further investigation into the use of the proposed methodology with participants outside of academia would be beneficial.

Impact

Little is understood about how musicians relate content and ways of learning from one learning context to another and/or others to form cohesive and usable understandings of musical and music-related concepts. This study presents a new means by which to use cumulative learning theory in music education research, rising to Burnard's charge for music education researchers to improve the breadth and depth of research by advancing new methodological and theoretical approaches to music education research (Burnard, 2006). This aligns with the aims of the Australian Society for Music Education "to recognise and encourage innovative pedagogies in music education" (Australian Society for Music Education, n.d.).

There is scope for this methodology to be implemented outside of music education. Centring around the benefits of metacognition to learning, it may be argued that mind maps offer an accessible way to visualise many learning experiences. Participants of this study have indicated a great appreciation for the benefits of visualising their own music learning. The methodology has been scaffolded in such a way that it may be beneficial for any area of learning.

This study will facilitate a subsequent PhD thesis which will attempt to identify key learning strategies utilised and developed in multi-dimensional music education essential for success in

the 21st century (Lamb et al., 2017). The current study illuminates the potential for a new, more holistic lens through which music education may be viewed. Musicians are no longer learning in the same ways as there were before. Learning is becoming more fluid in nature; the contexts from which musicians learn, less static. It is hoped that the following doctoral dissertation will more fully point to this idea that formal education must be repositioned not at the centre of music education but as part of the whole array of music learning experiences. Through this new lens, researchers may gain a perspective closer to the reality of current music education practices.

Future Research

Identifying popular modes of music education and common patterns of learning behaviour lays the groundwork for future research understanding how best to facilitate the music education of modern musicians by combining music education modes to create effective learning networks. This study failed to fully explore the ways in which musicians currently learn, and as a result, further research in this area is required.

Lifelong learning has been identified as a key skill necessary for success in the 21st century (Lamb et al., 2017), so research into the methods by which educators can facilitate this is critical. The replication of this study would provide greater insights into the impacts of learning across contexts on learning more generally. Further, it may be argued that the framework developed has potential to be employed as a heuristic framework for individual development. That participants have frequently reported learning more about oneself is one indicator of this. This aligns with findings of Jones et al. (2012).

The current study has developed a method of investigating metacognitive processes of those learning music across domains. The skills required to facilitate this process (self-reflection, monitoring, planning and evaluating) are linked to lifelong learning and as such represent the ways in which music learning may be beneficial to success in the 21st century. This hypothesis will be more fully investigated over the coming years as part of the author's doctoral dissertation.

It is reasonable to assume, given indications from the available literature, that metacognitive skills developed within the context of music education are transferable to other areas of education. Further research as to the discipline-transcendent nature of metacognitive skills developed in learning across contexts is required.

The current research provides preliminary evidence of the value of learning across MLCs. It could be suggested that the process of learning across contexts should not be considered valuable only in the context of music education, but all education. Further research into the ways in which education across contexts impacts the learning experience is required to fully understand this. Areas of interest for initial research include the creative arts and sports, where instruction and learning across multiple contexts occurs both simultaneously and consecutively occurs regularly.

Understanding more about the metacognitive processes employed by musicians fuels our understanding of metacognition in general. The ultimate goal of understanding these processes is to provide better instruction and guidance for learners so as to further facilitate and encourage the learning process. Implementation of metacognitive skills and knowledge has the potential to make us more efficient learners. Learners are capable of more effective learning and long-

lasting knowledge if they more fully integrate new content with existing cognitive structures.

Reference List

2020 Classical Guitar Syllabus. Australian Music Examination Board (2020). Melbourne: Author.

Agee, J. (2009). Developing qualitative research questions: A reflective process. *International Journal of Qualitative Studies in Education*, *22*(4), 431–447. https://doi.org/10.1080/09518390902736512

Aldamen, H., Duncan, K., & Ziegelmayer, J. L. (2018). Cumulative learning and sustained engagement in an introduction to accounting course. *Asian Review of Accounting*, *26*(1), 19–38. https://doi.org/10.1108/ARA-03-2017-0036

Anderson, D., Nashon, S. M., & Thomas, G. P. (2009). Evolution of research methods for probing and understanding metacognition. *Research in Science Education*, *39*(2), 181–195. https://doi.org/10.1007/s11165-007-9078-1Australian Society for Music Education. (n.d.). *About ASME*. Retrieved September 3, 2018, from Australian Society for Music Education website: http://www.asme.edu.au/asme/

Australian standards for editing practices. (2013). Retrieved from http://iped-editors.org/About_editing/Editing_standards.aspx

Ausubel, D. P. (1960). The use of advance organizers in the learning and retention of meaningful verbal material. *Journal of Educational Psychology*, *51*(5), 267–272. https://doi.org/10.1037/h0046669

Ausubel, D. P. (1980). Schemata, cognitive structure, and advance organizers: A reply to Anderson, Spiro, and Anderson. *American Educational Research Journal*, *17*(3), 400–404.

Bada, S. O. (2015). Constructivism learning theory: A paradigm for teaching and learning. *IOSR Journal of Research and Method in Education*, *5*(6), 66–70. Retrieved from https://pdfs.semanticscholar.org/1c75/083a05630a663371136310a30060a2afe4b1.pdf

Baptista, V. (2015). Starting physiology: Bioelectrogenesis. *Advances in Physiology Education*, *39*(4), 397–404. https://doi.org/10.1152/advan.00051.2015

Barley, M. (2012). Learning from reflective practice and metacognition – an anaesthetist's perspective. *Reflective Practice*, *13*(2), 271–280. https://doi.org/10.1080/14623943.2012.657792

Bathgate, M., Sims-Knight, J., & Schunn, C. (2011). Thoughts on thinking: Engaging novice music students in metacognition. *Applied Cognitive Psychology*, *26*(3), 403–409. https://doi.org/10.1002/acp.1842

Bennett, H. S. (1980). *On becoming a rock musician*. Amberst: University of Massachusetts Press.

Benton, C. W. (2002). *A study of the effects of metacognition on sight-singing achievement and attitudes among students in a middle school choral music program* (Doctoral Dissertation). Shenandoah University, Ann Arbor, Michigan.

Benton, C. W. (2013). Promoting metacognition in music classes. *Music Educators Journal*, *100*(2), 52–59. https://doi.org/10.1177/0027432113500077

Benton, C. W. (2014). *Thinking about thinking: Metacognition for music learning*. Lanham, US: R&L Education.

Bernstein, B. B. (1996). *Pedagogy, symbolic control, and identity: Theory, research, critique*. London: Taylor & Francis.

Bjøntegaard, B. J. (2015). A combination of one-to-one teaching and small group teaching in higher music education in Norway – A good model for teaching? *British Journal of Music Education*, *32*(01), 23–36. https://doi.org/10.1017/S026505171400014X

Blom, D., & Poole, K. (2015). Presage: What knowledge and experience higher education songwriting students bring to the classroom. *Journal of the International Association for the Study of Popular Music*, *5*(1), 157–180. https://doi.org/10.5429/2079-3871(2015)v5i1.10en

Bolderston, A. (2012). Conducting a research interview. *Journal of Medical Imaging and Radiation Sciences*, *43*(1), 66–76. https://doi.org/10.1016/j.jmir.2011.12.002

Bråten, I., & Strømsø, H. I. (2011). Measuring strategic processing when students read multiple texts. *Metacognition and Learning*, *6*(2), 111–130. https://doi.org/10.1007/s11409-011-9075-7

Brunswik, E. (1956). *Perception and the representative design of psychological experiments* (Second edition). Berkeley: University of California Press.

Buitron de la Vega, P., Coe, C., Paasche-Orlow, M. K., Clark, J. A., Waite, K., Sanchez, M. J., … Bokhour, B. G. (2018). "It's like a mirror image of my illness": Exploring patient perceptions about illness using health mind mapping—a qualitative Study. *Journal of General Internal Medicine*, *33*(10), 1692–1699. https://doi.org/10.1007/s11606-018-4557-9

Burgess-Allen, J., & Owen-Smith, V. (2010). Using mind mapping techniques for rapid qualitative data analysis in public participation processes. *Health Expectations*, *13*(4), 406–415. https://doi.org/10.1111/j.1369-7625.2010.00594.x

Burnard, P. (2006). Telling half the story: Making explicit the significance of methods and methodologies in music education research. *Music Education Research*, *8*(2), 143–152. https://doi.org/10.1080/14613800600827730

Buzan, T. (2018). *Mind map mastery: The complete guide to learning and using the most powerful thinking tool in the universe*. London: Watkins Media.

Calissendorff, M. (2006). Understanding the learning style of pre-school children learning the violin. *Music Education Research*, *8*(1), 83–96. https://doi.org/10.1080/14613800600570769

Callaghan, J. (2002). Grounded theory methodology in music education research. In J. Southcott & R. Smith (Eds.), *A Community of Researchers* (pp. 39–45). Melbourne: Australian Association for Research in Music Education.

Carey, G., & Grant, C. (2015). Teacher and student perspectives on one-to-one pedagogy: Practices and possibilities. *British Journal of Music Education*, *32*(01), 5–22. https://doi.org/10.1017/S0265051714000084

Carey, G., Grant, C., McWilliam, E., & Taylor, P. (2013). One-to-one pedagogy: Developing a protocol for illuminating the nature of teaching in the conservatoire. *International Journal of Music Education*, *31*(2), 148–159. https://doi.org/10.1177/0255761413483077

Chance, P. (2014). *Learning and behavior* (Seventh edition.). Belmont, California: Wadsworth Cengage Learning.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through quantitative analysis*. London: Sage Publications.

Charmaz, K. (2017a). Constructivist grounded theory. *The Journal of Positive Psychology*, *12*(3), 299–300. https://doi.org/10.1080/17439760.2016.1262612

Charmaz, K. (2017b). The power of constructivist grounded theory for critical inquiry. *Qualitative Inquiry*, *23*(1), 34–45. https://doi.org/10.1177/1077800416657105

Clarke, V., & Braun, V. (2019). *Answers to frequently asked questions about thematic analysis*. Retrieved from the University of Aukland: https://cdn.auckland.ac.nz/assets/psych/about/our-research/documents/Answers%20to%20frequently%20asked%20questions%20about%20thematic%20analysis%20April%202019.pdf

Cleaver, D., & Ballantyne, J. (2014). Teachers' views of constructivist theory: A qualitative study illuminating relationships between epistemological understanding and music teaching practice. *International Journal of Music Education*, *32*(2), 228–241. https://doi.org/10.1177/0255761413508066

Cobern, W. W. (1993). Constructivism. *Journal of Educational and Psychological Consultation*, *4*(1), 105–112. https://doi.org/10.1207/s1532768xjepc0401_8

Colombo, B., & Antonietti, A. (2017). The role of metacognitive strategies in learning music: A multiple case study. *British Journal of Music Education*, *34*(1), 95–113. https://doi.org/10.1017/S0265051716000267

Conceição, S. C. O., Samuel, A., & Yelich Biniecki, S. M. (2017). Using concept mapping as a tool for conducting research: An analysis of three approaches. *Cogent Social Sciences*, *3*(1). https://doi.org/10.1080/23311886.2017.1404753

Coombs, P., & Ahmed, M. (1974). *Attacking rural poverty: How nonformal education can help*. Baltimore: Johns Hopkins University Press.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2014). *Applied behavior analysis* (Second Edition). Essex: Pearson.

Coutinho, S. A. (2007). The relationship between goals, metacognition, and academic success. *Educate*, *17*(1), 39–47. Retrieved from http://www.educatejournal.org/index.php/educate/article/view/116/134

Creech, A., & Hallam, S. (2003). Parent–teacher–pupil interactions in instrumental music tuition: A literature review. *British Journal of Music Education*, *20*(1), 29–44. https://doi.org/10.1017/S0265051702005272

Cremata, R., Pignato, J., Powell, B., & Smith, G. D. (2016). Flash study analysis and the Music Learning Profiles Project. *Action, Criticism, and Theory for Music Education*, *15*(5), 51–79. https://doi.org/10.22176/act15.5.51

Cremata, R., & Powell, B. (2017). Online music collaboration project: Digitally mediated, deterritorialized music education. *International Journal of Music Education*, *35*(2), 302–315. https://doi.org/10.1177/0255761415620225

Daniel, R. (2004). Innovations in piano teaching: A small-group model for the tertiary level. *Music Education Research*, *6*(1), 23–43. https://doi.org/10.1080/1461380032000182911

Daniel, R. (2006). Exploring music instrument teaching and learning environments: Video analysis as a means of elucidating process and learning outcomes. *Music Education Research*, *8*(2), 191–215. https://doi.org/10.1080/14613800600779519

Doolittle, P. E., & Camp, W. G. (1999). Constructivism: The career and technical education perspective. *Journal of Vocation and Technical Education*, *16*(1). https://doi.org/10.21061/jcte.v16i1.706

Dunlosky, J., Bottiroli, S., & Hartwig, M. (2009). Sins committed in the name of ecological validity. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of Metacognition in Education* (1st ed., pp. 430–440). https://doi.org/10.4324/9780203876428

Dunning, T. (2016). Transparency, replication, and cumulative learning: What experiments alone cannot achieve. *Annual Review of Political Science*, *19*(1), S1–S23. https://doi.org/10.1146/annurev-polisci-072516-014127

Efklides, A. (2006). Metacognition and affect: What can metacognitive experiences tell us about the learning process? *Educational Research Review*, *1*(1), 3–14. https://doi.org/10.1016/j.edurev.2005.11.001

Egan, M. M. (1995). *Effects of metacognition on music achievement of university students* (Doctoral dissertation). Retrieved from Proquest Dissertations and Theses database. (UMI No. 9536648)

Egolf, E. J. (2018). *Learning processes of electronic dance music club DJs* (Doctoral dissertation). Retrieved from Proquest Dissertations and Theses database. (UMI No. 3613475)

Evans, P. A., McPherson, G. E., & Davidson, J. W. (2013). The role of psychological needs in ceasing music and music learning activities. *Psychology of Music*, *41*(5), 600–619. https://doi.org/10.1177/0305735612441736

Faulkner, R., Davidson, J. W., & McPherson, G. E. (2010). The value of data mining in music education research and some findings from its application to a study of instrumental learning during childhood. *International Journal of Music Education*, *28*(3), 212–230. https://doi.org/10.1177/0255761410371048

Flavell, J. H. (1963). *The developmental psychology of Jean Piaget*. New York: D Van Nostrand Company.

Folkestad, G. (2004). A meta-analytic approach to qualitative studies in music education: A new model applied to creativity and composition. *Bulletin of the Council for Research in Music Education*, (1), 83–90.

Folkestad, G. (2006). Formal and informal learning situations or practices vs formal and informal ways of learning. *British Journal of Music Education*, *23*(02), 135–145. https://doi.org/10.1017/S0265051706006887

Forrester, S. H. (2018). Transfer of learning and music understanding: A review of literature. *Update: Applications of Research in Music Education*, *37*(1), 30–35. https://doi.org/10.1177/8755123318762262

Fraser, A. (2012). The spaces, politics, and cultural economies of electronic dance music: Spaces, politics, and cultural economies of EDM. *Geography Compass*, *6*(8), 500–511. https://doi.org/10.1111/j.1749-8198.2012.00505.x

Gagné, R. M. (1970). *Basic study of learning hierarchies in school subjects* (Project No. 6-2949). U.S Department of Health, Education and Welfare.

Gagné, R. M. (1973). Learning and Instructional Sequence. *Review of Research in Education*, *1*(1), 3–33.

Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gaunt, H. (2008). One-to-one tuition in a conservatoire: The perceptions of instrumental and vocal teachers. *Psychology of Music*, *36*(2), 215–245. https://doi.org/10.1177/0305735607080827

Gaunt, H., Westerlund, H., & Welch, G. (2016). *Collaborative learning in higher music education: Why what and how?* Farnham, United Kingdom.

Gelb, M. (2004). *How to think like Leonardo Da Vinci: Seven steps to genius every day*. New York: Delta Trade Paperbacks.

Gordon, R. L., Fehd, H. M., & McCandliss, B. D. (2015). Does music training enhance literacy skills? A meta-analysis. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01777

Green, L. (2002). *How popular musicians learn: A way ahead for music education*. Aldershot, England: Ashgate.

Green, L. (2008). *Music, informal learning and the school: A new classroom pedagogy*. Aldershot, England: Ashgate.

Greer, A. (2013). Thinking outside the box: Meta-cognition and the music lesson. *The American Music Teacher*, *62*(5), 24–27.

Gruzd, A., Paulin, D., & Haythornthwaite, C. (2016). Analyzing social media and learning through content and social network analysis: A faceted methodological approach. *Journal of Learning Analytics*, *3*(3), 46–71. https://doi.org/10.18608/jla.2016.33.4

Guest-Scott, A. (2008). Categories in motion: The use of generic multiplicity in music store guitar lessons. *Ethnomusicology*, *52*(3), 426–457. Retrieved from http://www.jstor.org/stable/20174607

Halick, M. E. (2016). What can you teach with electronic dance music? A music teacher's guide to EDM. *General Music Today*, *30*(1), 4–10. https://doi.org/10.1177/1048371316637887

Hart, A. (2017). Towards an effective freeware resource for music composition in the primary classroom. *London Review of Education*, *15*(3), 407–424. https://doi.org/10.18546/LRE.15.3.06

Hipwell, R. (2017). *Guitar and bass guitar player's perceptions about health and well-being: A phenomenological exploration* (Doctoral dissertation). East Carolina University, Carolina.

Ilomäki, L. (2013). Learning from one another's musicianship: Exploring the potential for collaborative development of aural skills with pianists. In H. Gaunt & H. Westerlund (Eds.), *Collaborative learning in higher music education* (pp. 123–133). Ashgate: Taylor & Francis Group.

Impellizzeri, J., Savinsky, D. M., King, J. A., & Leitch-Alford, L. (2017). Conceptual mapping task: An effective verification tool for qualitative counseling research. C*ounseling Outcome Research and Evaluation*, *8*(1), 31–47. https://doi.org/10.1080/21501378.2017.1327745

Irwin, M. S. (2014). *Teaching the way we learnt: A study in popular music education*. University of Sussex, Sussex.

Jackson, A. (1980). The effect of group size on individual achievement in beginning piano classes. *Journal of Research in Music Education*, *28*(3), 162–166. https://doi.org/10.2307/3345233

Jabusch, H-C. (2016). Setting the stage for self-regulated learning instruction and metacognition instruction in musical practice. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.01319

Jaffurs, S. E. (2004). The impact of informal music learning practices in the classroom, or how I learned how to teach from a garage band. *International Journal of Music Education*, *22*(3), 189–200. https://doi.org/10.1177/0255761404047401

Jenkins, P. (2011). Formal and informal music educational practices. *Philosophy of Music Education Review*, *19*(2), 179. https://doi.org/10.2979/philmusieducrevi.19.2.179

Johanson, G. A., & Brooks, G. P. (2010). Initial scale development: Sample size for pilot studies. *Educational and Psychological Measurement*, *70*(3), 394–400. https://doi.org/10.1177/0013164409355692

Johnson, C. (2017). Teaching music online: Changing pedagogical approach when moving to the online environment. *London Review of Education*, *15*(3), 439–456. https://doi.org/10.18546/LRE.15.3.08

Jones, B. D., Ruff, C., Snyder, J., Petrich, B., & Koonce, C. (2012). The effects of mind mapping activities on students' motivation. *International Journal for the Scholarship of Teaching and Learning*, *6*(1). https://doi.org/10.20429/ijsotl.2012.060105

Josephsen, J. M. (2017). A qualitative analysis of metacognition in simulation. *Journal of Nursing Education*, *56*(11), 675–678. https://doi.org/10.3928/01484834-20171020-07

Kandel, E., Schwartz, J., & Jessell, T. (2000). Learning and memory. In E. Kandel, J. Schwartz & T. Jessell (Eds.), *Principles of neural science* (Fourth Edition, pp. 1227–1246). Blacklick, United States: McGraw-Hill Publishing.

Kazimi, E. (1984). *An empirical investigation of Gagne's cumulative learning theory vs. Piaget's developmental theory regarding the conservation of liquid* (Doctoral dissertation). Texas A&M University, Texas.

Keebler, J. R., Wiltshire, T. J., Smith, D. C., Fiore, S. M., & Bedwell, J. S. (2014). Shifting the paradigm of music instruction: Implications of embodiment stemming from an augmented reality guitar learning system. *Frontiers in Psychology*, *5*(1), 1–19. https://doi.org/10.3389/fpsyg.2014.00471

Kennell, R. (2002). Systematic research in studio instruction in music. In R. Colwell, C. Richardson, & Music Educators National Conference Staff (Eds.), *The new handbook of research on music teaching and learning: A project of the music educators national conference*. Cary, United States: Oxford University Press.

Kim, M. S., Hung, W. L. D., Jamaludin, A. B., & Lim, S. H. (2014). Expanding "within context" to "across contexts" learning: A case study of informal and formal activities. *Interactive Learning Environments*, *22*(6), 704–720. https://doi.org/10.1080/10494820.2012.745424

Kotob, F., Styger, L., & Richardson, L. P. (2016). Exploring mind mapping techniques to analyse complex case study data. *Australian Academy of Business and Economics Review 2*(3), 21. Retrieved from https://ro.uow.edu.au/buspapers/958/

Koziel, E. (2018). *Are we lovin' it? The edTPA and the Mcdonaldization of music teacher training*. University of Memphis, Memphis, Tennessee. Retrieved from Proquest Dissertation and Theses database. (No. 10788085)

Lamb, S., Mare, Q., & Doecke, E. (2017). *Key skills for the 21st century: An evidence-based review*. Retrieved from https://education.nsw.gov.au/our-priorities/innovate-for-the-future/education-for-a-changing-world/research-findings/future-frontiers-analytical-report-key-skills-for-the-21st-century/Key-Skills-for-the-21st-Century-Analytical-Report.pdf

Lamont, A., Hargreaves, D. J., Marshall, N. A., & Tarrant, M. (2003). Young people's music in and out of school. *British Journal of Music Education*, *20*(3), 229–241. https://doi.org/10.1017/S0265051703005412

Lane, J. (2011). A descriptive analysis of qualitative research published in two eminent music education research journals. *Bulletin of the Council for Research in Music Education*, (188), 65–76. Retrieved from https://www.jstor.org/stable/41162330

Larsen, R. L., & Boody, C. G. (1971). Some implications for music education in the work of Jean Piaget. *Journal of Research in Music Education*, *19*(1), 35–50. https://doi.org/10.2307/3344113

Lee, J. (2012). *Cumulative learning and schematization in problem solving* (Doctoral dissertation). Albert-Ludwigs-Universität, Frieburg. Retrieved from https://d-nb.info/1123472610/34

Lilliedahl, J. (2018). Building knowledge through arts integration. *Pedagogies: An International Journal*, *13*(2), 133–145. https://doi.org/10.1080/1554480X.2018.1454320

Lilliestam, L. (1996). On playing by ear. *Popular Music*, *15*(2), 195–216.

Lincoln, Y. S., & Guba, E. G. (2013). *The constructivist credo*. Walnut Creek, United States: Routledge.

Linsin, T. (2016). *Music learning networks: Support the music learning of adolescents* (Doctoral dissertation). University of Washington, Washington D.C.

Locke, J. (2017). An Essay Concerning Human Understanding Book II: Ideas (J. Bennett, Trans.). *Early Modern Texts*, 130.

Lonie, D., & Dickens, L. (2016). Becoming musicians: Situating young people's experiences of musical learning between formal, informal and non-formal spheres. *Cultural Geographies*, *23*(1), 87–101. https://doi.org/10.1177/1474474015587477

Lowe, G. (2012). Lessons for teachers: What lower secondary school students tell us about learning a musical instrument. *International Journal of Music Education*, *30*(3), 227–243. https://doi.org/10.1177/0255761411433717

Macedo, F. (2013). Teaching creative music technology in higher education: A phenomenological approach. *Journal of Music, Technology and Education*, *6*(2), 207–219. https://doi.org/10.1386/jmte.6.2.207_1

Mak, P. (2006). *Learning music in formal, non-formal and informal contexts*. Groningen, Netherlands: Hanzehogeschool Groningen.

Maton, K. (2009). Cumulative and segmented learning: Exploring the role of curriculum structures in knowledge-building. *British Journal of Sociology of Education*, *30*(1), 43–57. https://doi.org/10.1080/01425690802514342

McCormick, C. B., Dimmitt, C., & Sullivan, F. R. (2012). Metacognition, learning, and instruction. In I. B. Weiner, W. M. Reynolds, & G. E. Miller (Eds.), *Handbook of psychology, volume 7, educational psychology* (Second Edition, pp. 69–98). https://doi.org/10.1002/9781118133880.hop207004

McGillen, C., & McMillan, R. (2005). Engaging With adolescent musicians: Lessons in song writing, cooperation and the power of original music. *Research Studies in Music Education*, *25*(1), 1–20. https://doi.org/10.1177/1321103X050250010401

McPherson, G. E. (1997). Cognitive strategies and skill acquisition in musical performance. *Bulletin of the Council for Research in Music Education*, *133*, 64–71. Retrieved from https://www.jstor.org/stable/40318841

McPherson, G. E., Osborne, M. S., Evans, P., & Miksza, P. (2019). Applying self-regulated learning Microanalysis to study musicians' practice. *Psychology of Music*, *47*(1), 18–32. https://doi.org/10.1177/0305735617731614

Merchie, E., & Van Keer, H. (2016). Mind mapping as a meta-learning strategy: Stimulating pre-adolescents' text-learning strategies and performance? *Contemporary Educational Psychology*, *46*, 128–147. https://doi.org/10.1016/j.cedpsych.2016.05.005

Merrick, B. (2007). Valuing self-regulation in music performance: An evaluation of self-regulation and strategy development in adolescents. In P. de Vries & J. Southcott (Eds.), *Proceedings of the XXIXth Annual Conference* (pp. 112–122). Melbourne: Australian Association for Research in Music Education.

Mifsud, A. (2013). Using social network sites to foster creativity and collaboration in the music classroom. *Redefining the Musical Landscape: Inspired Learning and Innovation in Music Education 1*(1), 138–143. Parkeville, VIC: Australian Society for Music Education.

Miksza, P., & Johnson, E. (2012). Theoretical frameworks applied in music education research: A content analysis of the journal of research in music education, 1979 to 2009. *Bulletin of the Council for Research in Music Education*, (193), 7. https://doi.org/10.5406/bulcouresmusedu.193.0007

Mills, J., Bonner, A., & Francis, K. (2006). The development of constructivist grounded theory. *International Journal of Qualitative Methods*, *5*(1), 25–35. https://doi.org/10.1177/160940690600500103

Mogashoa, T. (2014). Applicability of constructivist theory in qualitative educational research. *American International Journal of Contemporary Research*, *4*(7), 9.

Mok, O. N. A. (2011). Non-formal learning: Clarification of the concept and its application in music learning. *Australian Journal of Music Education*, (1), 11–15.

Morford, J. B. (2007). Constructivism: Implications for postsecondary music education and beyond. *Journal of Music Teacher Education*, *16*(2), 75–83. https://doi.org/10.1177/10570837070160020108

Moritz, S., & Lysaker, P. H. (2018). Metacognition – What did James H. Flavell really say and the implications for the conceptualization and design of metacognitive interventions. *Schizophrenia Research*, *201*(1), 20–26. https://doi.org/10.1016/j.schres.2018.06.001

Muklis, M., Abidin, C., Pamungkas, M. D., & Djalil, M. (2018). The implementation of cumulative learning theory in calculating triangular prism and tube volumes. *Journal of Physics: Conference Series*, *947*(1), 1–6. https://doi.org/10.1088/1742-6596/947/1/012029

Nesbit, J. C., & Adesope, O. O. (2006). Learning with concept and knowledge maps: A meta-analysis. *Review of Educational Research*, *76*(3), 413–448. https://doi.org/10.3102/00346543076003413

NSW Board of Studies. (2006). *Creative arts K-6: Syllabus*. NSW Board of Studies. Retrieved from https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/learning-areas/creative-arts/creative-arts-k-6-syllabus

O'Donnell, A. M., Dobozy, E., Bartlett, B. J., Nagel, M. C., Spooner-Lane, R., & Youssef-Shalala, A. (2016). *Educational psychology* (Second Australian edition.). Milton, Qld: John Wiley and Sons Australia, Ltd.

O'Neill, S., Geoghegan, D., & Petersen, S. (2013). Raising the pedagogical bar: Teachers' co-construction of explicit teaching. *Improving Schools*, *16*(2), 148–158. https://doi.org/10.1177/1365480213493709

Passer, M. (2013). *Psychology: The science of mind and behaviour* (Australian ed.). North Ryde, Australia: McGraw-Hill Australia.

Pelech, J., & Pieper, G. W. (2010). *The comprehensive handbook of constructivist teaching: From theory to practice*. Charlotte, United States: Information Age Pubishing Inc.

Piaget, J. (1964). Part I: Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching*, *2*(3), 176–186. https://doi.org/10.1002/tea.3660020306

Radmehr, F., & Drake, M. (2018). An assessment-based model for exploring the solving of mathematical problems: Utilizing revised bloom's taxonomy and facets of metacognition. *Studies in Educational Evaluation*, *59*, 41–51. https://doi.org/10.1016/j.stueduc.2018.02.004

Rapley, T. (2004). Interviews. In C. Seale, G. Gobo, J. Gubrium, & D. Silverman (Eds.), *Qualitative research practice* (First Edition, pp. 16–34). https://doi.org/10.4135/9781848608191

Renwick, J. M. (2008). *Because I love playing my instrument: Young musicians' internalised motivation and self-regulated practising behaviour* (Doctoral dissertation). University of New South Wales. Retrieved from http://unsworks.unsw.edu.au/fapi/datastream/unsworks:2399/SOURCE2

Riester, S. (2018). *An investigation of the impacts of combined classes on elementary music education* (Master of Music Education). University of Oklahoma, Oklahoma.

Sala, G., & Gobet, F. (2017). When the music's over. Does music skill transfer to children's and young adolescents' cognitive and academic skills? A meta-analysis. *Educational Research Review*, *20*(1), 55–67. https://doi.org/10.1016/j.edurev.2016.11.005

Salavuo, M. (2006). Open and informal online communities as forums of collaborative musical activities and learning. *British Journal of Music Education*, *23*(3), 253–271. https://doi.org/10.1017/S0265051706007042

Scheid, M. (2014). Music education – Privately, personally and professionally The school subject of Music, digital media and tools. *Education Inquiry*, *5*(2), 23255. https://doi.org/10.3402/edui.v5.23255

Schellings, G. (2011). Applying learning strategy questionnaires: Problems and possibilities. *Metacognition and Learning*, *6*(2), 91–109. https://doi.org/10.1007/s11409-011-9069-5

Schmidt-Jones, C. A. (2017). Open ends and means: Inquiry as a link between formal music concepts and informal music learning. *International Journal of Music Education*, *35*(4), 621–630. https://doi.org/10.1177/0255761417689919

Scott, S. (2011). Contemplating a constructivist stance for active learning within music education. *Arts Education Policy Review*, *112*(4), 191–198. https://doi.org/10.1080/10632913.2011.592469

Seddon, F. A., & O'Neill, S. A. (2003). Creative thinking processes in adolescent computer-based composition: An analysis of strategies adopted and the influence of instrumental music training. *Music Education Research*, *5*(2), 125–137. https://doi.org/10.1080/1461380032000085513

Seidman, I. (2006). *Interviewing as qualitative research a guide for researchers in education and the social sciences* (3rd Edition). Retrieved from http://ezproxy.uws.edu.au/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=158421&site=ehost-live&scope=site

Shively, J. (2015). Constructivism in music education. *Arts Education Policy Review*, *116*(3), 128–136. https://doi.org/10.1080/10632913.2015.1011815

Sledge, L. (1971). *The application of selected writings by Gagné, Bruner, and Ausubel to music theory pedagogy* (Doctoral dissertation). Florida State University, Florida.

Stevens, R., & Stefanakis, M. (2014). Filling the gaps: What research is needed to assist with music education advocacy in Australia. *Journal of Music Research Online*, *5*, 1–13. Retrieved from http://www.jmro.org.au/index.php/mca2/article/view/123

Tanriseven, I. (2014). A tool that can be effective in the self-regulated learning of pre-service teachers: The mind map. *Australian Journal of Teacher Education*, *39*(1). https://doi.org/10.14221/ajte.2014v39n1.1

Tattersall, C., Powell, J., Stroud, J., & Pringle, J. (2011). Mind mapping in qualitative research. *Nursing Times*, *107*(18), 20–22.

Thomas, G. P. (2012). Metacognition in science education: Past, present and future considerations. In B. J. Fraser, K. Tobin, & C. J. McRobbie (Eds.), *Second International Handbook of Science Education* (pp. 131–144). https://doi.org/10.1007/978-1-4020-9041-7_11

Thorp, J. (2010). *Playing with understanding: Constructivist instrumental learning strategies* (Master's Thesis). University of Western Sydney, Sydney.

Tobias, E. S. (2015). Crossfading music education: Connections between secondary students' in- and out-of-school music experience. *International Journal of Music Education*, *33*(1), 18–35. https://doi.org/10.1177/0255761413515809

Treglia, M. (2018). *A comparison of offline and online Measures of metacognition*. Trinity College, Connecticut. Retrieved from https://digitalrepository.trincoll.edu/cgi/viewcontent.cgi?article=1750&context=theses

Umoquit, M., Tso, P., Varga-Atkins, T., O'Brien, M., & Wheeldon, J. (2013). Diagrammatic elicitation: Defining the use of diagrams in data collection. *The Qualitative Report*, *18*(30), 14. Retrieved from https://nsuworks.nova.edu/tqr/vol18/iss30/2/

van Donkersgoed, G. (2016). *Using the metacognition and reflective inquiry method as a metacognitive stimulant for gifted students* (Master's Thesis). Utrecht University, Netherlands.

Varga-Atkins, T., & O'Brien, M. (2009). From drawings to diagrams: Maintaining researcher control during graphic elicitation in qualitative interviews. *International Journal of*

Research & Method in Education, *32*(1), 53–67. https://doi.org/10.1080/17437270902759998

Veenman, M. V. J. (2011). Alternative assessment of strategy use with self-report instruments: A discussion. *Metacognition and Learning*, *6*(2), 205–211. https://doi.org/10.1007/s11409-011-9080-x

Veenman, M. V. J., Van Hout-Wolters, B. H. A. M., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and Learning*, *1*(1), 3–14. https://doi.org/10.1007/s11409-006-6893-0

von Glaserfeld, E. (1995). *Radical Constructivism: A way of knowing and learning*. London: RoutledgeFalmer.

Wheeldon, J. (2011). Is a picture worth a thousand words? Using mind maps to facilitate participant recall in qualitative research. *The Qualitative Report, 16*(2), 509–522.

Wheeldon, J., & Åhlberg, M. (2012). *Visualizing social science research: Maps, methods, & meaning*. Thousand Oaks, California: Sage Publications.

Wheeldon, J., & Åhlberg, M. (2017). Mind maps in qualitative research. In P. Liamputtong (Ed.), *Handbook of research methods in health social sciences* (pp. 1–17). https://doi.org/10.1007/978-981-10-2779-6_7-1

Wheeldon, J., & Faubert, J. (2009). Framing experience: Concept maps, mind maps, and data collection in qualitative research. *International Journal of Qualitative Methods*, *8*(3), 68–83. https://doi.org/10.1177/160940690900800307

Wheeler, W. (1993). *Practicing flamenco guitar in Madrid, Spain: An event-centered study of accompanists in guitar lessons and dance classes*. Indiana University, Indiana. Retrieved from Proquest Dissertations and Theses database. (UMI No. 9326276)

Whiting, M., & Sines, D. (2012). Mind maps: Establishing 'trustworthiness' in qualitative research. *Nurse Researcher*, *20*(1), 21–27. https://doi.org/10.7748/nr2012.09.20.1.21.c9304

Wilkins, S. E. (1977). Music education and cumulative sequential learning. *Journal of the Kodály Education Institute of Australia*, *2*(1), 5–18.

Wosnitza, M., & Beltman, S. (2012). Learning and motivation in multiple contexts: The development of a heuristic framework. *European Journal of Psychology of Education*, *27*(2), 177–193. https://doi.org/10.1007/s10212-011-0081-6

Wright, R., & Froehlich, H. (2012). Basil Bernstein's theory of the pedagogic device and formal music schooling: Putting the theory Into practice. *Theory Into Practice*, *51*(3), 212–220. https://doi.org/10.1080/00405841.2012.690307

Yarbrough, C. (2003). Multiple methods of research: Possibilities for the study of music teaching and learning. *Research Studies in Music Education*, *21*(1), 3–15. https://doi.org/10.1177/1321103X030210010101

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal*, *29*(3), 663–676.

Zimmerman, B. J., & Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Education Research Journal*, *23*(4), 614–628.

List of Appendices

APPENDIX A: Summary table of music learning across context

A1

Researching Music Learning Across Contexts*

Title	Author(s)	Year	Philosophical	Theoretical	Aims	Method	Data Collection	Data Analysis	Findings
The effect of group size on individual achievement in beginning piano classes	Anita Jackson	1980	Positivist	Positivist	To determind the effect of group size on individual achievement in beginner piano classes (size 2-8)	Positivist	Performance Testing	Positivist (t Test)	No significant differences to individual achievement
Practicing flamenco guitar in Madrid, Spain: An event-centered study of accompanists in guitar lessons and dance classes	William Wheeler	1993	Interpretivist	Ethnomusicology	To provide an understanding of flamenco culture	Ethnographic method	Participant observation, interviews, audio recordings, field notes	Thematic analysis	The contexts of lessons and classes act as a window to the nature of tradition, improvisation and professional life in flamenco
How popular musicians learn: A way ahead for music education	Lucy Green	2002	Interpretivist	Ethnomusicology	To explore some of the possibilities which informal popular music learning practices might offer to formal music education	Ethnographic method	Interviews, observations, focus groups,	Thematic analysis	Ideas of purposive listening, enculturation and singing/playing along to records should be considered for inclusion by formal educators
Systematic research in studio instruction in music	Richard Kennell	2002			To provide an overview of understandings about studio instruction in music	Systematic Review	Systematic Review	Descriptive analysis	Studio instruction presents as deceptively simple, however is complex. It acts the interface between professionals and students and functions as a cultural replication of the music community
Creative thinking processes in adolescent computer-based composition: An analysis of strategies adopted and the influence of instrumental music training	Frederick Seddon and Susan O'Neil	2003		Grounded Theory	To investigate potential differences in composition strategies adopted by adolescents, with and without prior experience of formal instrumental music tuition when engaging with computer-based composition	Grounded Theory	Video recording, midi files of compositions and questionnaire	Grounded theory (constant comparative method)	Participants with formal instrumental music training spent less time in 'exploratory' behaviour than those without. Those with training also rated their own compositions higher than those without despite teachers finding no significant difference.
Innovations in piano teaching: A small-group model for the tertiary level	Ryan Daniel	2004			To consider an alternative to the one-to-one model of teaching piano in the tertiary setting		In-depth interviews, questionnaires, written reports, video/audio recordings and	Descriptive analysis	Findings indicate the need for further study into the benefits of the small group tuition model and comparisons between this and the one-to-one model, having shown many advantages of the former.
The impact of informal music learning practices in the classroom, or how I learned how to teach from a garage band	Sher Jaffurs	2004	Social Constructivism	Ethnography	To describe a developing 'rock group', and the factors that contributed to its creation	Ethnographic case study	Observation, interviews, video-taped rehearsals and field notes	Thematic analysis	Understanding how children problem solve and create knowledge through social interactions builds shared knowledge between student and teacher. Learning that is related to the context and not presented as an abstract method out of context may be more meaningful for the learner.
Exploring music instrument teaching and learning environments: Video analysis as a means of elucidating process and learning outcomes	Ryan Daniel	2006			To create systematic procedures by which to investigate the field of instrument tuition in formal instittutions	Methodological Experimental Design	Video/audio recording	Video/audio analysis	The study propose that there is a need to consider the appropriate balance of teaching modes for students, i.e. what format or formats for learning are most appropriate for students at the various stages of development?
Formal and informal learning situations or practices vs formal and informal ways of learning	Göran Folkestad	2006	Socio-cultural perspective	Socio-cultural perspective	To examine research studies which in different ways focus on formal and informal learning situations and practices or formal and informal ways of learning	Literature Review	Literature Review	Text Analysis	The analysis of the presented research within this area suggests that formal – informal should not be regarded as a dichotomy, but rather as the two poles of a continuum, and that in most learning situations, both these aspects of learning are in various degrees present and interacting in the learning process.
Learning music in formal, non-formal and informal contexts	Peter Mak	2006			To explore the various learning contexts (formal, non-formal and informal), which are relevant for the training of professional musicians as lifelong learners.	Report	N/A	N/A	Institutions for the education of professional musicians have to make use of the various learning contexts for educating professional musicians. Change of contextt makes that the student can master the various competencies that are necessary to engage in the music profession of today.
One-to-one tuition in a conservatoire: The perceptions of instrumental and vocal teachers	Helena Gaunt	2008			This article provides an analysis of the perceptions of 20 principal study teachers in a conservatoire in the UK about one-to-one tuition, its aims, processes and context.	Comparative Analysis	Semi-structured interviews	Comparative Analysis	In this context, the dynamics of power invested in the one-to-one relationship suggested that whilst the potential of detailed shared reflection-in-action in one-to-one tuition was great, the relationship could also inhibit the development of self-responsibility and of an individual artistic voice, both of which were so prized by the teachers.
Music, informal learning and the school: A new classroom pedagogy	Lucy Green	2008	Relatitvistic	Constructivist Learning Theory	To investigate whether it would be possible and beneficial to bring at least some aspects of informal popular music learning practices into the realms of the school classroom.	Case study	Participant observation, observation, vide/audio recording, semi-structured interviews, recording meetings, unstructured conversations (recorded) and field notes	Qualitative	Informal learning practices can introduce fresh, constructive ways for formal music teachers to understand and approach their work, and worthwhile new perspectives on pupils' capacities and needs.
Categories in motion: The use of generic multiplicity in music store guitar lessons	Anthony Guest-Scott	2008			To explore some of the ways people utilize multiple musical genres in the pedagogical context of music store guitar lessons in ways that dramatically affect how they are defined.	Ethnographic method	Interviews, observations, participant observation and field notes.		The juxtaposition of multiple musical genres-genericmultiplicity-is a significant orienting feature for two dimensions of their use in MSGLs: the role of the guitar teacher, and the process of teaching guitar performance.
Formal and informal music educational practices	Phil Jenkins	2011	Constructivism?		To examine the theoretical underpinnings of informal learning practices, and compare them to those of more formal learning practices to clarify what might be distinctive and valuable about using informal instructional practices in formal music educational settings.	Literature Review	Literature Review	Text Analysis	Informal instructional practices in formal music education can, along with formal practices, contribute to the formation of an individual learner's identity and agency through engagement with music.

*Yellow indicates a lack of clarity presented by researchers. In some cases, an attempt has been made to inference details from available information.

Researching Music Learning Across Contexts*

Non-formal learning: Clarification of the concept and its application in music learning	On Nei Annie Mok	2011			To summarize various literature in this area and then an operational concept about non-formal learning which is applicable in music learning-practices will be formulated.	Literature Review	Literature Review	Text Analysis	the discussion of non-formal learning can provide supplementary framework to the discussion of the well-established concepts of informal and formal ways of learning in the music education field. It is hoped that the concept of non-formal learning discussed above can be found useful in explaining and to differentiate the diverse ways of music learning practices prevailing in the world.
Learning and motivation in multiple contexts: The development of a heuristic framework	Marold Wosnitza and Susan Beltman	2012			To develop a heuristic framework that integrates three aspects of context (perspective, content and level) from a number of established theoretical approaches.	Literature Review	Literature Review	Text Analysis	The heuristic framework represents a useful way of organising multiple aspects of context. It enables researchers to locate current studies and to generate further empirical work.
One-to-one pedagogy: Developing a protocol for illuminating the nature of teaching in the conservatoire	Gemma Carey, Catherine Grant, Erica McWilliam and Peter Taylor	2013			To develop a scheme to characterize the nature and quality of specific practices of one-to-one teaching, selected on the basis of their potential significance to the development of student performance.	Methodological Experimental Design?	Interviews, video/audio recordings, focus-groups	Thematic analysis, coding of videographic data according to Taylor's (2012) scheme.	Findings not reported in this work.
Learning from one another's musicianship: Exploring the potential for collaborative development of aural skills with pianists	Lotta Ilomäki, Helana Gaunt and Heidi Westerlund	2013	Socio-cultural perspective	Socio-cultural perspective	To discuss some possibilities to turn competition into collaboration in aural-skills education.	Literature Review	Literature Review	Text Analysis	This work suggested that collaborative activities such as improvisation tasks or co-operative analyses of musical examples benefited the classroom atmosphere and enabled a group with diverse skills to work together.
Teaching creative music technology in higher education: A phenomenological approach	Frederico Macedo	2013	Phenomenology	Phenomenology	To discuss how phenomenology can offer the philosophical foundation and practical insights for teaching creative music technology in higher education.	Literature Review	Literature Review		I believe the phenomenological approach to creative music technology can offer answers to many of the challenges faced by lecturers and course designers working with music technology in higher education, helping them to deal with the different, and sometimes conflicting, expectations of students and governmental policies, regarding music technology degrees.
Using social network sites to foster creativity and collaboration in the music classroom	Andrew Mifsud	2013			To explore the issues of disengagement in boys' learninge experience and how this affects their creative capacity through implementing an education-based social networking platform, Edmodo.	Action Research	Data gathered from Social Network Site, Observations journal and group discussion.	Descriptive Analysis	While the results of this task showed that some students did not completely benefit from a collaborative environment for all aspects of the task, my perception was that the boys having to listen and give feedback on other boys' compositions, at each stage, enriched the task. Further, there was demonstrable evidence that a deeper understanding of composition ensued and the boys' final compositions were definitely more interesting and
Shifting the paradigm of music instruction: Implications of embodiment stemming from an augmented reality guitar learning system	Joseph Keebler, Travis Wiltshire, Dustin Smith, Stephen Fiore and Jeffrey Bedwell	2014	Embodied music cognition (Action-Reaction Cycle)		To examine a novel augmented reality guitar learning system (i.e.,theFretlight®guitar) in regards to current theories of embodied music cognition.	Positivist	Performance Testing	Positivist	Broadly, the evidence provided by these two experiments demonstrates that, when the musical material to be learned becomes embodied and embedded within the instrument itself this may lower the barriers of entry for learning and enhance long-term retention of the learned musical information.
Expanding "within context" to "across contexts" learning: A case study of informal and formal activities	Mi Song Kim, Wei Loong David Hung, Azilawati Bte Jamaludin and Seo Hong Lim	2014	Situated cognition	RSP framework (reification, selves and phenomena)	To maximize the different activity-milieux in which learners are engaged in developing their lifelong learning dispositions to learn within and across contexts.	Case study	Participant observation, field observations, interview	Use of RSP framework	The findings show that for learning to be meaningful and authentic for the twenty-first century, it is essential for the learner(s) to be in constant dialectical interactions and relationship with oneself, others, and with the social-cultural artifacts that afford the learning.
A combination of one-to-one teaching and small group teaching in higher music education in Norway – a good model for teaching?	Bjørg Julsrud Bjøntegaard	2015			To investigate the use of a combination of one-to-one teaching and small group teaching in higher music education in one Norwegian institution.	Case Study	Observation and interviews.		The evidence suggests that a combination of teaching in individual, small group and master class lessons is the best way of educating students as responsible, reflective and professional musicians.
Teacher and student perspectives on one-to-one pedagogy: Practices and possibilities	Gemma Carey and Catherine Grant	2015	collaborative enquiry		To explore teachers' and students' perceptions of one-to-one pedagogy, in the context of tertiary vocal and instrumental tuition.	Case study	Interviews, focus groups and video/audio recording	Thematic Analysis	Aside from an undisputed view that one-to-one is essential to students' learning and development, findings indicate diverse perceptions, including discrepancies between intentions of teachers and their pedagogical practice, and between teacher practice and student expectations.
Flash study analysis and the Music Learning Profiles Project	Radio Cremata, Joseph Pignato, Bryan Powell and Gareth Dylan Smith	2016	Constructivism	Flash Study Analysis	Flash study analysis is a method that draws heavily on extant qualitative approaches to education research, to develop broad understandings of music learning in diverse contexts.The MLPP aims to benefit the music education community and wider society by helping to democratize research to include more diverse experiences of music learning.	Ethnographic case study	Semi-structured interviews	Descriptive analysis, thematic analysis and assertions ("an interpretation of the meanings") (Creswell 2007, 75)	Music educators, in particular, may find the applied ethnomusicological perspectives enriching to the discussion of socio-cultural aspects of musical learning practices. Music education exists within spheres of culture that include sub-spheres of time, place, peoples, and cultures.

*Yellow indicates a lack of clarity presented by researchers. In some cases, an attempt has been made to inference details from available information.

Researching Music Learning Across Contexts*

Collaborative learning in higher music education: Why what and how?	Helana Gaunt, Heidi Westerlund and Graham Welch	2016							
Becoming musicians: Situating young people's experiences of musical learning between formal, informal and non-formal spheres	Douglas Lonie and Luke Dickens	2016	Phenomenology	Bourdieu's social theory of 'habitus'	To explore processes of access, inclusion and appropriation of music learning environments across formal, non-formal and informal contexts and spaces.	Ethnographic method	Focus groups	Interpretative Phenomenological Analysis	Participants described implicit and explicit processes of exclusion to some formal music education settings and approaches, whereby a less formal though still intentional approach to learning was enacted in response. This included re-appropriating spaces and creating music in communities of practice, mbracing multi-modal approaches to learning across art forms and genres and self-directing learning opportunities
Online music collaboration project: Digitally mediated, deterritorialized music education	Radio Cremata and Bryan Powell	2017		Theories of deterritorialisation in relation to music learning	To investigate and interrogates notions of student-centered music learning through collaboration in digital spaces.	Case study	Audio recordings, interviews, observations and prolonged engagement	Case study framework	The data discusses participant perspectives and contextualizes it within implications for music education in an evolving social sphere. The purpose of this research is to shed light on new pedagogies and push boundaries on what constitutes musical sharing places.
Towards an effective freeware resource for music composition in the primary classroom	Adam Hart	2017			To develop a freeware resource for music composition in the primary classroom.	Case study	Participant observation	Thematic analysis	Although more research is required at this stage, the compositional activities described in this paper have yielded some promising results in terms of reativity and reflection, leading to concrete learning outcomes, and have suggested that resources such as Graphick Score can be valuable in providing access to real music-making experiences, as well as in clarifying musical dimensions.
Teaching music online: Changing pedagogical approach when moving to the online environment	Carol Johnson	2017	Constructivism	Social-constructivist	To explore how teaching staff in an American university music department (N=7) transformed their pedagogy when teaching undergraduate music courses online.	Case study	Semi-structured interviews, focus group	Inductive analysis and theming using first and second coding (Saldaña, 2013)	The pedagogical elements of teaching music online were found to have connections with the community of inquiry framework's nexus of teaching presence, cognitive presence and social presence, and suggested a social-constructivist course design. Finally, the findings show that teaching staff experienced a shift of pedagogical approach when transitioning to teaching music online.
Open ends and means: Inquiry as a link between formal music concepts and informal music learning	Catherine Schmidt-Jones	2017		Activity theory	To investigate what can cause substantive difficulties when self-motivated adults try to use available resources independently to pursue their own music-making and learning projects.	Participatory action research	Questionnaire, online discussion (posts/comments/resources referenced), researcher's journal and works submitted by participants (compositions, recording and journal entries)	Activity theory analysis	The findings of this study suggest the effectiveness of a Deweyan, inquiry-based approach, in which the goals of activities, as well as the tools used, are designed to take into account the learner's own background and interests, matching them with appropriate curriculum goals, such as the acquisition of music theory concepts that would be helpful in reaching the goals.
Transfer of Learning and Music Understanding: A Review of Literature	Sommer Forrester	2018			To examine the development of transfer of learning over the past 40 years and consider the implications for music education practices.	Literature Review	Literature Review	Text Analysis	In order for educators to teach for transfer they must have experience using their knowledge autonomously and be able to solve authentic and appropriate problems in music. Creating dynamic learning environments where learners are challenged to develop understanding J43and apply their knowledge to new contexts may help reinforce the ultimate goal of education: developing autonomous learners.
An investigation of the impacts of combined classes on elementary music education	Sara Riester	2018			To investigate the impacts of combined classes on elementary general music education as well as to gather information about how music educators teaching combined classes in elementary general music were adapting instructional techniques and strategies to successfully deliver instruction and achieve curricular goals in combined classes.	Case studies	Survey, interviews and observation.	Positivist analysis and combination of descriptive, "in vivo" and process coding as well as second-cycle coding and theme analysis across cases	Considering the impacts of combined classes on elementary general music education, the challenges these impacts present in instruction, and the findings of previous studies in class size, single classes with smaller numbers of students are better for student achievement in the music classroom than combined classes with larger numbers of students and should be advocated for whenever possible.

*Yellow indicates a lack of clarity presented by researchers. In some cases, an attempt has been made to inference details from available information.

APPENDIX B: Participant Advertisement Posters

Research Participants Needed

WESTERN SYDNEY UNIVERSITY

Research in Music Education

OVERVIEW

This study seeks WSU BMus students to volunteers to take part in a student project studying music learning across contexts. We hope to learn more about the music education experience.

PARTICIPATION

As a participant in this study, you will be asked to complete:

an online survey

and may be invited to complete **a mind-map and a face-to-face interview.**

Your participation is **entirely voluntary** and may take approximately

2.5 hours over 3 sessions

1x 5 minute survey, 1x 1 hour mind-map, 1x 1.5 hour interview.

REIMBURSEMENT

In appreciation for your time and recognition of the cost of participation, those participants that complete all 3 stages of the research project will receive:

1 x $50 Woolworths Gift Card

CONTACT

To learn more about this study, or to participate, please contact:

Principal Researcher

Steven Loomes
s.loomes@westernsydney.edu.au

or visit:

WEBLINK

tinyurl.com/WSU-MusEd

Please note: Only current WSU Bachelor of Music students to apply.

RESEARCHERS

STEVEN LOOMES

Principal Researcher

Master of Research Candidate
Western Sydney University
s.loomes@westernsydney.edu.au

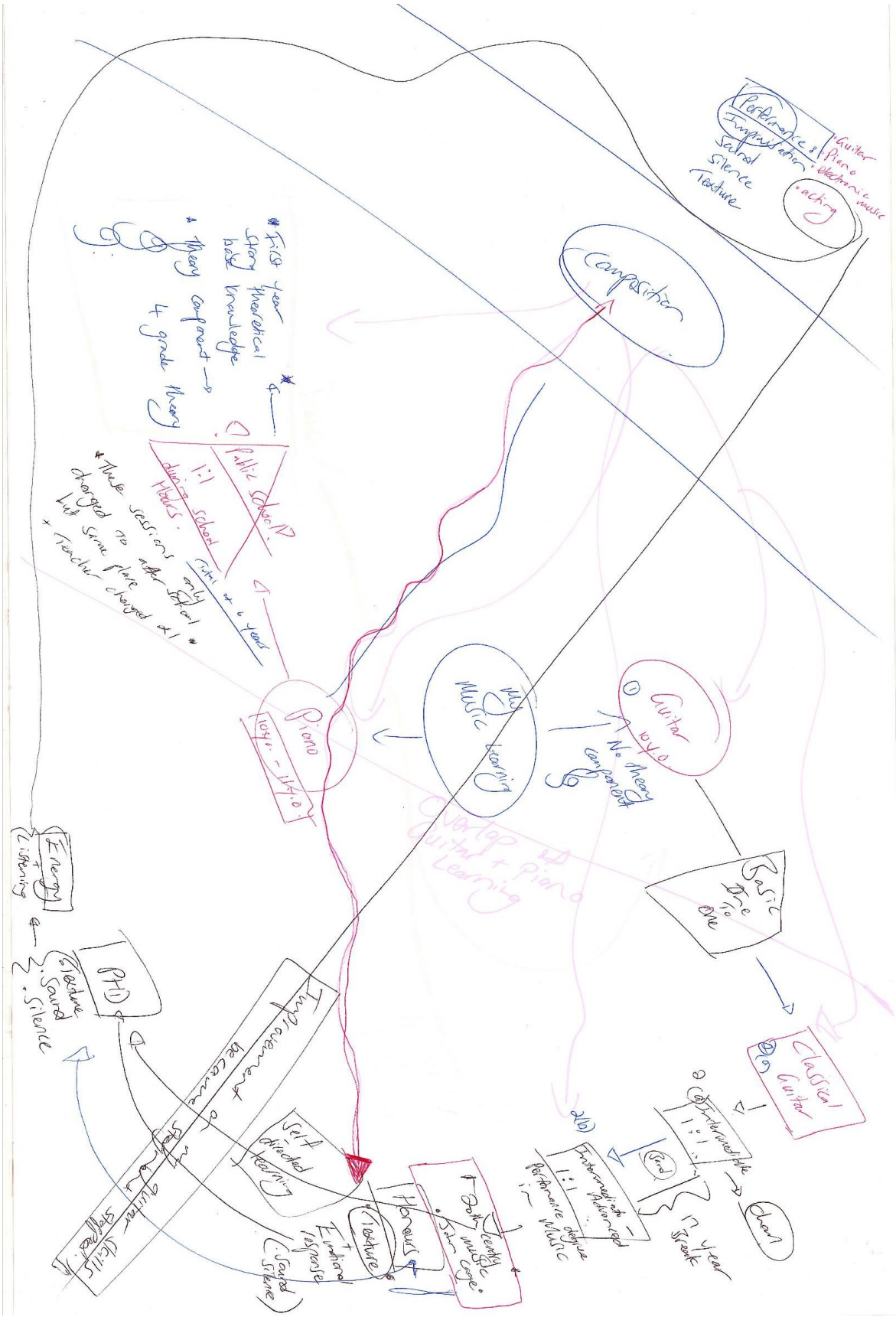
DIANA BLOM

Project Supervisor

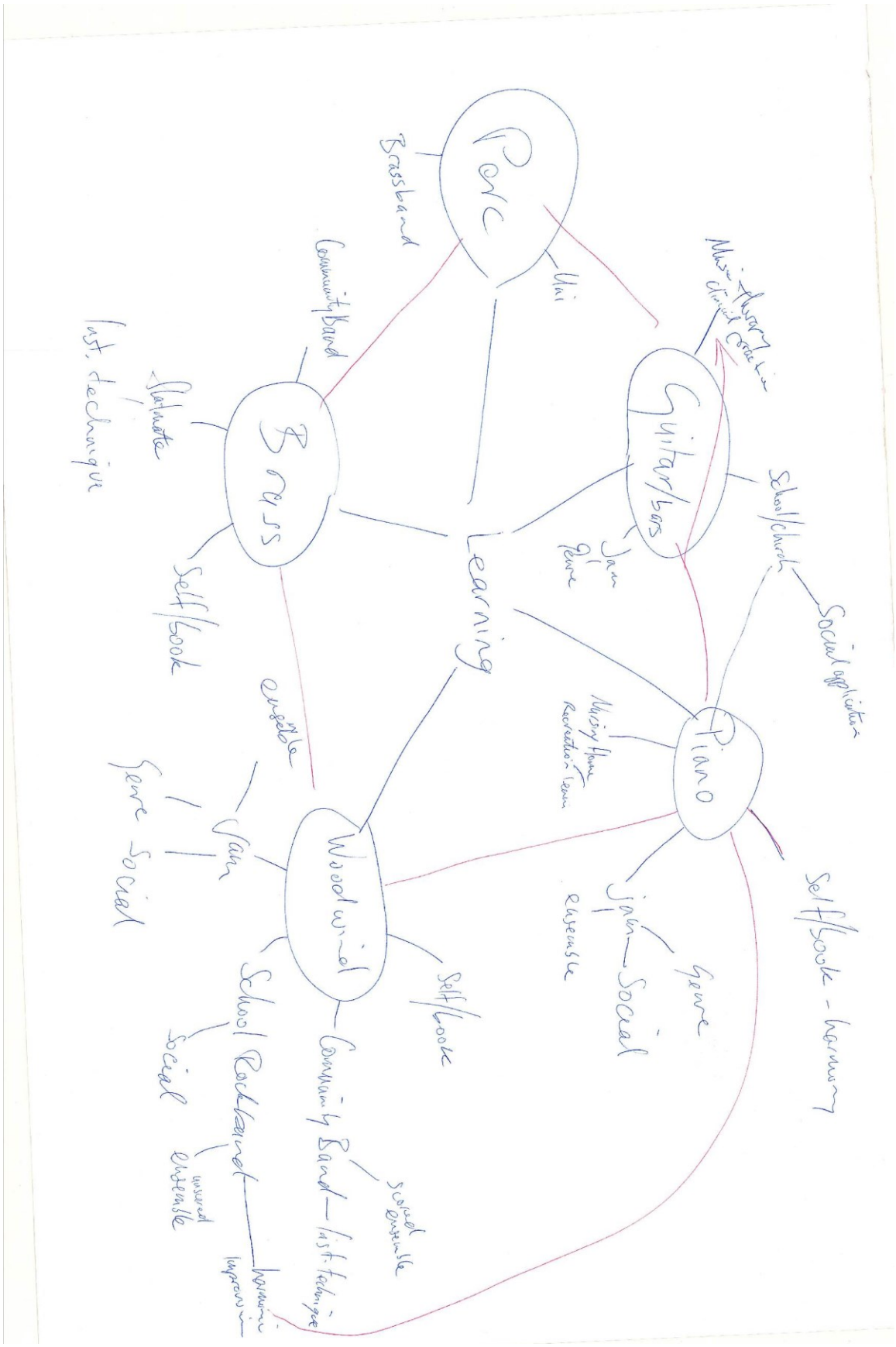
Associate Professor
Western Sydney University
d.blom@westernsydney.edu.au

Human Ethics Review Approval Number: H13187

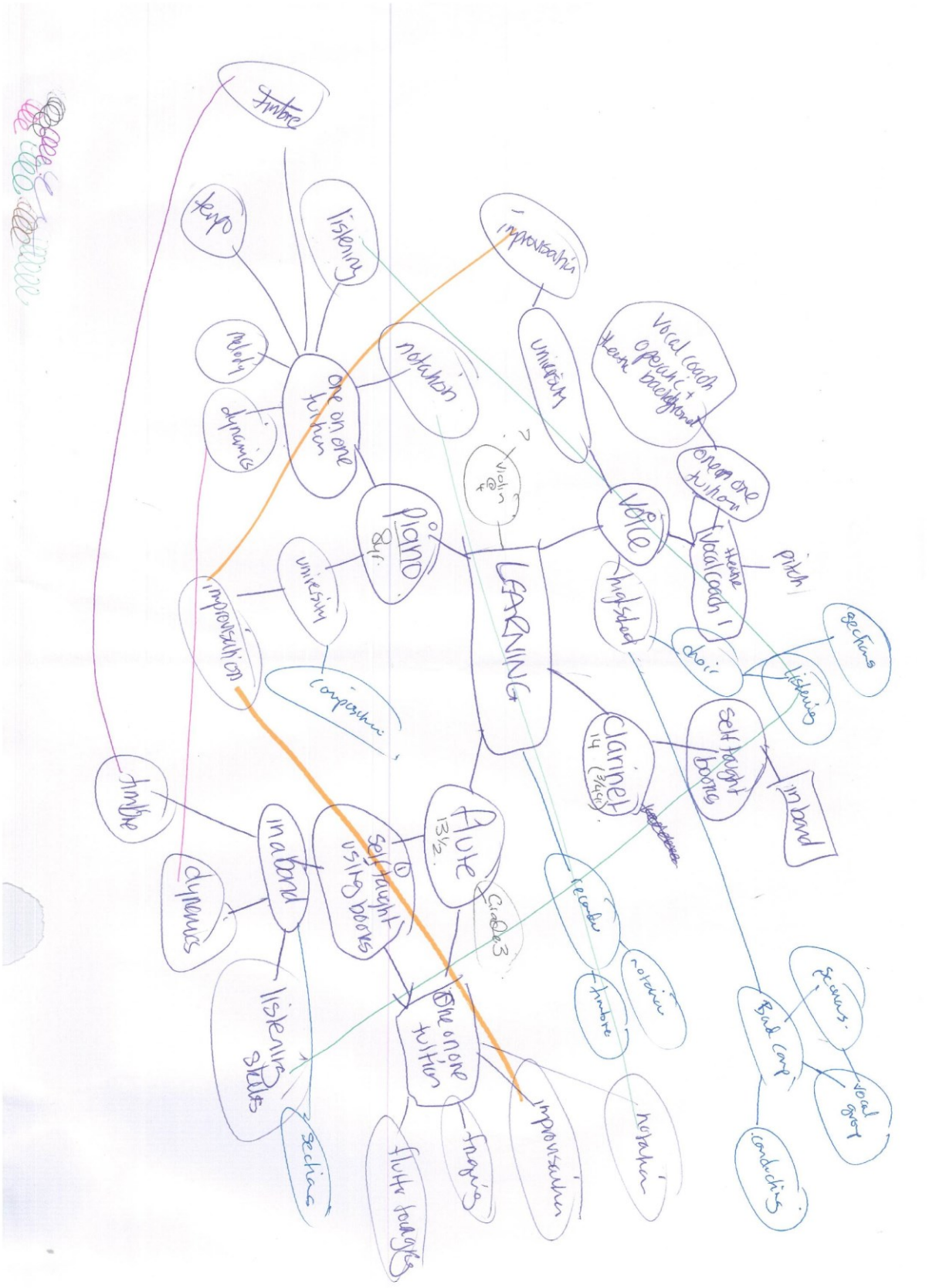
APPENDIX C: Mind map 1 – Sean (learning-centric)



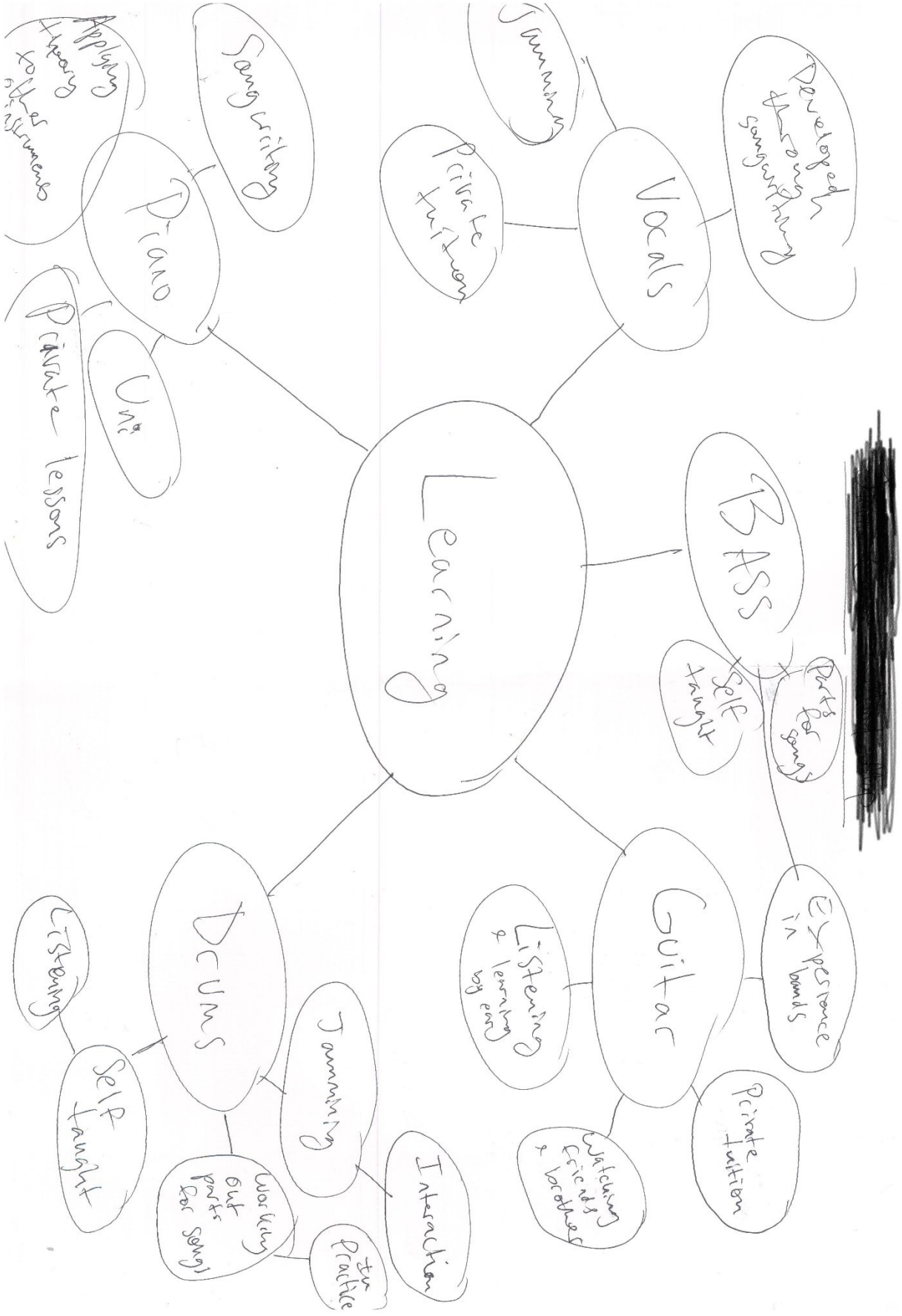
APPENDIX D: Mind map 2 – Owen (learning-centric)



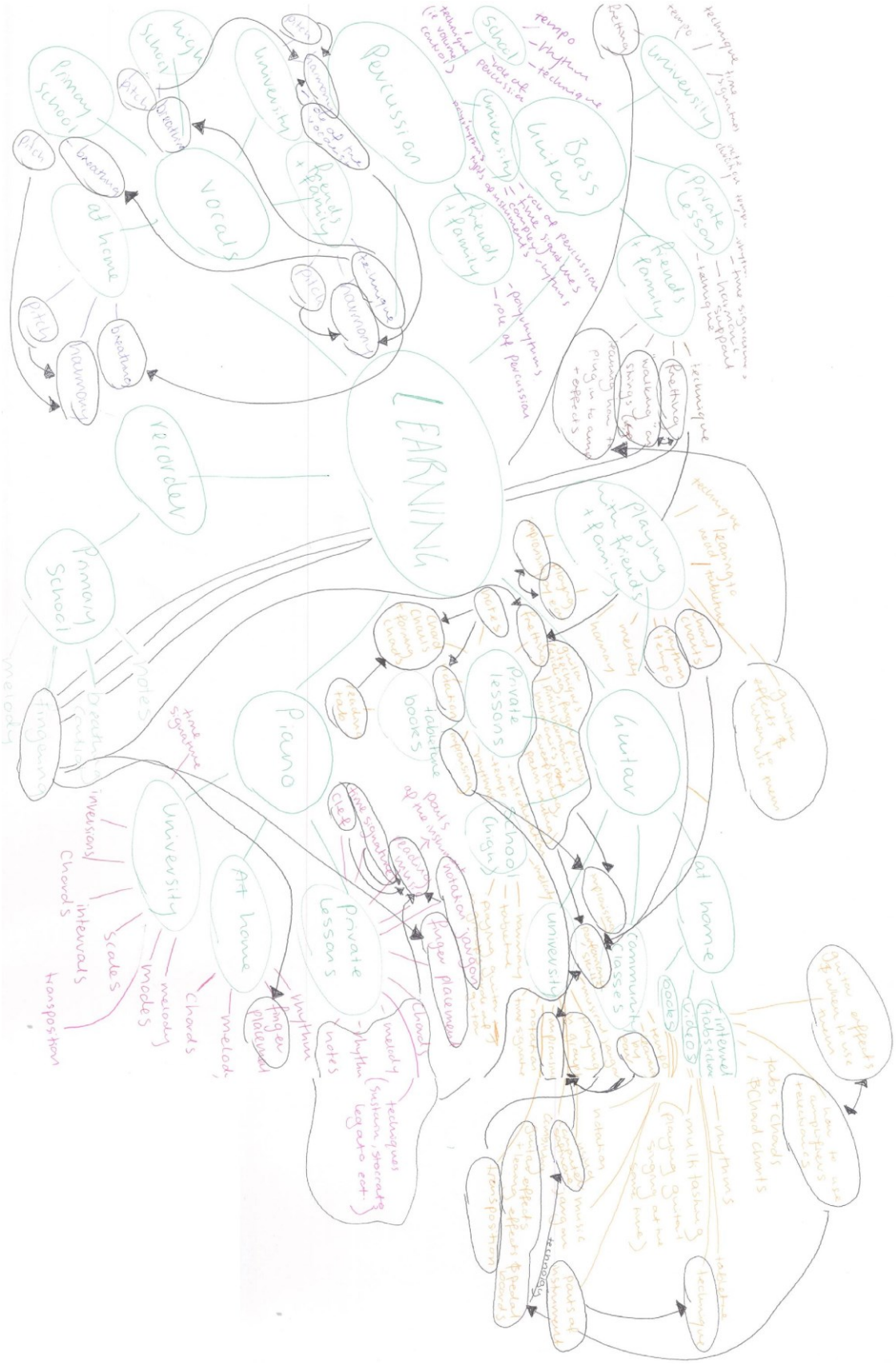
APPENDIX E: Mind map 3 – Sarah (learning-centric)



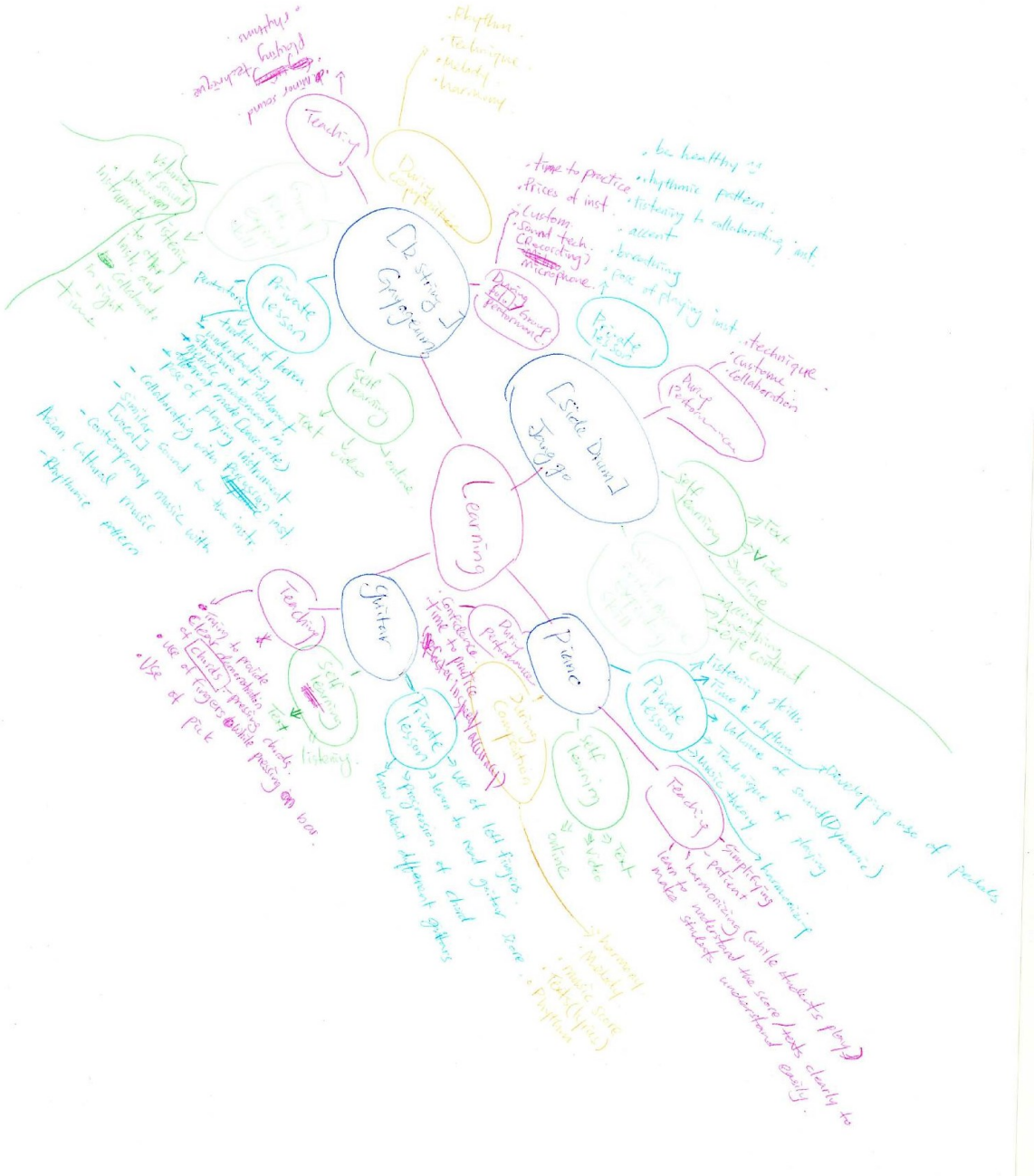
APPENDIX F: Mind map 4 – Dr J (learning-centric)



APPENDIX G: Mind map 5 – E (learning-centric)

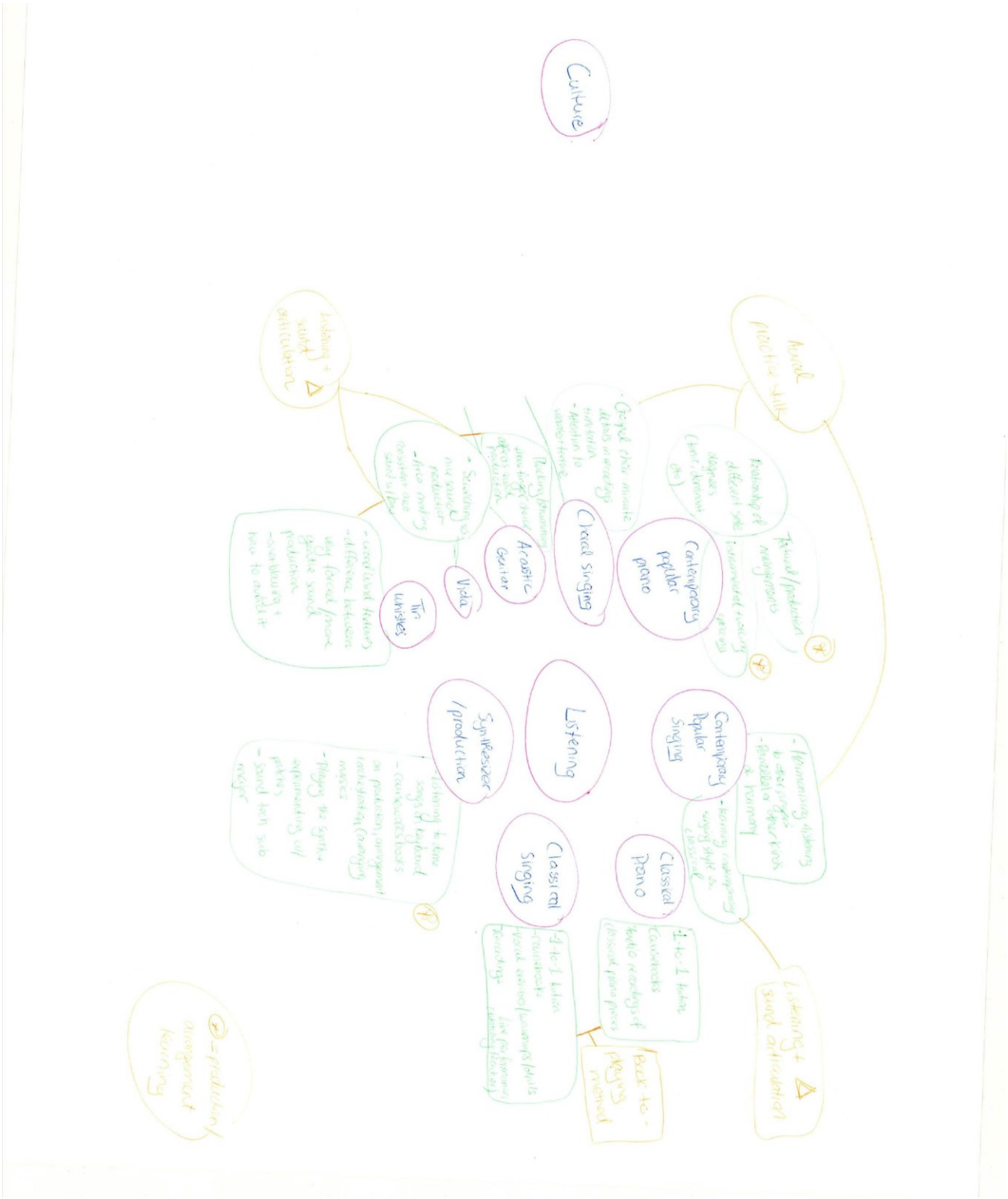


APPENDIX H: Mind map 6 – Jane (learning-centric)

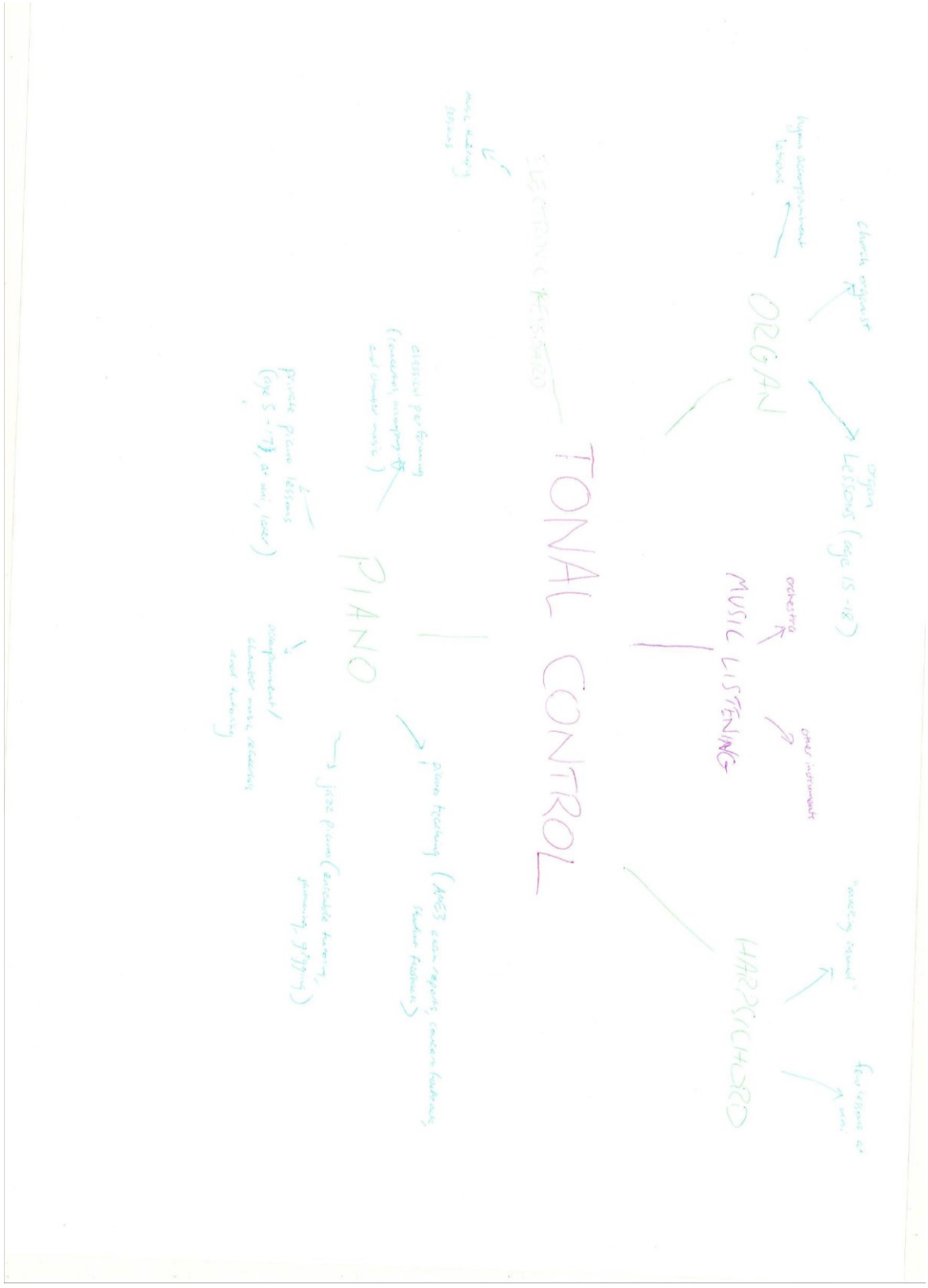


APPENDIX I: Mind map 7a – Mark (learning-centric)

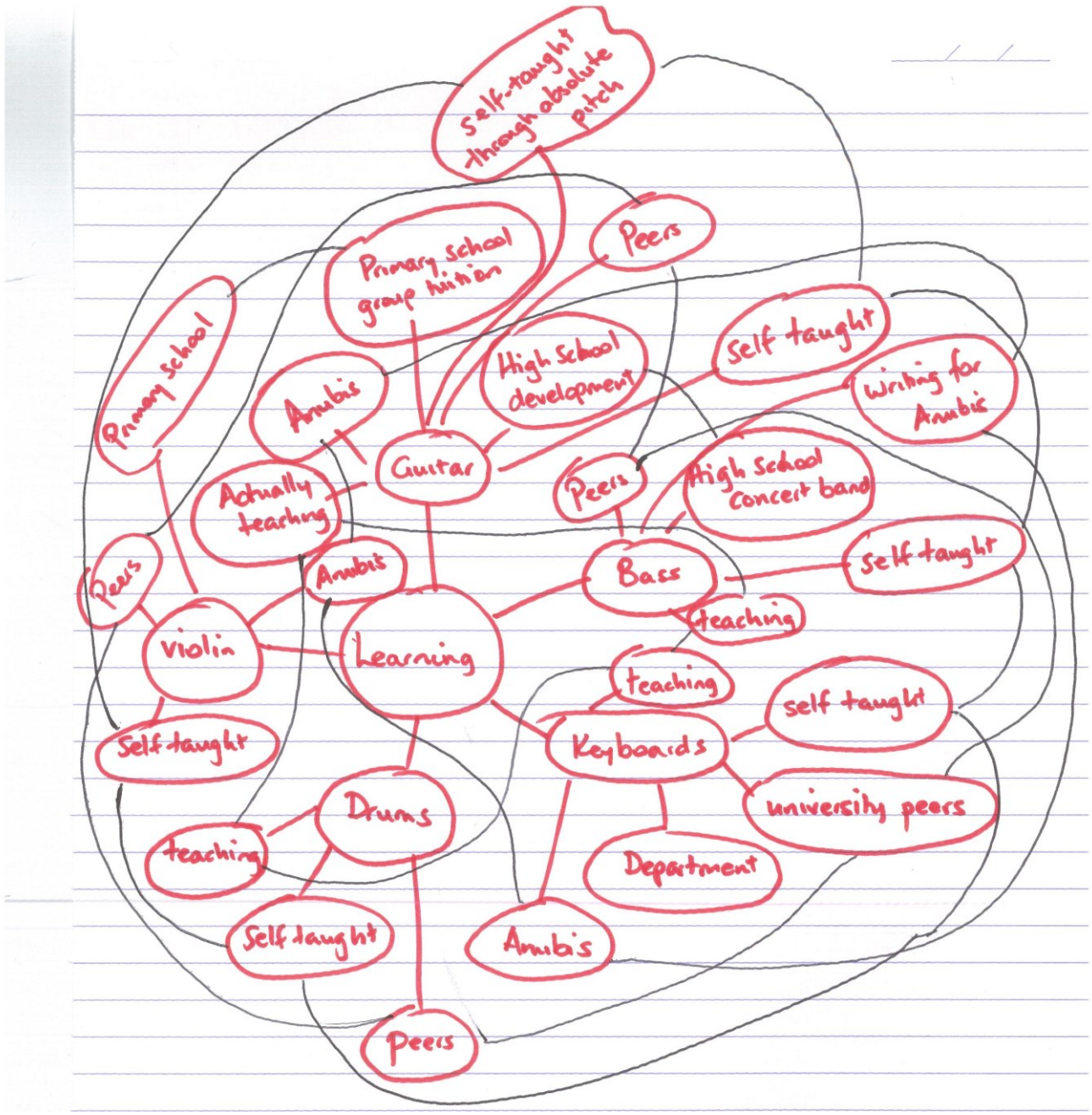
APPENDIX J: Mind map 7b – Mark (concept-centric)



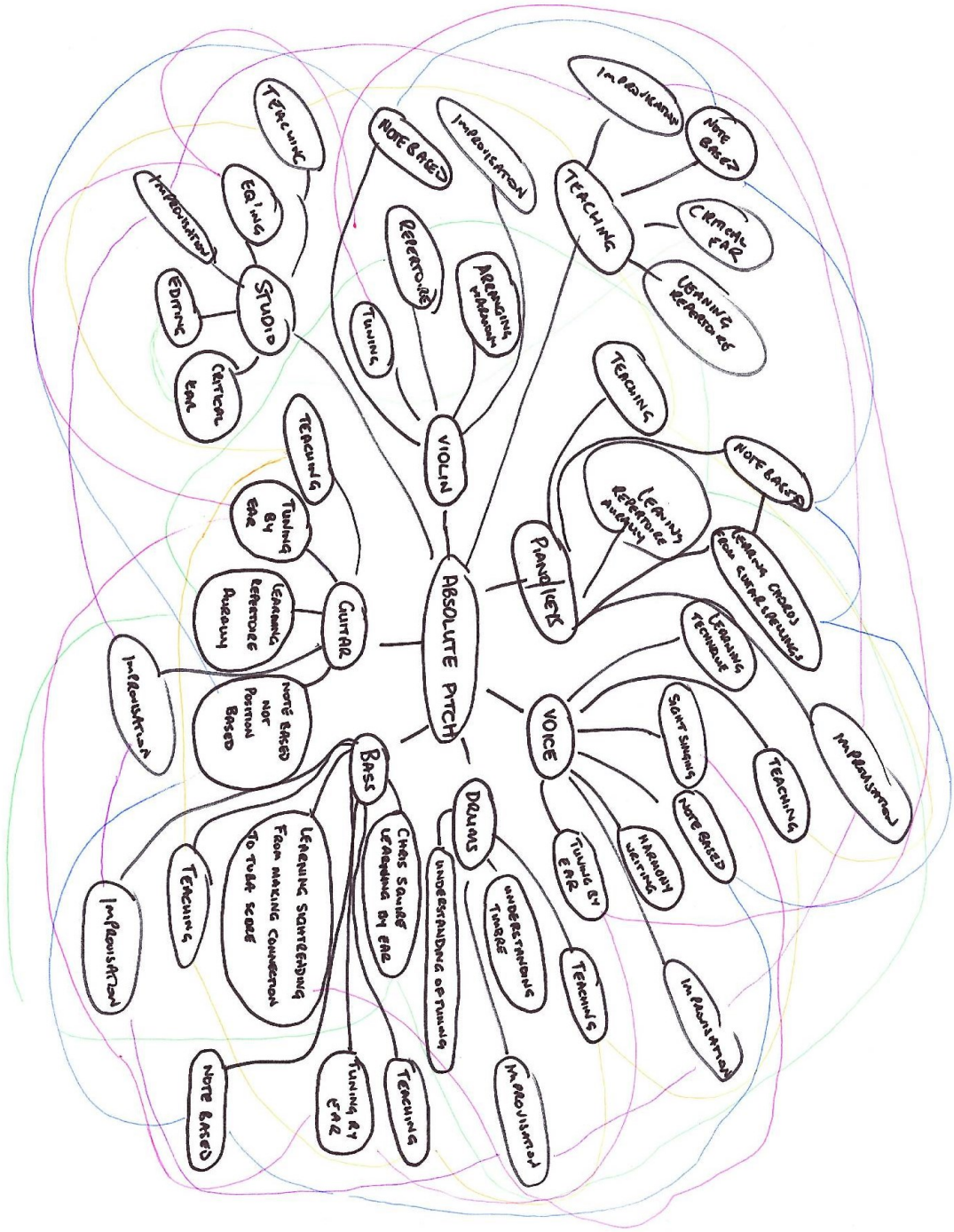
APPENDIX K: Mind map 8 – Basil (concept-centric)



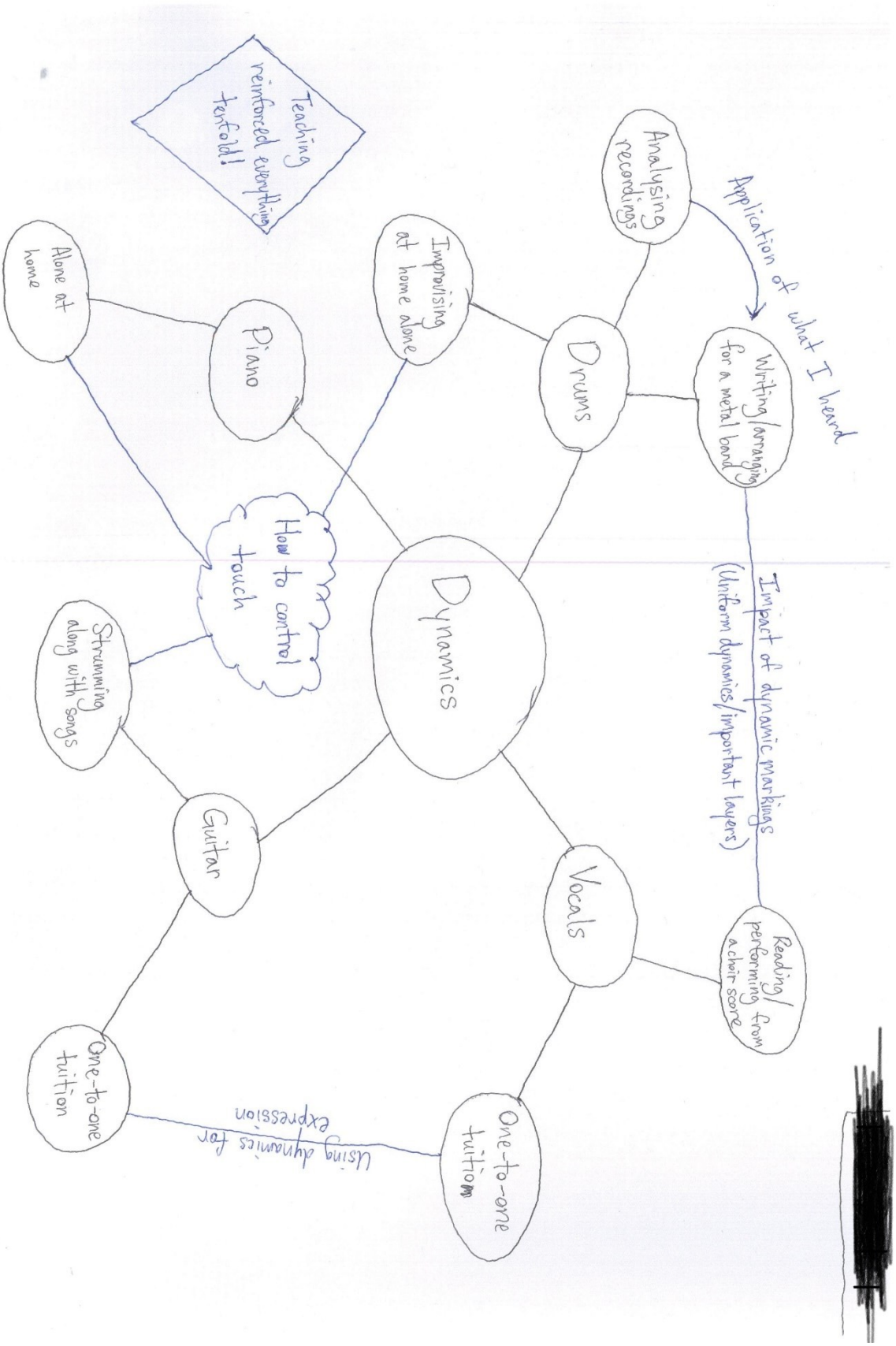
APPENDIX L: Mind map 9a – Dante (learning-centric)



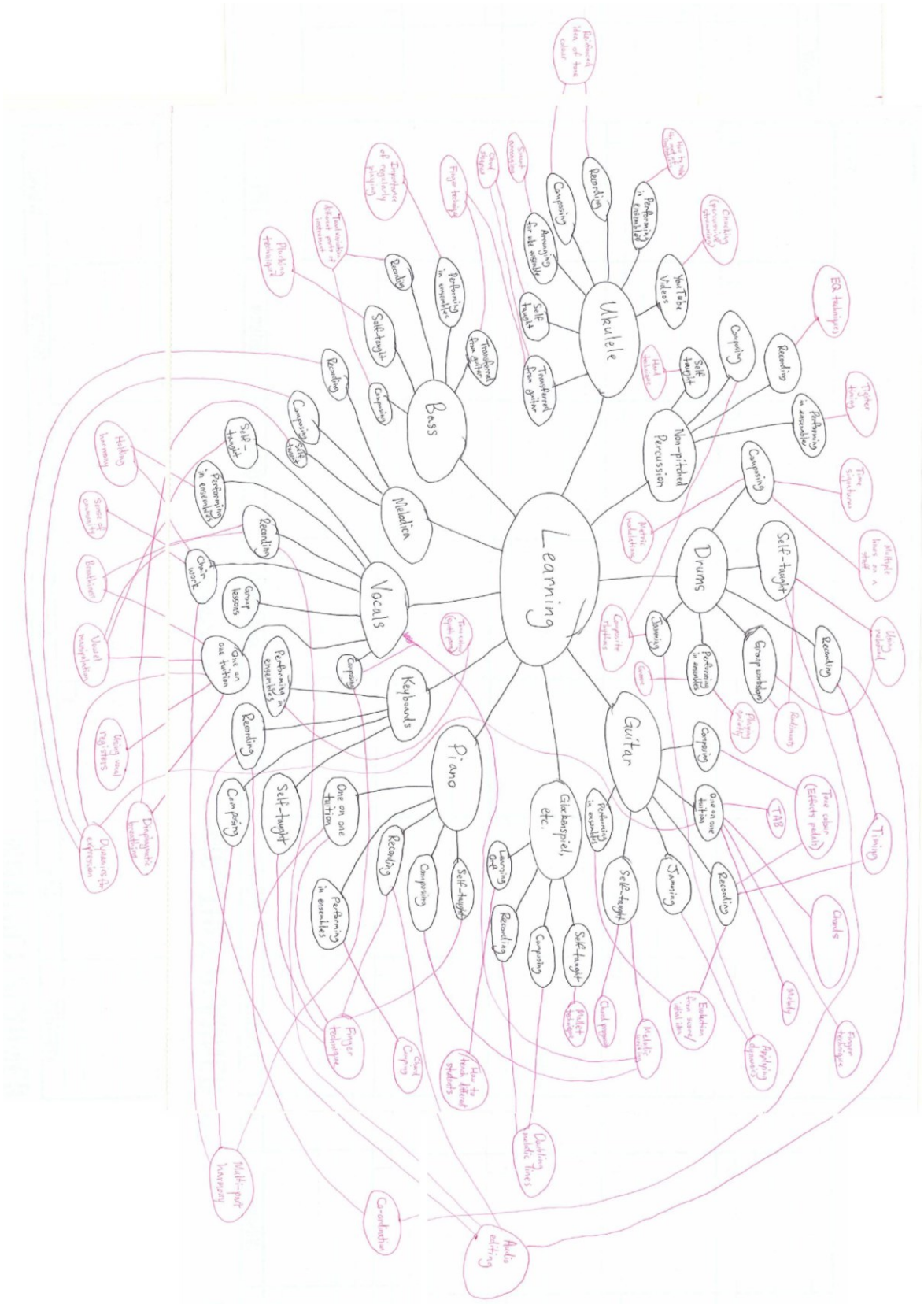
APPENDIX M: Mind map 9b – Dante (concept-centric)



APPENDIX N: Mind map 10a – Colin (concept-centric)



APPENDIX O: Mind map 10b – Colin (concept-centric)



Music Education Experience Survey

1. Research information

   Thank you for attempting the Music Education Experience Survey. This survey forms part of the Thinking Across Music Learning Contexts (MLCs) research project. Before completing the survey, please review the Participant Information Sheet and Consent Form (below).

   a. Research aims + docs
   b. Consent checkboxes

      "I have read the provided information and consent to participating in this online survey"

      "I consent to the researchers contacting me for further participation in the research project" (optional)

2. Personal information
   a. Name
   b. Age
   c. Contact Email
   d. Other interests (outside playing music)/hobbies/occupation (may help understand how these affected your music learning experience)

3. Musical History
   a. How many instruments do you play?
   b. List each instrument
   c. **For each instrument**: How long have you played x instrument in years? (For example, 3 years and 9 months is displayed as 3.75)
   d. **For each instrument**: How have you learnt x instrument? (Tick all that apply)
      i. Private lesson
      ii. Group lesson
      iii. In school class
      iv. Through school music program (give details)

v. Using a guide book
vi. Using notation/tablature websites
vii. Watching videos e.g. YouTube
viii. Using an app
ix. Playing with friends/family
x. Self-taught
xi. Other (please specify):

4. Additional Music History
    a. Briefly explain your experience composing music?
    b. Describe your experience performing music?
    c. What other musical experiences have you taken part of?

5. Consent/Thanks
    a. Review consent
    b. Thanks

    Thank you for completing the Music Education Experience Survey. Those who have agreed to engage in subsequent stages of research will be contacted shortly. Your contribution will aid in our efforts to in furthering knowledge of current music education practices.

APPENDIX Q: Meeting schedule*

Interview Schedule – Areas of Discussion

1. **Participant information/consent**
   Confirm participant's understanding of project requirements
   Confirm participant's rights (especially regarding consent)
   Creation of pseudonym

2. **Project information**
   Research aims
   Interview schedule

3. **Getting to know participant**
   How did you start learning music?
   Favourite musical experiences?

4. **Music story**
   Participant to recount history of music learning

5. **Mind-map**
   Reflecting on accuracy of pre-interview mind-map
   Creation of new, more detailed mind-map(?)

6. **Connecting learning**
   Detailed discussion of content learned in each learning context
   (e.g. scales, chords, note names, rhythm, meter, group dynamics, phrasing, timing, dynamics)
   Participant to reflect on impact of learning across contexts
   (e.g. Researcher's own experience: learning piano from a young age gave me an understanding of the construction of chords. When I began playing bass guitar and acoustic guitar, I used this understanding to fuel my curiosity and experiment with constructing unconventional chords/bass lines)

   Conversation about tangible vs intangible connections between learning experiences
   (i.e we expect learning to be transferred from one context to another, but sometimes it may be difficult to express in words)

7. **Wrap-up**
   Final thoughts and questions
   Participant's review of mind-map as a tool for reflection
   How to improve use of mind-map?
   Explanation of researchers' next steps
   Provision of Gift card

*The use of the term 'interview' was replaced with 'meeting' in the process of writing up findings. As such, the schedule is presented here as it was to the participants, titled 'Interview Schedule'

APPENDIX R: Mind map guidelines – learning centric

R1

Mind-map guidelines

The mind-map we are developing is hoped to help facilitate discussion around the ways in which your learning experiences from various music learning contexts may overlap. We're looking to understand the ways in which you negotiated conflicting information, and instances where what you were learning in one context made sense of something you learned in another context.

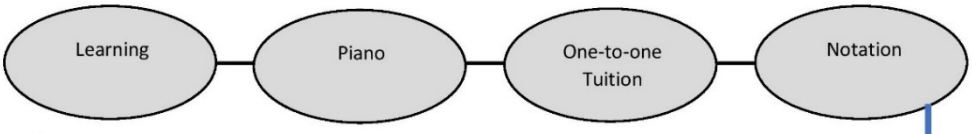
Before completing the mind-map:

Please complete the survey at tinyurl.com/WSU-MusEd. This ensures you have read and agreed to **participant information** and **consent forms**. This survey also provides me with an idea of your experience before we meet.

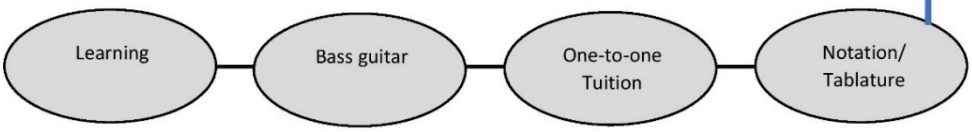
Follow the steps below to create your mind-map:
Remember, these steps are just a guide to get you started – if you have other ideas of how best to explore your music learning history using a mind-map, go for it!

1. In the centre of the page write the phrase 'Learning'
2. Branching out from that term, list the instruments you have played/learned.
3. Branching out from each of those instruments, list the contexts in which you have learned each instrument.
4. The fourth level outward from the centre represents the musical and music-related concepts you have learned from each context.
5. Using another colour pen, draw lines to represent connections between concepts learnt in different contexts

For example: I learned how to read music notation on piano from my tutor. So my mind-map would contain:



I also developed further skills reading notation when I began learning bass guitar, reading combinations of both tablature and notation. Therefore, I would draw a line between concepts:



Defining Music Learning Contexts:

A music learning context, for the purposes of this research project, is defined as **any situation in which a person is able to learn more about music.**

Defining Musical Concepts:

Music concepts are terms we use to describe what it is we have learnt. For example: music notation, improvisation, syncopation and listening skills.

Music learning contexts can be divided into three categories: formal, informal and non-formal. Some examples are provided below.

In-school music class	Jamming Session
One-to-one instrument tuition	Performances
Group instrument tuition	Music-related discussions
Band rehearsal	Using notation/tablature software
Solo rehearsal	Watching videos e.g. YouTube tutorials
Using an app	Reading music-related books

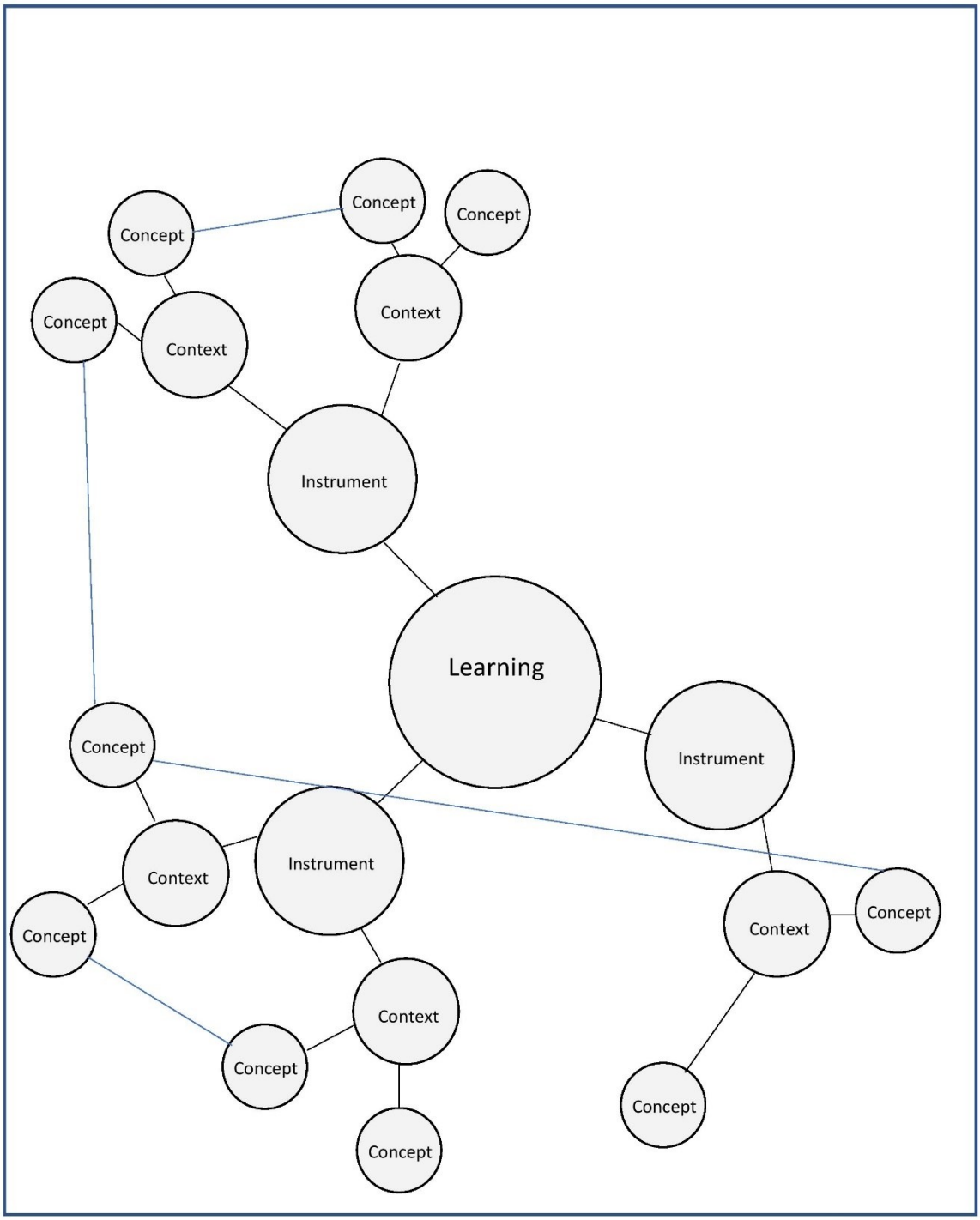
Music-related Concepts:

To assist with your mind-map I've made up this bank of musical and music-related concepts that may be able to stir some thought for you. Avoid referring to this until you are absolutely desperate! Let your creativity guide you first.

Scales	Finger position	Notation	Chords	Group dynamics	Role	Accompaniment
Duration	Feel	Treble clef	Improvisation	Variation	Ostinatos	Recording
Pitch	Embouchure	Bass clef	Composition	Harmony	Mastering	Mixing
Dynamics	Tempo	Note Names	Genre	Monophonic	Rehearsal	Performance
Timbre	Beat	Rhythm names	Appreciation	Polyphonic	Lyrics	Downbeat
Texture	Accent	Melody	Key	Ensemble	Crescendo	Ensemble
Structure	Form	Tremelo	Tonguing	Strumming	Picking	Plucking
Breathing	Riffs	Technology	Sight reading	Time signatures	Bowing	Measure
Intervals	Tuning	Syncopation	Bars	Pulse	Ornamentation	Expressive Technique
Accent	Melodic contour	Tonality	Instrument family	Counter melody	Chromaticism	Style
Triad	Movement	Cadence	Tonic	Serialism	Broken chord	Double stop
Unison	Tremelo	Glissando	Drone	Technique	Theme	Medley
Instrument	Octave	Canon	Upbeat	Waltz	Accompaniment	Lyrics
Capo	Syncopation	Vibrato	Effects	Listening	Counterpoint	Meaning
Practice	Examination	Echo	Reverb	Metre	Transcription	Vocalise
Phrasing	Exploration	Register	Transposition	Drop	Variation	Dance

Example Mind-map:

To give you an idea of what your mind map *may* look like, here's a conceptual version. We've added hypothetical connections between concepts in blue.



APPENDIX S: Mind map guidelines – concept-centric

S1

Mind-map guidelines

The mind-map we are developing is hoped to help facilitate discussion around the ways in which your learning experiences from various music learning contexts may overlap. We're looking to understand the ways in which you negotiated conflicting information, and instances where what you were learning in one context made sense of something you learned in another context.

Before completing the mind-map:

Please complete the survey at tinyurl.com/WSU-MusEd. This ensures you have read and agreed to **participant information** and **consent forms**. This survey also provides me with an idea of your experience before we meet.

Follow the steps below to create your mind-map:
Remember, these steps are just a guide to get you started – if you have other ideas of how best to explore your music learning history using a mind-map, go for it!

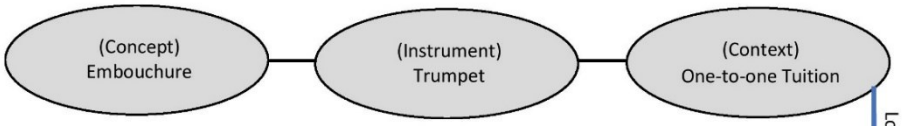
We're looking to create a mind map that displays all the contexts in which you've learnt about one concept/idea. Take some time to reflect on your music learning – think about what music is to you, and what one of the most important things about music is for you.

For example, embouchure is a central part of playing the flute. There are so many contexts in which a flautist may learn about embouchure and it's many musicians transfer understandings about embouchure across various instruments.

Once you have identified a concept that is important to you, follow the steps below:

1. In the centre of an A4 page write the name of the concept you find important
2. Branching out from that term, list the instruments you have played/learnt about that concept.
3. Branching out from each of those instruments, list the contexts in which you have learned each instrument.
4. Using a different colour pen, draw lines to represent connections between concepts learnt in different contexts with a few words describing the connection

For example: I learnt how to shape my embouchure playing trumpet from my private tutor. So my mind-map would contain:



I also learnt about embouchure playing my brother's baritone horn at home. Therefore, I would draw another branch out from 'embouchure' for that instrument and context.

Playing the baritone horn taught me how to loosen my lips. This allowed me to play lower notes on the trumpet than I could before. To show this, I would draw a line between concepts (seen above in blue) labelling it with a few descriptive words.

Defining Music Learning Contexts:

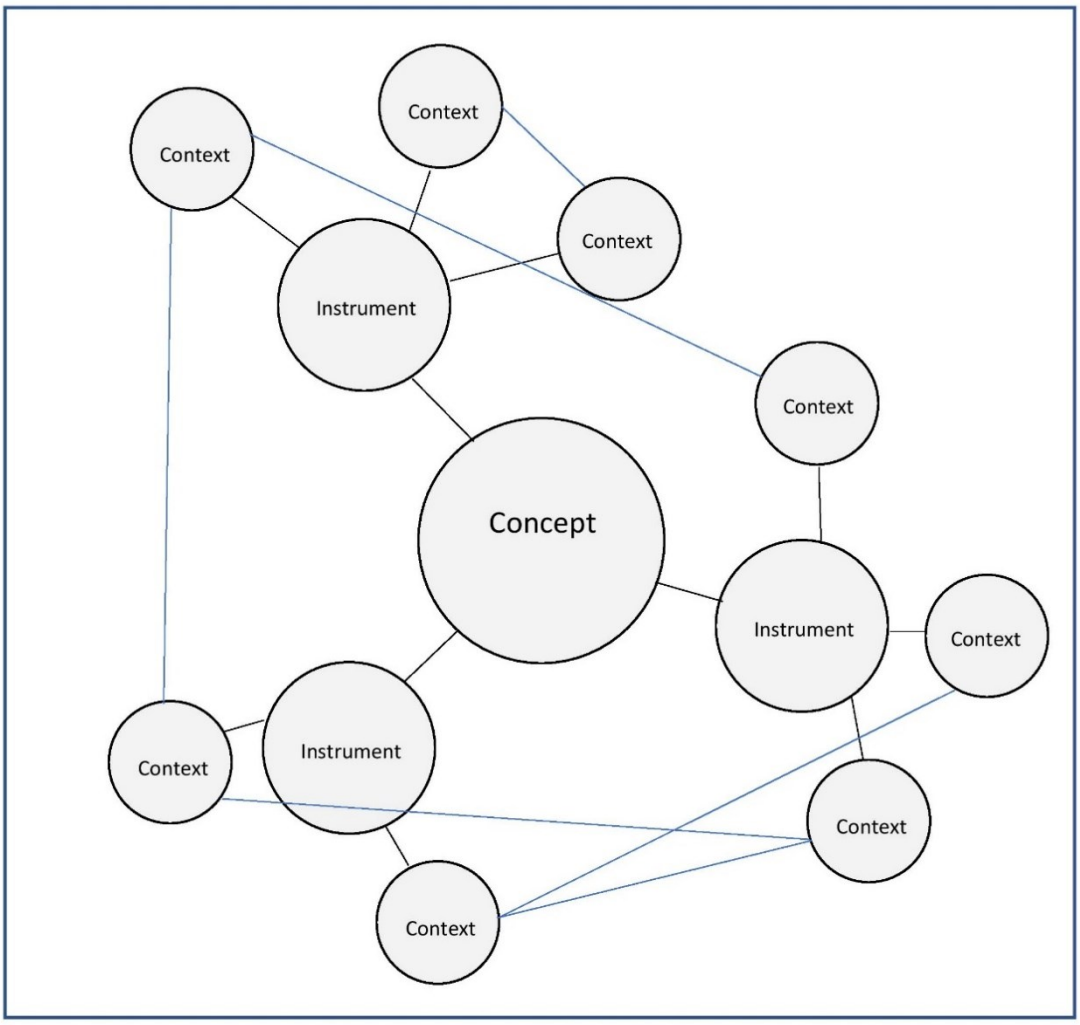
A music learning context, for the purposes of this research project, is defined as **any situation in which a person is able to learn more about music.**

Defining Musical Concepts:

Music concepts are terms we use to describe what it is we have learnt. For example: music notation, improvisation, syncopation and listening skills.

Example Mind-map:

To give you an idea of what your mind map *may* look like, here's a conceptual version. We've added hypothetical connections between concepts in blue. Don't forget to label your connections!



APPENDIX T: Participant consent form

T1

WESTERN SYDNEY
UNIVERSITY

Consent Form

Project Title: *Thinking Across Music Learning Contexts: Developing the means by which to examine musicians' cumulate learning strategies*

I hereby consent to participate in the above named research project.

I acknowledge that:

- I have read the participant information sheet (or where appropriate, have had it read to me) and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s
- The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.

I consent to:

☐ *Participating in an interview*

☐ *Having my information video recorded*

☐*Having my mind-map photographed*

Data publication, reuse and storage

This project seeks consent for the data provided to be used in future projects.

I understand that in relation to publication of the data:

☐ *my involvement is confidential and the information gained during the study may be published but no information about me will be used in any way that reveals my identity.*

☐ *the researchers will not to make the non-identified data from this project available for other research projects.*

☐ *I can withdraw from the study at any time without affecting my relationship with the researcher/s, and any organisations involved, now or in the future.*

Signed:

Name:

Date:

This study has been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H13187

What if I have a complaint?

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email humanethics@westernsydney.edu.au.

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Counselling services:

Should you feel at any time that this project has caused you any distress, please don't hesitate to contact the Western Sydney University Counselling Service:

Office hours are Monday to Friday 9.00am - 5:00pm.
Email: counselling@westernsydney.edu.au
Phone: 1300 668 370

University of Western Sydney
ABN 53 014 069 881 CRICOS Provider No: 00917K
Locked Bag 1797 Penrith NSW 2751 Australia
westernsydney.edu.au