

PRODUCTIVE PIANO PEDAGOGY: TOWARDS A COMPOSITIONAL
APPROACH TO PIANO LESSONS IN A SOUTH AFRICAN PRIMARY
SCHOOL IN MAKHANDA, EASTERN CAPE

A thesis submitted in fulfilment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

of

RHODES UNIVERSITY

By

DONOVAN WYNNE

ORCID ID

<https://orcid.org/0009-0006-6445-2294>

SUPERVISOR: DR. BOUDINA McCONNACHIE

December 2024

ABSTRACT

Despite global trends towards creative and productive musical learning, there is little available research on how to support music educators' efforts to adopt productive praxis in piano lessons in primary schools, and none situated in South Africa. This climate of pedagogical innovation makes possible a turn to play-based teaching methods emerging from the global north, which are aligned with African traditions of knowledge transmission in which agentive participation in authentic cultural processes is of greater value than evaluative judgements of ensuing products. The literature advocates the cultivation of music learning ecologies that privilege learner agency through composition, yet practical means of doing so within established conventions of instrumental music tuition in South African primary schools are not provided. This thesis investigates how such an ecology might be cultivated in a primary school in the Eastern Cape, with particular emphasis on how this can be achieved without compromising established pedagogical practises that are oriented toward the attainment of important external benchmarks of musical achievement. A design-based study was conducted in a primary school over the course of 12 months, in which nine young students composed their own music during piano lessons through collaborative activity in which they were afforded a degree of autonomy in their work as they acquired and consolidated knowledge of music through its creation. A play-based teaching intervention was devised, which was iteratively enacted, analysed, and redesigned through three research cycles. This resulted in findings that drove the development of a framework for teaching composition in this context, as well as tangible teaching materials. Results show that this adapted play-based model is an effective vehicle for fostering an agentive music learning ecology in piano lessons in an Eastern Cape primary school and suggest that it is reasonable to expect similar success in comparable school contexts. The insularity of a single school setting limited this research in terms of broader applicability, so further trialling of the proposed framework is recommended in a range of school situations in South Africa and beyond to establish transferability.

Keywords: Composition; Piano pedagogy; Play; Cultural-historical activity theory; Design-based research; Primary schools; Hogenes' three-step model.

TABLE OF CONTENTS

ABSTRACT.....	i
TABLE OF CONTENTS	ii
LIST OF FIGURES	vii
LIST OF APPENDICES	viii
LIST OF ACRONYMS.....	x
ACKNOWLEDGEMENTS.....	xi
CHAPTER 1	1
INTRODUCTION	1
Research context	4
Research question	7
Research goals	8
Thesis overview	11
Conclusion	13
CHAPTER 2	14
LITERATURE REVIEW	14
Introduction.....	14
21 st -century skills	14
Creativity.....	16
Critical thinking	18
Collaboration.....	18
Experiential learning.....	19
Brain-based learning	20
Play	22
Musical identity	24
Towards a definition of musical identity	25
Mechanism of social identity development	26
The development of children’s identities in music	26
Contexts of development	27
Ethical idealisation.....	29
The piano in musical identity.....	29
Agentive music learning ecologies	30
African music aesthetics	31
Composition.....	34
Towards a productive approach	34
Agency	36

Scaffolding.....	37
Assessment.....	37
Notation.....	38
Case studies.....	40
Non-interventionist studies in secondary schools.....	41
Non-interventionist studies in primary schools.....	42
Interventionist studies in primary and secondary schools.....	44
Interventionist studies in primary schools.....	45
Themes.....	48
Arts-based education research.....	49
Conclusion.....	50
CHAPTER 3.....	52
THEORETICAL FRAMEWORK.....	52
Introduction.....	52
Four generations of CHAT.....	53
Composition as imitative participation.....	57
Conclusion.....	59
CHAPTER 4.....	60
METHODOLOGY.....	60
Introduction.....	60
Research question and goals.....	60
Research design.....	63
Design-based research.....	64
Overview.....	64
Characterisations of DBR.....	66
Design phase.....	69
Teaching experiment phase.....	71
Analysis phase.....	73
Conclusion.....	74
CHAPTER 5.....	76
METHODS AND PROCEDURES.....	76
Introduction.....	76
Intervention design.....	76
Hogenes' model.....	76
Design principles.....	79
Lesson schedule and Hypothetical Learning Trajectory (HLT).....	81
Data collection methods.....	85

Interviews.....	87
Musical identity	87
Agency	87
Connectedness.....	88
Lesson transcripts.....	89
Transcription in the first iteration	90
Transcription in the second and third iterations.....	91
Data selection.....	92
Data analysis methods.....	92
Procedures.....	94
Participant selection	94
Ethical considerations	96
Participants.....	97
Implementation challenges	101
Conclusion	103
CHAPTER 6	104
ANALYSIS: ITERATION 1	104
Introduction.....	104
Summary of enactment	104
Gloria: summary of observations.....	105
Jane: summary of observations.....	105
Maggie: summary of observations.....	106
Saira: summary of observations.....	106
Tammy: summary of observations.....	107
Analysis of iteration 1	107
Learning trajectories	107
Design strengths.....	109
Design weaknesses.....	111
Motific development.....	114
Results.....	117
Redesign.....	118
Conclusion	121
CHAPTER 7	123
ANALYSIS: ITERATION 2	123
Summary of enactment	123
Gloria: summary of observations.....	123
Jane: summary of observations.....	124

Maggie: summary of observations.....	124
Saira: summary of observations.....	125
Tammy: summary of observations.....	125
Performance	126
Analysis of iteration 2	126
Framework feasibility	126
Help items	128
Emergent items	132
Agency	133
Time	137
Results.....	139
Redesign.....	140
Conclusion	141
CHAPTER 8	143
ANALYSIS: ITERATION 3	143
Summary of enactment	143
Alex: summary of observations	143
Emma: summary of observations.....	144
Khanya: summary of observations.....	144
Neela: summary of observations.....	144
Analysis of iteration 3	145
Orientation	145
Time	145
Icon grouping	146
Agency	147
Results.....	150
Conclusion	154
CHAPTER 9	156
DISCUSSION	156
Introduction.....	156
Objectives	156
Conclusion	164
CHAPTER 10	166
CONCLUSION.....	166
Introduction.....	166
Intervention design.....	166
Musical identity and meaning.....	167

Transferability.....	167
Findings.....	168
Limitations.....	170
Recommendations.....	170
Conclusion.....	172
REFERENCES.....	173
APPENDICES.....	199

LIST OF FIGURES

Figure 1. Vygotsky's mediated action triangle (Yamagata-Lynch and Haudenschild 2009, 508).....	53
Figure 2. Model of an activity system (Yamagata-Lynch and Haudenschild 2009, 508).	55
Figure 3. Lesson schedule, iteration 1.....	85
Figure 4. Semi-structured interview questions.	89
Figure 5. HLT vs. ALT, iteration 1.	108
Figure 6. Coding vocabulary, iteration 1.....	109
Figure 7. Time comparisons, iteration 1.	113
Figure 8. Motific development strategies, iteration 1.	115
Figure 9. Pie chart of useful strategies, iteration 1.....	116
Figure 10. Overview of themed pages designed for iteration 2.	119
Figure 11. Pie chart of Piano Technique help icons used, iteration 2.	129
Figure 12. Pie chart of Creative Ideas help icons used, iteration 2.	130
Figure 13. Pie chart of Helpful Ideas help icons used, iteration 2.	131
Figure 14. Help icon coding references, iteration 2.....	131
Figure 15. Pie chart of Emergent Help Items, iteration 2.	132
Figure 16. NVivo screenshot showing Teacher's Approach codes, iteration 2.....	134
Figure 17. Pie chart of Teacher's Approach coding, iteration 2.	134
Figure 18. NVivo screenshot showing Pupil's Approach codes, iteration 2.....	136
Figure 19. Pie chart showing Pupil's Approach coding, iteration 2.	136
Figure 20. Time comparisons, iteration 2.	137
Figure 21. Time-saving strategies, iteration 2.....	138
Figure 22. Time comparisons, iteration 3.	146
Figure 23. Aggregate coding diagram for Alex, iteration 3.	149
Figure 24. Aggregate coding diagram for Emma, iteration 3.	149
Figure 25. Aggregate coding diagram for Khanya, iteration 3.	150
Figure 26. Aggregate coding diagram for Neela, iteration 3.....	150
Figure 27. Pie chart showing activity overview for Alex, iteration 3.	151
Figure 28. Pie chart showing activity overview for Emma, iteration 3.	152
Figure 29. Pie chart showing activity overview for Khanya, iteration 3.	152
Figure 30. Pie chart showing activity overview for Neela, iteration 3.....	153
Figure 31. Pie chart showing activity overview across participants, iteration 3.....	153

LIST OF APPENDICES

Appendix A. Lesson schedule: iteration 1	199
Appendix B. Letter from the Rhodes University, granting ethical clearance	209
Appendix C. Permission letter from the school principal	210
Appendix D. Permission letter from the Eastern Cape Department of Education	211
Appendix E. Summary of pre-intervention interview responses: iteration 1	212
Appendix F. Summary of pre-intervention interview responses: iteration 3	213
Appendix G. Gloria: summary of enactment, iteration 1	214
Appendix H. Jane: summary of enactment, iteration 1	216
Appendix I. Maggie: summary of enactment, iteration 1	218
Appendix J. Saira: summary of enactment, iteration 1	220
Appendix K. Tammy: summary of enactment, iteration 1	222
Appendix L. Summary of post-intervention interview responses: iteration 1	224
Appendix M. Composition booklet: iteration 2	225
Appendix N. Lesson schedule: iteration 2	237
Appendix O. Gloria: summary of enactment, iteration 2	241
Appendix P. Jane: summary of enactment, iteration 2	243
Appendix Q. Maggie: summary of enactment, iteration 2	245
Appendix R. Saira: summary of enactment, iteration 2	247
Appendix S. Tammy: summary of enactment, iteration 2	249
Appendix T. <i>Different Notes and Places</i> by Gloria, iteration 2	251
Appendix U. <i>Best Place Ever!</i> by Jane, iteration 2	252
Appendix V. <i>Different</i> by Maggie, iteration 2	253
Appendix W. <i>Me!</i> by Saira, iteration 2	254
Appendix X. <i>F Piece</i> by Tammy, iteration 2	255
Appendix Y. Summary of post-intervention interview responses: iteration 2	256
Appendix Z. Composition booklet: iteration 3	257
Appendix AA. Alex: summary of enactment, iteration 3	272

Appendix BB. Emma: summary of enactment, iteration 3	274
Appendix CC. Khanya: summary of enactment, iteration 3	275
Appendix DD. Neela: summary of enactment, iteration 3.....	276
Appendix EE. <i>Changing Seasons</i> by Alex, iteration 3.....	277
Appendix FF. <i>Memories of my Granpa</i> by Emma, iteration 3	278
Appendix GG. <i>The Princess Step</i> by Khanya, iteration 3.....	279
Appendix HH. <i>A Night in a Big City</i> by Neela, iteration 3	280
Appendix II. Summary of post-intervention interview responses: iteration 3	281

LIST OF ACRONYMS

ABL	Activity-Based Learning
ABRSM	Associated Board of the Royal Schools of Music
ALT	Actual Learning Trajectory
CAPS	Curriculum and Assessment Policy Statement
CHAT	Cultural-Historical Activity Theory
CONSORT	Consolidated Standards of Reporting Trials
DBR	Design-Based Research
DoE	Department of Education
HLT	Hypothetical Learning Trajectory
IMP	Intrinsic Motive Pulse
MENT	Mentalising System
MNS	Mirror Neuron System
RCT	Randomised Controlled Trial
UNISA	University of South Africa

ACKNOWLEDGEMENTS

I wish to extend my heartfelt gratitude to my supervisor, Dr. Boudina McConnachie, for her guidance in the evolution of my research and its explication in this thesis. I am also indebted to the many music teachers, both mentors and colleagues, who have instilled in me a love of music and a profound curiosity about its teaching. I am grateful to my parents, Charmaine and Stephen Wynne, for their encouragement and support throughout my studies, and my husband, Michael Wynne, for his unfailing willingness to be the sounding board for my thoughts, which helped this research to take shape.

CHAPTER 1

INTRODUCTION

If we examine current trends, we see that students will continue to have greater and greater access to music. Will this be matched by an equal access to their own creative artistic power?" (Kaschub and Smith 2013, 13).

Music education is rapidly evolving to embrace the modern world, owing to technologically mediated shifts in the ways in which music is created and experienced (Kaschub and Smith 2013). However, piano pedagogy in South African primary schools has remained largely unchanged for a century. In my teaching experience in Eastern Cape schools, I have observed that piano teaching approaches have remained stagnant in this climate of didactic innovation, a situation that I aim to redress in this thesis. We are nearly one quarter of the way through the 21st century and there has been a global emphasis on the development of 21st-century skills in schools in recent decades, an orientation that aims to prepare students for the future workplace (Kereluik *et al.* 2013). Although this future is not entirely understood at present due to the rapid advances in information technology and an increasingly globalised economy, education stakeholders have found some consensus on what constitutes 21st-century skills, namely creativity, critical thinking, and collaboration, the development of which will result in "sophisticated skill sets that can be applied readily to solving a multitude of complex problems" (Corbisiero-Drakos *et al.* 2021). 21st-century skills are driving innovations in education, where skills are developed through goal-oriented classroom practices in which knowledge and skills are acquired through the productive synthesis of knowledge across domains in the generation of new ideas and artefacts (Chalkiadaki 2018; Kereluik *et al.* 2013). My study aims to investigate how composition, as a process of productive synthesis of musical knowledge, can be integrated into piano lessons in an Eastern Cape primary school. This research is significant because it seeks to offer a practical means of using composition as a pedagogical tool in this context, an approach that is currently lacking.

This productive turn extends to arts education, in which passive rote learning is giving way to methods that enable students to become active agents in their learning (Corbisiero-Drakos *et al.* 2021). Musical learning in schools has historically been characterised by reproductive practices, where children acquire musical knowledge and skills through learning and performing extant repertoire selected by teachers, which limits their involvement (Hogenes *et al.* 2016). This limitation may be alienating, as Elliott (1995, 235) explains,

Although musicianship is a form of knowledge that is applicable to and achievable by the majority of children, some teachers and administrators base their decisions about music curricula on the false assumption that music making is possible and appropriate only for special students; namely, the so-called talented.

This passage describes the restrictive power that teachers wield, however unintentionally, in their choices of repertoire and instruction methods, which prompts me to reiterate Blacking's (1973) question: "must the majority be made "unmusical" so that a few may become more "musical"?" (Blacking 1973, 4). This, surely, is not the objective of music education. Instead, music teachers should encourage their students to become involved in their learning through creative and productive pursuits such as composition.

These notions about musical creativity and to whom the authority to compose extends have long denied children access to involvement in creative endeavour and should therefore be challenged (Hill 2012). The praxial philosophy of music education presented by Elliott (2009, 1995) offers new ways of thinking about music education in which the "musical actions of learners are enabled and promoted by the interactive, goal-directed swirl of questions, issues, and knowings that develop around our students' efforts as reflective musical practitioners" (Elliott 2009, 13). In this way, students' musicianship can be developed through their immersion in music listening, improvising, and composing activities in which they draw on and appropriate musical traditions, skills, and knowledge as legitimised cultural agents (*ibid.*). This thesis investigates how such an approach to learning and teaching can be fostered in piano lessons in primary school settings with a focus on promoting music education environments that empower learners to take control of their learning process, particularly through activities such as music composition.

Play-based teaching methods are advocated in the literature and are aligned with Elliott's praxial philosophy, in that students are inducted into the musical world through immersion in cultural processes that afford them agentive control over the rules of the activity and their manipulation of conceptual and material tools in the creation of new music (De Bruin 2018; Hogenes *et al.* 2016; Marsh and Young 2015; Merkow 2012; Niland 2009). Exploratory musical play allows children to experiment with sonic materials, a process that gives way to constructive play, in which initial sound structures become deliberately organised (Yi 2021; Niland 2009; Tarnowski 1999). When the teacher gains access to this zone of play, they assume the role of more knowledgeable play partner and are able to scaffold the child's development and help them achieve things that would not be possible without this assistance (Yi 2021). Vygotsky (1978) describes the site of this intersubjective activity as the "zone of proximal development" (Vygotsky 1978, 86), in which teachers enrich student's cultural experiences and support their development (Veraksa *et al.* 2020).

Productive musical learning presupposes enacted creativity, the nature of which has long been debated (Barrett 2009, 179). Wallas (1945) proposed a model of creative thinking in 1926, in which four distinct stages of thought were identified: preparation, incubation, illumination and verification. Webster's (2002) model of creative thinking interprets these stages as the interplay between divergent processes,

in which possibilities are explored, and convergent ones characterised by decision-making, within an enabling environment (Webster 2002). Gestalt theorists disagree with the linearity of stage models in favour of a more comprehensive view of the creative process, conceived as problem solving, in which multiple sub-elements of a creative problem are manipulated and reorganised into an emergent product, and that illuminative moments occur when the thinker unexpectedly perceives solutions to the creative problem being solved (Collins 2005). Similarly, the emerging systems view of creativity emphasises a problem-solving orientation, acknowledges the presence of divergent and convergent processes, but includes the socio-cultural system in which the activity is undertaken (Barrett and Gromko 2007). The systems view also recognises the importance of the creative collaboration that occurs within the teacher/student dyad and the goal-directed activity undertaken within the student's zone of proximal development (Barrett and Gromko 2007). This perspective appears to be consistent with Elliott's praxial philosophy of music education, in which an enabling learning environment supports "progressive musical problem-solving, problem-finding, musical problem reduction, critical reflection, and the creative generation and selection of musical ideas" (Elliott 2009, 12).

While these theories are interesting to contemplate, they do not provide teachers with a tangible means of approaching composition as a pedagogical tool in instrumental music lessons, the development of which is the purpose of this research. Music teachers tend to have limited composing experience and lack the confidence and skills needed to teach composition in schools (Hickey 2012; Berkley 2004; Dogani 2004; Odam 2000). This perpetuates a cycle of teaching incompetency as teachers avoid teaching composition in their classrooms, thereby denying students and potential future music teachers access to the development of these competencies (Hickey 2012). Hickey (2012) addresses this need by providing practical ideas for classroom settings in the United States, using a five-stage model for teaching composition. These stages are: define, listen, and explore (in which parameters and possible sounds are established); the use of compositional prompts; attention to form; attention to musical elements; and attention to aesthetics, which are termed "big elements" (Hickey 2012, 130). This model is accompanied by practical suggestions for lesson plans that are aligned with the American music education curriculum. I suspect that Hickey's contribution constitutes a valuable resource for American general music teachers, although its focus on classroom situations limits its usefulness in piano teaching contexts in South African schools. Hogenes (2016) presents a three-step model for teaching composition that is aligned with a play-based orientation and promotes creative collaboration within the student's zone of proximal development. The first step is the creation of a common base, the second is the creation of musical ideas and writing the composition, and the third involves presentation or publication (Hogenes 2016). This model, developed in the Netherlands, has been successfully trialled by its creator in a classroom context and in a single-participant case study, suggesting that it is flexible enough to be used in piano lessons (Hogenes *et al.* 2016, 2014a). The three steps constitute a general guideline and

while this may be helpful for teachers with composing experience, there is no evidence that this model can be successfully implemented by teachers with no compositional training.

Research context

Although I am the teacher and researcher in this project, I am not using autoethnographic methods. Adams and Jones (2018) describe autoethnography as “an approach to doing and representing social research that uses personal (“auto”) experience to create a representation (“graphy”) of cultural (“ethno”) experiences”, which include shared practices, value systems, and social expectations (Adams and Jones 2018, 142). The purpose of this study was not to document and represent my lived experience of teaching piano lessons using productive methods, but rather to establish how this might be successfully accomplished in my teaching context, which has historically favoured a reproductive approach. However, to faithfully present my work within this context, it is important to include an autobiographical statement that describes not only me, but also the site of this research.

In my undergraduate years I studied piano teaching and composition, the latter being the focus of my master’s degree. After graduating I, like many music graduates, embarked on a teaching career, and I have since taught in girls’ primary schools in the Eastern Cape for 17 years. It is from this experience that I draw my descriptions of the primary school piano teaching context. In my teaching, I have observed that learning is teacher-oriented and interaction in lessons tends to be one-sided. Learning is done through a reproductive approach instead of a productive one where children learn to play music written by others, much of which is written specifically for tuition or examination purposes. In addition, most of the teaching methods I use have been acquired through tertiary training or inherited through institutional conventions and are derived from practices propounded by Western educators between the early and mid-20th century. Pedagogues like Annie Curwen (1913), John Thompson (1955), and Edna Mae Burnam (1957), to name a few, each developed method books that are widely used today and these names will be familiar to most piano teachers. The last two decades have seen a global shift towards developing 21st-century skills in education, yet the prevailing piano pedagogies in the Eastern Cape have remained rooted in the Western paradigm of the last century in which children’s creativity and cultural agency were marginalised (Mngoma 1987). Having received training in music composition I have come to understand that engaging in the act of composing affords one a unique agentive voice, that gives rise to music that is rooted in and representative of the composer’s unique musical identity. This study is situated in an Eastern Cape girls’ primary school, where learners’ musical identities are influenced by a range of factors, including songs sung in school and church, film and television music, Spotify playlists, and traditional Xhosa music. In this research I aim to show that the integration of composition into piano lessons can lead to enjoyable and meaningful learning, in which children’s musical identities are privileged.

My teaching context is typical of fee-paying government schools in South Africa (De Villiers 2023). Instrumental tuition is offered as an additional extracurricular activity and children attend weekly piano lessons during the school day that are scheduled around the school's academic timetable. Timetabling is a significant factor in this context and music teachers are required to schedule lessons in such a way that they do not coincide with the core academic subjects, namely mathematics and languages. The National Curriculum and Assessment Policy Statement (CAPS) makes provision for instrumental tuition in high schools, but not in primary schools (DoE 2011a, 2011b), meaning that instrumental lessons are offered only by those primary schools that are financially able to do so, and that these lessons are regarded as a luxury. My teaching practice is therefore embedded in a system in which piano lessons are given beyond the boundaries of the classroom and the national curriculum. In the absence of an established curriculum, music teachers in primary schools must look to external sources for guidance in formulating their syllabuses. The Associated Board of the Royal Schools of Music (ABRSM) and Trinity College are both based in London and offer internationally accredited music examinations in countries across the globe. The University of South Africa (UNISA) is a South African distance learning institution that also offers these music examinations. South African music teachers have prepared their students for these external examinations for decades and aligned their teaching with the syllabuses of these examining boards. Instrumental teaching is therefore implicitly governed by these standards in primary schools, and it is in this somewhat underdefined context that a turn to productive methods can be achieved.

Despite piano lessons occupying a curricular no-man's-land, schools offering music lessons nevertheless have systems in place that govern the teaching and assessment of instrumental tuition. Scheduling of piano lessons is dictated by the school's academic timetable and although schools have differing regulations, scheduling of piano lessons is not considered when the academic timetable is created. Academic subjects are prioritised, particularly core subjects (languages and Mathematics), as performance in these subjects determines promotion to the next grade at the end of each year and school management structures justifiably aim to protect contact time in these classes. My experience has shown that music teachers in government primary schools are required to create their own timetables, scheduling lessons in such a way that does not cause learners to miss core subject classes. Piano lessons tend to be scheduled during other subjects, like Natural Science or Physical Education, on alternating or rotating systems, so that learners do not repeatedly miss the same subject each week. If a child is meant to write a test during their piano lesson, the test takes precedence, and the piano lesson must be made up at another time.

This is a precarious existence for instrumental music teachers, who operate on the fringes of the school's academic programme, and who are perpetually cognisant of what their pupils are missing when they come to music, while simultaneously fighting for lesson time and educational legitimacy.

Furthermore, instrumental music teachers face the challenge of limited employment opportunities because not all primary schools are able to offer instrumental music lessons. Generally, only fee-paying government schools possess the resources necessary to offer instrumental music lessons, which are offered as extracurricular activities (De Villiers 2023). However, it is my experience that the fee-paying government schools in the Eastern Cape frequently rely on their music programmes to promote the holistic ethos of the school, which aims to foster children's development of sporting and cultural competencies in addition to academic achievement, to attract fee-paying parents. Performances of the school's wind band, string ensemble, or choir consolidate the school's position as a place of well-rounded learning, and instrumental pupils' participation in local and national eisteddfods and competitions award the school a measure of prestige. In this sense, a school's music programme is a valuable component of the school's public relations efforts and a vehicle for advertising its desirability to prospective parents. Schools therefore regulate the teaching of instrumental music lessons and the primary tool for quality assurance is the child's music report. This document is issued along with the academic report at the end of each school term. The format of the music report varies between schools, but its purpose is universal: to report on pupils' progress and attainment of musical skills. The specific competencies addressed in music reports are generally aligned with those of external music examining boards like ABRSM, Trinity College, and UNISA, and include sight-reading, technical and aural skills, scales and arpeggios, three pieces of repertoire, and theory.

Teaching is therefore oriented towards the assessment of these competencies, which are also the examinable components of external music examinations. As such, they constitute an authoritative framework of musical learning that has universal meaning. Indeed, the music curriculum for Grades 10-12 clearly conforms to this syllabus structure and indicates that external examining bodies' syllabuses should inform repertoire choice and level of difficulty in high schools (DoE 2011b). External syllabuses likewise inform teaching and the structure of the music report in primary schools, albeit implicitly. The music report is useful to music teachers who acquire students who have transferred from other schools as the child's music report will provide some idea of his/her competencies, as determined by the previous teacher. This frame of reference is also useful for teachers in gauging pupils' levels of development and eligibility for external examinations. This latter consideration is important as successful results in external examinations legitimise the work of instrumental music teachers in primary schools, unlike their secondary school counterparts who operate within the ambit, and under the auspices, of the national senior certificate.

ABRSM and Trinity College have broadened the scope of their examinations in recent years, in that they now offer an alternative pathway to graded musical accreditation in the form of digital examinations, in which performances are recorded and submitted to be assessed remotely. However, this response to global technological change is not the only innovation being made by these examining

bodies. More importantly, from the perspective of this research, is the fact that ABRSM and Trinity College now both accept an own composition as one of the pieces presented in the exam. In the case of ABRSM, a student's own composition may be included in digital assessments, while Trinity College accepts own compositions in both digital and face-to-face examinations (ABRSM 2023; Trinity College London 2023a, 2023b). UNISA has not chosen to accept own compositions in their piano examinations and continue to assess musical performance according to the traditional syllabus structure, in which candidates choose three pieces from three prescribed repertoire lists (UNISA 2016). The fact that ABRSM and Trinity College, which are based in London, both accept own compositions indicates an acknowledgement of a turn towards productive praxis in instrumental music education. It is interesting to consider that these examination bodies are based in the United Kingdom, historically the seat of colonial power, and that while their music performance policies are evolving to include composition, those of UNISA are not. Indeed, this South African educational institution continues to offer music examinations in accordance with the colonial framework of assessment standards, although their syllabus does include works by South African composers. I believe that it is important for primary school music educators to embrace the global change and include productive praxes in their respective contexts and work with school management structures to reformat the music report to align it with an international orientation towards composition. One way to accomplish this at school level is to include an own composition as a fourth piece of repertoire. This study aims to demonstrate how composition can be included in school-based piano lessons and based on the findings (described in Chapters 6-8), it might be possible for piano teachers to appeal to school management structures to revise the music report to include composition, in line with external examining bodies' assessments.

Research question

Adopting an ecological view of the teaching context affords a “dynamic, culturally responsive, and context-sensitive” (O’Neill 2017, 84) perspective of piano lessons. Activity undertaken by the teacher/student dyad in this context is understood as “mutually influential relations among integrated and interactive processes” (O’Neill 2017, 83). Such a view designates the current piano teaching situation as a segmented music learning ecology, characterised by sequential episodes of formalised activity that are oriented toward the attainment of specific goals (O’Neill 2017). This characterisation aptly describes piano tuition because lessons are structured and occur weekly, and both teaching and the student’s independent practising are aligned with the pursuit of specific goals, such as external examinations or concert performances. Vygotsky’s socio-cultural theory of development stipulates that learning is socially constructed in the learner’s zone of proximal development and involves the use of culture-specific tools (Moore 2011). Affording students agency over the rules of the activity aligns the activity with the principles of play-based approaches, which is easily achieved through the introduction of productive activities such as composition (Hogenes *et al.* 2023). A learning environment that

intentionally promotes student agency through music creation constitutes an agentic music learning ecology, in which students experience a deep sense of connectedness to their learning and are empowered to attain “personally meaningful musical goals” (O’Neill 2017, 95). It is the pursuit of cultivating agentic music learning ecologies in piano lessons that motivates the current study.

Despite the advocacy of the inclusion of composition in music education, there is insufficient literature on how this might be applied in piano pedagogy. Internet searches for prior research in this field revealed that there is no practical guidance on including composition in piano lessons in South Africa, which are structured according to institutional conventions rooted in century-old traditions from the global north. The literature does, however, offer pedagogical theories that advocate composing and provides models that are theoretical and therefore potentially generalisable to a range of contexts (Hogenes *et al.* 2023; Collins 2005; Fautley 2005; Berkley 2004). It is this vagueness that poses challenges to teachers who require practical tools and methods, not theories. There is an acknowledged divide between educational research and teaching practice, where research is frequently disconnected from the issues of real-world teaching situations (Anderson and Shattuck 2012; Reimann 2011; Sandoval and Bell 2004; The Design-Based Research Collective 2003). It is this gap, between theory and practical application, that this study aims to fill through the answering of the research question:

How can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape?

This question informs research design and necessitates a longitudinal and interventionist methodological orientation. It also facilitates the formulation of the following secondary research objectives, which are needed to adequately answer the research question.

Research goals

1. To design an intervention that successfully integrates compositional activity with traditional piano teaching methods.

The structure of each piano lesson is determined by institutional imperatives that are aligned with assessment frameworks of external examining boards. Lessons therefore include the following standard components: sight-reading and aural exercises, technical drills, scales and arpeggios, three pieces of repertoire, and theory exercises. It is necessary to develop an intervention that not only incorporates composition into this context, but in doing so does not displace standard lesson components. Implementing an intervention in a monastic environment also necessitates caution in choosing which compositional prompts to use to initiate creative work. Gender identities are socially constructed and

reinforced, and gendered delineations can inadvertently be imposed (Hargreaves *et al.* 2017; Green 1997). In order to avoid inadvertently foisting these identities upon the girls participating in this study, neutral themes for composing activities must be chosen, a design principle that is discussed in greater detail in Chapter 5.

2. To establish whether Hogenes' three-step model for teaching composition is effective in piano lessons in a primary school in the Eastern Cape.

This three-step model was successfully trialled in a single-participant case study (Hogenes *et al.* 2014a) and although this one-on-one interaction is typical of piano lessons, it could not be presumed that the model would be equally effective in this context. This is because Hogenes' participant was not a piano student and the study comprised 10 sessions, each lasting approximately one hour, that were devoted exclusively to composition. Despite the contextual disparity between the single-participant case study and my teaching situation, the one-on-one mode of interaction is similar. Hogenes' model is therefore considered a suitable approach to implement in authentic piano lessons, with potential adaptations, to establish not only whether this is possible, but also how contextual factors impact such enactment, which will be discussed in Chapter 5.

3. To determine if composition, as an instructional activity on the piano, can contribute to children's opinions about the piano and music literacy.

It is my experience that the piano is often not a parent's first choice of instrument when enrolling their daughter for music lessons, which may be due to their unfamiliarity with the instrument or its prohibitive cost. I have also seen that, of those children who do start taking lessons, a significant percentage discontinue within the first few years of study. This may be due to the emphasis placed on learning notation, as opposed to music making, which causes children to become demotivated and ultimately abandoning music tuition altogether (Mills and McPherson 2015). As a piano teacher, the possibility of dwindling pupil numbers is a cause for alarm and it is my opinion that the piano, although a Western instrument, has immense value as a tool in music education in the Eastern Cape. The pitch range, dynamic scope, and polyphonic textural potential of the instrument afford the learner a rich medium for the acquisition of musical knowledge, including an understanding of intervallic relationships, harmony, and keyboard skills. Affording children creative agency contributes to the cultivation of an agentive music learning ecology (O'Neill 2017). I speculate that the piano, if positioned as the site of this ecology's construction, will no longer be viewed as an extraneous entity, but rather intrinsically valuable and an integral part of the child's musical identity. The instrument may then be viewed more favourably by parents and prospective pupils, which may lead to an increase in enrolment.

4. To determine whether the integration of music composition into piano lessons can facilitate musical learning and render these lessons intrinsically meaningful to the students.

Van Oers (2012) asserts that the acquisition of cultural knowledge (in this case the knowledge, skills, and practices associated with piano tuition) through a play-based approach leads to learning that has personal meaning for the learner, through a process that integrates the Vygotskian notions of meaning and sense (Van Oers 2012). Meaning is defined as the domain-specific content knowledge to be learnt, while sense is the personal value that the learning has for the student (*ibid.*). In the context of primary school piano tuition, content knowledge can be defined as the combination of musical literacy (note values, pitch letter names, key signatures, Italian musical terms) and technical skills (articulation, finger independence, coordination, voicing). From this perspective the performative reproduction of music written by others, which is the basis of my current piano teaching practice, does not satisfy the requirements for meaningful learning. However, meaningful learning arises from the learner's autonomous participation in cultural practices (in this case piano lessons and their concomitant activities) in collaboration with a more knowledgeable teacher (Van Oers 2012). This is aligned with the principles of cultural-historical activity theory (CHAT), which essentially postulates that all activity can be understood as collective, rule-bound action by subjects towards a common object using culturally and historically defined tools (Foot 2014). It is therefore possible to conceptualise composition as an activity in which the child and teacher are agentively engaged and which is mediated by the use of domain-specific tools. This perspective of composition, as a productive pursuit that promotes student agency in a cultural practice, better meets the requirements of meaningful learning, an assumption that will focus observations during intervention implementation.

5. To explore how a play-based compositional tool can be tailored to meet each child's creative needs.

Each child represents a unique social and cultural worldview and therefore constitutes a distinct teaching context, yet I find it challenging to differentiate my teaching methods for different students. I tend to use the same instructional publications with all my pupils and my teaching is aligned with the benchmarks established by external examining bodies and adopted by the school. Experience has shown me that this generic approach is commonplace in schools and although piano lessons tend to be offered on an individual basis, each pupil's experience is very much the same. However, the introduction of composition offers a means by which musical learning can be differentiated and tailored to each child because it “allows them to create their own versions of this complex activity” (Hogenes *et al.* 2023, 259). A play-based approach to composition affords children a measure of control over the rules of the activity and allows them to construct cultural artefacts according to their own aesthetic principles and

technical skills (*ibid.*). It is therefore hypothesised that a single play-based composing intervention may be enacted with multiple students and that each enactment might therefore be unique.

6. To develop a play-based compositional approach to piano lessons that can be utilised by other piano teachers.

While the intervention designed for this teaching context may be useful, its value as a pedagogical tool can only be realised if it can be implemented in other, similar contexts. Of particular interest is the possibility of enabling other teachers to approach composition with their students despite having limited composing experience themselves. As a single teacher/researcher/composer, I fulfil multiple roles and I am therefore granted multiple perspectives. Subjective insights gleaned through research are thus rendered transparent using a theoretical perspective that allows these contextualised understandings to transcend this context, for the benefit of others (Riis and Groth 2020). It will therefore be important to codify the findings of this study in a user-friendly format, which might constitute a teaching resource that is not only underscored by compositional expertise but is also easy to implement. Such an output may appeal to busy teachers. Having established the context and goals of this research, the structure of the thesis will be described in the following section.

Thesis overview

Chapter 2 constitutes a literature review, in which current educational orientations are elaborated and their links with Vygotsky's socio-cultural theory of development are described. Play and collaborative activity are discussed in greater detail and supporting literature from the field of neuroscience is presented. Collaborative composition involves interaction between distinct individuals and their respective musical identities. Notions of musical identity and the mechanisms of its development are therefore described, followed by an elaboration of O'Neill's (2017) proposed agentive music learning ecology and how the cultivation of this enabling environment relates to piano pedagogy. This study is situated in a South African context, which differs in many respects from the sites of prior research, so African musical aesthetics are discussed, with a particular emphasis on modes of transmission of musical knowledge. Approaches to teaching composition and the nature of this creative process have been extensively researched and the literature includes several case studies conducted in authentic learning environments. The chapter concludes with a review of these case studies and a discussion of the key themes that emerge from them.

Chapter 3 introduces the theoretical framework used to guide intervention design and retrospective analysis. CHAT is defined in terms of its origins and the evolution of its prime unit of analysis through its four successive generations. Van Oers' (2012) interpretation of CHAT is then elaborated with

emphasis on how this theory's focus on collaborative goal-oriented and tool-mediated action can be used to promote meaningful learning.

Chapter 4 provides an account of this study's context, in which I am both teacher and researcher. Some of the implications of fulfilling this dual role are discussed, after which the research question and subordinate goals are elaborated. Design-based research (DBR) was the chosen methodology in this study and its characteristics are described with a particular focus on its iterative cycles of design, enactment, and analysis.

Chapter 5 describes the data collection methods used and explicates my decisions about procedures related to data selection, participant sampling, and analysis. Hogenes' model is elaborated and its use as a design template in the initial design phase is described, in addition to other design principles engendered by the context of enactment. The chapter concludes with a detailed description of the first iteration's lesson schedule and an overview of implementation challenges faced in its enactment.

Chapters 6 to 8 constitute a compartmentalised account of the three iterations undertaken in this design-based study, over a period of 12 months. The first cycle of enactment occurred from July to November 2022, the second from January to March 2023, and the third from April to June 2023. Each chapter describes details of enactment, retrospective analysis, research findings, and subsequent redesign of the intervention, apart from Chapter 8, which concerns the third and final iteration in which no redesign was undertaken.

Chapter 9 presents a discussion on findings and their relation to the research goals, the superordinate research question, and the theoretical underpinnings of the study. CHAT is shown to be a flexible theoretical framework because it serves not only as a means of conceptualising composing as tool-mediated activity, but also to expose tensions between the intervention and the context of enactment in a manner that points to potential resolutions.

The thesis concludes with Chapter 10, which summarises the purpose of this research and the means through which it was conducted. Conclusions are drawn from the findings that relate to intervention design, musical meaning and identity, feasibility and transferability of the approach developed, and the limitations of this research. Suggestions for future studies in this field are made, with an emphasis on establishing broader applicability of the designed intervention and a suggested expansion of Hogenes' model.

Conclusion

The development of 21st-century skills, namely creativity, critical thinking, and collaboration, is aligned with a turn to a productive approach to music education. Play-based teaching methods hold great promise in this pursuit because they foster student agency, integrate domain knowledge and personal meaning, and contribute to the cultivation of agentic learning ecologies. However, a commitment to these tenets is insufficient. Teachers require practical and specific strategies that can be employed in real-world teaching contexts. My current teaching practice, the site of this research, has been described in terms of its marginalised standing within primary schools and the underspecified nature of its curricular frameworks. External examining bodies' syllabuses inform lesson structure and the content taught in this context, and it is the recent inclusion of composition in these external bodies' examination requirements that warrants consideration of productive praxis in piano lessons. This study aims to start bridging the divide between composing and piano teaching epistemologies. Teacher/researchers have an important role to play in education research and "by documenting what it is like to try to make learning happen from the point of view of those who would foster learning, we may be edging toward a more usable, and hence more valid, form of research" (Hoadley 2004, 205). In undertaking this study, I adopt dual perspectives of teacher and researcher, while simultaneously drawing on my experience as composer, to answer a call to trial and further develop a model for teaching composition in an authentic teaching context (Hogenes et al 2023; Hogenes *et al.* 2014b). I also aim to heed Webster's (2002) suggestion to contribute to current understandings of how to support children's musical creativity, without undermining their agency, using established data collection and analysis methods within the parameters and time constraints of a naturalistic school environment (Webster 2002). Bolden (2009) asserts that "through composing music, students are able to create something uniquely their own, and then share that personal expression with others" (Bolden 2009, 150). As a teacher, I wish to enable them to do so, and as a researcher I aim to find out how.

CHAPTER 2

LITERATURE REVIEW

Introduction

In this chapter, prior educational research that is pertinent to this investigation is discussed, beginning with a current pedagogical orientation towards the development of 21st-century skills in schools. Creativity, critical thinking, and collaboration are identified as crucial competencies, that are further elaborated and then linked to the work of Russian psychologist Lev Semyonovitch Vygotsky (1896-1934), which has influenced research in a multitude of disciplines to the present day. Play studies offer a promising paradigm for teacher/student interaction in music education, which is described before issues of musical identity and composition are explored. The research context of this investigation is then established through a review of case studies that document the teaching of composition in learning environments, and emergent themes are identified. Finally, the positionality of practitioner-researchers in arts-based research is contemplated, drawing on literature that advocates the synthesis of the multiple perspectives held by individuals who are simultaneously practitioners, researchers, and artists. As a teacher, researcher, and composer, I fulfil these multiple roles and am therefore afforded the triple perspectives from which subjective insights can be drawn and critically examined.

21st-century skills

Globalisation, the rise of multicultural societies, and the ever-increasing rate of technological advancement have prompted education stakeholders to reevaluate education systems with a view to aligning them with a future that is not clearly envisaged today. Nations aim to safeguard their enduring socio-economic sustainability through investment in education, but there is a growing divide between the competencies developed in schools and those required in the workplace (Chalkiadaki 2018). This incongruity has prompted discourse amongst education scholars and organisations in the pursuit of an understanding of the skills required to be citizens of the new millennium, broadly referred to as 21st-century skills. This term, although familiar in the field of education, is not altogether understood as its exact definition is the topic of debate (Kereluik *et al.* 2013).

It is necessary for education researchers and teachers to consider their work in terms of 21st-century skills, due to a global trend in education towards developing these competencies (Chalkiadaki 2018; Gardner 2008). Instead of defining these competencies, Gardner discusses the need to develop “five minds” (Gardner 2008, 17) in students to equip them for the future. He asserts that discipline, synthesis, creativity, mutual respect, and ethical behaviour constitute the interrelated attributes that should be cultivated within an education system. Discipline is defined as the mastery of a particular domain as well as the trait required for such mastery, while synthesis involves what Gardner terms a shrewd triage

of large volumes of information when seeking understanding and making evaluations and decisions (Gardner 2008). The notion of creativity is not limited to the arts but is expanded to encompass multiple forms of innovation in a time when human activity is being automated. The two socially oriented respectful and ethical mindsets speak to the growing need for individuals to adapt to changing social environments populated by an increasing number of worldviews and to make affordances accordingly, embrace differences, and integrate into a complex society. Gardner maintains that these attributes should be nurtured from an early age and modelled by parents and teachers.

Kereluik and colleagues identify three skills that are most frequently emphasised in the field, namely creativity, innovation and collaboration (Kereluik *et al.* 2013). However, they offer a broader interpretation of the discussion in the form of a framework of 21st-century learning in which three categories of knowledge are interrelated and contain within them subcategories. The first category, foundational knowledge, consists of digital literacy, content knowledge and cross-disciplinary knowledge. The second, meta knowledge, consists of creativity and innovation, problem solving and critical thinking, and communication and collaboration. The third category, humanistic knowledge, consists of life/job skills, ethical/emotional awareness, and cultural competence.

In reviewing the literature, Chalkiadaki (2018) identifies four broad categories of 21st-century skills: personal skills, social skills, information and knowledge, and digital literacy. Each of these categories consists of many skills and there are correlations between these categories, Gardner's mindsets, and the frameworks presented by Kereluik and colleagues. For example, social competencies like interpersonal and collaborative skills and cultural sensitivity are acknowledged to be of value. Creativity and innovation are likewise emphasised, along with critical thinking and problem solving. Corbisiero-Drakos and colleagues (2021) identify four core 21st-century skills, namely creativity, critical thinking, communication, and collaboration (Corbisiero-Drakos *et al.* 2021). Many of these terms are interrelated; for example, collaboration cannot be accomplished without some form of communication, so it is my view that these can be dually understood under the former. Creativity and innovation are likewise related. I therefore consider creativity, critical thinking, and collaboration to be the core 21st-century skills.

But what does this mean for piano teaching in government schools in the Eastern Cape? The South African Department of Basic Education is unequivocal in its espousal of these skills, as articulated in CAPS (DoE 2011a). Although CAPS governs the learning and teaching activities in the classroom, there is no provision for individual instrumental tuition in the primary school curriculum. Specialist instrumental lessons are conducted outside of the school's academic programme so instrumental teachers (like me) must resort to interpreting the syllabuses of external examination boards (ABRSM,

Trinity College, and UNISA)¹ to formulate their own curricula. However, piano lessons are nevertheless conducted in this school environment and should therefore be aligned with the institutional didactic orientation towards the development of 21st-century skills. This will ensure that school-based instrumental music teaching continues to evolve and address the needs of current and future students through practices that promote creativity, critical thinking, and collaboration. In the next section, I discuss these three 21st-century skills, distilled from the many such competencies mentioned in the literature.

Creativity

Composing is a creative endeavour, as opposed to learning repertoire written by others (Webster 2002). Webster (2002) presents a hypothetical scenario in which an imagined child, who attends piano lessons, is thought to be creative in various capacities by members of her family. This distinction, being creative, is attributed to her for demonstrating competencies like drawing crotchet notes legibly, playing her recital piece accurately, and her ability to read notation. Webster argues that in this familiar scenario, none of these competencies are inherently creative. Composition, however, is viewed as a creative endeavour by scholars and not only is this form of creative activity possible for young students, but its pursuit is also a realistic goal in schools (Impett 2016; Webster 2016b; Webster 2013).

It has been suggested that the rapid and ongoing evolution of technology and its impact on global systems necessitates the development of creativity in young students, to equip them with the innovative skills required to remain competitive in an ever-changing workplace (Chalkiadaki 2018). To investigate what this means for music education it is useful to examine the research that has been done on musical creativity. Several theories have been presented and are described by Collins (2005). Some theories identify distinct stages of activity and are referred to as stage theories. Wallas' (1945) frequently cited stage theory delineates four such stages: preparation, incubation, illumination, and verification. Preparation refers to the cultivation of a problem attitude, in which a problem, or several problems, are conceived and superimposed upon the body of knowledge and thought systems related to the problem domain, acquired through education and experience (Wallas 1945). While preparation involves the deliberate framing of problems, incubation is a subconscious, exploratory stage of creative thinking, where multiple trains of association are allowed to run their respective courses in time spent away from the problem-solving task. Illumination occurs when a train of association is successful in solving the problem as conceived during the preparation stage. Wallas describes how this sudden flash occurs in the periphery of consciousness, or fringe consciousness, and as such is perceived by the conscious mind as independent of the subconscious processes from which it emerged. Verification is a conscious stage

¹ ABRSM and Trinity College are both examination bodies that are based in London and offer graded practical examinations to music students in many countries. UNISA (University of South Africa) is a South African distance learning institution that also offers these music examinations.

of thought in which the validity of the solution or idea that burst from the illumination stage is tested and succinctly articulated, or “reduced to exact form” (Wallas 1945, 41).

The Gestalt theorists, however, find this problematic and prefer to consider the creative process as one of organising structures and sub-structures into a unified whole (Collins 2005). Emerging systems theory regards the creative process as a proliferation of goals and sub-goals, while information processing theory views creativity as problem solving and seeks to simulate and test these processes using computer software models (Collins 2005). Webster (2002) defines musical creativity as “*the engagement of the mind in the active, structured process of thinking in sound for the purpose of producing some product that is new for the creator*” (Webster 2002, 11, italics in original). He advances a model of creative thinking that is characterised by the interplay of two types of thought processes: divergent thinking and convergent thinking. According to Webster, divergent thinking describes thought pathways that have no predetermined point of termination, where multiple possibilities and connections are sought, which he terms “personal brainstorming” (Webster 2002, 5). Convergent thinking is goal-oriented and terminates in a sought product or result. In this model, divergent (imaginative) and convergent (analytical) thinking processes alternate within a mediating environment of enabling skills and conditions. Included in Webster’s model is an acknowledged need for time away from the problem, which preserves Wallas’ (1945) notion of interplay between conscious and subconscious operations. Fundamentally, “creative thinking is driven by a problem and a need for its solution” (Webster 2002, 12), a view endorsed by Collins (2005), who suggests that elements of all these theoretical frameworks are at play during creative processes (Collins 2005). As such, this research does not strictly ascribe to any single theory of creative thinking. However, the notion of enabling conditions, as proposed in Webster’s model, has sensitised me to the importance of a supportive and consciously engineered learning environment and consideration for the mode of interaction that should occur within a teacher/student dyad engaged in creative activity.

When designing their curricula, teachers need to maintain a balance between creative activity and structured content learning (Berkley 2004; Webster 2002). In discussing the various ways that composing has been approached as a classroom activity in case studies, Berkley (2004) notes that researchers tend to avoid defining the role of the teacher in these learning environments and stresses the importance of describing a composing pedagogy. She proposes that composition should be taught as creative problem solving, where the teacher needs to maintain a balance between two dichotomies. The first relates to content knowledge and whether it is open or closed, in other words, whether the content applies to the general domain or is task specific. The other dichotomy relates to classroom control and whether the teacher’s approach is formal or informal, essentially describing the degree of freedom experienced by students (Berkley 2004). This agrees with Odam’s (2000) observations of classroom practices in secondary music classes in the United Kingdom. He states that teachers need to

conduct lessons in such a way that individual and small-group work alternates with whole-class activities and discussions, and that teachers should be flexible enough to not only teach content but also facilitate the creative process (Odam 2000).

Critical thinking

Composition as creative problem solving promotes critical thinking. By framing composing activities as problem solving, teachers adopt a facilitating stance in which they support students as they identify the problem and then consider multiple solutions. This type of critical thinking involves the student creating a piece of music by systematically identifying multiple smaller interim problems, hypothesising how each one might be solved, and then testing various solutions to verify efficacy (Barrett and Gromko 2007; Berkley 2004). These processes of planning, hypothesising, and verifying increases the student's metacognitive functions because they involve constant reflexive thought processes (Pang 2010; Berkley 2004). The teacher's role in these episodes of creative problem solving is characterised according to the type of problem identified. In the case of procedural problems, for example, where specific solutions are sought for the sake of notational clarity, the teacher may respond by offering specific potential solutions for the student to consider, which is a convergent approach (Barrett and Gromko 2007). In the case of conceptual problems, involving the creation and "communication of musical ideas" (Barrett and Gromko 2007, 219) the teacher might respond by questioning and prompting the student to evaluate their musical intention, which is a divergent approach. When one considers the dialogic nature of the interaction between teacher and student, it becomes apparent that abstract thinking is also being developed through this collaborative negotiation within a symbol-mediated conceptual framework (Van Oers 2012).

Collaboration

The many studies within the domain of music education conducted in recent years reveal a growing need for music educators to include composition as a pedagogical tool (Kaschub and Smith 2013), and that these creative practices should be incorporated into music learning programmes in schools (Webster 2016b). Composition has historically been thought to be the domain of an elite few individuals possessing remarkable musical talent, a Romantic notion that engendered the exclusive practices and institutions of musical learning that persist today (Webster 2016a; Allsup 2013). These practices have been characterised as inductive, in which a student is systematically enculturated, through means of apprenticeship, into specific forms of musical engagement within a specific musical tradition (Allsup 2013). This autocratic approach to musical learning exerts control over participants to minimise or sanction diversity to maintain that tradition's identity for posterity (Van Oers 2012). However, a new, more democratic approach is emerging in music education and much research is focused on the social and collaborative orientations inherent in this approach (Webster 2016a; Webster 2016b; Kaschub and

Smith 2013; Sætre 2011; Barrett and Gromko 2007). This study is situated within this research context and the paradigm shift from inductive apprenticeship to constructive facilitation.

This collaborative paradigm is aligned with Vygotsky's theory of cognitive development, which maintains that learning is socially constructed within the child's zone of proximal development and is mediated by cultural tools (Moore 2011). Vygotsky (1978) describes how a child's actual developmental level is assessed through a battery of tests and problems posed by a psychologist or researcher that the child needs to solve. Noting the type and difficulty of the tasks that the child can complete independently is the way in which the child's actual developmental level (or mental age) is determined. However, if the child can solve certain problems with some assistance from others who initiate the solution without completing it, or ask leading questions, these findings are discarded and not considered when determining the child's mental age. Vygotsky argues that if this additional data is considered, the child's mental age will be greater than initially determined. He terms this disparity the zone of proximal development, which he defines as:

... the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky 1978, 86, italics in original).

Vygotsky suggests that the "actual developmental level defines functions that have already matured" (Vygotsky 1978, 86), while the zone of proximal development defines cognitive functions that have not yet reached fruition. It is in this space of potential attainment of competencies that teachers can facilitate the development of students' skills through collaborative engagement in musical learning experiences.

Experiential learning

Studies have shown that significant improvements in learning outcomes can be achieved through the implementation of experiential learning, which is aligned with Vygotsky's theory, and that these benefits extend to intangible outcomes such as attitudes and skills (Priyono *et al.* 2017). Experiential learning is defined as the "transformation of experience" (Kolb *et al.* 2001, 228). In this model, two types of grasping experience (concrete experience and abstract conceptualisation) and two types of transforming experience (reflective observation and active experimentation) form the four quadrants of a circular learning cycle. Individual learning preferences, or learning styles, are identified: diverging, assimilating, converging, and accommodating, which describe one's learning strengths (Kolb *et al.* 2001). When one superimposes Webster's critical thinking theory over this model, it is interesting to note that divergent and convergent processes are represented in both.

According to Priyono and colleagues (2017), it is necessary to improve the quality of current education systems to equip students with the tools and skills they will need to cope with 21-st century problems.

They characterise the traditional teaching approach as content-based and teacher-centred, which imposes a learning environment in which the student passively receives instruction. They refer to this as a surface approach, where information is presented and can be recited or reproduced. Students engaged in a deep approach perform activities in which they are encouraged to look for connections between the content under study and their own experiences. They stress the need for this alternative mode of instruction in which students actively participate in their own learning, specifically activity-based learning (ABL), because “the use of this approach in the instructional process can encourage a positive shift of students’ role, from passive to active learners [which] ... emphasises the development of students’ active participation and creativity” (Priyono *et al.* 2017, 020008-2). This form of learning is characterised by the students’ manipulation of concrete and symbolic objects (Carbonneau and Marley 2012). This is theoretically aligned with Piaget’s (1999) assertion that cognitive development in children occurs through successive stages, from the material to the symbolic, as he explains,

The constitution of the symbolic function is only possible as a result of this union between actual or mental imitation of an absent model and the “meanings” provided by the various forms of assimilation. Then it is that language, a system of collective signs, becomes possible, and through the set of individual symbols and of these signs the sensory-motor schemas can be transformed into concepts or integrate new concepts (Piaget 1999, 3).

Cognitive skills develop sequentially and in complexity, and “are often described in terms of capability to manipulate various mental representations” (Carbonneau and Marley 2012, 282). This is an experiential mode of learning, where students learn by doing. For example, manipulating wooden blocks to learn about subtraction in Mathematics, and then imagining the wooden blocks in subsequent similar situations. By adopting an activity-based approach, teachers are positioned as facilitators in a learner-centred approach, where students assume some responsibility for their learning in a constructivist paradigm (Pang 2010). This shift in orientation from presentational lessons to active participation may be useful in fostering a learning culture “where transformation to a creative, stimulating learning environment is the primary goal” and where the ability to think critically, analyse, compare, and assimilate information is more valuable than simple information recall (Pang 2010, 36).

Brain-based learning

The human brain is “a dynamic, opportunistic, pattern-forming, self-organized system of systems” which responds to environmental influences that in turn affect the cognitive functioning of the individual (Jensen 2005, 13). Brain-based learning has received much attention in the last 40 years, with an emphasis on how the brain works and what teachers can do to harness children’s innate learning potential through biologically informed pedagogical strategies (Jensen 2005). Research in the field of social neuroscience has confirmed the importance of collaborative learning and identified the neural structures and processes that support it. From a social constructivist perspective, cognitive development

and learning occur through the internalisation of culture-specific knowledge and conventions through the appropriation and use of cultural signs and tools with the assistance of more knowledgeable others (Sivan 1986). This perspective reiterates Vygotsky's theory of cognitive development and confirms its validity in the field today, and because of the social nature of the activity under discussion, distances itself from Piagetian theory, which views cognitive development as a process that occurs within the individual (Sivan 1986). Because the current study seeks to investigate the possibility of cultivating a music learning environment in piano lessons that is productive, it is important to understand the neural mechanisms through which socially mediated learning is achieved and sustained in a teacher/student dyad.

One area of focus in social neuroscience research is motivation, which has been described as a “socially negotiated process which results in some behaviour that shows the individual's interest and cognitive and affective engagement” (Sivan 1986, 226). In classroom settings, teachers need to integrate instruction with motivation, which can be achieved by developing intersubjectivity, in which the teacher and students develop a shared awareness of the activity's purpose, objective, and reward (Sivan 1986). This intersubjectivity in a self/other dyad is characterised by each member's mutual recognition of the other, while still maintaining their individual identities in a setting “in which a shared subjective state is possible” (Marchetti and Koster 2014, 1). It is an interpersonal paradigm in which inferences are made and understood reciprocally, the other's motives and perspectives are comprehended (Clark and Dumas 2015), and knowledge and skills are transferred from the “social-interactive plane to the internal-thinking plane” (Berk *et al.* 2006, 76). This reciprocity is important because it “motivates learners by recruiting the reward circuitry in the human brain, which encourages, sustains, and deepens individual peer-learning” (Clark and Dumas, 2015, 4).

In order to understand how this works, it is necessary to take a closer look at the two neural networks in the human brain that are associated with social interaction. The first is the mirror neuron system (MNS), which regulates low-level, externally oriented processes, “related to one's own or others' visible expressions, actions and emotions” (Clark and Dumas 2015, 5). The second network is the mentalising (MENT) system, which regulates high-level, internally focused reflective and inferential processes. Recent studies of these systems have led scientists to conclude that while the MNS coordinates an individual's responses to various social stimuli, the MENT system integrates these lower-order signals with more complex meta-processes, encouraging reflective insights into the motives of others. These two systems are integrated and work together to generate insights “about others in order to prepare and execute appropriate social interaction” (Clark and Dumas 2015, 6). Cooperative learning engages these two interconnected networks and recruits the mesolimbic dopamine reward system (Clark and Dumas 2015; Redcay *et al.* 2010) and triggers the production of dopamine, the neurotransmitter associated with

a feeling of fulfilment and a natural high, which benefits not only motivation, but also memory formation because children “remember that which is most emotionally laden” (Jensen 1995, 80).

This reward system is also activated when students engaged in cooperative learning are afforded a measure of control over the interaction, where this “agentic equity” (Clark and Dumas 2015, 7) induces a sense of self-worth. In this way cooperative learning activates dopamine production, leading to intrinsic motivation, and when motivation is evoked within the zone of proximal development, the responsibility for learning passes to the child (Sivan 1986). It is also worth noting that activating this dopamine reward system and promoting agentic equity in cooperative learning activities from an early age protects “learners from academic disaffection and failure later in life” (Clark and Dumas 2015, 8). While it is widely accepted that the interaction within a teacher/student dyad is important (Gaunt 2010; De Villiers 2010), from the perspective of brain-based research it is crucial to the cultivation of an intersubjectivity that is productive in nature (Clayton 2016).

Play

Niland’s assertion that “young children learn through play” (Niland 2009, 17) is a view that is widely acknowledged, and numerous scholars have advocated for the inclusion of play-based teaching methods in schools (Yi 2021; Marsh and Young 2015; Niland 2009; Berger and Cooper 2003; Tarnowski 1999). However, there is yet no universally accepted definition of play, nor is there consensus on what constitutes play-based learning. Researchers have investigated play for over 150 years, and this has led to a vast array of play research methodologies, classifications of play, analytical tools used to interpret play data (both qualitative and quantitative), and play-based classroom approaches (Veraksa *et al.* 2020). In fact, the only thread connecting all play-based learning models is a reliance upon Vygotsky’s cultural-historical theory of cognitive development (Veraksa *et al.* 2020). Vygotsky recognises that play is a catalyst for cognitive development in childhood. He discusses the evolution of the child’s needs and the proximity of their fulfilment. For example, the desires of very young children tend to be gratified immediately, but as they reach pre-school age these desires change and cannot always be fulfilled at once, which Vygotsky terms unrealisable tendencies (Vygotsky 1978). At this point in a child’s development, desires become more sophisticated but the need for instant gratification is retained from the preceding stage of development. To relieve this tension, children venture into an imaginary world in which their unrealisable tendencies can be fulfilled and where they are able to unhinge the constraints of the real situation and harness imagination to impose their own rules (Vygotsky 1978). This subjective inner world becomes the child’s own domain, through which the child defines the boundaries between the real world and the imagined one, between inner thoughts and expressed utterances (Sutton-Smith 2008).

Activity within this imaginary domain is sustained by the motivational imperatives of fulfilling unrealisable tendencies and is governed by rules, which are usually implicit (Sutton-Smith 2008; Berk *et al.* 2006; Vygotsky 1978). These rules have a regulatory function in that they impose limits upon the actions of the player. For example, a child may pretend to be the mother and a doll becomes the child. In this scenario the child will need to adhere to the culturally normative behaviours associated with motherhood (Vygotsky 1978). As children develop, they can interact within a shared imaginary domain and each participant who gains access to the game is bound by the game's rules (Sutton-Smith 2008; Berk *et al.* 2006; Vygotsky 1978). Interaction within this shared zone of play is characterised by the players assuming roles, making affordances for the actions of others, and sublimating their independent desires to sustain the game, a source of enjoyment (Berk *et al.* 2006; Vygotsky 1978). Vygotsky identifies this as a paradox in children's play. He notes that when a child renounces candy in a game because the rule deems it inedible, the child is exerting willpower and self-control because satisfying the rule has supplanted the candy as the primary desire (Vygotsky 1978). This paradox indicates that play is important in the development of metacognitive abilities like self-regulation in children (De Bruin 2018; Zachariou and Whitebread 2015; Sutton-Smith 2008; Berk *et al.* 2006; Vygotsky 1978). Children sublimate their impulses in play because of their enjoyment of the game, an activity in which they participate voluntarily and are intrinsically motivated to extend. It is this engagement that holds appeal for the players, a process that does not culminate in a product (Niland 2009; Berger and Cooper 2003; Tarnowski 1999), and in which free choice is exercised within the boundaries of the self-imposed rules of the game (Hogenes *et al.* 2014b; Niland 2009; Vygotsky 1978).

Regulating one's own actions while engaging in activity with others in a mutually understood domain engenders the cultivation of dialogue-mediated intersubjectivity (Berk *et al.* 2006). It is within this liminal space that the teacher can participate in the child's zone of play, enriching their social and cultural experience and supporting their development (Veraksa *et al.* 2020). It is important for the teacher, as mutual yet more knowledgeable play partner, to play with the child at their level (Tarnowski 1999) and to create zones of proximal development through which it becomes possible to guide the child's participation in learning activities and support their development (Yi 2021; Van Oers 2012). This emphasis on the teacher's access to and involvement in the child's zone of proximal development reinforces the importance of Vygotsky's socio-cultural learning theory in play-based learning models.

In terms of music education, specifically piano pedagogy, it is therefore important to develop a playful approach to lessons that is characterised by the factors mentioned thus far. These factors include enjoyment, voluntary participation, and intersubjective engagement within the child's zone of play. Furthermore, this engagement should be process-oriented, where the emphasis is on the activity rather than the ensuing product. This is aligned with the characteristics most attributed to play-based methods,

which involve activities that are “voluntary, internally motivated, process-oriented rather than result-based, spontaneous, joyous and pleasant” (Veraksa *et al.* 2020, 60).

As discussed, play, as a form of self-regulated activity within a dialogic, intersubjective domain allows for the cultivation of zones of proximal development (Berk *et al.* 2006). Musical play is an ideal context for self-regulation because it is universal and innate (Zachariou and Whitebread 2015). Exploratory musical play, often called functional play, allows children to experiment with sound without externally imposed constraints (Yi 2021; Niland 2009; Tarnowski 1999). When engaged in functional play with instruments, children create patterns and sequences of sounds that seem chaotic and might not be considered music at all, but this process affords children the opportunity to explore the instrument’s sound-producing potentials (Marsh and Young 2015). In studies involving functional play, researchers have observed that coherent patterns of sound emerge as children experiment with rhythms, tones, and technique (Marsh and Young 2015; Niland 2009; Berger and Cooper 2003; Tarnowski 1999). This exploration of sound and the instrument’s sonic affordances is a divergent practice, in terms of Webster’s theory of creative thought. In constructive play these rudimentary sound structures become organised through manipulation of the instrument that is deliberate (Yi 2021; Niland 2009; Tarnowski 1999). In terms of Webster’s theory, these organisational decisions are inherently convergent. Free music-play allows children to explore sound and the tools of music-making. This leads to a greater awareness of these sounds and tools and allows them to then extend their knowledge of these in more structured music-play through improvisatory and compositional processes (Niland 2009). Musical play is therefore a creative activity in which divergent and convergent thought processes are linked (De Bruin 2018), and when the teacher and child share a collaborative zone of play, the child engages with a play partner who is able to “model, scaffold, guide, and interact so that the child can achieve things that are not possible when tried alone” (Yi 2021, 26).

Musical identity

As discussed, the cultivation of intersubjectivity between individuals is necessary for the creation of the zone of proximal development, and each participant’s social and cultural histories influence who they are. In music education, in this case piano teaching, the successful creation of the zone of proximal development will also depend upon the teacher’s sensitivity to the pupil’s musical identity. The subject of musical identities is a broad one, which has received much interest in the last 25 years. In 1998, a series of seminars was hosted by The British Psychological Society in which music scholars, teachers, therapists, and musicians discussed issues of music psychology, with particular emphasis on how musical communication and identity formation are linked (MacDonald *et al.* 2002). This sparked multidisciplinary interest that has been manifested in empirical studies and publications that have led to the rapid growth of the field in a broad spectrum of scholarly domains (Hargreaves *et al.* 2017).

Towards a definition of musical identity

One's musical preferences alone do not constitute or define one's musical identity because these preferences are transient and dependent on mood, social contexts, and other circumstantial factors, which change throughout the course of the day (Hargreaves *et al.* 2002). Furthermore, one's engagement with music when listening varies according to situation on a continuum, from low-level engagement, such as the background music in a restaurant that is barely perceived, to high-level critical engagement. Between these extremes on this continuum are those experiences in which listening is used as a mode of mood regulation. The music one listens to has an influence on one's musical identity, an effect that is proportional to the level of engagement (Hargreaves *et al.* 2002). However, listening is only one form of musical engagement, alongside composition and performance (Green 2016). The Oxford dictionary defines a musician as "a person who plays a musical instrument or writes music" (Hawker and Waite 2007, 598). From this definition it would follow that those who engage with music exclusively through listening are not musicians. Many of the studies undertaken in the field, specifically on children's identities, describe participants as either musicians or non-musicians according to whether they play musical instruments (Lamont 2002), a practice that has received criticism because these distinctions are arguably imposed by the researchers and do not consider other forms of musical involvement (Gracyk 2004; Lamont 2002).

Christopher Small, in his seminal work *Musicking: the meanings of performing and listening*, asserts that "music is not a thing at all but an activity, something that people do", and he redefines the obscure verb "musicking" to mean any form of music-oriented activity including performance, listening, composing, and dancing (Small 1998, 2 & 9). Everyone therefore has a notion of their own musicality; whether this involves virtuosic instrumental performance made possible by years of training, being a music critic, or merely singing in the shower; which are examples of individuals' perceived roles in the musical domain, or "identities in music" (Ilari 2017; Hargreaves *et al.* 2017, 2002). In addition, music exerts an influence on our self-identities through the ongoing reconstruction of who we are in relation to others, because "music is typically experienced in a social realm" (Ilari 2017, 528). This social identity is characterised by an in-group/out-group dichotomy, through which non-musical characteristics such as gender, age, national identity, and religion are reinforced by listening to music that embodies or is representative of these characteristics (Hargreaves *et al.* 2017, 2002; Ilari 2017; Gracyk 2004; Folkestad 2002; Tarrant *et al.* 2002; Dibben 2002). This "music in identities" (Hargreaves *et al.* 2017, 2002) is a social constructionist paradigm that can be enacted through statements like, "I love Lady Gaga", in which the speaker is not merely indicating a musical preference, but "affiliating himself with a specific community of music makers and listeners, and arguably, "performing" his self-narrative" (Elliott and Silverman 2017, 28).

Mechanism of social identity development

In humans, the auditory system begins functioning three to four months prior to birth, and research has shown that foetuses react to external sounds within 30 weeks of conception (Parncutt 2016; McPherson and Hallam 2016). Infants, from birth to one year, possess an innate predisposition for “affective culture” (Trevarthen 2002, 22), and mimicry and participation in cultural processes (songs, dances, games) is more about socialising oneself than learning cultural artefacts and conventions. Studies involving newborn infants have shown how babies respond to their mothers’ facial expressions and vocalisations, and that when these responses are imitated, proto-conversations emerge (Trevarthen 2002). This innate intersubjectivity is the mechanism through which babies and their parents communicate and build a sense of shared experience and closeness, and through which language is acquired (Elliott and Silverman 2017; Hargreaves *et al* 2002; Trevarthen 2002).

In these intersubjective communicative episodes, the mother’s child-directed language, or baby talk (Trevarthen 2002) has rhythmic and melodic features that are perceived and reciprocated by the child (Parncutt 2016). This is made possible by the “intrinsic motive pulse (IMP) generated in the human brain” (Trevarthen 2002, 25), which consists of three sensitivities: the ability to perceive rhythmic stimuli, the ability to distinguish changes in timbre, pitch and variations in volume over time, and the ability to discern a sense of narrative in vocal and instrumental performances (Hargreaves *et al* 2002; Trevarthen 2002). This IMP is instrumental in the development of communicative musicality through which vocal imitation and vocal/musical play develops into speech, and through which young children negotiate their social environment and become members of their society (McPherson and Hallam 2016; Hargreaves *et al* 2002; Trevarthen 2002). In this way the interactions between mothers and their infants “develop into “narratives” of mutually constructed meaning, which are characterised by their intersubjectivity” (Hargreaves *et al* 2002, 6), and which constitute a powerful mediator for socialisation, identity formation, and by extension, education, a Vygotskian perspective.

The development of children’s identities in music

This study involves the integration of composition into formalised piano tuition and involves children who are currently taking lessons. As such, it is presupposed that notions of musical identity are already established and that these children regard themselves as musicians, in other words, they perceive their own identities in the musical domain. In considering the ways in which these self-concepts are formed, one must consider the influences of the home environment and school. Bronfenbrenner’s ecological theory of human development describes how progressively expanding contexts of development influence the formation of identity; from the micro level (in which the child is an active role-player and has influence), to the macro level, where the child does not have any agency but is nevertheless affected, however indirectly (Rosa and Tudge 2013; Lamont 2002). The theory identifies three key

ecological contexts within the child's immediate microsystem: home, school, and neighbourhood (Zapata Restrepo and Hargreaves 2017; Rosa and Tudge 2013; Lamont 2002).

Contexts of development

The home is the ecological context in which children influence and are influenced by their immediate environment through interactions with family members over time (Rosa and Tudge 2013). A child's home environment is of crucial importance in terms of musical development and parents are responsible for providing opportunities for musical learning (McPherson and Hallam 2016), particularly in terms of instrumental tuition, which is not included in the primary school curriculum in South Africa. This parental influence is guided by the family script, the transgenerational values and beliefs that dictate behaviours and family interactions, which include "the family's attitudes, taboos, expectations, myths, secrets, legacies and loaded issues with which children grow up" (Borthwick and Davidson 2002, 60).

A study was conducted by Borthwick and Davidson (2002) with 12 families, which shows that parents who had themselves received music lessons had higher musical expectations of their children than non-musician parents and were therefore more likely to enforce strict practice routines. In addition, if one parent was a musician and the other was not, the non-musician parent generally desired their children to benefit from opportunities that they felt they had missed. Interestingly, there is a paradox between parents' expectations of current and future musical engagement. On one hand, they may insist that their children practise for hours, because musical training is considered a socially valued attribute. On the other hand, in discussions about future careers in music, parents usually express a desire for their children to continue with music as a hobby, because the music profession is not regarded as financially rewarding. In either case, a high level of musical attainment is more likely if parent and child work alongside each other and adopt a unified musical identity.

Birth order was revealed as a key factor in determining parents' perceptions of musicality in their children. The older child (in two-child families) was viewed as the musically talented one, while the second child was usually relegated another role (artist, sportsman/woman). The researchers conducting the study concluded that the parents' scripts (in terms of musical ability) were heavily influenced by the birth order of their children. The second child usually resolved this potential tension through niche diversification: readily adopting an alternative role to that of musician, which is usually the domain of the older sibling. However, this parent scripting was not evident in families with three children. It is presumed that there may have been the familiar two-child scripting when there were only two children, but it was not possible for the researchers to document this at the time of conducting interviews. In three-child families, each child's talents were fostered on their own merits, with equal support for each, as individual niche roles were encouraged for all three children with little evidence of sibling rivalry or jealousy. Parental supervision, support, and encouragement have therefore been determined to be

crucial factors in attaining high levels of musical skill, as well as positive musical identity (Borthwick and Davidson 2002).

Another key component of this microsystem context is the school. Research into children's musical identities suggests that a greater percentage of children will have positive musical identities in an environment where class music is taught to everyone and there are fewer opportunities for extra-curricular music training. This scenario is typical of primary school contexts in South Africa, in which general music classes are part of the curriculum. The percentage of children with negative musical identities grows in secondary schools, where there are more opportunities for extra-curricular music study. This indicates that these children are defining their own musical identities in terms competency beliefs (O'Neill 2002) and through social comparison (Evans and McPherson 2017; Lamont 2017, 2002; O'Neill 2002). This is aligned with Bronfenbrenner's theory because self-reflective awareness develops through the relationships with others within microsystem contexts and is dependent upon the perceived perspectives of these others, "in other words, our self-perceptions develop through a perspective-taking process" (O'Neill 2002, 80).

Once an individual has taken a position of perceiving themselves as a musician or non-musician, they will tend to experience everything from this restrictive perspective. These socially mediated self-perceptions therefore result in either positive or negative self-narratives, which tend to become self-fulfilling prophecies (O'Neill 2002). Children's self-beliefs are powerful predictors of musical achievement and self-perceptions of musical ability determine how successful the child will be. These self-beliefs become manifest as either helpless or mastery-oriented mindsets (O'Neill 2002). Helpless children exhibit maladaptive motivational patterns of behaviour and tend to focus on the achievement of goals and are easily discouraged when faced with failure. Mastery-oriented children exhibit adaptive motivational patterns of behaviour and tend to focus on the process of pursuing mastery, despite being faced with failure, and often enjoy this pursuit (O'Neill 2002). From this one can surmise that these socially constructed mindsets might predetermine children's levels of musical achievement. One example of this can be found in Green's (1997) study, in which gender stereotypes were found to be upheld in schools, where teachers and pupils held the belief that girls were suited to vocal and instrumental performance, specifically of classical music, and some participants believed that girls lacked the competencies necessary for composition (Green 1997). This study reveals how attitudes at a local level reflect those of a broader social context, and that by perpetuating them, girls are self-actualising these beliefs about gender identity and granting them legitimacy, while simultaneously fostering a negative self-narrative with regards to composition (Dibben 2002).

Ethical idealisation

One route towards fostering positive self-narratives is through ethical idealisation (Elliott and Silverman 2017). This can be understood as the mode of interaction between parent and child in which the parent's behaviour and language presuppose the existence of the abilities and positive or desired attributes that the child will eventually attain. Crucial to the cultivation of ethical idealisation is the provision that children are "raised with care and empathy in morally, socially, and culturally humanistic contexts" (Elliott and Silverman 2017, 35). To use the example put forth by Noë (2004, 1), "think of a blind person tap-tapping his or her way around a cluttered space, perceiving that space by touch, not all at once, but through time, by skilful probing and movement". In this way, teachers can introduce students to the world of music and music-making through a mode of exploration that is not loaded with societal values that may trigger negative self-concepts. Instead, students should be encouraged and empowered through praxes that are characterised by the teacher's affordances, that enable them to achieve musical goals and to flourish (Elliot and Silverman 2017). These affordances are moments of invitation created by the teacher, in which students are granted access to musical perceptions and experiences. It is through these affordances that teachers can, and should, create opportunities for children to embark on a discovery of the realm of music on their own terms, and that they do so from a charitable stance of ethical idealisation that bestows upon them a sense of musical self-hood (Elliott and Silverman 2017). In other words, teachers, as musical mentors, should acknowledge children as musical beings and afford them an exploration of the musical world so that they are empowered to construct their own musical and personal identities through socially constructive processes.

The piano in musical identity

In my teaching I have come to understand that my students do not regard the piano as part of who they are musically. It is merely an instrument that they are learning to play, and it tends to have no significance beyond lessons or time spent practising. However, this is a site of untapped potential because the instrument may grant students access to a wealth of meaningful musical experiences and enable them to make their own transformative journeys (O'Neill 2017). This requires a recentring of the piano in young students' musical identities. Children's musical identities are not static but are constantly evolving (Elliott and Silverman 2017; Evans and McPherson 2017; Ilari 2017; Lamont 2017, 2002; O'Neill 2017, 2002; Gracyk 2004; Borthwick and Davidson 2002; Dibben 2002; Tarrant *et al.* 2002; Trevarthen 2002). Furthermore, the concept of musical identity is difficult to confine within one definition. However, considering the issues discussed, one might define musical identity as a fluid, ever-evolving process of enactment in which individuals engage with and are affected by music, that engenders personal and social self-concepts. As O'Neill points out, "social constructionism depicts the self as something that is fluid and constantly changing from situation to situation whilst embedded in social and cultural contexts" (2002, 91). It is this fluidity, due to the influence of social constructionist processes of identity formation, that holds particular significance for this study. The piano can therefore

be recentred in students' musical identities because these identities are dynamic and continuously evolving. Musical identity is not a thing, it is a process, and by reconfiguring the piano as the locus of processes of agentic cultural enactment, the instrument will cease to be an extraneous object and will become the vehicle for musical exploration and the development of who students are musically.

Agentic music learning ecologies

The promotion of learner agency plays an important role in fostering a child's positive musical identity (Elliott and Silverman 2017; Evans and McPherson 2017; Lamont 2017), but notions of learning context also need to be reconsidered. O'Neill (2017) proposes that the learning context should be reconceptualised as a learning ecology, which is a thick concept in that it is a "multifaceted and multidimensional description of a system and at the same time a value-laden explanation for how a system came to be the way it is" (2017, 83). Learning ecologies are theoretically derived from Bronfenbrenner's ecological theory of human development in combination with phenomenology to provide a perspective that "affords a more dynamic, culturally responsive, context-sensitive perspective for interpreting the individual's own meaning making process" (Spencer *et al.* 1997, 828). From this perspective a learning ecology is a set of interrelated systems sustained by social and cultural structures and processes, in which students and teachers are not only embedded but help to sustain. This embeddedness connects students to these learning systems, for which they are at least partially responsible, that "contain elements of agency, responsibility, meaning, and creativity that are interconnected and yet fluid and changeable" (O'Neill 2017, 83). Cultivating agentic learning ecologies such as these would therefore enable students to "*make sense* of their own musical learning in ways that they find meaningful and enriching" (O'Neill 2015, 607, italics in original).

O'Neill (2017) presents three music learning ecologies: segmented, situated, and agentic, which are characterised by the level of connectedness students feel towards their own musical learning. Traditional piano teaching approaches can be described as segmented ecologies in that children experience musical learning in a sequence of lessons with the overarching goal of learning to play specific pieces of music to pass exams or perform in concerts. These children are afforded very little agency and although the lessons result in musical learning, engagement is not collaborative and the children do not feel innately connected to the music they play or the learning process itself (O'Neill 2017, 89-90).

Situated ecologies are characterised by the social cohesion experienced by students in learning contexts that are situated in a particular time and place, with others, much like a band rehearsal. Within these ecologies, the relationships with others and the situatedness of the musical activities are more meaningful than the music itself. These ecologies have been described as transformative experiences where concepts understood by students in one context can be used or understood in a different context, a "flexible use of knowledge" (Fredricks *et al.* 2004, 79) that transforms the perspective of the student

through social interaction. Situated ecologies are therefore collaborative, but there is little scope for students' autonomy (O'Neill 2017).

Agentive music learning ecologies, however, are characterised by students' engagement in musical creation, experimentation, their control over the rules of the activity, and the deep sense of connectedness they feel towards their musical learning (O'Neill 2017). "Zones of interaction" (O'Neill 2017, 97) are created in which music is composed through meaningful collaboration and students enact their identities through a transformative journey of decision making. Within an agentive music learning ecology, young people navigate the complex and interrelated affordances and subjectivities inherent in this context, which reflect the "heterogeneity and complexity of the real world" (Larson 2011, 319). Furthermore, such navigation is predicated upon young people exercising a level of autonomy that results in positive engagement (Fredricks *et al.* 2004) through which young people produce their own development (Larson 2011). A play-based, compositional approach will therefore result in the cultivation of an agentive music learning ecology, which will affirm children's identities as musicians through experimentation, as they construct their musical self-concepts within their particular experiential worlds (O'Neill 2017).

African music aesthetics

This research is situated in South Africa, which since its first democratic elections in 1994, has sought to redress imbalances wrought by the Apartheid regime and forge a new multi-cultural national identity. However, transformation in musical learning has been slow and there is an acknowledged marginalisation of African musical arts in the education sphere, in favour of Western musical practices and repertoire (Kruger 2016; McConnachie 2016; Oehrle 2013). Scholars have advocated for the inclusion of African musical arts in education for decades, in terms of both repertoire (products) and modes of production and transmission (processes) (Oehrle 2013; Nzewi 1999; Mngoma 1987). It is the latter orientation that is of particular importance to this study in piano pedagogy. The piano, a Western instrument, holds a dominant position in South African music education with, in Mngoma's view, the undesirable consequence of "students who behave like deaf mutes the minute they are taken away from the piano or any keyboard instrument" (Mngoma 1987, 202). According to Mngoma, this is due to the emphasis on Western musical traditions, specifically a reliance on the piano and reproductive traditions, in schools and tertiary institutions, which "de-musicates" (1987, 203) students by eroding their capacities for musical creation and enjoyment. This notion of de-musication is in direct opposition to the musical enculturation that characterises the transmission of African musical traditions, as Nzewi (1999, 73) explains,

African music education is largely an informal process, even in instances of musical families and music trades. But informality does not imply lack of philosophy and systematic procedure in transmitting the knowledge of a music culture. The first principle in traditional African music education is the encouragement of mass musical cognition through active participation. Then participation enables the identification of special aptitudes and capabilities. The second principle is the production of specialized or specialist musicians who become the culture's music referents, with responsibility for maintaining as well as extending standards and repertory.

This passage throws into stark contrast the methods currently employed by South African piano teachers. In her study on the lived experiences of South African piano teachers, Kruger (2016) notes that pedagogical approaches and repertoire choices do not seem to have changed since 1994 in South Africa, which are “embedded in the Western tradition” (2016, 12). Oehrle corroborates this observation and points out that although there is a growing awareness of the need to include African music in the curriculum, Western musical traditions are superordinate to, and tend to displace, indigenous music education philosophies in African countries (Oehrle 1991b, 28). My own teaching experience within schools in the Eastern Cape has provided ample evidence of Kruger's claim. Method books, such as those written by John Thompson (1955) and Edna-Mae Burnam (1957) are staple resources in primary schools and are aligned with the didactic orientations codified by Curwen in *Mrs. Curwen's Pianoforte Method* (1913), a name familiar to most piano teachers.

Curwen asserts that one should “teach the *thing* before the *sign*” (Curwen 1913, viii, italics in original), an approach that is congruous with Piaget's constructivist theory of cognitive development, which is based on the premise that abstract concepts are built through the continuous “assimilation and accommodation” of concrete objects (Flavell 1996, 200). Indeed, Piaget's theory constituted the foundation of my tertiary training in piano pedagogy. Although Curwen's emphasis on teaching the thing (or sound) before the symbol agrees with Piaget's notion of “concrete operations” (Kuhn 1979, 341), when discussing the teaching of time (minims or crotchets), she asserts that “there is no way of teaching it except *through* the symbols” (Curwen 1913, 14, italics in original). This emphasis on symbols characterises Curwen's seminal work and the method books penned by the pedagogues that followed, in which pupils' reproduction of educational music on the piano through the systematic deciphering of staff notation is the primary objective. This goal is appropriate within the Western tradition because piano tuition has historically been focused on the acquisition of skills related to performance of musical works written by composers who are valued by this culture. However, more recent research suggests that pupils' understanding of musical literacy will develop in a learning environment where pupils are made aware of the value of notation in their musical activities (Hogenes *et al.* 2014b). Notation, therefore, need not be an obstacle to the creative process and the pupil's creativity should not be limited by their understanding of staff notation. Furthermore, learning to play an instrument should be focused on the relationship between sound and instrument-mediated action (Varvarigou and Green 2015).

This emphasis on notation is not the only Western paradigm being maintained in South African piano lessons. Teachers exercise authority over their pupils' repertoire choices and instruct them in the correct performance of these musical works, or cultural products. This authoritarian stance, while arguably useful for producing specialist performers within a niche tradition of piano performance, is a limiting one as it serves to inculcate competencies and attitudes from the lived experience of that teacher and therefore inhibits the cultivation of heterogeneous musical learning experiences. Oehrle (1991a) argues that these Western principles of music education were introduced by colonists and are still perpetuated using publications that privilege these methods. She advocates for a turn to African philosophies of music education, rooted in African traditions of music making. For the purposes of this discussion, my use of the term aesthetics is more closely aligned with the notion of philosophies that pertain to music production and transmission than specific musical elements used in music creation, or musical tastes in relation to its reception.

There are fundamental differences between African and Western music aesthetics, most notably in terms of the differential prioritisation of musical process and musical product. In African traditions, the means of music production are of greater importance than the music produced, a notion contrary to Western conventions that value performances of autonomous musical texts, which are the culmination of creative musical processes (Oehrle 1991a). This is due to opposing conceptions of music's purpose. In African traditions, music serves a socialising function, characterised by communal participation in which music-making supports social life. Western traditions, specifically those related to Western art music, view music as the purpose, where only specialist composers and performers engage in music-making for the benefit of a passive listening community. These divergent purposes precipitate another important difference, involving contexts of musical learning. In the West, students (for example, aspiring pianists) attend specialist music schools or conservatories, while in Africa music is learnt through socially mediated participation with the broader community. Furthermore, Western music education is centred around the acquisition of notation-based music literacy (as discussed above), whereas an African music education privileges aural practices, in which children are exposed to musical ideas that they imitate, before being encouraged to improvise their own (Oehrle 1991a).

As previously mentioned, music education practices in South Africa are steeped in well-established Western epistemologies that were introduced by colonial forces and perpetuated after South Africa celebrated its democracy. Although this dissertation does not intend to explore decolonial discourse, it is nevertheless pertinent to reflect on South Africa's geopolitical place, as being neither within the imperial metropole, nor entirely divorced from its influence. Rather, it exists on the margin, which has prompted the cultivation of border thinking, which is a "critical epistemology constructed through the textual histories, linguistic traditions, and expressive artefacts and modalities that are situated beyond the frontiers made known and knowable in and by the West" (Fourie 2020, 199). This form of thinking

agrees with the principles of transgressive learning, which seeks “to re-seed a decolonial future through a germ of multiple beginnings” (Kulundu-Bolus *et al.* 2020, 114). According to Kulundu-Bolus and colleagues (2020), transgressive learning can be described as,

... learning to see and feel into what parts of oneself and the collective are left outside the ontological demarcations of our current reality. It requires that we lean into the parts of ourselves and the collective that have been forced into exile by the status quo. This kind of learning requires a stripping away of conditioned norms that no longer serve us or that were never of us (Kulundu-Bolus *et al.* 2020, 114).

This passage articulates an imperative to redefine borders, shed old ideas and identities, and move towards seeding a decolonial future through actions in the present that are emancipatory. Transgressive learning and transformative action involve multiple actors and perspectives, in which collective agency transforms praxis. One example of this is found in the recovery of indigenous agricultural traditions in Africa (Kulundu-Bolus *et al.* 2020). Music education might similarly benefit from a turn to African ways of thinking about music.

Composition

Towards a productive approach

Despite the growing emphasis on a need for education to be oriented towards productive activity, music education remains largely reproductive. Studies in the Global North, the site of most available research, describe musical classroom practices characterised by the singing of songs written by others, whereas in visual arts and literature, children are encouraged to explore the materials and create novel artefacts, a more productive approach (Hogenes *et al.* 2014b; Niland 2009). Indeed, research conducted in music education in African contexts tends to be centred around the policies and attitudes related to the inclusion of African musical artefacts in the school curriculum (McConnachie 2016; Otchere 2015; Oehrle 1991b; Mngoma 1987). This is aligned with the notion that African music is considered a functional artform as opposed to the Western contemplative paradigm, and African music should enjoy the same attention to its “inner workings, the life of its tones” (Agawu 2001, 8) as Western classical music does.

This turn towards a productive approach to music education establishes composition as an ideal point of departure. Kaschub and Smith (2013), in advocating for this productive orientation, say that music teachers and music teacher educators agree that there is a growing need for training in teaching composition in schools. There is also a growing number of teachers who are incorporating composition in their own practices, leading experts to consider ways to include this in teacher training. They delineate three fundamental shifts in musical experience. The first involves access to music, and they state,

Whether the role is that of creator, performer, or listener, access to music is instant, all-pervasive, and no longer bound by place or time. Musical freedom of such latitude has never been experienced by humanity (Kaschub and Smith 2013, 4).

The second shift is contextual, in that music is increasingly experienced individually using an electronic device, as opposed to the group contexts that characterised musical experiences of prior decades. The third shift relates to music in schools, and how musical experiences in these settings have tended to privilege a small population of student performers. The authors point out that “accelerating advances in technology have ushered in new possibilities for musical experiences for an increasingly large population with eclectic interests” (Kaschub and Smith 2013, 5). These three shifts seem to be driven by technological and social changes, where individuals can explore and express their unique worldviews. As Kaschub and Smith (2013, 7) point out,

Were words, numbers, colours, and movement sufficient for capturing human experience, music would not exist. To provide every student—not just those who pursue performance—an opportunity to explore and expand the intuitive and feelingful understanding of what it is to be human through music composition is the responsibility of every music teacher.

This passage emphasises the universality of music as both a human capacity and a need. Technology has made it possible for anyone to be a composer and people no longer rely on others for the performance of their composing endeavours. In other words, everyone now possesses the means to express themselves in the realm of sound and music education must make affordances for this emergent musical autonomy. Kaschub and Smith assert that great literary works are rare, but most people can invent a story that captures some part of the inventor’s human experience (2013, 8). Composition can likewise be cultivated as a form of expression and meaning-making. As they point out, the act of composing music “requires the interweaving of *knowledge about* and *know-how*. When combined synergistically, composers can create pieces that represent their knowing within and of music” (Kaschub and Smith 2009, 3, italics in original). The authors assert that many budding composers will feel stifled by compositional exercises that are characterised by notational demands or are restricted to developing one compositional device. The focus should rather be on exploring the balance of musical relationships (sound/silence, movement/stasis, tensions/release). Furthermore, teachers need experience in composing individually and through collaboration, participating in composer communities, and they must have developed a foundation of pedagogical knowledge. There is an absence of method books and similar resources for teachers to use when approaching composition pedagogy, a situation that should be regarded as beneficial, which Kaschub and Smith (2013, 11) point out,

... allows teachers to learn that their most important pedagogical tool is the ability to develop materials that are purposefully and specifically tailored to the students being taught. After all, even with hundreds of years of documented compositional practice, no single pedagogy of composition

has emerged. There are as many approaches to teaching composition as there are potential composers waiting to be taught.

Koops (2013) addresses productive musical learning in middle school and high school instrumental groups, like wind bands and other ensembles. He argues that although teachers know the value of composition, they do not have enough time, or compositional training and experience, to meaningfully integrate composition into their school music programmes. In the case of school ensembles, concert programmes are constituted of pieces of existing music and rehearsals are structured around learning this repertoire within the annual concert schedule. Performance of this repertoire leads to school administration support, which perpetuates the status quo (Koops 2013). However, Koops maintains that music ensembles situated in schools nevertheless have an educational imperative and the focus should therefore be on learning. He argues that productive methods teach students about music, and that “students who compose become increasingly aware of how music works” (Koops 2013, 151). This is also consistent with processes of enculturation in which musical knowledge and skills are acquired through active involvement in music-making (Green 2016).

Agency

Music composition can be defined as “a planned, deliberate, realisation of a creative process with a new piece of music as outcome” (Hogenes *et al.* 2014a, 3). This creative process “involves thoughtful musical behaviours such as careful listening, exploration, divergent thinking, critical decision making, and aesthetic craftsmanship” (Hickey 2012, 7). Despite the assertion that everyone can engage in creative musical development through composing (Hickey 2012; Bosch 2008), composition is widely regarded as the domain of a talented minority of individuals who are particularly gifted in the realm of music creation, a perception that has been perpetuated by modernist capitalism (Koops 2013; Hickey 2012; Small 1998). Green (2002) notes that there has been a shift from music making to music consumption over the course of the last century, largely due to individuals’ musical agency being eroded by the rise of the commercially oriented music industry, to which Small (1998, 8) adds,

... our present-day concert life, whether "classical" or "popular," in which the "talented" few are empowered to produce music for the "untalented" majority, is based on a falsehood. It means that our powers of making music for ourselves have been hijacked and the majority of people robbed of the musicality that is theirs by right of birth, while a few stars, and their handlers, grow rich and famous through selling us what we have been led to believe we lack.

A pedagogical approach that encourages music composition may ameliorate this problem and the use of music composition software, where available, could indeed exploit the allure of popular and electronic music. However, whether children are able to access these technologies in public schools should not determine the extent to which they enact their own musicianship. Elliott (1995) uses the term musicianship to describe musical procedural knowledge that is mediated through verbal and non-

verbal means, and in which formal knowledge (rules, facts, information) and informal knowledge (common sense and best practice strategies acquired through experience) are integrated. He reminds us that “the musicianship of every musical practice is learned through interactions with musically significant “others”” (Elliott 1995, 161), such as teachers, and more indirectly, with past practitioners within the musical domain. Recognising and promoting “children’s agency in their own music making is needed to tap the musicianship that children bring to the school setting” (Barrett 2009, 190). The responsibility for this recognition and promotion resides with the teacher, who must seek to strike a balance between the transferral of an epistemology of explicit musical knowledge and a participatory induction into implicit processes of musical creativity (*ibid*). Composing music is an inherently agentive activity, through which children can access the musical world, because “composition represents a unique form of knowing that both reveals and constructs an understanding of one’s self and others” (Kaschub and Smith 2013, 7). Composition is also experiential and cannot be taught, rather it is done, through a mode of collaborative apprenticeship in which the respective experiences of teacher and student meet in the latter’s zone of proximal development (Barrett and Gromko 2007).

Scaffolding

Collaborative work is more fruitful if the collaborators have differing levels of ability (MacDonald, Miell, and Mitchell 2002), a condition that can easily be satisfied in a teacher/student dyad, which is typical of piano lessons. Elliott points out that “by designing learning situations based on realistic and engaging musical challenges ... music educators develop students’ musicianship appropriately and effectively in situ (or contextually)” (Elliott 1995, 177). Because “musicianship is social and situational” (Elliott 1995, 176), learning to compose (as with any form of learning) is dependent upon the creative affordances of the learning environment. This is particularly manifest in the nature of interaction between student and teacher. Scaffolding is an important aspect of the teacher’s interaction in facilitating composition, and is the mechanism through which creative problems can be identified and potential solutions explored (Wiggins and Medvinsky 2013; Barrett and Gromko 2007). Through careful framing of problems, asking provocative questions, and encouraging students to explore and articulate musical ideas, teachers can scaffold novice composers’ creative endeavours in a way that honours each student’s unique agentive voice (Wiggins and Medvinsky 2013). This approach invites students to bring their own socio-cultural musicalities to the learning context, engages them in self-motivated musical learning that has personal meaning for them, and supports their agency in the creative process (*ibid*).

Assessment

Composition is productive and therefore supports meaningful learning and engagement, and when approached from a play-based stance, the creative process is valued above the creative product

(Hogenes *et al.* 2016). Hence, teachers should avoid making evaluative judgements of children's compositions, because their efforts will initially be rudimentary and may seem musically unsophisticated. In discussing children's drawings, Vygotsky notes that "children do not strive for representation; they are much more symbolists than naturalists and are in no way concerned with complete and exact similarity, desiring only the most superficial indications" (Vygotsky 1978, 112). Similarly, children's early musical compositions are the sonic embodiments of their musical exploration, articulated without attention to the musical conventions (form, texture, balance) to which music teachers' ears are attuned. According to Hickey (2012, 13),

The point is that children's compositions will likely not be recognized as masterpieces, and may not even sound "right" to our conservatory trained ears. But to compose music is as natural as finger painting, and in the beginning stages, at least, teaching this requires no specialized education, but only the capability to offer materials, time, and support.

As Hickey points out, the focus is on enjoyment and learning through exploration. Assessment of children's composition is an area that is debated by music educators and researchers, who argue that a musical composition, being the product of historically and culturally informed subjectivity, is difficult to evaluate objectively. Others argue that children's compositions should not be assessed at all because criticism may erode intrinsic motivation, and that creative activities should allow children to express themselves without censorship (Hickey 2012). There are also conflicting ideas about how teachers should provide feedback to students when engaging in composition activity, and there is a belief that criticism or correction could undermine learner autonomy and cause learners to feel that they are not composing for themselves but for the teacher (Ruthmann 2008). Furthermore, because composition is a deeply personal experience, there is great potential for feedback to have a negative influence on students (Ruthmann 2008). Hickey (2012) offers a solution to this quandary by suggesting that feedback should be positive, rooted in an understanding of the intentions of the composer, suggestions should be appropriate to the composition and the age of the composer, and critique should be specific.

Notation

Musical literacy and notation also need to be considered. Although the value of music composition as a classroom activity is acknowledged, many teachers tend to avoid it, or experience difficulties in including these activities. This is because they view children's limited understanding of staff notation as an obstacle to musical creativity (Koops 2013; Hickey 2012), despite observations that children value notation-based work (Green 2012). There is an assumption among these educators that an understanding of staff notation is essential for musical learning and a prerequisite for composition (Hickey 2012). Furthermore, a prevailing opinion in music education is that the ability to read staff notation is necessary to be considered musically literate (Mills and McPherson 2015). However, an

understanding of staff notation does not constitute musical literacy but is rather one facet of what it means to be musically literate (Philpott 2015).

Musical literacy is a broad concept that includes aural and non-notational musical practices (Dolloff 2009) and encompasses the capacities to make, listen to, and reflect on music (Mills and McPherson 2015), which Elliott terms “musicianship” (Dolloff 2009; Veblen 2009; Elliott 1995). The ability to read and write music, on the other hand, is merely a competency in decoding symbolic representations of sound using a notational system (Elliott 1995). The literal meaning of composing is “to put together”, from the Latin *com* (together) and *ponere* (to put) (Sykes 1976). From this definition, music composition is the organising of sounds and musical ideas, which is commensurate with the definitions articulated by Hogenes (2014a) and Hickey (2012) above. It therefore follows that a musical score written in staff notation is merely a symbolic representation of the music it records, it is not actually the music itself, which is essentially a temporal sonic phenomenon (Gruhn 2009).

Vygotsky describes how children naturally develop written language through first acquiring speech and then using symbols to capture meanings of and between abstract ideas (Vygotsky 1978). Children’s understanding of music notation should be developed in the same way, incrementally and contextually, “as a coding problem to be gradually reduced within the larger process of *musical* problem solving through active music making” (Elliott 1995, 61, italics in original). If approached in this way, children’s mastery of staff notation will arise naturally as they come to need it (Woodward 2009), and it “will emerge in music activities when the musical environment of children shows that music notation is an integral part of this musical environment and is useful in executing these activities” (Hogenes *et al.* 2014b, 153). Acquiring an understanding of staff notation therefore “requires immediate experience of it and the chance to use and experiment with it, finding out what it says and how it works by using it” (Odam 2000, 125). Such an understanding of notation, developed through first-hand experience, will serve not only a codifying function, but will enable children to use “notation for meta-cognitive processes, such as planning, monitoring, and evaluation” (Hogenes *et al.* 2014b, 153), thereby granting children access to notation’s organisational, theoretical, and perspicacious potentials.

Studies have confirmed that not only are children able to compose, but that they enjoy these activities. Furthermore, emergent learner-centred approaches are most satisfying (Hickey 2013). Children who compose know that when they go to school they will make music, experience it, and assume “ownership of both the process and the product of composition” (Gould 2006, 199). Teachers can help students by framing composing tasks as creative problem solving, providing the tools they’ll need, encouraging them to verbalise their composing strategies, and instilling motivation by creating performance opportunities (Bolden 2009). However, teachers admit to lacking confidence in initiating composing activities due to lack of composing experience (Dolloff 2009; Odam 2000). Their

approaches then tend to be teacher-centred (Dogani 2004). Teachers with composing experience can draw on this expertise and are better able to guide the creative process with their students (Bolden 2009). However, music educators are frequently unable to allow sufficient time for musical exploration or free play and in many cases the creative activity is product-oriented (Dogani 2004). Composing activities are more meaningful if the teacher engages with children collaboratively, but this intersubjectivity necessary for meaningful creative musical learning is not evident in most learning contexts (Dogani 2004).

Case studies

There was very little published research on composition in schools twenty years ago (Berkley 2004; Odam 2000). However, there has been a proliferation of case studies and published material in the last two decades, in which composing pedagogy has been investigated from a range of perspectives. Much of this research focuses on one-on-one interaction in tertiary settings, or classroom situations in schools. I have found only one study that documents the teaching of composition in a teacher/pupil dyad with a primary school-age child (Hogenes *et al.* 2014a), but this was done outside the school environment. My interest is the teaching of composition, not as a classroom activity, but rather within school-based piano lessons in South African primary schools, and there is no literature to review that addresses this form of composing activity in this context. For the purposes of this research, 18 studies have been selected that are most closely aligned with my area of focus, which have been divided into two categories, based on the researchers' positionality in terms of their adoption of interventionist or non-interventionist methodologies. These categories have been further organised in terms of research context, according to whether these studies were conducted in primary schools, secondary schools, or both. Although the current study is situated in a primary school, prior research involving interventions in both primary and secondary school contexts have been considered because of their broader relevance to understanding educational interventions across different age groups and learning environments. In addition, insights gleaned from research in secondary school contexts, whether interventionist or non-interventionist, offer comparative perspectives and contribute to an overall understanding of pedagogical strategies and their potential applicability or adaptation in primary school settings.

Several studies in composing pedagogy have focused specifically on the role of technology and computer-assisted modes of music production (Hickey 2013). Although some of this work is considered here, I have intentionally avoided including a comprehensive description of this literature as the current study is situated in one of the government schools in the Eastern Cape, which are typically under-resourced. Many of these schools do not have dedicated music departments or music programmes and those that do are usually not equipped with the technological infrastructure (computers, keyboards, synthesisers, technical support staff) necessary to offer computer-based

composition lessons. In this discussion I have also chosen to exclude studies that were not conducted in schools, except for the single-participant case study conducted by Hogenes and colleagues (Hogenes *et al.* 2014a) mentioned above, which has been included because the intervention used has the potential to facilitate composing in one-on-one piano lessons. Furthermore, two studies not included in this discussion are those conducted by Collins (2005) and Barrett and Gromko (2007), which document the creative strategies adopted by a professional composer and a tertiary level lecturer/student dyad respectively. Although these studies offer valuable insights into the creative process, their objectives and the age of the participants render their inclusion inappropriate for this section, which is aimed at composition in schools. Their respective contributions have therefore been included in the discussions on creativity and critical thinking above.

Non-interventionist studies in secondary schools

Odam (2000) conducted a large, non-interventionist research project in the United Kingdom, in which 26 secondary schools participated over the course of two years. The purpose of this “Creative Dream” (Odam 2000, 110) project was to investigate the ways in which composition is taught and to compile a corpus of strategies that constitute best practice. Through analysis of interviews and questionnaires with teachers and students, it was concluded that teacher attitudes towards teaching composition were significant in determining how successful these lessons would be. Appropriate physical resources, including technological infrastructure, were also found to be important, along with detailed lesson planning and time management. Based on these findings, Odam encourages teachers to optimise the use of time and available materials and “work with rather than against their resources” (Odam 2000, 124). He suggests that time wasted in whole-class and group activities can be better utilised through the careful planning and inclusion of individualised tasks, and that teachers should be more involved in the creative process. Furthermore, he stresses the importance of presenting student work and that this is shared within and beyond the school context.

Berkley (2004) reports on a longitudinal study (from 1997 to 2001) undertaken in the United Kingdom, involving 14 educators and 251 students aged 14 to 16 years, from 11 schools. The purpose of the study was to gain insight into how teachers conceptualise the teaching of composition in the curriculum, through a combination of surveys, interviews, and classroom observations. Berkley confirms that although the national GCSE curriculum specifies learning outcomes, it does not provide a methodology for their attainment. Teachers therefore resort to designing their own curricula, which results in variations in approach. However, common factors were found, including teachers’ creation of a positive, supportive learning environment, their fostering of student autonomy, and the effective management of time and material resources, factors that are aligned with Odam’s (2000) observations. Berkley argues that teachers conceive of composing as creative problem solving, with its attendant divergent and convergent processes and elements of hypothesis and verification (Berkley 2004). A

mode of feedback, or predictive analysis is identified as the method through which teachers provide coaching, offer solutions, and review student work (Berkley 2004). This verbal appraisal is a significant aspect of teacher interaction and serves to affirm students' efforts and scaffold their development.

Another non-interventionist study in secondary school classrooms in the United Kingdom was conducted by Fautley (2005), in which group composing was investigated with the aim of understanding the creative process in this group context. The research design included elements of two familiar theories of creative thinking, namely those proposed by Wallas and Webster, as well as Vygotsky's zone of proximal development. These theories informed the creation of a model for group composing, which was compared to actual group composing activities in a classroom setting. From the findings, Fautley suggests that this model is an effective analytical tool for understanding group composing and affords the teacher and students a shared frame of reference for identifying and discussing the various stages of the creative process, and that the adoption of this model is a useful first step in moving "students along the novice-expert composing continuum from group work towards solo composing" (Fautley 2005, 54).

Bolden's (2009) four-week case study was situated in a Canadian secondary school and sought to understand how one experienced music teacher approached teaching composition to two classes of students who ranged in age from 16 to 19 years. These students worked individually or in groups of two or three on authentic real-world tasks, for instance, the creation of a soundtrack to accompany a short flash animation video, using computers (Bolden 2009). The findings of this study suggest that lesson structure, specifically the provision of a brief, is a crucial factor in student success, and that students learn theoretical music knowledge through discovery while engaged in authentic tasks. Bolden also stresses the importance of the teacher's role as knowledgeable collaborator and argues that students' sense of ownership of their work can be preserved when the teacher frames suggestions as questions or offers multiple solutions to musical problems. Bolden notes that maintaining a balance between the teacher's control and students' creative freedom is necessary for the creation of music that is student-owned and that can, and should, be presented beyond the classroom.

Non-interventionist studies in primary schools

Another investigation, similar to the case study conducted by Bolden, was undertaken in the United States by Ruthmann (2008), in which the researcher as non-participating observer documented one teacher and her class of 16 students, who ranged in age from 10 to 11 years, for a period of 10 weeks. The students were tasked with creating a soundtrack to accompany a scene from *The Lord of the Rings*, using synthesisers and computers that supported digital audio processing software. The purpose of the study was to investigate the role of feedback in teacher-student interaction within the context of this

creative task. Based on the findings, Ruthmann suggests that teacher feedback plays a significant role in composing activities and asserts, like Bolden, that teachers need to maintain a delicate balance between affording creative freedom and imposing restraint. Ruthmann argues that teachers should frame composing tasks within specific parameters, but that these rules should not be so restrictive that children feel excluded from the creative process. In addition, he encourages teachers to elicit and understand children's creative intentions and to offer supportive feedback, inclusive of these intentions, to facilitate their ultimate manifestation.

Major and Cottle (2010) similarly sought to determine the significance of teacher language during composing tasks, specifically with younger children. Eight pairs of children, from six to seven years old, were interviewed at their school in London, following whole-class composition activities using percussion instruments. Based on their findings, the researchers suggest that collaborative engagement occurs within Vygotsky's zone of proximal development and that it is within this space that teachers can scaffold children's learning. They also argue that through questioning and encouraging children to engage in evaluative discourse, teachers can stimulate metacognitive processes like self-reflection and problem solving. This resonates with Berkley's (2004) notion of predictive analysis, a form of child-directed teacher language that is evaluative and promotes critical thinking.

Dogani's (2004) study, also situated in England, aimed to investigate six primary school teachers' understandings of composing pedagogy. Through analysis of interviews and observations of whole-class composing activities, Dogani concludes that many teachers lack composing experience, and therefore confidence in approaching creative music lessons. They tend to frame composing activities as structured tasks in which the teaching of musical concepts and content knowledge are prioritised. Although children are afforded a measure of creative choice, these tasks are generally teacher-directed and there is an emphasis on the creation of an "appropriate outcome" (Dogani 2004, 267). The musical product is therefore of greater value than the creative process, due to curricular imperatives and a focus on assessment. There are, however, cases of exceptional practice, in which teachers afford children the time and freedom to experiment, and who encourage personal engagement in meaningful musical creation. These teachers support students' reflective processes through evaluative questioning and scaffolding, in which we find yet another instantiation of Berkley's predictive analysis (2004).

In Norway, Sætre (2011) conducted research with an objective similar to Odam's (2000) Creative Dream project, although smaller in scale. Sætre documented three primary school music teachers' approaches to teaching composition with their classes, where students ranged in age from 10 to 11 years. Like Odam, Sætre sought to investigate teachers' approaches to composing pedagogy, and similarly determined that teachers tend to interpret the curriculum according to their own educational orientations (Sætre 2011). Task design and mode of teacher-student interaction varied between

teachers, as did assessment. The teachers found the assessment of student compositions challenging and although they all acknowledged the value of formative assessment, the nature of this assessment was different in each of the three cases. Furthermore, it was found that making affordances for student autonomy, agency, and collaboration was crucial in the creation of learning environments that support musical creation. Sætre identifies a gap in the literature and suggests that “descriptive-analytic studies of subject matter and learning tasks may reveal an interesting range of variety” and that such evidence may enable teachers to make “reflective, qualified choices of tasks and methods” for use in their respective teaching contexts (Sætre 2011, 48).

With a similar objective, Gould (2006) conducted a case study in the United States with one primary school music teacher, who was also an active composer, seeking to understand the philosophical tenets of her composing pedagogy. Gould observes that classroom activities usually involve the collaborative creation of songs that are inspired by a non-musical theme currently being taught in another school subject. Song lyrics are elicited from the children’s understanding of the topic, followed by free music-play in which sonic possibilities are explored. Vocal improvisation leads to a democratically constituted melody, which the teacher notates and accompanies on her guitar. Gould notes that through the creation and manipulation of musical ideas, students are encouraged to explore possibilities and make creative decisions, which are divergent and convergent processes, respectively. The teacher’s approach is described as that of a collaborative facilitator, who encourages experimentation and supports students’ creative efforts through scaffolding questions and affirmation. Gould concludes that in such an approach, composition can be understood as an enacted philosophy of experience.

Interventionist studies in primary and secondary schools

Kaschub (1997) reports on a study conducted in the United States, in which composers were paired with groups of students within two music learning contexts. One setting involved a composer working with a high school choir of 85 members, from autumn to spring, to create a song. In the other setting, six groups of sixth grade primary school students worked with a composer throughout the course of one full academic year, where each group was similarly tasked to create a new song. The purpose of this study was to understand the composers’ and students’ approaches to music-creation tasks across these two contexts. Kaschub describes how the initial creation of a text was common to all groups, and that differences in approach emerged when musical ideas were being generated and revised (1997). The high school students tended to respond well to an open-ended approach where the song’s style and form were not predefined by the composer guide, and they were able to transfer prior musical knowledge to their task. On the other hand, the younger students benefitted from having the style and structure in place at the outset, which served as a framework within which they could explore possibilities.

Another study in group composing was conducted by Burnard and Younker (2008) and involved a primary school music class in the United States and a high school class in the United Kingdom. The natures of the composing tasks were in direct opposition to those adopted in Kaschub's (1997) study, in that an open-ended composing task was assigned to the younger students, while the older students were required to arrange an existing piece of music in a new way, which is a semi-structured task. The purpose of the research was to define the characteristics of collaborative musical creation through the application of CHAT to the datasets. Using this theoretical lens, Burnard and Younker found that student choices and collaborative discourse were key factors in driving the creative process, and that student interaction in group composing and arranging can be viewed as differentiated activity systems, which students create and to which they are simultaneously subordinate. They further assert that the application of CHAT provides a "useful framework to make sense of the interrelated elements that characterise interaction in peer collaboration" (Burnard and Younker 2008, 60).

Interventionist studies in primary schools

All the studies discussed thus far have been situated in classrooms, where collaborative composing is done in groups or involves the whole class. MacDonald, Miell, and Mitchell (2002) investigated the nature of children's collaboration and how factors like age and friendship affect these interactions. Their case study, conducted in the United Kingdom, documented the verbal and musical communication that occurred between 20 pairs of girls. 10 of the pairs were made of eight-year-olds, while the other 10 pairs comprised girls of 11 years. In addition, half of the pairs were friends while the other pairs were not. Each pair was tasked with the creation of a piece of keyboard music within 20 minutes, with the starting note (Middle C) being the only stipulation. The quality of the resultant compositions, as determined by a music teacher, and the level of constructive interaction between partners revealed that friendship was an important factor in constructive collaboration, although this effect was less evident with the older age group. The researchers note that older children may have more experience in solving problems collaboratively, which allows them to negotiate their intentions and potential solutions to problems more effectively than younger children. The younger participants' interactions were significantly more fruitful when paired with friends, which suggests that young children need to "establish a way of working together before any productive activity can take place, a feature which seems to come naturally to friends with a history of interactions" (MacDonald, Miell and Mitchell 2002, 160). These scholars argue that when friends are grouped together, they are more easily able to cultivate the intersubjectivity required for collaborative composition. This has implications for education because although the researchers do not make specific reference to Vygotsky's zone of proximal development, it seems reasonable to surmise from this account that friendship, or at least an amicable history of interaction in the case of a teacher, is a prerequisite for children's productive collaborative engagement, which is necessary for the creation of this zone.

In China, Leung (2008) investigated changes in children's motivation to compose. 582 children in five Hong Kong primary schools completed questionnaires before and after a three-month classroom composing task, which resulted in findings that suggest that gender and prior instrumental learning affect children's motivation to compose music. Leung found that motivation to compose increased in boys and non-instrumentalists after completing the composing task, while there was a slight decrease in motivation among girls and instrumentalists. He ascribes these changes to cultural factors and observes that in Hong Kong schools, music is socially regarded as a subject studied by girls, while boys tend to favour the sciences and sporting activities. Leung notes that because of this social bias, girls were highly motivated prior to the composing task, while boys were not. He speculates that composing led to an increase in motivation in boys because their notions of self-efficacy were positively altered by engaging in this previously unfamiliar activity. Similarly, non-instrumentalists were initially less motivated to compose than their instrumentalist counterparts because of their socially imposed self-identities as non-musicians, but these perceptions changed once they experienced agency in this new domain. Leung suggests that teachers should design differentiated composing tasks that appropriately challenge students of varying levels of competence. He also stresses the importance of teachers' active involvement in the creative process and argues that students' notions of ownership of their work can be fostered through this creative negotiation.

Differentiating tasks within a classroom context and its attendant time limitations is a challenge for music teachers, as Miller (2004) points out in her research conducted in a primary school in the United States. In this study, Miller was both the teacher and researcher, seeking to understand how best to approach composing with classes of very active children. She acknowledges a constructivist orientation in her teaching practice and argues that "students need to actively manipulate music elements in order to understand the whole of music" (Miller 2004, 60). Miller asserts that whole-class composition can be approached by guiding students through a series of structured activities that are attuned to children's cognitive development, and that this attunement need not be narrow or restrictive if children are allowed to participate at a level that is appropriate for them. In addition, grouping children into pairs or groups of three allows children of similar ability to work together. According to Miller, it is this flexibility that allows her to differentiate tasks to include children of varying abilities and accommodate their contributions. This implies that composing tasks, although structured, need not be prescriptive and might be better conceived as frameworks within which children can explore and manipulate musical ideas.

Bosch (2008) asserts that composition is not a rare talent, nor is it a pursuit reserved exclusively for a select few. In her research in teaching composition in primary school music classes in the United States, she observes that composition is a skill that can be learnt by everyone. Like Miller (2004), Bosch fulfilled dual roles as both researcher and teacher, and was herself a practising composer, a fact that

was acknowledged as a factor that motivated and facilitated her teaching of composition to classes of children. The aim of this research was to describe her approach to teaching composition and to present her notation-based method, in the form of a student workbook. Bosch asserts that children's manipulation of notes is important to their understanding of music, and that working with pitches is more advantageous than using non-pitched sounds. The workbook presented guides individual students in grouping beats into rhythms and then assigning pitches to create melodies, and later, harmonies. Through this carefully structured method, concepts are thus introduced incrementally, and tasks become increasingly complex as the student progresses through the workbook.

The significance of task structure was investigated by Smith (2008), who, like Bosch (2008), was also both teacher and researcher. Her study was conducted with 12 recorder students in a primary school in the United States, each of whom worked individually to complete six composing tasks in which the parameters imposed ranged from unstructured tasks (creating a piece without parameters), to restrictive activities (setting a poem to music). Smith found that restrictive tasks yielded outcomes of greater musicality than less structured tasks, as judged by a panel of experts, and that the children had mixed preferences when asked which tasks they liked best and least. Even though several participants viewed the poem-setting task as difficult, the resultant compositions were frequently regarded as favourites among the six works produced. From this, Smith deduces that the use of text as a stimulus, while not always favourably received, may be a good starting point for young composers as a means of developing their confidence. Furthermore, she encourages music teachers to balance structured tasks with unstructured ones, and to afford students agency in exercising their preferences.

A quasi-experimental study was conducted in a primary school in the Netherlands in the 2010-2011 academic year, which aimed to determine the effects of classroom composing on engagement and achievement in music and other school subjects (Hogenes *et al.* 2016). The study was conducted over the course of six months, in which the control group's lessons featured teacher-centred activities like singing and playing music written by composers, while the experimental group's focus was on composing new music through collaborative interaction. The control and experimental interventions thus differed in their emphasis on music reproduction or production, respectively. The researchers found that although both interventions produced positive musical engagement, this effect was greater in the experimental group. Furthermore, it was found that the students receiving the experimental composition-based lessons fared better academically than those receiving the control intervention, specifically in terms of reading comprehension. However, the aspect of this study that is of greatest significance to the current research is the nature of the experimental intervention used, which is based on CHAT and thus derived from Vygotsky's socio-cultural theory of cognitive development.

In a follow-up study (Hogenes *et al.* 2014a), this CHAT-based model was used in an intervention with a single participant, a 10-year-old girl, who attended 10 composition lessons in which she composed pieces for voice, percussion instruments, and recorder, in addition to using computer software to create digitally synthesised music. The purpose of this single-subject case study was to examine the guided composition process in greater detail than was possible in the previous class-based study. Hogenes and colleagues found that not only was the participant able to engage in composing activities, but her compositions were more complex than those created in the prior classroom study (Hogenes *et al.* 2016), which they attributed to the individualised guidance afforded to the single participant. They suggest that this one-on-one guidance allowed the teacher to effectively stimulate and support the participant's creative endeavours and it allowed the participant to assume a more autonomous role as composer than may have been possible in a classroom situation. In reporting on this case study, the authors discuss their CHAT-based model for teaching composition in greater detail and define its three steps as "(1) creation of a common basis in order to start the process of music composition; (2) creating ideas and writing the composition ...; and (3) presentation and publication or recording" (Hogenes *et al.* 2014a, 2). Furthermore, they stress the importance of adopting a play-based approach to teaching composition through affording children degrees of creative freedom, and allowing them to engage in musical creation in their own way, essentially manipulating the rules of the activity.

Themes

Although these case studies were undertaken with different objectives and methodologies, several themes emerge regarding important factors at play in teaching composition. The most cited aspect of successful composing pedagogy is collaboration. Peer collaboration has been shown to be a useful classroom strategy (Burnard and Younker 2008; Miller 2004; MacDonald, Miell, and Mitchell 2002), although a greater emphasis has been ascribed to collaborative interaction between teachers and students (Hogenes *et al.* 2016, 2014a; Sætre 2011; Leung 2008; Gould 2006; Dogani 2004; Odam 2000). As previously noted, collaboration occurs within the boundaries of a shared intersubjectivity, which allows for the creation of a student's zone of proximal development, and in which the teacher is able to scaffold and guide their learning (Hogenes *et al.* 2014a; Major and Cottle 2010; Fautley 2005). Notions of student ownership of compositions and autonomy in their creation are also viewed as crucial to successful composition teaching because this creates musical learning that has personal meaning to students (Hogenes *et al.* 2014a; Sætre 2011; Bolden 2008; Leung 2008; Ruthmann 2008; Smith 2008; Gould 2006; Berkley 2004). Pupil autonomy is also conducive to play, and by engaging students in creative activities that students enjoy and affording them a measure of control over the rules of activity, teachers are able to adopt a play-based approach to composition lessons (Hogenes *et al.* 2014a; Burnard and Younker 2008; Gould 2006; Berkley 2004).

Several of the studies reviewed stress the importance of task design. Kaschub (1997) suggests that younger students benefit from more structured tasks, while other researchers encourage teachers to design activities that strike a balance between creative freedom and restraint (Hogenes *et al.* 2014a; Bolden 2009; Ruthmann 2008; Smith 2008; Gould 2006; Dogani 2004; Miller 2004), and that are appropriate and meaningful to students of differing abilities and ages (Leung 2008; Miller 2004). With regards to teacher training, there is an acknowledged lack of compositional competencies and composing experience, which leads many teachers to feel apprehensive when tasked with teaching music through creative activity in their classrooms (Berkley 2004; Dogani 2004; Odam 2000).

The role and nature of teacher feedback is discussed in varying forms, although the traits of efficacious feedback common to most descriptions involve the teacher's use of supportive commentary that is constructive instead of critical, prompting self-reflection through questioning, and offering multiple potential solutions to problems (Hogenes *et al.* 2014a; Major and Cottle 2010; Ruthmann 2008; Gould 2006; Berkley 2004; Dogani 2004). The framing of composing problems is another important aspect of teacher interaction, particularly when this problem-posing is used to encourage both divergent and convergent thinking processes (Bolden 2009; Ruthmann 2008; Gould 2006; Fautley 2005; Berkley 2004). Teachers are also encouraged to create opportunities for their students to present their compositions beyond the classroom (Hogenes *et al.* 2014a; Bolden 2009; Odam 2000), which constitutes the third component of a three-step teaching model that has been used in classrooms (Hogenes *et al.* 2016) and in individual composition lessons with a single participant (Hogenes *et al.* 2014a). This model is based on the principles of CHAT, which has been used as a framework, both theoretically and analytically, in composing pedagogy studies (Hogenes *et al.* 2016, 2014a; Burnard and Younker 2008).

Arts-based education research

Research that encompasses the arts and education has increased in recent years and while it was once relegated to the fringes of academic significance, new perceptions of knowledge and knowledge production have legitimised the field (Hawkins and Wilson 2017; De Oliveira and Charreu 2016). Academic institutions have historically favoured research that adopts the objective scientific method over the subjective forms of inquiry that characterise research in the humanities, but universities are increasingly recognising the validity of alternative research paradigms due to shifting appreciations of what constitutes “*good* research” (Hawkins and Wilson 2017, 84, italics in original). Arts-based education research is a broad, transdisciplinary field of study that challenges established methodologies because researchers are frequently faced with the limitations of existing frameworks and as such a proliferation of methodologies have emerged as researchers seek pathways appropriate to their specific investigations (Riis and Groth 2020; De Oliveira and Charreu 2016).

Biggs and Büchler (2010) note that when arts researchers are also practitioners, dissatisfaction emerges between these practitioner-researchers and the academic community. One of the factors contributing to this dissatisfaction is differences in the value ascribed to lived experience. For proponents of the scientific model, where questions are formulated and empirically answered, subjectivity emerging from personal experience is something to be controlled, while practitioner-researchers in the arts view this subjectivity as more meaningful, and as something that should be enhanced. Another source of tension involves research models. Academia has a long tradition of posing questions and using established domain-specific methodologies to systematically find answers that are generalisable. In seeking appropriate methodologies, practitioner-researchers in the creative community “transit between the creative practice community values and the academically valid models of research” (Biggs and Büchler 2010, 97). In addition, they are motivated by the desire to understand context-specific processes more than the pursuit of generalisable answers. This emphasis on subjective experience precludes prescriptive routes for practitioner-researchers to follow, so they adopt community-bridging strategies, in which they make methodological compromises or propose new methods to render articulations of value-laden creative processes academically valid (Biggs and Büchler 2010).

As Riis and Groth point out, “the *informed practitioner* is the best person to analyse the practice under investigation, as an outsider would not have the same ability to detect what is important to that practice” (Riis and Groth 2020, 5, italics in original). As a teacher, composer, and researcher, I am aptly qualified to investigate the inclusion of composing in piano lessons in the context of an Eastern Cape primary school. Practitioner-research has increasingly involved the third, educational, component since the 1990s, and when these three roles are embodied in the same individual, these new practitioners are able to “contribute to a more robust, self-confident, and dialogue-oriented field of practice and inquiry” (Dunin-Woyseth and Nilsson 2014, 13). This is due to their assumption of multiple perspectives. Practitioner-research is a mode of inquiry in which practitioners draw on their unique and specialised personal knowledge of their respective practices and undertake research in which hunches are explicated and critically examined (Riis and Groth 2020; Hawkins and Wilson 2017). Subjective insights are rendered transparent through the use of a theoretical perspective that allows these contextualised understandings to transcend a specific practice and “contribute to generalisable knowledge for others” (Riis and Groth 2020, 18).

Conclusion

In this chapter, creativity, critical thinking, and collaboration were identified as the key competencies to be developed in students to equip them for a 21st-century world. Vygotsky’s socio-cultural theory of development proposes that the zone of proximal development is a site of rich learning potentials and that the cultivation of this zone is an important facet of the teacher’s role. The theory suggests that

collaborative interaction within children's zones of proximal development can facilitate learning, and when play-based methods are used, students' learning is not only supported, but deep connections to this learning are forged. These claims are supported by studies conducted in the field of social neuroscience, in which collaborative learning has been found to engage the interconnected MNS and MENT systems, which is necessary for cultivating intersubjectivity between participants and recruiting the mesolimbic dopamine reward system. Fostering this agentic equity through collaborative learning can be achieved by adopting play-based approaches in which children are afforded a measure of control over the rules of the activity in which they are engaged. Furthermore, it is this emphasis on student agency within intersubjective learning episodes that contributes to the cultivation of agentic learning ecologies. In terms of music education, these agentic ecologies are characterised by students' enacted creativity, specifically through composition, in which music educators scaffold and support the creative process and provide evaluative feedback that prompts critical thinking and self-reflection. Being sensitive to children's ever-evolving musical identities and assuming a charitable stance of ethical idealisation are strategies that are crucial to teachers in their attempts to create learning environments that promote exploratory induction into the musical world. Studies conducted in the Netherlands confirmed that children can be taught to compose in classroom and single-participant settings using a play-based teaching model that is aligned with CHAT (Hogenes *et al.* 2016, 2014a). This theoretical framework is elaborated in the following chapter, with specific reference to how it relates to meaningful musical learning and the context of this research. As a practitioner-researcher working within this context, it was important to understand how researchers in the field of arts education negotiate the tensions between the scientific and creative spheres, which stem from differences in the value ascribed to either scientific objectivity or the subjectivity of contextual experience. Prior research in arts education shows that this tension can be resolved through the assumption of multiple perspectives, in which subjective insights are objectively examined (Dunin-Woyseth and Nilsson 2014). This has methodological implications, which will be elaborated in Chapter 4.

CHAPTER 3

THEORETICAL FRAMEWORK

Introduction

The origins of Cultural-Historical Activity Theory (CHAT) are rooted in revolutionary Russia, in the work done between the 1920s and 1930s by Soviet-Russian psychologists Vygotsky, Luria, and Leont'ev, and later expanded beyond Russia's borders by others in fields such as educational psychology and philosophy after the second world war (Sannino and Engeström 2018). More recently, scholars have identified a need to adopt CHAT to gain a deeper understanding of professional practices, with the aim of improving and reshaping them, including a diverse array of fields such as social work, education, health care, public policy development, and in government agencies aimed at service delivery (Sannino and Engeström 2018; Foot 2014). In broad terms, CHAT can be defined as “a practice-oriented theoretical framework that focuses on tool-mediated actions by collective actors as well as socioeconomic relations within and between institutional contexts over time” (Foot 2014, 344).

In understanding CHAT, it is useful to consider the significance of each word represented in this acronym. Cultural refers to the values, practices, beliefs, and goals shared by members of a group, population, or institution; and “an essential function of culture is to control diversity within a community in order to maintain identities (at a communal and personal level) in the present and in the future” (Van Oers 2012, 138). Humans experience the world as beings intrinsically embedded in socio-cultural contexts (Stetsenko and Arieviditch 2004), and they are enculturated into the values and practices that ultimately influence their actions (Foot 2014). Van Oers (2012, 138-139) defines culture as,

... a family of historically developed expectations in the members of a community concerning acceptable varieties of acting in their community. These expectations are controlled, transmitted, maintained, and changed with the help of the shared cultural tools within the context of cultural practices.

This definition emphasises the enactive potential of culture. It is not an established construct, but rather a system of interactive processes. Historical refers to the “historicity” (Engeström and Sannino 2021; Sannino and Engeström 2018; Foot 2014) of both individuals and the contexts within which they are situated. Human activity is always historically informed, and “layers of historically earlier forms of ... activity can be both constraints and resources. They persist in routine actions, in ways of thinking, in material artefacts and in rules” (Engeström and Sannino 2021, 7). Current actions are therefore influenced by past actions, whether this influence is consciously perceived or not. Cultural-historical is hyphenated, which emphasises their interrelatedness in that “cultures are grounded in histories and evolve over time” (Foot 2014, 330), and the nature of individuals' actions are not fixed, but change in line with paradigm shifts that are socially, culturally, and economically mediated (Sannino and

Engeström 2018). Activity is a problematic term because CHAT was initially conceived and proposed in Russian and German, in which the word activity encompasses a great deal more than it does in English (Foot 2014). To understand activity as it appears in CHAT, one must consider not only the actions of the individual, but also those of a collective. It is a term that describes a multi-faceted process of action and interaction that “involves people operating jointly in a persistent system of relations with other people and institutions as well as with the natural world” (Foot 2014, 333).

Four generations of CHAT

The three fundamental tenets of CHAT are based on Vygotsky’s ideas regarding human action, the first being that individuals learn and communicate through collective actions. The second is that humans create, use, and adapt material and conceptual tools in these activities and third, humans interpret meaning through social processes (Foot 2014). The evolution of CHAT can be understood in terms of its development of four successive “generations of theorising and research” (Engeström and Sannino 2021, 5), in which each generation was concerned with the development of a specific unit of analysis, which became increasingly broader. The first-generation unit of analysis involves three components: subject, object, and tools, and is focused on culturally and socially mediated activity, as proposed by Vygotsky, where subjects engage in tool-mediated activity that is directed at a shared object to achieve a mutually desired outcome (Engeström and Sannino 2021; Foot 2014), as depicted in Figure 1.

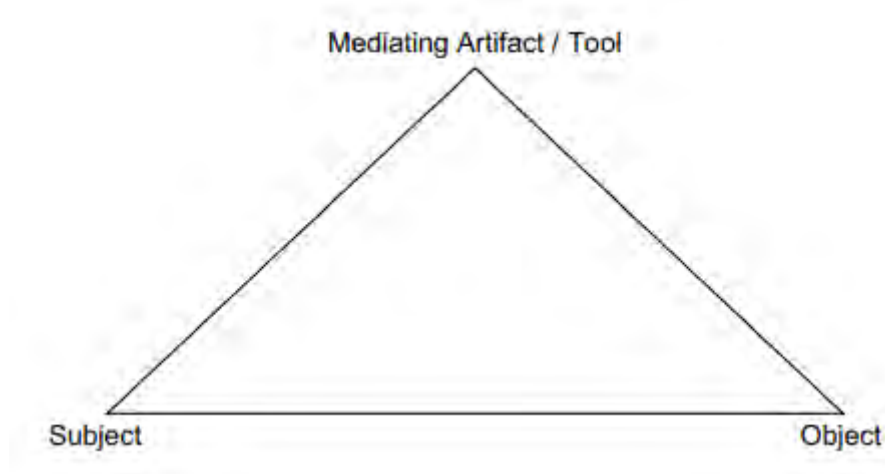


Figure 1. Vygotsky's mediated action triangle (Yamagata-Lynch and Haudenschild 2009, 508).

Subjects are the actors who engage in activity and who bring with them their personal histories and cultural affiliations, whether consciously or not, which affects the nature of their actions (Foot 2014; Van Oers 2012). Mediating artefacts, or tools, are likewise shaped by the histories of their development and use within the cultural practices in which they are employed. Foot (2014) gives us an example of this cultural-historical dimension in describing how a shovel’s design is optimised to assist workers in their task of shovelling soil, and that if it is culturally appropriate, at that time, for men to perform this

work, then the “length of shovel handles will correspond to the average height of adult males in that culture, and the design of shovel blades will, over time, be optimized for that work” (Foot 2014, 331). The object of an activity gives that activity direction (Engeström and Sannino 2021) and is simultaneously a motive for action and a desired outcome (Foot 2014). Activity within a piano lesson may be interpreted using this framework, in which the teacher and pupil are subjects engaged in activities that are oriented towards the shared object, which in this case is developing the pupil’s mastery of the instrument, using tools that are both material (piano, pencil, books) and symbolic (staff notation).

In this scenario, the teacher and pupil are both subjects engaged in the activities typical of a piano lesson, for example, approaching a new piece of repertoire. The music is codified in the form of staff notation, a symbolic tool, and the pupil is guided in deciphering the printed score and reproducing its tones on the piano, which is a material tool. Both tools are products of their respective histories within the cultures in which they were conceived, utilised and adapted. In addition, both the teacher and pupil are subject to the influences of their respective histories within the boundaries of the piano teaching tradition, which can be understood to be a culture unto itself in terms of the definition offered by Van Oers (2012) above. As such, each subject’s actions are influenced by their past actions within this episode of cultural enactment. For example, the teacher may recognise the pupil’s apprehension when attempting to read a sequence of notes in the bass clef, having observed similar responses to this sort of task in other pupils. Drawing on this prior experience, the teacher adopts an approach to the problem that may have been successful before. Similarly, the pupil may draw upon prior experience within this domain and feign an attitude of being utterly perplexed, knowing that the teacher will likely respond by demonstrating the passage instead of insisting that it be painstakingly deciphered. These tool-mediated actions are socially negotiated through dialogue and non-verbal means and contribute to the broader activity in which both subjects are engaged, namely the learning of a new piece of music, which is itself aligned with the mutually shared object of developing the pupil’s proficiency on the piano.

The second generation of CHAT takes as its unit of analysis a broader activity system, with the addition of three components: community of significant others, rules, and division of labour (Engeström and Sannino 2021, 2010; Foot 2014), as depicted in Figure 2.

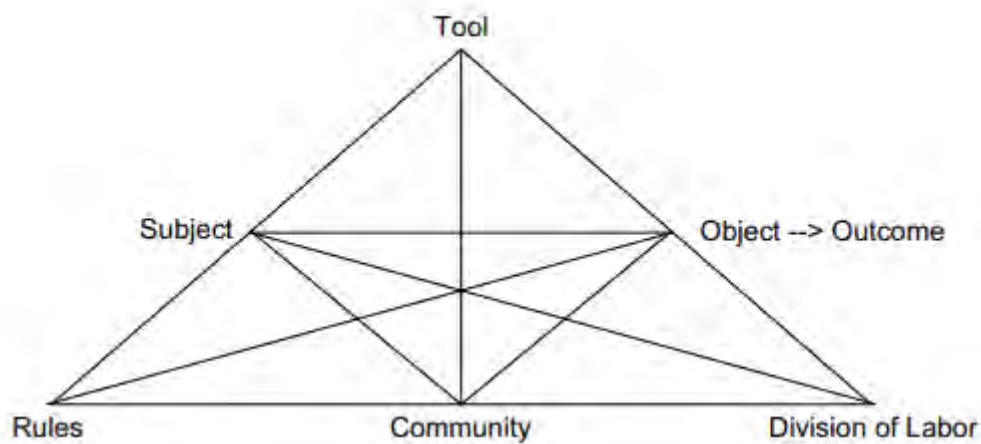


Figure 2. Model of an activity system (Yamagata-Lynch and Haudenschild 2009, 508).

In this expanded framework, the community of significant others represents individuals or groups who are directly and/or indirectly involved in activities that are oriented towards a shared object. The rules, which are determined by this community and the activity system’s “broader cultural, economic, and political context” (Foot 2014, 332), govern the subjects’ actions and regulate their use of mediating tools and their interactions with each other. Division of labour refers to both the horizontal allocation of object-directed tasks, and the vertical hierarchy of power, status, and access to resources (Engeström and Sannino 2021, 2010; Sannino and Engeström 2018; Foot 2014; Yamagata-Lynch and Haudenschild 2009). The precise nature of the object in an activity system is inherently ambiguous and often difficult for participants to define. This is due to their differing subjective perspectives of the shared object, which are culturally and historically informed, and their differentiated roles within the activity system itself (Engeström and Sannino 2021, 2010; Sannino and Engeström 2018; Foot 2014). The system’s object is therefore “an invitation to interpretation, personal sense making, and societal transformation” (Engeström and Sannino 2010, 6).

In the context of a piano lesson, the object is perceived differently by the two actors. For the teacher, the object may be to advance the pupil’s musical knowledge and technical skill on the instrument with the aim of producing a young performer who will also be an asset to the school’s music programme. The pupil, however, may view the object differently, and may wish to learn to play the piano to appease her parents. In this scenario, the subjects’ activities are oriented toward a shared object, but their motives are quite different, being shaped by their respective culturally and historically informed roles and perspectives. In seeking to understand these multi-voiced systems, it is important for analysts to assume two perspectives, alternating between a “systems view and a subject view” (Engeström and Sannino 2010, 6). This leads to a grasp of the general object and “the specific object as it appears to a particular subject, at a given moment, in a given action” (Sannino and Engeström 2018, 45). Analysis of activity

systems is centred around examining the tensions, or “contradictions” (Engeström and Sannino 2010, 7) that arise between nodes, in which there is a breakdown in functionality or coordination in the system’s operations. These contradictions represent areas of development and can be viewed as the points “in an activity system from which innovations emerge” (Foot 2014, 337). Contradictions can therefore be considered the windows through which analysts are able to gain access to an activity system’s zone of proximal development (Engeström and Sannino 2010), which in the context of CHAT analysis is interpreted as “an activity system’s present and foreseeable future” (Foot 2014, 337). Contradictions and their resolutions constitute the system’s cycles of “expansive learning” (Engeström and Sannino 2010, 7), through which the system evolves over time through successive learning actions undertaken by the system’s actors (Foot 2014). When subjects are aware of their actions’ historicity, they are afforded the “transformative agency” (Engeström and Sannino 2021, 5) necessary to effect change through modifying their actions and thereby overcoming emergent contradictions.

In the primary school context, the piano lesson takes place within a larger activity system, in which the principal, staff, learners, and parents constitute the community of significant others, whose actions are regulated by culturally and historically influenced rules that are both implicit (normative conventions of behaviour) and explicit (timetables, policies). Division of labour can be interpreted, horizontally, as the ways in which each of these stakeholders, or subjects, have designated roles that determine their tasks, while in a vertical sense, each subject is afforded power, status, and access to resources according to the school’s hierarchy. In this expanded context, the object of the activity system is not centred on piano tuition, but rather learning in a broader sense, which includes successful delivery of the national curriculum as well as extracurriculars such as sporting and cultural pursuits, of which the piano lesson is only a small part.

In second-generation CHAT, the prime unit of analysis is the activity system, but in the current study, the focus is on tool-mediated activity between teacher and pupil in piano lessons, a first-generation construct, and how this activity can be expanded to include a productive element not typically associated with this form of activity. However, the other components of the broader activity system (the school) do indeed affect these interactions. For example, the length of the lesson (rule) and the skills to be assessed for reporting purposes via the child’s music report (tool) are regulated by the school’s management structure (community), which occupies an elevated hierarchical position with the power to define these rules and tools (division of labour). The first-generation mediated activity depicted in Figure 1, which is the focal point of this research, is therefore nonetheless influenced by the activity system within which it occurs (Figure 2), so these factors cannot be disregarded.

The third and fourth generations of CHAT’s evolution involve analyses of domains that are beyond the purview of this study, so they will be briefly outlined here. Third-generation CHAT takes as its unit of

analysis a “constellation of two or more activity systems that have a partially shared object” (Engeström and Sannino 2021, 5), for example, multiple schools within a school district, or multiple educational institutions within a province. The focus here is on the boundary-crossing interactions between subjects of interrelated activity systems with the purpose of resolving the contradictions between them and to mediate these systems’ expansive learning cycles (Engeström and Sannino 2021; Yamagata-Lynch and Haudenschild 2009). More recently, fourth-generation CHAT has evolved to deal with large-scale societal issues like homelessness and climate change, where third-generation analysis of multiple activity systems is insufficient. In fourth-generation CHAT studies, the focus is on “the multiple coalescing cycles of expansive learning involved within and across the activities involved, their relatively independent dynamics and their interdependency” (Engeström and Sannino 2021, 15). Interventionist strategies on this scale require “a radical expansion of social relations”, in which collaboration between actors occurs between local, national, and global coalitions (Engeström and Sannino 2021, 19).

As previously noted, this study is situated in the context of piano lessons and is focused on the interactions between teacher and pupil, not an analysis of the broader activity system. First-generation CHAT, being centred on mediated action, is therefore the theoretical framework for this study, with additional elements introduced in the form of second-generation nodes (represented in Figure 2). However, it is not my intention to provide an analysis of these mediated actions or the activity system, but rather to use the components of this theory as a conceptual framework, through which to interpret and understand the nature of learning interactions between teacher and pupil, as they interact with an introduced intervention using domain-specific tools. The externally imposed intervention satisfies a research agenda and might not be readily accommodated within the established activity parameters of piano lessons in this context. CHAT, with its emphasis on contextual factors, makes possible an examination of how the intervention functions within this learning environment and allows for the identification and resolution of potential contradictions that may emerge during enactment.

Composition as imitative participation

Van Oers (2012) argues that a CHAT-based approach to learning can grant children access to a “culture’s collective memory, mastery of communicative means, and prevent alienation” (Van Oers 2012, 136). This is achieved through what he calls imitative participation, in which children are afforded agentive roles in the enactment of cultural processes (Van Oers 2012). He explains that children’s development depends upon,

... the appropriation of cultural tools (particularly languages) in collaboration with more knowledgeable others (adults or peers). This appropriation is a process of apprenticeship and guided participation in cultural practices in which participants try to figure out through dialogues (communication and mutual coordination) ... how to accomplish their roles in that particular

practice, with the help of the available tools, rules, and meanings, or with the help of newly constructed tools, rules, and meanings (Van Oers 2012, 139-140).

This passage emphasises the importance of agency in children's learning, an attribute that is typically lacking in traditional schooling, which focuses on transmitting domain-specific knowledge without considering what this knowledge means to the learners (Van Oers 2012). Van Oers makes a distinction between meaning and sense and argues that meaning refers to the codified knowledge and skills that have general cultural value, while sense refers to the personal meaning an object or concept has for the individual. He argues that in terms of Vygotsky's cultural-historical theory of cognitive development, meaningful learning "integrates both meaning and sense, [that] ... produces learning outcomes with general cultural significance and that makes personal sense for the learner as well" (Van Oers 2012, 141). From this perspective, meaning encompasses the information and skills to be learnt (content knowledge), while sense is the personal value that the learning has for the student.

Vygotsky believed that learning begins with pupils' activity and is predicated on their actions, and that through imitative activity, guided by adults, children can accomplish more than they would have without this guidance (Vygotsky 1978). In this context, imitation does not refer to the copying of an activity, but rather its collaborative reconstruction "within the boundaries allowed by the social environment that is in charge of controlling the acceptable variations within the socially shared definition of that practice" (Van Oers 2012, 143). This social environment, in the case of piano lessons, is constituted by the teacher and the pupil, and it is through the teacher, as a crucial component of this environment, that ideal forms of activity are modelled (Van Oers 2012). The child's zone of proximal development can be constructed through "imitative participation in cultural practices" (Van Oers 2012, 145), which in the context of this research is music composition, where the creative activity "challenges their current understanding, but is within reach of their understanding" (Hogenes *et al.* 2016, 34).

As previously discussed, a play-based approach allows the child to experiment with and appropriate tools, and manipulate the rules of their activity, and it is through playful, imitative participation in this cultural practice that the teacher can introduce content knowledge (meaning) that makes personal sense to the child because of their agentive and intrinsically motivated involvement. This apperception of musical content knowledge occurs in a realm that prevents alienation because children are allowed to "apply and evaluate their available knowledge and skills, however diverse these might be as a result of varying cultural backgrounds" (Van Oers 2012, 143). Children's musical identities can therefore be allowed to develop without self-concepts being imposed by the teacher. This transcends cultural lines and the pupil's own conscious and/or unconscious cultural imperatives can be brought into the learning context and acknowledged, however different they may be from those of their teacher.

Conclusion

In this chapter, the development of CHAT has been described in terms of its evolving prime unit of analysis, from Vygotsky's initially proposed model of mediated action in the first generation, to the expansive learning cycles described by Engeström and Sannino (2021), in which fourth-generation CHAT practitioners address issues with global implications. This study draws on the first two generations for its theoretical framework on two levels. The first pertains to the activity itself, in which composing in piano lessons is conceived as collaborative, tool-mediated action towards a shared goal, or object. This within-lesson perspective is aligned with the principles of first-generation CHAT and designates both the teacher and pupil as agentic actors who appropriate and employ culturally and historically defined tools in their actions. The second perspective views this activity paradigm as one that is embedded in a larger activity system, the school, in which interrelated components, such as rules and the hierarchical community that constitute the activity system, influence these subjects' actions, as contemplated in second-generation CHAT. An intervention that is implemented in piano lessons will undoubtedly influence these lessons and it is anticipated that contextual factors will reciprocally influence the intervention's enactment. CHAT offers a means of attending to and understanding the dynamics involved between the introduction of an exogenous composing intervention and the endogenous contextual parameters of the learning environment in which it is implemented, and it is through identifying and resolving the contradictions between intervention and context that true integration can be achieved. This has methodological implications, which are discussed in the following chapter, along with a detailed description of DBR, which was selected as an appropriate methodological approach in this research.

CHAPTER 4

METHODOLOGY

Introduction

Qualitative research in education is frequently situated in authentic contexts, meaning that studies are conducted in real classroom settings, which are unique because each is composed of the setting's institutional conventions, environmental affordances and constraints, and the individuals who inhabit them (Taylor *et al.* 2016; Kennedy-Clark 2013). Research in these settings is therefore methodologically adaptive in order to successfully address the researchers' imperatives (Mason 2002). This study was conducted in such a context and therefore required the selection of a methodological approach that was sensitive to these real-world conditions, appropriate in terms of practical application, and which adequately addressed my overarching research question and the subordinate goals that were established. The research design involved a longitudinal interventionist qualitative study, in which DBR was selected as an approach due to its flexibility and adaptability (Goff and Getenet 2017; Kennedy-Clark 2013). This chapter describes the research context in which this study was conducted, elaborates the research question and goals that drove the investigation, explains how DBR was chosen as a methodology, and describes the affordances and constituent elements of this approach. One important aspect of DBR, through which claims of trustworthiness can be made, is that the researcher's thinking must be made visible, to help others understand the reasons for the researcher's decisions and to make the research process transparent (Reimann 2011; Hoadley 2004; Cobb *et al.* 2003; The Design-Based Research Collective 2003). In the interests of such transparency this chapter will document my methodological decisions and the principles that informed the design of the first incarnation of the intervention. Details related to participant selection, data collection, and analysis methods used will be discussed in the following chapter, while descriptions of enactment will be discussed in greater detail in Chapters 6, 7, and 8. Unlike studies in which a single episode of fieldwork is analysed retrospectively, this study was conducted in three successive cycles. This is because DBR is iterative and is concerned with intervention interaction in real time in authentic contexts. The actions and thoughts of the researcher, which change over time, must also be faithfully recorded along this timeline (Tabak 2004). To present these iterative cycles faithfully, with their concomitant contextual information and my contemporaneous perspectives as teacher and researcher, these cycles will therefore be described comprehensively in their respective chapters in terms of enactment, analysis, and findings.

Research question and goals

As previously discussed, there is a tendency for practitioner-researchers in the creative sphere to seek an understanding of discipline-specific processes rather than find objective answers to domain-specific questions. However, this study intends to do both. Narrowing the focus to one specific teaching context

allowed for targeted theorising about composing in piano lessons, as opposed to broadly thinking about composition pedagogy in general, which is a vast and multifaceted field. Intentionally limiting the study to one group of learners in my own teaching practice prompted me to theorise about the practicalities of a productive approach to musical learning, which drove the development of an overarching question that interrogates the nature and feasibility of the creative process in this context. The main research question that drove this study is:

How can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape?

To answer this question, six interrelated goals were developed, which address the key areas of interest. The first goal was to design an intervention that successfully integrates compositional activity with traditional piano teaching methods. Composing is not a typical feature of piano lessons in government schools in the Eastern Cape, where the focus is teaching children to play music written by others. This reproductive approach satisfies the school's expectations of piano tuition, as manifest in the music report, and therefore needed to be retained in this study. The inclusion of composition within this established teaching model required the design and enactment of an intervention that introduces creative activities without displacing institutionally mandated lesson elements.

The second goal was to establish whether Hogenes' three-step model for teaching composition is effective in piano lessons in a primary school in the Eastern Cape. This model was developed in the Netherlands and used in studies in classroom and single-participant situations. I wanted to determine whether this European model was appropriate for use in a government school in the Eastern Cape, in South Africa. Furthermore, Hogenes' model was developed for teaching composition in music lessons in which music creation was the primary focus, but the intervention for this study was designed as an additional lesson component, not intended to replace existing lesson elements. It was therefore necessary to gauge the model's efficacy within this limited scope.

The third goal was to determine whether composition, as an instructional activity on the piano, can contribute to children's opinions about the piano and music literacy. It is my experience that the piano is often not a parent's first choice when enrolling their daughter into a school's music programme, which is hardly surprising when one considers that few parents in the Eastern Cape have themselves received piano tuition and even fewer possess this costly instrument. I have also seen that, of those children who do start taking lessons, a significant percentage discontinue within the first few years of study. This is largely due to a lack of intrinsic motivation and these pupils, justifiably, do not see the point of the practising required of them. As previously discussed, children's musical identities are not immutable constructs. Rather, they are processes of socially mediated enactment that are constantly evolving. If

this is the case, then the piano, if utilised as the site of this enactment, could become more personally meaningful and play a more central role in children's musical identities.

The fourth goal was to determine whether the integration of music composition into piano lessons can facilitate musical learning and render these lessons intrinsically meaningful to the students, as suggested by CHAT. As Van Oers (2012) points out, meaningful learning is dependent upon the content knowledge being taught having personal value to the learner. From the perspective of first-generation CHAT, activity within lessons can be understood as the collective actions undertaken by teacher and pupil, using material and symbolic tools, towards a common object. By framing this activity as play-based collaboration in a creative process, where the pupil is afforded a measure of control over the rules of the activity, a zone of proximal development is created in which knowledge of music is constructed, not passively received. This musical knowledge, being collaboratively constructed and rooted in the pupil's enactment of their agency, is meaningful because it has personal value to the pupil, owing to their investment in its creation. Reconceptualising piano teaching in terms of this theoretical framework prompted me to view teaching as a collaborative activity, and that I could manipulate the tools and rules of my practice to affect change. I surmised that my transformative agency could be exercised through the introduction of an intervention that consisted of a series of composing lesson plans (tool), and in which I (subject) taught in a manner that privileged learner autonomy in directing the activity (rules).

The fifth goal was to explore how a play-based compositional tool could be tailored to meet each child's creative needs, as each embodies a unique social and cultural worldview. In other words, it was important to investigate whether an approach to teaching composition would be effective across pupils. No two children are alike, yet piano teachers tend to apply standardised Western methods universally. This study aimed to demonstrate that compositional activity in piano lessons is inherently individualistic because these lessons are offered in a dyadic paradigm. However, because Hogenes' three-step model is CHAT-based it allows each child to engage in creative processes that are informed by their unique cultural-historical perspectives and their engagement with the designed intervention will therefore be equally unique. From this hypothesis it was predicted that a single pedagogical approach to composing would therefore be individualised by each child's lived experience of the creative process.

The sixth goal was to develop a play-based compositional approach to piano lessons that could be utilised by other piano teachers, particularly those who may not have compositional training or experience. There is an acknowledged need for researchers to investigate experienced teachers' practices and to codify these practitioners' tacit knowledge in order to make the implicit explicit for the continued growth of the profession (Lennon 1996; Shulman 1987). As a practitioner-researcher, I intended to develop an approach to including composition in piano lessons that can transcend my own teaching context. To do this, the intervention and the strategies employed in its enactment must be

codified in a format that is sufficiently generalised and which, it is hoped, will equip teachers of limited composing experience with a tool that enables them to engage in creative piano lessons in their respective contexts.

Research design

To achieve these goals a qualitative study was conducted within a primary school in Makhanda, in the Eastern Cape. Qualitative inquiry may take many forms and there are many established methodologies available to the researcher, including case studies, ethnography, and experimental designs. In selecting a methodology for this study, I was guided by Mason's (2002) assertion that one's research questions connect the intended area of research with the methods used to conduct it. By considering my overarching research question and the six interrelated research goals, it became clear that my chosen methodology would need to make various affordances. The first of these affordances would need to address the overarching research question: how can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape?

This question, and the interrogative adverb from which it proceeds, suggest the need for an open and exploratory research design through which a phenomenon is described and understood. The first research goal, however, proposes an interventionist imperative that precludes certain exploratory methodological orientations, such as ethnography or naturalistic case studies. The second goal proposes an evaluative element, in which Hogene's three-step model for teaching composition is trialled in a novel context, which suggests an experimental research design. The role of the piano in children's musical identities, and the sense of connectedness they feel towards their musical learning represent the objectives of the third and fourth goals respectively. These would require the gathering of data relating to opinions and first-hand experience in the form of interviews, a method commonly employed in qualitative research. The fifth and sixth goals are concerned with the potential transferability of a teaching approach, across pupils as well as learning contexts, which suggests the need for a mode of inquiry that attends to contextual factors. In addition to these goals, it was also important to acknowledge that "learning needs time" (Reimann 2016, 133), and that learning research is often longitudinal as these expanded timeframes allow researchers to see how learning happens over time (Brown 1992). I therefore needed my research design to be longitudinal, but the time constraints imposed by my higher degree candidacy would require a measure of flexibility that would allow me to save time by making changes to the intervention during its enactment without having to wait for its conclusion.

Armed with these required methodological affordances I investigated a range of research designs, searching for one that was appropriate for my study. As previously discussed, I am undertaking this study as practitioner-researcher and Riis and Groth (2020) assert that “the term practitioner-research is sometimes used interchangeably with action research, design-based research and self-study” (Riis and Groth 2020, 5). This statement guided my exploration of the various methodologies commonly used in this form of research. Four approaches were found that, at first glance, may be suitable: experimental research in the form of a randomised controlled trial (RCT), a/r/tography, action research, and DBR. Upon closer examination, the first three were discarded in favour of DBR, described in the following section, which was able to meet the requirements of my investigation.

Design-based research

Overview

I chose to use DBR for this study, which can be described as a mixed-method approach to educational research that is conducted over the course of multiple iterations in authentic teaching settings, using designed interventions that are theoretically informed (Anderson and Shattuck 2012). This approach is also flexible and pragmatic enough to allow practitioners to make spontaneous, locally effective changes to the designed intervention in order to solve unpredicted or context-related problems, which in turn lead to refined and new theories (Joseph 2004). A key strength of DBR is the fact that it requires careful attention to the complex learning ecology in which it is situated, as opposed to traditional case-control experiments, such as RCT, that occur in artificial laboratory conditions (Barab and Squire 2004). Design researchers strive to achieve learning objectives within this specific context while also developing theories that transcend the ecology from which they emerged, thereby making the findings generalisable (Barab and Squire 2004). However, DBR tends to be avoided in higher degrees studies and doctoral students are discouraged from adopting this methodological approach because it is regarded as excessively longitudinal and intensive (Goff and Getenet 2017).

DBR is an emerging methodology in education research, proposed by Ann Brown and Alan Collins in 1992 (Reimann 2011; Walker 2011; Cobb *et al.* 2003; The Design-Based Research Collective 2003), which simultaneously aims to contribute to knowledge in specific fields of research and to students’ learning (Reimann 2011). DBR has its roots in the design experiments routinely undertaken in fields like aeronautics, engineering, and artificial intelligence, where prototypical artefacts or interventions are designed and tested (Gorard *et al.* 2004). This is not the first time that education researchers have turned to alternative disciplines for methodological guidance, and in the case of DBR the practice of design, which is the work of engineers, was adopted as an approach to investigating classroom practice (Walker 2011; Gorard and Taylor 2004; Brown 1992). Design researchers engineer innovative learning environments in authentic contexts that are able to survive being transplanted in “settings outside the

innovator's control” (Brown 1992, 171). According to Brown (1992), this transferability is dependent upon issues relating to dissemination and are crucial to the successful adoption of such interventions, and she references the stages of computer software development as an analogy. The first, or *alpha* stage, involves the designer conceptualising, developing, and testing the product, before it undergoes further testing in the *beta* stage, where the developer has limited influence. In the *gamma* stage, the product is disseminated for widespread use with very little developer support, and it is this stage that requires developers (in this case design researchers) to clearly articulate their theories and to determine which design features are essential for effective change in learning outcomes in typical school settings (Brown 1992).

Educational psychology has influenced the way educational research is conducted, although learning theories developed through this research are not easily transmuted into educational practice (Sandoval and Bell 2004). In fact, educational research outputs tend to have limited influence on educational practice, unlike medical research outputs, which lead to new treatments and innovative healthcare practices (Anderson and Shattuck 2012). Similarly, Reimann (2011) argues that education research tends to be conducted by cognitive scientists and psychologists in university settings and that this work, being beyond the purview of classroom educators, does not tend to have an impact on educational practices or policies. He emphasises the importance of conducting research in schools and that it is this authentic context that lends real-world relevance to education research outputs (Reimann 2011). These real-world contexts, or learning ecologies, are complex and involve multiple interacting elements (Cobb *et al.* 2003). My own teaching experience bears out this description and I can attest that the real-world teaching context is fluid, dynamic, unpredictable, and messy. Design researchers acknowledge the importance of the learning context, such as a classroom, and do not view this context in terms of its separate constituents (teacher, students, textbooks, teacher training, school administration), but as a dynamic system in which each part is sensitive to and affected by changes in other parts of the system (Brown 1992). DBR is therefore conducted in authentic learning contexts, which are environments that have not been artificially constructed like the laboratory conditions necessary for experimental research, such as RCT. A further distinction between these research designs is that DBR is flexible in that the design of the intervention may change during its enactment, while in RCT, treatment protocols may not be altered mid-implementation (Hoadley 2004).

As Sandoval and Bell (2004) point out, much of the work done in educational research is viewed with scepticism because of issues of validity, caused by differing opinions regarding methodological orientations. They highlight tensions between two research paradigms: experimental designs that produce generalisable knowledge that is theoretically sound, and ecologically oriented designs that produce knowledge with local applicability. DBR has the potential to bridge this methodological divide by empirically investigating the efficacy of theoretically derived interventions as they are enacted in

natural laboratories, where the intent is to iteratively refine these interventions and the theories from which they originated (Bakker and Van Eerde 2015; Sandoval and Bell 2004; Cobb *et al.* 2003; The Design-Based Research Collective 2003). Barab and Squire (2004) note that education, being a practical endeavour, is an applied field, and by developing learning tools and theories, researchers are able to conduct research that results in outputs that are tangible, applicable in other contexts, and that are “validated through the consequences of their use” (Barab and Squire 2004, 2). Engineering and iteratively refining an intervention in the context of my teaching situation would therefore lead to the development of an approach to teaching composition in piano lessons that could be reasonably assumed to be successful in similar contexts.

Characterisations of DBR

The expanding literature on DBR describes how this methodology can be implemented in a wide variety of settings and with varying degrees of scale, ranging from one-on-one studies with a single researcher and individual students, to broader studies where a research team works with multiple educational institutions within a school district (Cobb *et al.* 2003). However, despite the growing number of studies that report the use of DBR as their adopted methodology (Anderson and Shattuck 2012), there is no universally accepted prescriptive method for undertaking this form of research (Walker 2011; Jan *et al.* 2010; Joseph 2004; The Design-Based Research Collective 2003). DBR is not a single approach to research, but “a series of approaches, with the intent of producing new theories, artifacts, and practices that account for and potentially impact learning and teaching in naturalistic settings” (Barab and Squire 2004, 2). In the absence of a standardised set of methodological rules, as embodied in the CONSORT statement that guides experimental research (Moher *et al.* 2012; Torgerson 2009), scholars have offered numerous characterisations of DBR, which will be described here.

The Design-Based Research Collective (2003) suggests that DBR should demonstrate five characteristics: 1) learning theories and the design of learning environments (interventions in context) must be intertwined; 2) iterative cycles of intervention design, implementation, and analysis inform subsequent cycles; 3) emergent theories must be communicated to educational practitioners and researchers; 4) the enactment of the designed intervention (including contextual interactions) must be documented and described; and 5) these descriptions must link “processes of enactment to outcomes of interest” (The Design-Based Research Collective 2003, 5). Cobb and colleagues (2003) also identify five features of DBR, although with a more theoretical focus: 1) the goal of DBR is to develop theories about learning and the means developed to support it; 2) studies conducted using DBR are interventionist in nature; 3) they cultivate environments in which theoretical conjectures are both generated and tested; 4) they are iterative and involve cycles of invention, enactment, and revision; and 5) the theories guiding the research are limited to the specific circumstances under investigation and are

pragmatically refined. In this way design researchers avoid “grand theories of learning that may be difficult to project into particular circumstances” (Cobb *et al.* 2004, 10).

Instead of enumerating specific characteristics of DBR, Barab and Squire (2004) describe common principles such as theory development, the design of interventions, and iterative enactment in authentic contexts. They also note that the positionality of the researcher, and their manipulation of the learning environment, need not diminish the credibility of the research. Instead, these manipulative measures should be documented and explored to refine initial theories or develop new ones for testing in subsequent iterations. Joseph (2004) offers a similar description of DBR in which design, research, and educational practice are intertwined in research that involves the iterative enactment of designed interventions that are developed from, and test, theories about learning in authentic contexts. Like Barab and Squire (2004), Joseph (2004) emphasises the importance of attending to unforeseen events in an intervention’s enactment. She argues that factors relating to the design, or practical contextual issues, may create problems that can be addressed through the use of an engineering technique called rapid prototyping, in which a locally effective practical solution to a problem is implemented. In this way, elements of the design can be fixed *in situ* without having to wait for the iteration’s conclusion and theoretical redrafting. This pragmatic and responsive approach ensures that the findings and theories derived from research in a particular context “are highly faithful to that context” (Joseph 2004, 236).

Jan and colleagues (2010) list four essential features of DBR: 1) the design is theoretically informed; 2) researchers modify learning contexts to change educational practice; 3) learning is investigated in these modified contexts; and 4) interventions and their supporting theories are improved through iterative cycles of enactment and redesign. Reimann’s (2011) characterisation concurs with the one offered by The Design-Based Research Collective (2003), to which he adds that contextual factors such as student-teacher interaction and students’ prior knowledge influence the intervention and that these factors must be carefully documented. He describes DBR as “an inter-disciplinary mixed-method research approach conducted ‘in the field’ that serves applied and theory-building purposes” (Reimann 2011, 37). This approach simultaneously supports students’ learning and contributes knowledge to the research community. Anderson and Shattuck (2012) note that quality DBR studies share common attributes, such as being situated in authentic learning contexts, the design and testing of interventions over multiple iterations, the pragmatic use of mixed methods to develop theories that are grounded in practice, a collaborative relationship between researchers and teachers, and an emphasis on tangible research outputs that have real-world applicability. They also observe that DBR is frequently compared to action research in the literature, as both involve the active development of contextually bound humble theories that “do real work” (Anderson and Shattuck 2012, 17). Furthermore, it is noted that DBR and action research are also both examples of applied research that share a level of pragmatism and an

emphasis on reflection, although these two methodologies differ in terms of the role of design and generalisability of findings (Anderson and Shattuck 2012).

Bakker and Van Eerde (2015) similarly define DBR by comparing this approach with other qualitative research methodologies in terms of two dichotomies: naturalistic or interventionist, and open or closed. Naturalistic studies in education aim to investigate learning without any form of researcher interference, using methods that include ethnographies, questionnaires, and surveys. Interventionist studies, on the other hand, are predicated on the introduction of some sort of intervention into the learning environment, as is the case in action research or experimental research designs. DBR involves the design, enactment, and revision of an intervention and deliberate manipulation of the learning environment and can therefore be considered interventionist. The other dichotomy involves open or closed approaches, which describe the level of control researchers exercise over the data collected. Closed methods afford researchers a great deal of control and involve the collection of specific data through closed questions in interviews and questionnaires, or survey responses using a Likert scale. Open methods, like semi-structured interviews and ethnographies, offer the researcher very little control over the data and in DBR, “educational materials or ways of teaching are emergent and adjustable” (Bakker and Van Eerde 2015, 432). This is a flexible paradigm where researchers have limited control over the data being generated, so DBR can be categorised as an open approach.

Although DBR and RCT share an interventionist orientation, there are fundamental differences. The first involves the design of the intervention and the fact that in RCT, protocols require the intervention to be designed and enacted with control and experimental groups without further manipulation. In DBR, however, the intervention is designed and enacted in authentic contexts without a control condition, and researchers can manipulate the intervention and the means of its enactment, for example, by making adjustments if tasks are too difficult for students or to accommodate unforeseen incidents in the classroom. Causality can be established in RCT through pre- and post-intervention testing, a variance-oriented approach that confirms whether an intervention worked. DBR, being process-oriented, attends and responds to contextual conditions, offering insights into why an intervention was successful or not. Action research and DBR are both open and interventionist modes of research which aim to integrate theory and practice through cyclic processes of action and reflection. A crucial difference, however, is the role of design. In action research, “the focus is on action and change, which can but need not involve the design of a new learning environment” (Bakker and Van Eerde 2015, 435). This differs from DBR, in which design is a central component through which how, why, and what questions can be answered (Tabak 2004).

Design phase

Design-based studies are conducted in cycles in which three phases are iteratively repeated. These three phases are: preparation and design, the teaching experiment, and retrospective analysis (Bakker and Van Eerde 2015; Reimann 2011). In the first phase, researchers collaborate with teachers, consult curricular documentation, and study the domain-specific content to be learnt by students along with the pedagogical practices used to support this learning. Students' prior knowledge is identified, through interviews or diagnostic assessments, and starting points of instruction are documented. Learning goals are clarified in this preparatory phase and the path to the attainment of these goals is delineated through the development of a hypothetical learning trajectory (HLT) (Bakker and Van Eerde 2015; Reimann 2011; Doorman 2018). The HLT consists of the learning goals and predicted learning processes that are mapped by the researcher. HLTs are useful in all phases of DBR: they inform the design of the intervention in the initial design phase, provide a guideline for the teacher to follow throughout the teaching experiment phase, and they assist in the retrospective analysis phase where the HLT is compared with the actual learning trajectory (ALT) (Bakker and Van Eerde 2015).

At this point I feel it is prudent to point out that in the absence of a curriculum for teaching composition in piano lessons in South Africa, the term trajectory is not used here to describe what is learnt in relation to anticipated learning benchmarks, as typically determined through assessment, but rather how the learning process unfolds in lessons. This is consistent with established expectations of DBR, which is primarily concerned with the documentation of the learning process through the collection of multiple forms of qualitative data drawn from authentic learning contexts (Tabak 2004).

The initial design phase of DBR involves the development of two interrelated components, the HLT and the instructional activities and materials to be used in the intervention. As Doorman (2018) points out, the HLT provides a means of capturing an investigator's thinking as they consider the students' initial knowledge and skills, anticipated end goals, and conjectures about students' thinking. In doing so, the researcher makes explicit the "choices, hypotheses and expectations that otherwise might have remained implicit" (Doorman 2018, 85). The researcher essentially plots and articulates a hypothetical learning route that is informed by context-specific information regarding student motivation and ability, as well as details about the learning environment (Bakker and Van Eerde 2015). In this way, the researcher's intentions and motivations in the selection and/or creation of activities and materials are exposed and documented, a process that allows key items to be identified. These key items then act as a guide to retrospective data analysis (Doorman 2018). One of the main purposes of the HLT is therefore to bridge the gap between educational theory and teaching practice (Bakker and Van Eerde 2015), a gap that is widely acknowledged in the literature (Anderson and Shattuck 2012; Sandoval and Bell 2004; The Design-Based Research Collective 2003). These educational theories are domain-specific and are therefore not grand theories with universal applicability but are of the mid-range type and therefore

must do actual work in context (Reimann 2011). Furthermore, the HLT should not be thought of as a rigid research instrument that assumes that learning will occur at the same rate for all students. Rather, it “represents a learning route that is broader than one single track and has a particular bandwidth” (Doorman 2018, 86). A single HLT can therefore accommodate the various interactions of multiple students.

The design of instructional activities is guided by predictions of student thinking as articulated in the HLT (Bakker and Van Eerde 2015). In creating and selecting tasks the researcher draws on prior research (Cobb *et al.* 2003) and works closely with the implementing teacher to develop the instructional activities to be used (Reimann 2011). Although DBR is frequently conducted by research teams that consist of designers, teachers, and researchers, it is possible for one individual to embody all three roles within this methodology (Joseph 2004), a “pragmatic approach to research [that] may be valuable in that it creates theory that serves local practice” (Barab and Squire 2004, 9). Therefore, in DBR the designer, researcher, and teacher can, and frequently are, embodied in the same individual (Joseph 2004). This affords a valuable perspective from which the interaction between theory and practice can be observed. As Joseph (2004, 235-236) writes,

As researchers, we want to learn about some aspect of learning by designing an intervention that, through subsequent iterations, gets better and better at activating and supporting that aspect of learning. As designers, we want to use research on the use of the designed intervention, as well as prior research knowledge, to improve the effectiveness of the design. In addition, we expect to get better at the practice of education—by participating in design and research, educators develop an intimate knowledge of the theoretical and design ideas involved in the intervention.

This passage clearly articulates the three agendas that shape a DBR study, which although representing distinct motivations and perspectives, converge and interact as the study unfolds. Joseph herself undertook a study in which she was researcher, designer, and teacher, and she asserts that this afforded her the opportunity to see how design, research, and educational practice were interwoven (Joseph 2004).

This study represents such a case, in which I designed and enacted the intervention, and collected and analysed the data, so consultation with an implementing teacher was not necessary. In the design phase, instructional activities are selected and invented with the intended learning goals in mind while simultaneously considering how challenging and meaningful these tasks will be for students (Bakker and Van Eerde 2015). In most cases these tasks and the details of their implementation are then documented in a set of task descriptions and teacher instructions that guide the implementing teacher in the teaching phase (Doorman 2018). In this research, task design and my notions of predicted learning were amalgamated into one document for ease of use, as I was both the teacher and researcher (see Appendix A).

A further feature that makes DBR suitable for this investigation is its compatibility with CHAT. One of the key principles of CHAT is that knowledge is socially constructed in context through tool-mediated activity (Van Oers 2012). Similarly, design-based investigations aim to improve learning in authentic contexts through interaction with designed interventions, or tools (The Design-Based Research Collective 2003). In DBR the context is “not an extraneous variable to be trivialised” (Barab and Squire 2004, 3). Rather, it is a learning ecology in which the designed tool is embedded (Cobb *et al.* 2003). The intervention is therefore a constituent part of the learning environment, and it is this attention to the complex learning context that is common to both the theoretical framework (CHAT) and methodological approach (DBR) employed in this study. Cognition is not a process that resides within an individual, but a process that occurs across the learning environment between the individuals engaged in specific learning activities (Barab and Squire 2004). This view is consistent with characterisations of both CHAT and DBR, which indicates that they were an ideal pairing in this research.

A final design-related consideration that confirmed the suitability of DBR for this study is the relationship between endogenous and exogenous elements of the learning context. Learning environments are comprised of a constellation of interdependent elements, ranging from physical materials to instructional strategies. When conducting interventionist research in real-world settings, it is important for researchers to distinguish between contextual elements that are endogenous, which refers to those materials and strategies that are embedded in the local context, and exogenous elements that are introduced by researchers in the form of materials and strategies that constitute the intervention (Tabak 2004). These two distinctions are not as discreet as one might suppose, because participants are active agents in the enactment of the intervention and their interaction with the design is considered endogenous. This blurs the boundaries between insider/outsider perspectives and renders the design endogenous, despite the external and therefore exogenous research agenda that motivated the initial design. This endogenous embedding occurs using designed materials and strategies in the authentic context, and it is by documenting the details of this localised and authentic use that researchers can understand tensions between exogenous and endogenous elements and their resolutions in order to “enrich and elaborate the design” (Tabak 2004, 228). This was important for this study because a compositional intervention could therefore be integrated into the context of piano lessons by attending to and resolving the tensions between them.

Teaching experiment phase

The term experiment is used here to denote the novel teaching and learning activities being used in the intervention, which is distinct from established methodologies employed in experimental research designs, such as RCT. While enacting an intervention in DBR it is typically important for researchers

and implementing teachers to cultivate a relationship that allows for a shared view of potential and actual learning pathways, allows them to respond to emergent contextual challenges, and which serves to develop a deep understanding of the learning ecology as it evolves in real time (Cobb *et al.* 2003). This relationship between teachers and researchers in DBR has been known to extend from the initial stages of problem identification through to publication, since each of these parties is able to contribute valuable intellectual resources grounded in experience within their respective fields (Anderson and Shattuck 2012). In the current study, however, I was both teacher and researcher, which precluded the need to cultivate this relationship.

The type of data collected during a design-based study requires careful consideration. Not only must these measures serve subsequent analytical processes by faithfully recording phenomena under investigation, but they must also be “feasible to administer” (Cobb *et al.* 2003, 12). In addition, data collection should not only document interactions and students’ learning but should also capture researchers’ learning as conjectures are tested and revised, which can be done through audiovisual or textual means, a practice common in engineering fields (Reimann 2011; Cobb *et al.* 2003). Design-based researchers must therefore attend to “the generation of data on both learning and the means by which that learning was generated and supported” (Cobb *et al.* 2003, 12). As previously noted, during the design phase the HLT explicates the researcher’s predictions about students’ learning, but in the teaching experiment phase it also serves as a guide for the teacher to follow (Bakker and Van Eerde 2015). It is important to remember that the HLT should not be regarded as a rigid instrument, but rather a proposed learning route that is flexible. It is during the teaching phase of a DBR study that this flexibility allows adjustments to be made where necessary, the documentation of which constitutes valuable information that informs subsequent iterations of the design (Bakker and Van Eerde 2015). It was therefore necessary for observations made during lessons to be recorded and included in the retrospective analysis of each iteration in this study.

Observations and interpretations made during an intervention’s enactment inform the researcher’s design decisions (Bakker and Van Eerde 2015; Reimann 2011). By reflecting on an intervention and its enactment, design researchers “can produce robust explanations of innovative practice and provide principles that can be localised for others to apply to new settings” (The Design-Based Research Collective 2003, 8). Data collected during the teaching experiment phase may take many forms, including interviews, researcher observations, and audio and video recordings of classroom interaction (Doorman 2018; Goff and Getenet 2017). It is through the gathering of multiple types of data that researchers ensure that retrospective analysis “will result in rigorous, empirically grounded claims and assertions” (Cobb *et al.* 2003, 12). These imperatives were addressed in this study through careful documentation of lesson interactions, pre- and post-intervention interviews, and researcher observations

in the form of field notes that related to both the exogenous design and the endogenous activity within the learning environment.

Analysis phase

In this third phase, data are analysed and reflections on the findings inform the design of the intervention to be used in the subsequent research cycle (Doorman 2018). The HLT developed during the initial preparation and design phase, and possibly altered during the teaching experiment phase, serves as an analytical guideline for researchers to follow in the retrospective analysis phase. Initial predictions about student learning can be compared with observations of actual learning, and “such an analysis of the interplay between the evolving HLT and empirical observations forms the basis for developing an instruction theory” (Bakker and Van Eerde 2015, 440). Two types of analysis are particularly useful in DBR: a task-level analysis in which predicted learning as articulated in the HLT is compared with the actual learning observed, and a broader, longitudinal approach in which the data are analysed to confirm or generate theoretical conjectures (Bakker and Van Eerde 2015). One way of doing this broader analysis is to look for notable events or trends in the data and to cross-reference these with the other types of data collected to determine whether any patterns emerge (Doorman 2018). These trends are interpreted to form conjectures that can be tested in the next study cycle. Conjectures can be design oriented, in that they relate to the intervention and the specific instructional activities and materials, or theory oriented, in that they link these materials to research outcomes (Reimann 2016).

Sandoval (2004) argues that in DBR, researchers design interventions that include instructional materials and participatory guidelines, and that the design of these innovative learning environments is a theoretical pursuit. He points out that these “designed learning environments embody design conjectures about how to support learning ... that are themselves based on theoretical conjectures of how learning occurs” (Sandoval 2004, 215). An embodied conjecture is a theoretical proposition that is reified in the design of learning environments, which differs from design principles. While design principles are general and therefore impossible to test empirically due to their reliance on interpretation (for example, a commitment to making researcher thinking explicit), embodied conjectures are articulated specifically and unambiguously, allowing them to be either rejected or refined (Sandoval 2004). Because these embodied conjectures are the manifested instantiations of theoretical principles, they serve as focal points that direct researchers’ attention in the retrospective analysis phase of a DBR cycle. This is because they predict specific outcomes in terms of contextual interactions, or more importantly for the current study, the intervention itself. An embodied conjecture aims to predict whether a particular design feature can successfully support learning in a specific context, and by tracing the patterns that emerge in the data generated through enactment back to the conjecture that shaped the

design feature, the conjecture can be confirmed if the outcome was anticipated, or rejected if it was not (Sandoval 2004).

A typical outcome of DBR is a design solution, usually in the form of teaching materials and learning activities, but the notational methods in which these solutions are articulated are often neglected in the literature, which may limit the potential for designs to be transferred from the contexts in which they were created (Reimann 2011). To address this need for a transferrable solution that is notated in a format with broad applicability, the current study endeavoured to produce an output that not only worked in its originating context, but could easily be implemented in other, similar contexts, in a form that would be familiar to school-based music educators. Given that teachers are perpetually faced with constraints in terms of time and resources, it was important to present this output in a plug-and-play format that is user friendly and that will not require the teacher to embark on additional training or research.

Conclusion

This chapter elaborated upon the research question and six subordinate goals that drove the study, which also served to explicate the methodological affordances required of the chosen approach. As discussed in Chapter 2, the tensions between scientific objectivity and subjective contextual experience can be resolved by assuming multiple perspectives. This was particularly important for my investigation because as composer, teacher, and researcher, I was well positioned to investigate piano teaching with the intention of introducing a creative element, and DBR offered the means through which these multiple perspectives could be reconciled (Joseph 2004). DBR was therefore chosen as the methodological approach for this study, through which my inquiry not only included, but was enriched by my experience as teacher and composer, and through which conjectures originating from these multiple perspectives could be iteratively trialled and refined in an authentic context. This approach is characterised by its iterative cycles of implementation and redesign of interventions, attention to interactions between endogenous contextual factors and exogenous elements introduced by researchers, and its orientation towards bridging the divide between educational research and practice. Studies using DBR methods also tend to be longitudinal, due to these iterative research cycles, a characteristic that satisfied my research requirements. Furthermore, its pragmatic orientation was of particular value to my research, which was conducted within the time constraints imposed by my degree candidature and the school's academic timeframes, and rapid prototyping presented a means by which I could engineer locally effective solutions to problems as they cropped up to ensure that each version of the intervention could be enacted in the time allocated. The role of the HLT was defined in terms of its value in exposing researcher thinking, informing intervention design, directing teaching cycles, and guiding analysis. The objectives of DBR were also discussed, one of them being the development of a design solution to an educational problem in a tangible form, such as a lesson schedule. Through successive cycles of design,

enactment, and analysis, an intervention was developed in this study that constitutes a research output that is intended to have practical applicability in real-world educational practice.

CHAPTER 5

METHODS AND PROCEDURES

Introduction

In this chapter, the intervention used in the first iteration is introduced and Hogenes' three-step model for teaching composition, which constituted the starting point for the design, is elaborated. Contextual factors relating to time availability and participants' competencies also influenced intervention design and were instrumental in formulating context-sensitive design principles, which are also discussed. Data collection methods used in this study are described, which include semi-structured interviews, transcribed audio recordings of piano lessons, and field notes that recorded observations made during lessons. The gathering of different types of data provided multiple perspectives of the interactions between the teacher and the participants, which facilitated retrospective analysis by illuminating connections in the data between design elements and participants' interaction with the intervention. These connections constituted key themes that served to focus analysis, which aimed to identify effective strategies for teaching composition in this context, design strengths and weaknesses, and which enabled me to make conjectures that were embodied in subsequent versions of the design, which will be described in the following chapter. Finally, matters relating to participant selection are discussed and the participants themselves are introduced.

Intervention design

Hogenes' model

In DBR an intervention is designed to support learning and since piano lessons are offered on an individual basis, each learner constitutes a distinct teaching context. However, a single intervention was designed to be implemented with all five participants in the first teaching phase, which was feasible because of the similarity of the participants. As briefly mentioned in Chapter 2, Hogenes and colleagues (2016, 2014a, 2014b) devised a three-step model for teaching composition in Dutch schools, which is aligned with a productive orientation currently being adopted in other school subjects, such as mathematics and languages, in which students are actively engaged in the creation of content that is relevant to their learning in these subjects (Hogenes 2016). This play-based model has thus far been only superficially introduced and will therefore be more fully elaborated in this section. As previously noted, Van Oers (2012) developed an interpretation of Vygotsky's cultural-historical theory of learning that views these cultural practices as socio-cultural activities that can be playful in nature. Hogenes and colleagues (2023) clarify this interpretation when they assert that "cultural practices (and activities) can be accomplished in more strict and mechanistic ways (direct instruction), or in more free and joyful ways" (Hogenes *et al.* 2023, 257).

Play is regarded as a modality of activity that is defined by three essential and interrelated characteristics: the use of rules, affording participants degrees of freedom over the activity, and the participants' sense of involvement in the activity. The word rules is used here to denote a fundamental characteristic of play, and not in reference to a component of an activity system, which is the prime unit of analysis in second-generation CHAT. In terms of play, these rules, both implicit and explicit, are inherent to socio-cultural activities although they may be applied and obeyed with varying degrees of regulatory constraint (Hogenes *et al.* 2023). Children sublimate their independent desires in play scenarios to sustain the activity by following the rules of the activity, and it is through the use of increasingly complex rules that they learn to emulate cultural practices (Hogenes *et al.* 2023; Berk *et al.* 2006; Vygotsky 1978). For an activity to be characterised as playful, these rules must allow the players a degree of freedom over their participation in the activity, so it is important that these rules are not exclusively externally imposed. Players should be allowed to contribute to the creation and evolution of the activity through exercising a level of free choice over the mode and purpose of their actions, which in turn imbues the activity with personal meaning for the players (Hogenes *et al.* 2023). This deep involvement in the activity is dependent upon the environment in which the activity is undertaken, which includes the participant, the activity's content, and the participant's lived experience of the situated context in which the activity takes place. It is this expanded notion of the environment that influences children's development and characterises their involvement in playful activity (*ibid.*).

Composition is a creative activity through which musical learning can be achieved by collaboratively producing new pieces of music in a playful format. This necessitates the cultivation of a learning environment that is governed by rules in which children are intrinsically involved, and in which they are afforded a degree of freedom to exercise autonomy over the nature of their involvement. But how might this be practically accomplished in piano lessons in primary schools? A model was devised that proposes to enable all primary school music educators to compose music with their students, of which the three steps are:

1. Creation of a common base;
2. Creating ideas and writing the composition;
3. Presentation and publication or recording; (Hogenes *et al.* 2014b, 156).

The first step involves establishing common knowledge between all participants, a notion that recognises that knowledge is constructed in a social process. It is therefore important to establish a shared starting point for the composing activity and for children to understand not only the purpose of writing their compositions, but also to have an idea of how to go about writing them (Hogenes *et al.* 2014b). Crucial to the success of this first step is the input from the teacher, who can incentivise the activity by framing the purpose of the composition, for example, as the accompaniment to a story or poem around a theme that children find interesting. Stories, drama activities, and photographs are

useful for initiating class discussions to create a shared frame of reference. Listening activities are also useful for creating a common base, where discussions about musical elements can sensitise students to these elements and their use. Music consists of three components, “sound, form (musical structures), and meaning” (Hogenes 2016, 77). These components are integrated when the composer manipulates available sounds using a combination of devices, such as repetition, variation, and contrast to create music that serves emotive or practical purposes, for example, the creation of music that sounds happy, or music to accompany dancing (Hogenes 2016; Hogenes *et al.* 2014b). This description of a common base concurs with Hickey’s (2012) assertion that composition integrates craftsmanship (the manipulation of musical materials) and imagination in a creative process that proceeds from the teacher’s introduction of authentic compositional prompts that can range from students’ emotions or experiences, to stories or examples of visual art.

The second step in the model involves children exploring sound through free musical play to generate musical ideas. It is in this stage of the composing process that the teacher, as play partner, is able to access the student’s zone of proximal development and act as an enabling participant who scaffolds and guides the student to new action potentials (Hogenes *et al.* 2014a; 2014b). It is in this exploratory phase that the teacher supports students’ musical learning by actively participating in the creation of musical ideas through evaluative feedback. This feedback aims to introduce and deepen students’ understanding of musical concepts, develop technical skills, and offer reflective guidance (Hogenes; 2016; Hogenes *et al.* 2014b), in a process akin to Berkley’s (2004) notion of predictive analysis. Revision of musical ideas is an important part of this step in which the teacher encourages students to reflect on their work and redraft musical ideas in order to fully align them with the students’ intentions and thereby improve their compositions (Hogenes 2016; Hogenes *et al.* 2023; 2014a, 2014b). This revision is achieved through three rounds of activity, the first of which is to establish whether the composition sounds as intended. The second round of revision is focused on the music’s structure, while the third round involves the notation of the music. Central to all three rounds is an emphasis on critical reflection of the music in terms of how it sounds, how it might sound to an audience, and whether it can be played by others (Hogenes 2016; Hogenes *et al.* 2014a; 2014b). It is in this second step of the composing model that students engage in true acts of musical creation, which is an important site of musical learning because “the most powerful learning will occur when children are allowed to create in order to learn the rules” (Hickey 2012, 107). This agrees with De Villiers’ (2023) assertion that it is through critical and analytical engagement with music, through composition, that students “learn to understand and appreciate how concepts are applied” (De Villiers 2023, 354).

The third step of the teaching model involves the presentation of the music through live performance or recording. This is important for maintaining students’ motivation to compose because it provides the reason for the entire composing activity. Writing music with the knowledge that it will be heard

and discussed by an audience affirms not only the necessity of the enterprise, but also its validity as an authentic cultural practice (Hogenes 2016; Hogenes *et al.* 2014b). This agrees with Hickey's (2012) assertion that composition is something that can be done by everyone. She maintains that there is a widely held belief that composition is an activity reserved for a talented few, a polarising view that creates a division between those who can compose and those who cannot. Instead, she argues that one should think of composing in terms of a beginner-expert continuum, along which children should be encouraged to compose music that is aimed at real audiences. This is important because it not only legitimises their composing activities, but it is also pedagogically significant in that it introduces a sense of authenticity that "raises students' awareness about choices in shaping their music compositions" (Hickey 2012, 70).

This model for teaching composition was used because it is aligned with CHAT, it is broad enough to accommodate many contexts and approaches, and it can be used in one-on-one lessons (Hogenes *et al.* 2023; 2014a; 2014b). Furthermore, elements of this model have been suggested in various ways in the literature as important factors in the teaching of composition. One example is Berkley's (2004) assertion that teacher feedback should be supportive and it should prompt self-reflection in students and a critical appraisal of their own work. This form of feedback, or predictive analysis, allows for the revision of musical ideas when creating a piece of music (Berkley 2004). This is consistent with the revision described by Hogenes as a crucial process in the second step of the model (Hogenes *et al.* 2023). Another example is Odam's (2000) observation that teachers should ensure that students' compositions are heard beyond the classroom, which essentially describes the third step of Hogenes' model.

Design principles

It was important to situate this study in an authentic context, so it was conducted during the children's piano lessons, which were scheduled in accordance with the school's timetable. Each weekly lesson was 50 minutes in duration, although in reality this was reduced to around 45 minutes as each child required a few minutes to make her way from the classroom to the music rooms. Piano lessons followed the familiar format (sight-reading, aural, technical exercises, scales, three pieces, and theory) with the addition of the intervention component at the end, which consisted of the composing activity. In music education, teachers engineer environments that enable students to construct an understanding of music that is personal (Webster 2002). These "designed environments include tools (like software), materials, and activity structures" (Sandoval 2004, 215). To achieve this goal of designing learning environments that are conducive to personally meaningful learning, teachers must tailor their lessons with consideration for their students. When approaching any teaching situation, teachers first establish the students' ages, learning abilities, needs, and prior knowledge. They then consider contextual details about the classroom environment and available resources. This combination of factors allows teachers

to formulate theories about what to teach and the specific methods they will use (Ewing 2011). My approach to task design was no different and I carefully considered each participant's prior musical knowledge, technical skill, and practising habits before creating the tasks that constituted the designed composing intervention. Composition tasks, like any learning activity, must be structured in such a way that prior knowledge and experience can be leveraged by teachers who scaffold students' efforts toward their successful completion (Wiggins and Medvinsky 2013). The question of relevance also required careful consideration because in my experience I have found that children are motivated to apply themselves to tasks that they find engaging and relevant to them. However, structuring tasks around one's notions of what children might find relevant is not as important as striking a balance between what they find familiar and what is novel (Dolloff 2009), so a variety of tasks were devised.

This study was undertaken in a girls' primary school and although gender is not an area of focus, it is important to remember that in music education, gender identities are socially constructed and reinforced through practices that either celebrate or challenge normative conventions (Hargreaves *et al.* 2017, 2002). Green (1997) describes how these "gendered delineations" (Green 1997, 50) are enacted in music classrooms, in which boys typically affirm a masculine delineation by playing or listening to popular and/or fast music, while girls affirm a feminine delineation by listening to or playing music that is slow and/or classical. These delineations are conversely interrupted when boys engage in classical musical practices, like playing the flute or joining a choir, or if girls sing pop music or play the drums, although both boys and girls have limited agency in transcending these delineations in school settings. Green (1997) describes how her investigations in schools have confirmed the presence of a prevailing assumption amongst teachers and students, that composition tends to affirm a masculine delineation and that boys are generally regarded as more creative, and that they exhibit more confidence in composition than girls do. However, it is not only the presence of these masculine and feminine delineations that is important, but the way in which the former overshadows the latter, as Green (1997, 228) explains,

The masculine delineation of music contributes to the perpetuation of the appearance of feminine musical conservatism and lack of talent, through its imposition of cerebral, creative masculinity as the normal and unquestionable backdrop to all musical experience, and the insertion of compositional feminine delineations as a threat to conventional patriarchal constructions of femininity.

This passage serves to expose the tensions inherent in the dichotomy between masculine and feminine delineations. However, if one eliminates the masculine delineation from the learning environment, I surmise that this tension will be resolved, and girls will be free to enact their musical becoming unencumbered by the imposition of the restrictive masculinity described above. In the interest of fostering an agentive learning ecology free of such restrictions, I deliberately avoided the inclusion of typically masculine themes and chose instead to use neutral concepts as compositional starting points when designing lesson activities.

Lesson schedule and Hypothetical Learning Trajectory (HLT)

A series of ten lessons were conceived, comprising seven composing activities that were designed to introduce compositional techniques incrementally. These activities were aligned with the three steps of Hogenes' model and were inspired by my own composing experience, as well as some suggestions offered by Hickey (2012). I chose to combine the elements of music (duration, pitch, form, texture, timbre), as suggested by Hickey (2012), with aspects of piano technique (finger independence, articulation, dynamics, coordination) to create the framework for these activities. These pianistic elements were included to emphasise the relationship between the conceptual tools (musical elements) and the physical tool (piano) being manipulated. It is important to cultivate this relationship in young pianists to develop their mastery of tonal control, in which young pupils "acquire a strict *mental* association between every musical effect and its technical reproduction" (Matthay 1932, 4, italics in original). Musical elements are never distinct, in other words, it is impossible to completely isolate pitch in a melody due to the temporal nature of music: different pitches occur with varying durations over time, so duration and pitch are interdependent. However, each element may constitute the primary focus of an activity in which the other elements are subordinate and of secondary importance. Hence, when a musical element is specified as the focus of an activity, this is done with the understanding that the other elements are auxiliary, not absent. By combining certain musical elements with pianistic ones, lessons were designed in which it was anticipated that musical materials would be explored, technical skills developed, and the child composer would move toward working with what Hickey (2012) calls the big elements in composition, namely unity/variety, tension/release, and balance. These aesthetic principles are difficult to teach as abstract concepts, particularly with young children, but would be easier to discuss as they emerged in pupils' own work. When selecting musical examples to serve as compositional prompts, I chose some items from the Western canon and a traditional Xhosa song because these are representative of the cultural communities at my school. As previously discussed, I decided to use the same schedule of tasks with all five participants in the first cohort because they were similar in terms of age and length of tuition, and their interactions with the design would provide the nomothetic, between-participant perspective I required to understand not only if, but how the design worked in real-world situations.

A brief description of each lesson follows, which can be simultaneously read as the HLT because these descriptions explicate not only the details of the task, but also my predictions about task implementation and potential learning. Where appropriate, prospective interaction with the design was problematised and alternative methods and approaches suggested to facilitate implementation. It was therefore possible to merge the design and the HLT into one document (see Appendix A) because I was the teacher and researcher, and working from one document was more practical than using multiple resources typically generated for several individuals fulfilling distinct roles as part of a research team.

The first composing activity, to be completed in the first lesson, involved the musical element pitch, and required the participant to create a simple melody. The first step in Hogenes' model calls for the creation of a common basis and a purpose for the emergent artefact, which is a two-fold process. First, the action must be incentivised because "the purpose decides the game and justifies the activity" (Vygotsky 1978, 103). Imagination is a rich resource and to help get started, participants were invited to write a few short lines about ice cream, perhaps even inventing a bizarre new flavour, and then setting these words to music by assigning a note to each syllable to create a song about a familiar theme. The second component of the common basis involves establishing the means through which the task can be completed, in other words, the tools, which in this instance meant the musical objects (notes) to be manipulated. Suggesting the assigning of notes to syllables was thought to be an appropriate way to equip participants with the means by which to accomplish this first task. The second step of Hogenes' model calls for the creation of musical ideas and writing the composition. Participants were encouraged to use the familiar Middle C position notes to create a simple melody, in which notes ascend, descend, or are repeated, ending on the tonic, or "home tone" (Hickey 2012, 109), and in which they were free to exercise their autonomy in making decisions about how the notes should move, thereby deciding the rules of the activity. Because the focus was on pitch, rhythmically accurate notation was not crucial, so finger numbers could be used to notate this melody. It was anticipated that participants would explore pitch autonomously, creating a sequence of notes that move by steps, leaps, or are repeated. The use of finger numbers in Middle C position would also be consolidated. The third step of Hogenes' model, relating to publication or recording, would be satisfied by recording the tune on my cell phone and sharing this audio file with the participants' parents as an email attachment.

The second lesson featured a composing activity that involved the musical element duration. As before, a common basis was needed, so the participant would be asked to recall and describe a recent walk with her parents. Carbonneau and Marley (2012) assert that ABL strategies are based on learning theories that suggest that cognitive skills develop through children's interaction with the learning environment. These skills emerge sequentially, as children attain mastery of competencies relating to the manipulation of three increasingly complex mental representations, the first of which is "enactive representation, [which] consists of memory for physically experienced events (i.e., motor learning)" (Carbonneau and Marley 2012, 282). The second and third forms of mental representation are iconic and symbolic representation, where information is stored and mentally manipulated as images and abstract symbols, respectively (*ibid.*). In order to delineate the route from enacted to symbolic representations of note values, specifically crotchets and minims, this activity would begin with the participant and I walking around the room, and then returning to the piano where we would tap our right knees with our right hands to simulate a walking rhythm in crotchets, which would then be translated to the keys in Middle C position to create a melody. The participant could use either finger numbers or staff notation to record the melody. Then, tapping our knees again, the left hand would be introduced, walking more slowly.

The participant would then create a left-hand part, in minims, to accompany the right hand in a 2:1 ratio. It was anticipated that it may be necessary to play the right-hand part for the participant as she worked with the left hand. This lesson, although focused on duration, also introduced harmony and second-species counterpoint. These additional elements could be noted and discussed as they could prove useful later and would certainly be important to general musical development, but they were not the primary focus of this activity, which was the ontological relationship between crotchets and minims. To satisfy the third step of the model, the participant would choose between making a recording as before, or writing it neatly in her manuscript book, with the possibility of cutting it out and pasting it into the hardcover book containing additional repertoire.

The third lesson dealt with articulation and the contrast between *legato* and *staccato*. The participant would once again be invited to create a simple walking melody. Her attention would then be directed to a small figurine of a bird nestled in a potted plant in my office and she would need to decide which of her notes were played *legato* or *staccato*, thereby signifying the identity of the walker, her or the hopping bird. By this time the participant would have already written two melodies, so I conjectured that the process of exploring available pitches and settling on emergent patterns would be familiar. Without specifying the region of the piano in which the melody would be set, she would have complete freedom in terms of pitch, which could be problematic when writing these pitches down. The participant might write in Middle C position, in which case she would be encouraged to notate the melody using staff notation by herself. However, if she chose to write away from Middle C position, using notes that were not familiar, I would write the notes for her, but she would add the *staccato* dots herself. The anticipated learning, here, was about exploring contrast in articulation and hopefully an emergent sense of balance between *legato* and *staccato*. As with the second lesson, the participant would choose whether to make a recording or to write it neatly to be pasted into her repertoire book.

The fourth lesson, where form was explored, was more open in that it involved more input from the participant after the initial common basis was established. I would play *Twinkle Twinkle Little Star* on the piano and ask her to identify the sections that were the same and which one was different, to reveal the ternary structure of the melody. She would then be encouraged to engage in exploratory free play for a few minutes, to find a melodic phrase that appealed to her, which she would use as a beginning. She would then create a second section that was different, the middle, which would be followed by a repetition of the initial melodic phrase to end the piece. As with the third activity, I conjectured that the process of creating motifs would be fairly straight-forward, and that the person notating the music would be determined by the notes chosen. Because this melody would be longer than those written in previous lessons, it would be prudent to make a recording to save time.

Lessons five to eight were presented in a series that involved the creation of a larger work than had previously been attempted, using the concepts that had been explored thus far. I would play Chopin's *Mazurka* in A minor (Op. 68, No. 2), after which we would discuss the different moods presented by the composer in this short piece. The participant would then choose one mood (perhaps her current mood, or a mood inspired by a memory) and write a short melody using a combination of musical elements that resulted in an expression of mood that she deemed appropriate. This melody would be notated (possibly with assistance) and she would be asked to practise it at home. In the next lesson her melody from the previous lesson would be revisited and we would work together to create a new version of it that embodied a different mood. In the following lesson her previous two melodies would be played and we would work on creating a third section. We would also discuss whether a return to the original idea either before or after the third melody worked, and the participant would be asked to play these ideas at home and to arrange them in an order that sounded pleasing to her. The last lesson in this series would be devoted to finalising the order of the musical ideas and possibly assisting the participant to create links between them. The completed piece would be given a title and written down in her manuscript book. The anticipated learning outcome of this set of lessons was to demonstrate an understanding of mood, form, articulation, and dynamics. It was also anticipated that the participant would begin to see the need for using staff notation to record ideas as works in progress, and to feel more comfortable using this system. Because this piece would have been created over the course of four lessons, it was anticipated that there would be ample time to write it down, so the piece would be pasted into her repertoire book. She might also wish to draw and colour an illustration to accompany her new score.

The ninth lesson involved harmony, particularly the use of primary triads. We would sing the traditional Xhosa song *Siyahamba* together (in C major), a song that would be familiar to the participant as this song is occasionally sung by the whole school. She would also know where C, F, and G were, and I would demonstrate how triads could be formed on these notes in the left hand. We would then work together to find where each of these triads fit best, writing C, F, and G above the printed lyrics to create a lead sheet. It was hoped that the participant would explore what she already knew about harmony (what feels right) and how a song could be harmonised with these three primary triads. Triads would be a new concept and possibly technically difficult for the participant to manage on the piano, so it was anticipated that I would initially need to play the triads, under her direction, until she was able to do this herself. The completed lead sheet would be pasted into her repertoire book, and a recording would be made and shared with her parents.

The tenth and final lesson would require the participant to draw on the composing experience acquired thus far to create a tone poem. I would show her a picture of an underwater scene, specifically a coral reef, and we would listen to *The Aquarium* by Saint-Saëns. After a discussion of why the music sounded

watery, the participant would create her own watery music on the piano, freely using any notes, rhythms, dynamics, and the pedal. The completed tone poem would be recorded on my cell phone and shared with her parents. I conjectured that the complete freedom allowed might generate many versions of a watery piece that were very different. The participant would therefore need to be reminded that she should try to focus on the patterns that appealed to her and to practise them so that she would be able to play the piece in the same way each time. Notation of this piece would likely be beyond the participant’s abilities, and would be prohibitively time consuming for me, so the music would be recorded using the Piano2Notes cell phone app, which is freely available from the Google Play Store. This recording would then be converted into a score by the app software, which could be downloaded as a PDF file, printed, and pasted into the repertoire book. The participant would be encouraged to draw an illustration to accompany her printed score and to colour it in.

This schedule of lessons constitutes the design that was implemented in the first iteration and is summarised in Figure 3 below.

Figure 3. Lesson schedule, iteration 1.

Lesson	Activity	Musical elements	Technical elements
1	1. Create a short melody about ice cream	Pitch	Finger independence
2	2. Create a walking tune (RH crotchets, LH minims)	Duration	Coordination
3	3. Create a new walking tune with a little bird	Pitch Duration	Articulation
4	4. Write a piece that has a beginning, middle, and end	Form	Finger independence Articulation/dynamics as chosen by the pupil
5-8	5. Write a piece that expresses different moods	Form Timbre	Articulation Dynamics
9	6. Create a lead sheet for “Siyahamba” using primary triads	Texture	Coordination
10	7. Write a “watery” piece	Timbre	Articulation Dynamics Pedal

Data collection methods

The three cycles of teaching experiments constituted the field work in this study, which lasted 12 months. The first teaching experiment phase was conducted during the third and fourth school terms, from July to November 2022, and involved five participants, all of whom were of similar ages and levels of experience. This first cohort of five participants also took part in the second teaching experiment phase during the first school term of the following year, from January to March 2023. The third teaching experiment phase involved the second cohort of participants of varying ages and levels of experience. This final phase was undertaken in the second school term, from April to June 2023.

In qualitative research, people, their actions, and the settings in which these actions occur are viewed holistically, where the “researcher studies people in the context of their pasts and the situations in which they find themselves” (Taylor *et al.* 2016, 9). Although qualitative researchers generally aim to remove themselves from the site of the research (Taylor *et al.* 2016) this perspective, as objective outsider, was not appropriate as I was both teacher and researcher. However, the adoption of a subjective perspective is possible when conducting DBR (Bakker and Van Eerde 2015; Joseph 2004). In qualitative research, the research design is not established *a priori*, rather it is flexible and may change before and during the research process (Taylor *et al.* 2016). Furthermore, qualitative research in naturalistic contexts offers avenues of inquiry that are virtually limitless, so the researcher must narrow the field of inquiry through first-hand engagement with that context (Taylor *et al.* 2016; Joseph 2004).

To document this first-hand engagement, four types of data were collected. The first of these were audio recordings of pre- and post-intervention interviews, which were transcribed. The second, and most substantial, set of data collected were audio recordings of piano lessons, which were also transcribed for analysis purposes. Third, were handwritten field notes, which were made during and immediately following piano lessons, while the fourth form of data consisted of the compositions themselves. I chose not to make video recordings of lessons because I was concerned that the presence of a video camera might cause the participants to feel that they were being closely observed, which might influence their behaviour and interaction during lessons. Recordings were therefore made using a small, portable digital voice recorder that was placed on top of the piano, which generated MP3 audio files. Audio recording devices are less intrusive than video cameras and people tend to forget that they are being recorded when audio devices are used (Taylor *et al.* 2016). This was certainly the case in this study and even though the participants were aware that they were being recorded, this unobtrusive recording device was quickly forgotten once the lesson had commenced. Although the audio recordings of piano lessons, and their subsequent transcriptions, provided an accurate record of these lessons, field notes were used to record any observations that were made. These observations included certain details that might not be apparent in the sound recordings, like participants’ attitudes and instances of non-verbal communication. In this way, audio recordings and transcripts thereof were supplemented by contextual data, which aids analysis (Wellard and McKenna 2001). These field notes were also used to record my thoughts, as researcher, about the success of each lesson and ideas about methods that might be changed in the future. These handwritten lesson observations were also typed up for analysis purposes. Finally, photocopies were made of participants’ written compositions, or in certain cases audio recordings were made when compositions did not lend themselves to notational means of recording. These copies of the children’s work were made so that the compositions could be reviewed and analysed if needed.

Interviews

Interviews are an established method for collecting data in qualitative research (Taylor *et al* 2016; Mason 2002), and I chose to use a semi-structured interview format. This was useful as it allowed me to ask some open-ended questions to initiate conversations about music and piano tuition that I had not previously had with students. This was deemed to be appropriate for this study because open-ended questions are useful in contextual exploratory research. Although semi-structured interviewing, also known as qualitative interviewing, tends to vary between studies in terms of style and format, common features include the use of an informal style of questioning, interactive and conversational dialogue, and open-ended questions (Mason 2002). Several closed questions were also included where yes/no responses were appropriate. The interview questions were aimed at eliciting information regarding musical exposure at home, musical identity, students' notions of agency in lessons, and their feelings of connectedness to the piano and their lessons in general. Pre-intervention interviews were conducted during the lesson preceding intervention commencement, and post-intervention interviews were conducted the week after its conclusion.

Musical identity

As discussed in Chapter 2, prior research in the field suggests that children's musical identities are influenced by the music they are exposed to at home, the role of musical activities within the home, and parental attitudes towards musical activity at home, at school, and in other settings like church services. Bronfenbrenner's model (Zapata Restrepo and Hargreaves 2017; Rosa and Tudge 2013; Lamont 2002), which describes how progressively expanding contexts of development influence the formation of identity, was used as a guide to help me understand the main spheres of influence on each student's musical identity. It was anticipated that information about the participants' musical identities, including musical preferences, would be useful in that it would inform the design of some of the composition tasks to be undertaken in the intervention. For example, a child who is influenced by the singing she hears at church is more likely to identify with a task that involves setting sacred words to music than a child that has never attended church. Or a song that is sung at school, and is therefore familiar to all participants, may be used as a starting point for a composing activity. Consideration was also given to parental influence on a child's emerging musical identity, which is itself influenced by the family script, and which comprises the transgenerational values and beliefs that dictate behaviours and family interactions (Borthwick and Davidson 2002).

Agency

It was also important to establish how the participants felt about their own musical learning, and the level of agency they felt they possessed in their piano lessons. CHAT suggests that students should enjoy a level of autonomy in their activities and knowing how autonomous each child perceives herself to be would be useful when determining the level of control afforded to her in the composition tasks. It

was important to gather this information because a child that is not accustomed to exercising any control may find it difficult to initiate creative actions and would therefore require more support from the teacher. The participants' own opinions about their abilities would also be important to consider when designing the intervention. Children's self-beliefs are powerful predictors of musical achievement, and self-perceptions of musical ability determine how successful the child will be. Once an individual has taken a position of perceiving themselves as either a musician or non-musician, they will tend to experience everything from that perspective in a process that perpetuates these positive or negative self-narratives (O'Neill 2002).

Connectedness

In addition to obtaining information about participants' musical identities and their sense of agency, it was important to establish how connected they felt to their musical learning and how intrinsically valuable their lessons were. I wished to ascertain their motivations for learning to play the instrument, and I wanted to know whether their piano lessons really mattered to them. It was also necessary to gauge how prominently the piano featured in their respective musical identities, particularly after the intervention had been concluded. As O'Neill (2017, 85) points out, children's "musical selves are aligned and woven into their experiential worlds", and one might assume that because they take piano lessons, the instrument should be a prominent part of their musical self-concepts. I aimed to determine whether the intervention's attempt to create an agentive music learning ecology would engender a deeper affinity for the piano among the participants.

Pre-intervention interviews were conducted to establish baseline levels of agency and connectedness, and to gain some insight into the participants' musical self-concepts, while post-intervention interviews aimed to determine whether the intervention had resulted in any significant changes in these factors, as perceived by the participants. Both pre- and post-intervention interviews comprised open-ended and closed questions, as shown in Figure 4.

Figure 4. Semi-structured interview questions.

Pre-intervention interview questions

1. Think of the music you hear at home. Can you tell me a bit about it?
2. What kind of music do you like best?
3. Do you have a favourite song?
4. Do you have a piano at home? Or a keyboard?
5. Does anyone else in your family play a musical instrument?
6. Why did you start learning to play the piano?
7. Do you like playing the piano? Can you tell me why?
8. Think of the pieces you play in your lessons. Do you have any favourites? What do you like about them?
9. Are you good at playing the piano?
10. What other instruments do you like the sound of?
11. How long do you think you would like to keep learning to play the piano?
12. Have you ever made up a song of your own? Or made up a tune?

Post-intervention interview questions

1. Out of the music that you made, which was your favourite piece? Can you tell me why?
 2. Did you find it easy to make up your own music, or was it difficult?
 3. Did you like using words to make up your music?
 4. Did you like writing the notes, or was it better when I was writing them?
 5. Next term, how can I help make it easier to make up your own music?
 6. Who have you shared your music with? Did you play your songs to anyone or show them your creative book?
 7. What did they think of it?
 8. Did making up your own music make you like the piano more?
 9. Did you enjoy making up your own music?
 10. Are you good at playing the piano?
 11. What was your favourite part of your piano lessons this term?
 12. What was your least favourite part of your piano lessons this term?
-

Lesson transcripts

There is an acknowledged neglect of transcription in the literature, despite this being a primary tool for the collection of data in qualitative research (Davidson 2009; Wellard and McKenna 2001). Wellard and McKenna (2001) suggest that decisions made about what to transcribe and how to go about it should be theoretically informed and explicated in the research report, and that this disclosure is necessary for improving the validity of the study. They also assert that although there are many different conventions for the conversion of audio data into text, researchers should employ a method that is suitable for their particular needs, although these methods must be consistently applied. I chose to transcribe all audio files manually, without the aid of transcription software, because I did not want the children's unique speech mannerisms such as mumbling, lisps, and occasionally stuffy noses, to be misinterpreted by the software. I also wanted to textually notate the pitches that were played during the composing activities using scientific pitch notation, where the A (A = 440 Hz) below Middle C is written A3, and Middle C is written C4 (Cross 1900). This was done in case this musical information proved useful during the analysis phase.

Although each piano lesson was recorded in its entirety, I transcribed only those sections in which the participants were engaged in the composing activities. Because transcription involves the textual representation of spoken utterances and dialogue, decisions must be made about what to transcribe. In this study, the interaction being documented involved children who frequently made grammatical errors in their speech or voiced incomplete thoughts and false starts. In these situations, the researcher must decide whether to transcribe every syllable faithfully, or to clean up the dialogue so that the transcript is grammatically correct and reads well. These two approaches are the polar extremes of a continuum between intelligent verbatim transcription, where mistakes are corrected, and full verbatim transcription, where they are not (McMullin 2023). I chose to adopt an approach that is closer to full verbatim because I wanted to preserve as much contextual detail as possible, although verbal fillers (uh, and, umm) were omitted when excessively repeated. Crosstalk and interruptions were managed by inserting a comma at the point at which the first speaker's statement was interrupted and transcribing the second speaker's interrupting statement on the next line in the usual manner, although also using a comma before returning to the first speaker's concluding words. In this way, all utterances were preserved. There were occasions when participants' words were unintelligible, despite repeated attempts to discern what was being said. When this occurred, it was noted in the transcript with square brackets containing the word inaudible, followed by the timestamp, for example, "T: [inaudible 00:29:49]" (Tammy 2022).

Davidson (2009) notes that transcription is a theoretical activity because it involves processes of selection that are aligned with the theoretical goals of the study. Davidson also claims that in reviewing the literature on transcription, it is clear that there is a relationship between a study's theoretical focus and the mode of transcription production, although the details about this relationship are "frequently left implicit or ignored" (Davidson 2009, 41). In order to avoid being considered likewise neglectful, I shall describe my transcription process here.

Transcription in the first iteration

This design-based study addressed issues of how a compositional approach might be developed in the context of my teaching practice, and the first iteration was primarily exploratory, being the first enactment of the intervention. At the outset I did not wish to lose potentially valuable data by selectively excluding anything relating to the intervention, so I transcribed everything during the first iteration. However, with such a large volume of audio to be transcribed, I decided to transcribe only those portions of the lessons in which the compositional intervention was being enacted, including the chit-chat or other such irrelevant dialogue that occurred during these portions of lessons. Later, when doing the analysis, I noticed that the moments in lessons that were relevant to the analysis tended to have been recorded in my written observations as well, and that these correlations indicated the presence of relevant themes in the digitally recorded utterances made during lessons. These themes were then

recorded in a research journal, which served to direct my focus during the analysis phase. I also textually notated every note played using scientific notation in case I needed to include this in the analysis and made photocopies of students' work. It is important to point out that lesson observations were written at micro and macro level. On the micro level, these observations were recorded with regard to each participant's interaction with the design in each lesson, while at the macro level, broader observations were made about the intervention and its enactment across participants, where hunches were articulated in my research journal, to be revisited during subsequent analysis and redesign cycles.

Time was a ubiquitous challenge during the teaching experiment phase of the first iteration because the intervention's enactment, writing of field notes, and transcribing of lessons were being done simultaneously. In order to manage this workload, design researchers choose the types of data they want to collect by pre-selecting that which is of interest in terms of answering the research question and the study's focus (Brown 1992). In DBR, "the revision of data collection procedures may be a part of the iterative process" (Cobb *et al.* 2003, 12), and after the first analysis cycle I knew precisely which audio data to transcribe in the second teaching and data-gathering cycle. It was before commencing the second iteration, specifically, that I made the decision to henceforth disregard two elements of the audio data during transcription. The first related to the off-topic chit-chat that occurred in lessons as these utterances, although situated in the learning context, did not contribute anything of value to the research. The second element to be abandoned was the faithful preservation of melodic pitches in scientific pitch notation because this data had not been necessary in the first analysis cycle. Both elements were immensely time-consuming during the first iteration's transcription process and by eliminating them I was better able to focus on those aspects that were relevant. This approach to data selection is consistent with established DBR methods (Doorman 2018; Brown 1992), through which researchers manage the data deluge that they encounter when documenting the iterative cycles of design, enactment, and analysis in DBR (Reimann 2011, 47). As Brown (1992) argues, it is important to document all possible aspects of learning contexts and the interactions that occur within them, but it is not possible to analyse this immense volume of data. Events of significance should be noted to become key areas of analytical interest, although the remaining raw data should be retained for later scrutiny, should the need arise.

Transcription in the second and third iterations

The correlations between pertinent dialogue in the audio recordings and my written observations during lessons in the first iteration led me to refine my methods for the second and third iterations and transcribe dialogue related to two issues, the first being those that might be theoretically significant in terms of the theoretical underpinnings of the research, such as collaboration, agency, enjoyment, or musical identity. The second issue was related to dialogue that dealt with the intervention itself, in terms of compositional activity and the decisions being articulated regarding the task at hand. This approach saved time yet still allowed me to cross-reference important moments in the audio with my written

observations, to make thematic connections that I recorded in my research journal. Because the textually notated music had not been used in the first iteration's analysis, I chose not to continue this practice, but to record played notes as "plays her tune" or "plays same tune", using adjectives like "same" or "new" to record any information about the notes played that may later prove useful, for example:

DW: That sounds very nice. So, should we start making a tune? Okay. Go for it. What do you think your tune should start like?

N: [plays some notes]

DW: Very nice. Can you play it again?

N: [plays the same notes again] (Neela 2023).

This was a pragmatic decision taken with the self-imposed condition that I would return to the audio data to record the notes textually, as I had done during the first iteration, if the need ever arose.

Data selection

Decisions about the types of data to be collected, made in the preparation and design phase, now reveal their importance. In planning an investigation, researchers choose between several data-gathering techniques including video documentation of classroom activity and interactions, examples of students' work, audio recordings of interviews, textual responses to surveys or questionnaires, and descriptions of lessons written by the researchers during their observations (Cobb *et al.* 2003). As anticipated, transcribing the recordings of piano lessons was a laborious task. Recordings of lessons and interviews resulted in over 78 hours of audio files to be transcribed, which was a daunting prospect when one considers that a single hour of audio data may take between three and eight hours to transcribe (McMullin 2023). However, as Cobb and colleagues (2003) point out, the researcher must distinguish "between elements that are the target of investigation and those that may be ancillary, accidental, or assumed as background conditions" (Cobb *et al.* 2003, 10). By focusing on only those portions of lessons that pertained to the enactment of the intervention, I was not compromising the validity of this research because "methods that document processes of enactment provide critical evidence to establish warrants for claims about why outcomes occurred" (The Design-Based Research Collective 2003, 7). Narrowing the focus to only those aspects that involved the intervention and disregarding the ancillary lesson elements that were not under investigation resulted in the total amount of audio data to be transcribed being reduced to just over 21 hours. These lesson transcripts, along with the interviews and lesson observations, resulted in 677 pages of text to be coded.

Data analysis methods

Data were analysed using NVivo, a qualitative data analysis programme manufactured by QSR International (NVivo Release 1.7.1(1534)). Being both the teacher and researcher was helpful as it allowed me to analyse lesson transcripts with an insider's knowledge of the text, the speakers, and the

context in which these utterances were voiced. Being the sole researcher also meant that I was familiar with the transcribed material before the analysis commenced, as I had listened to the audio many times during the transcription process.

Content analysis was used as the method for analysing transcripts, field notes, and researcher observations. This analytical method was selected because it is sensitive to the context from which the data are drawn, thus preventing utterances being interpreted out of context, which could skew results. It is also a method that allows the researcher to successfully handle large volumes of data, because coding vocabularies, informed by the research questions and emergent themes, are meticulously developed and systematically “applied to every unit of text equally and without exception” (Krippendorff 2004, 42). Content analysis also allows indices of frequency and favourable/unfavourable characteristics to be applied, through which references to specific ideas and, in this case, design strengths and weaknesses, can be quantified, in the pursuit of correlations that can be hypothesised and empirically tested (Krippendorff 2004). This methodological flexibility between qualitative and quantitative measures, the ability to generate testable hypotheses, and its emphasis on contextual fidelity, all served to confirm that content analysis was a suitable analytical method to use in this design-based study. In content analysis, validity is established when inferences made during analysis inform successful research actions, such as improved intervention design, and when the analyst explicates the analytical steps taken when writing the research report (Krippendorff 2004).

The first step was reading through the data to get an overall sense of what had been collected, to re-immense myself in the lesson setting, and to sensitise myself to the types of themes that might be present. The ways in which data are organised and coded depend upon the nature of the research question (Machi and McEvoy 2008), which in this case was essentially exploratory, being driven by a “how” orientation. Open coding was used initially to identify broad themes, after which I employed the constant comparative method, in which successive rounds of coding were done to identify and then saturate emergent categories (Creswell 2007). I used cross-sectional coding when analysing the data in all three analysis cycles, that is, within each round of analysis, all the data were coded using the same set of thematic categories, as opposed to treating each participant’s data in its own unique and discreet way, as is the case in case study research (Mason 2022). This nomothetic approach was used to gain insights into intervention interaction across participants, not within participants as is the case in idiographic studies. This method of coding is also consistent with that proposed by Krippendorff (2004), in which content analysis requires codes to be equitably applied. Lesson transcripts and field notes were then thematically cross-referenced, meaning that the themes used as coding categories were viewed as points of convergence, in order to make connections between participant interaction and design elements (Mason 2002).

During the three analysis cycles I made use of transcribed audio recordings of lessons, interviews, and my field notes. The fourth data source, copies of participants' compositions, were not analysed because it became evident that only the means of their creation was important, not their content. Three forms of data were therefore ultimately analysed. Combining different forms of data sources serve to triangulate the data and the insights gleaned from it (Taylor *et al.* 2016), "in which different forms of data are put together to make a more coherent, rational and rigorous whole" (Gorard and Taylor 2004, 4). I am not using the term triangulation as it is typically used in scientific research, where data are checked for internal validity, but rather in the sense presented by Gorard and Taylor (2004), who assert that data triangulation in qualitative research is about complementarity, in which data drawn from different perspectives create a holistic view of the phenomenon under investigation. This form of triangulation, using multiple data sources, leads to reliable findings when iteratively applied across multiple analysis cycles (The Design-Based Research Collective 2003). In this way, data collected through audio recordings of lessons and interviews, and data collected through field notes complement each other and provide a clearer picture of what is going on in the lesson. The metaphor of binocular vision is useful to apply here because it describes how an object's attributes are more clearly visible when the object is viewed from two viewpoints and both perspectives are synthesised (Gorard and Taylor 2004).

Procedures

Participant selection

Researchers must choose who to sample and how many participants constitute a representative sample (Mason 2002). Furthermore, researchers are advised to enter the field with general questions, not preconceptions, and an understanding that research design elements, such as the number of subjects to include in a sample, may change. Ideas about sampling evolve with the study, and when additional subjects are required due to expanding insights, "the researcher should maximize variation in additional cases selected in order to broaden the applicability of theoretical insights" (Taylor *et al.* 2016, 32). Qualitative researchers acknowledge that their initial notions about sampling are subject to change, so their research designs include theoretical sampling, which refers to the practice of recruiting additional participants if these additional insights might benefit the research. Similarly, organic sampling refers to sampling practices that are driven by practicalities and the evolution of the research project (Mason 2002). These flexible views on sampling allowed me a fair degree of freedom when deciding how many participants to recruit.

Participants were invited from among those learners who were already enrolled for piano lessons with me. I wanted to see how an approach to teaching composition might unfold differently with different children. After all, every individual is unique, and conclusions based on a single child's interaction with a designed intervention would serve to inform theories about supporting the musical learning of only

that child. I required a broader pool of data from which to draw conclusions in order to develop theories about supporting musical learning through composing that could be more generally applied. This was an essentially nomothetic approach, where one variable (the enactment of the intervention) was scrutinised across multiple participants with the aim of understanding these multiple interactions with a single intervention, as opposed to an idiographic approach, which is "the thorough study of individual cases, with emphasis on each subject's characteristic traits" (Brown 1992, 155). I determined that three pupils of similar ages and levels of competence on the piano would constitute a sufficiently representative sample of piano pupils at that age and level. This was an important sampling decision because I wanted to fully investigate intervention interaction with multiple participants, while simultaneously eliminating variables related to differing ages and levels in the first iteration.

However, I needed to consider potential dropout. Pupils occasionally discontinue their piano lessons because they do not enjoy them, although the most common reason for terminating lessons is a concern about academic performance, where pupils or their parents make the decision to discontinue piano lessons in order to focus on schoolwork. Fee payment is also a factor and parents are under increasing economic pressure. In the school in which this study was conducted, piano lessons are offered as an additional activity, which attracts an additional fee, and are therefore considered a luxury. This means that parents experiencing financial constraints are occasionally forced to terminate their children's piano lessons. Participant attrition also poses a potential challenge to research (Torgerson 2009). Because participation in this study was voluntary, participants were informed that they may choose to drop out of the study at any time without this affecting their enrolment in the school's music programme. It was therefore necessary to consider the possibility of pupils electing to drop out of the study yet continuing with their piano lessons as usual, which would have a negative impact on the collection of data. For these reasons, although it was determined that three participants would provide a sufficiently diverse dataset, five participants were invited in order to mitigate potential pupil and/or participant dropout.

Fulfilling dual roles as teacher and researcher allowed me to consider not only the goals and procedures of the study, but also the impact the intervention would have on the overall lesson structure. The chief of my concerns, as teacher, was time. The time required to complete a compositional task had not yet been established and I was concerned that the composition tasks would displace other components that needed to be retained, namely technical exercises, scales, sight-reading, aural, three pieces, and theory. I was also conscious that a number of my older pupils were finalising their preparations for external examinations at the time of the study's commencement, at the start of the third term, and I was concerned that an additional lesson component would not only distract them, but unnecessarily augment their workload. I therefore limited the scope to younger pupils who were not yet ready for external examinations, who were working through the *John Thompson* piano tutor books and other foundational

materials, and whose lessons were not yet oriented towards preparing for external examinations and the time constraints these impose.

In some forms of interventionist research, like RCT, the number of participants is crucial because the participants are viewed as representative of a population and results are generalised statistically (Bakker and Van Eerde, 2015). Conclusions drawn from this form of research are inductive inferences that may hold a probability of being true, but which are not logically conclusive (Krippendorff 2004). In DBR there are no treatment or control groups and results are generalised theoretically (Bakker and Eerde 2015). Sample size is therefore not dictated by methodological rules, but rather logistical concerns, in other words, what is manageable; and by organic sampling practices that are based on whether the sample chosen gives the researcher sufficient access to data that can answer the research question (Mason 2002). To glean as much across-participant information as possible from the designed intervention, I needed it to be implemented with pupils of similar ages and piano experience. Four learners in Grade 3 and one learner in Grade 2 were identified and invited to participate in the first two iterations of the study. They were between eight and nine years of age and their average length of tuition was 12 months. A new cohort of five pupils were invited to participate in the third and final iteration of the study, because having documented the interactions of a cohort of similar participants, I needed to determine whether the improved intervention could be successfully implemented with a more diverse group. Scholastically, two learners in the new cohort were in Grade 4, two were in Grade 6, and one was in Grade 7. They ranged in age from nine to 12 years and their piano experience ranged from one pupil who was a beginner and had been taking lessons for three months, to another who had been taking lessons for over four years and was preparing for her external Grade 3 examination. These participants were adequately representative of the range of pupils that I typically teach. Of these participants in the third iteration, one dropped out of the school's music programme, and hence the study, prior to the commencement of the teaching experiment due to a desire to focus on schoolwork. There were therefore four participants in the third cycle, who provided ample data due to the sampling decision taken at the outset, which mitigated the impact of participant dropout.

Ethical considerations

Ethical clearance was granted by the university, which gave permission for this study to proceed using human participants (see Appendix B). Gatekeeper permission was granted by the school principal (see Appendix C) and the district representative of the department of education, which was necessary as this study was conducted in a government school (see Appendix D). Letters of invitation were sent to the potential participants' parents via email and all were favourably received. Meetings were scheduled to discuss the project in detail and to explain what would be required of each participant. All the children's parents agreed to allow their daughters to participate and they signed the required consent forms, as did

the participants themselves. The voluntary nature of participation was discussed during these meetings and participants were informed that they may leave the study at any time without this jeopardising their piano lessons. Finally, each child was informed that their name would be replaced with a pseudonym in all research documentation, to protect their privacy and provide anonymity. Hence, all participant names that appear in this dissertation are pseudonyms, and the name of the school is not mentioned to safeguard the institution and to eliminate any identifying information that may be traced back to the participants.

Participants

In this section, the participants are introduced and their prior knowledge described, starting with the first cohort of five learners. Each child will be described from the point at which she joined the study and, as previously mentioned, pseudonyms will be used to protect their identities.

Gloria was nine years old and in Grade 3 at school. She had two older sisters, one of whom took violin lessons some time ago, although Gloria was the only sibling receiving music tuition and the only person in her family who played an instrument at that time. She had a keyboard at home and her practice habits were sufficient to allow her to make steady progress. She had been taking piano lessons for 13 months and knew several scales: C, G, D, and F majors, as well as A minor, all one octave with separate hands, and C major in contrary motion (one octave). Her note reading was quite good, which had allowed her to progress to the second book in the *John Thompson's Easiest Piano Course* series. She was familiar with quavers, crotchets, minims, dotted minims, semibreves, and rests, and had started to write notes in her theory book. She was also familiar with the terms *legato*, *staccato*, *piano*, and *forte*, and played exercises containing these features. Technically, she struggled with finger independence although she played with a good hand position.

Jane was eight years old and in Grade 2 at school. She had a younger sister, who was too young to enrol for music lessons, so Jane was the only one receiving piano tuition and had been playing for 12 months. She had a keyboard at home, which only she played as neither of her parents had received lessons. Jane read notes quite well and practised sufficiently to allow her to make steady progress through the first book in the *John Thompson's Easiest Piano Course* series. She knew the C, G, and D major scales, with each hand separately, as well as C major in contrary motion. She was also familiar with the terms *legato*, *staccato*, *piano*, and *forte*, and she had recently started to write notes in her theory book. Her technique was secure and her fingers seldom buckled when depressing keys.

Maggie was eight years old, in Grade 3 at school and she was an only child. She had been playing for six months and although she did not have a piano at home, she had a keyboard. Her mother took flute and piano lessons at one time and still occasionally played the keyboard at home, and she monitored

Maggie's practising, so she had been making steady progress. She was working through the first book in the *John Thompson's Easiest Piano Course* series, so she was familiar with Middle C position, crotchets, minims, dotted minims, semibreves, and rests. She also knew C, G and D majors, all one octave with separate hands. Her note reading was sufficient to approach new pieces without much apprehension, although finger independence was something that needed a lot of attention, as did her *legato*. She had been introduced to *staccato* in the technical exercises, although this tended to be produced from the arm and not the wrist. She was also familiar with *piano* and *forte* dynamics, and she was working through theory exercises in which she drew bar-lines and labelled notes in the treble and bass clefs in Middle C position.

Saira was eight years old and in Grade 3 at school. She had a younger sister who was too young to take music lessons and she had a keyboard at home, which only she played as her parents had never received piano lessons. She had been taking lessons for 17 months, the first nine of which were under another teacher. Her note reading had been steadily improving and this had led to an increase in the rate of progress through the first book in the *John Thompson's Easiest Piano Course* series. She knew the C, G, D, and F major scales, and A and D minors, all with separate hands; and C major in contrary motion (one octave). She had also recently learnt the C major arpeggio with separate hands (one octave). The *legato* and *staccato* articulations were familiar to her, as were the *piano* and *forte* dynamics, and although her fingers generally maintained the correct rounded shape, her wrists tended to drop. Her understanding of music theory was developing and although she had not yet started writing notes, she had been completing exercises in which she drew bar-lines and labelled notes in the treble and bass clefs in Middle C position.

Tammy was nine years old and in Grade 3 at school. She was the youngest of two siblings and the only one in the family who played an instrument, although her deceased grandfather used to play the guitar. She had been playing the piano for 12 months and although she had a keyboard at home, she tended to practise a little less frequently than required and she was therefore not progressing quite as rapidly as she could be. This intermittent practice also affected her note reading as this symbol recognition was not being regularly consolidated through independent work. She was steadily making her way through the first book in the *John Thompson's Easiest Piano Course* series, and she knew C, G, D, and F majors, all one octave with separate hands. She was familiar with the terms *legato*, *staccato*, *piano*, and *forte*, and she had started writing notes in her theory book.

These descriptions show that these five participants were of similar ages and levels of experience on the piano. Much of the information provided here is not specifically relevant to the study, but it is nevertheless important to document all ancillary data in a design-based study. During their pre-intervention interviews I sought to establish baseline levels of connectedness to the piano and their

musical learning in general. I also wanted to develop an understanding of their musical experiential landscapes. A summary of interview responses (see Appendix E) revealed that there were common themes across all five participants. The first was that the music they heard most regularly was whatever their parents were listening to, as well as music on television. Three participants mentioned occasional exposure to classical music in the form of opera, violin music, and in one case, the participant's mother playing the keyboard. Musical tastes were generally eclectic and no specific examples of musical preferences were mentioned apart from Tammy, who said that she particularly liked violin music, although three participants mentioned that they had a favourite song, all of which were popular at the time of conducting the interviews. The second cross-cutting theme was their motivation for playing the piano. The prevailing response was that their mothers had signed them up for lessons, although all five participants indicated that they enjoyed playing the instrument.

These five participants were selected for the first two cycles of the study, which aimed to develop an approach to including composition in piano lessons with children who were similar. The third cycle aimed to determine whether this approach would be successful with a more diverse sample of participants, and whether the range of ages and experience levels would necessitate significant adjustments to the design. As previously discussed, one participant discontinued her lessons after recruitment to the study, but before it commenced, so only the four participants who engaged with the intervention will be introduced. As before, each child will be described from the point of recruitment, and their real names have been replaced with pseudonyms.

Alex was 11 years old and in Grade 6 at school. She had two younger siblings and she was the only one taking music lessons. Her mother once took lessons and there was a piano in the home. Alex had been taking lessons for just over four years and she tended to practise very diligently. She was preparing for an external Grade 3 piano examination, and she was making progress with the pieces she had chosen, as well as the scales and arpeggios in the technical syllabus. Her technique was sound, although she struggled to play fast passages evenly. Sight-reading was a cause of anxiety for Alex and the development of this skill was being addressed each week. She was able to accurately identify all requirements in the aural syllabus (dynamics, articulation, tempo, and mode) and her theory work was generally correct and neatly presented.

Emma was nine years old and in Grade 4 at school. She was an only child and she had a keyboard at home, although she was the only member of her family that played an instrument. She had previously taken lessons with another teacher for approximately one year, before starting lessons with me three months prior to her participation in this study. Her sense of rhythmic differentiation (between quavers, crotchets, and minims) and her technique were both very weak, so these elements had been the focus of much of her lesson time, in which Burnam's (1957) *A Dozen A Day* books had been helpful. She read

notes quite well and she was working through the second book in the *John Thompson's Easiest Piano Course* series. She knew C, G, D, and F majors, as well as A and D minors (all one octave with separate hands). She also knew how to play C major and D minor in contrary motion (one octave). Her aural skills were also developing and she was able to identify *legato*, *staccato*, *piano*, and *forte* in the aural exercises. Her theory work was generally correctly completed.

Khanya was 12 years old and in Grade 7 at school, and she had been taking lessons for one year and three months. She was an only child and the only member of her family who played an instrument. She was a boarder in the school's hostel and although a practice room was available, her afternoon commitments tended to prevent her from practising regularly, so her progress was not quite as rapid as it could have been. She had recently started working through the second book in the *John Thompson's Easiest Piano Course* series and she knew C, G, D, and F majors, as well as A and D minors (all one octave with separate hands). She was familiar with *legato*, *staccato*, *piano*, and *forte*, and she was able to identify *crescendo* and *diminuendo* in aural tests. Her theory homework was frequently incomplete, although she was very capable.

Neela was nine years old and in Grade 4 at school. She had an older sister, although she was the only member of the family who played an instrument. She had been taking lessons for three months and was making very rapid progress through the first book in the *John Thompson's Easiest Piano Course* series, due to her excellent practice habits. She could play the C, G, D, and F major scales, and she was familiar with the terms *legato*, *staccato*, *piano*, and *forte*. Her theory homework was generally correctly completed and although she had yet to start writing notes, she had been drawing bar-lines and labelling notes in Middle C position in the treble and bass clefs.

Pre-intervention interviews (see Appendix F) provided information that was similar to that of the first cohort, in that their musical tastes ran to pop music and there was limited exposure to classical music at home. Although these four participants were culturally diverse, only Neela mentioned hearing music at home that was specific to her cultural background. All four participants' responses indicated that they enjoyed playing the piano and that they held positive opinions about their abilities on the instrument. When asked whether they had ever composed their own music, Alex and Neela confirmed that they had invented short tunes, while Emma and Khanya had not.

Having described the participants' prior knowledge, it is important to specify the types of goals I hoped to achieve at the end of the first iteration with the first cohort. As previously noted, the HLT is an anticipated learning route with sufficient bandwidth to accommodate multiple pathways (Doorman 2018). It was therefore possible to make broad predictions about learning across the five participants in the first cohort and establish common learning goals. In terms of technique, I hoped to see an

improvement in finger independence in these young pianists, which would support their technical development, and an understanding of how to produce different colours on the piano. Music theory, including staff notation, is an important aspect of piano tuition and I expected that they would be able to write notes in Middle C position, to have some understanding of triads, and a grasp of structure in music so that the pieces in their tutor books, and the music they heard, made more sense to them. The most important goal, however, relates to the overarching research question, regarding the creation of an agentive music learning ecology, so I hoped to see evidence in the data of a greater sense of connectedness to their lessons and their work, which may be characterised by increased intrinsic motivation to play the piano and a deeper affinity for the instrument.

Essential to achieving these outcomes, through composing activities, is the ability to invent melodic motifs and develop them to some extent. The prevailing literature describes research on classroom composition in primary schools, or individual compositional activity at secondary and tertiary level, predominantly in the United States and the United Kingdom. My study, however, is focused on individual primary school children in the Eastern Cape, so I have based my initial conjectures about the means to support student learning through collaborative composition on the principles of first-generation CHAT. This requires both the learner and teacher to engage in culturally and historically informed activity that is mediated by the use of domain-specific tools, towards a common object (Engeström and Sannino 2021; Foot 2014), which in this case is meaningful musical learning.

Implementation challenges

As previously noted, the first iteration of the designed intervention was enacted from July to November 2022, encompassing the third and fourth school terms. Each piano lesson followed the familiar structure, with the inclusion of a composing activity. After welcoming the participant and inviting her to be seated at the piano, work commenced on technical, sight-reading, and aural exercises. Scales were then checked and either corrected or a new scale was taught. Progress on the pieces was then evaluated and if satisfactory, new sections were taught. The participant's theory homework was then marked. Errors were discussed and corrected, and new exercises were given to be completed at home. It was imperative that these traditional lesson components were preserved because each of these items would be assessed at the end of term and these results would be reflected on the child's music report, the embodiment of the school's expectations of instrumental tuition. However, the additional composing activity would require time to complete, and its inclusion would be difficult to accomplish within the allotted lesson time. This implementation challenge prompted the first of three questions: how can Hogenes' three-step model be used in piano lessons without displacing those lesson elements that are essential in terms of the school's and parents' expectations? As a teacher I was concerned that the new composing activity might require too much of the valuable lesson time, so I decided that it should be

done at the end of the lesson to ensure that the institutionally mandated lesson components were not displaced. In this way the composing activity could be carried over and completed in the following lesson if necessary, which was a locally effective solution to this problem.

There were many occasions where external school-related factors eroded lesson time. For example, Maggie often arrived late for her lessons due to the time it took her to walk from her classroom to the music rooms, which are far away (see Appendix I, lessons 1, 4, 5, 8, 10). Other contextual factors, like school assemblies running overtime, also reduced lesson time (see Appendix K, lesson 4), or choir practice might run overtime, resulting in the pupil arriving late (see Appendix AA, lesson 2). On other occasions, lessons were skipped entirely due to school events like the Interhouse Athletics day (see Appendix G, lesson 4), or absenteeism (see Appendix J, lesson 2). These contextual problems prompted the second procedural question: how can an experimental intervention be successfully enacted in the living context of piano lessons, within a bustling school? These missed lessons prolonged the enactment of the intervention so it could not be completed as planned within the anticipated ten weeks, a fact that was noted, to be revisited during the analysis phase because a solution was not immediately apparent.

Upon conclusion of the intervention's first teaching cycle a wealth of data had been accumulated, as anticipated, but because the retrospective analysis had yet to be carried out, I was not yet able to determine whether the design had worked. This caused me to pose the third question, which was essentially more closely aligned with the research goals than aspects of procedure: how can the success of an experimental intervention, such as the one undertaken here, be evaluated? In the absence of control/treatment comparisons or quantitative measures, as are typical of RCT protocols, it was difficult to make evaluative judgements, particularly before analysing the data. The play-based and process-oriented nature of the intervention's pedagogical approach further compounded this dilemma, because the participants' own compositions were deliberately not assessed. While I was cognisant of the fact that the impending analysis would seek to uncover details relating to participant activity and the efficacy of the design itself, I needed some indication of the intervention's success, however provisional, possibly due to my own involvement in its implementation. Two descriptors were conceived against which preliminary evaluations of the intervention's success could be made, one derived from each of the dual perspectives I had assumed. The first was drawn from my role as researcher, in which notions of success could be affirmed by the fact that tool-mediated, collaborative activity had indeed resulted in new pieces of music, which is consistent with the principles elaborated by Hogenes (Hogenes *et al.* 2023, 2016). The second came from my role as teacher, in which curriculum coverage and pacing of lessons are a constant concern. From this perspective, success could be determined by the completion of all activities described in the lesson schedule within the allotted 10 weeks. In this sense, the intervention had not met the required criteria because one activity, the lead sheet task, had been

abandoned due to lack of time, an observation that would serve to direct the analysis of the accumulated data.

Conclusion

In DBR, an educational intervention is viewed holistically, as a set of interrelated and interdependent variables that constitute the learning ecology in which it is implemented, and through which productive learning conditions are created that were previously not widely practised or understood (Hoadley 2004; The Design-Based Research Collective 2003). DBR is iterative and as the name implies, researchers engage in two forms of activity, namely design and research (Reimann 2011). However, researchers using this method are also tasked with the documentation and explication of their decision-making in order to establish trustworthiness (Reimann 2011; Hoadley 2004; Cobb *et al.* 2003; The Design-Based Research Collective 2003). A design-based approach was used in this study as this made affordances for Hogenes' three-step model for teaching composition to be implemented in an authentic context, and because DBR is iterative, a longitudinal research design was necessary to allow for three incarnations of the intervention to be designed, enacted, and evaluated. This evaluative element was necessary to determine whether Hogenes' model was appropriate for use with primary school students in the Eastern Cape, which is a region that differs culturally, socially, and economically from the Netherlands, where the model was developed. A detailed description of Hogenes' model has been presented in this chapter, along with the lesson schedule that was aligned with its three steps, namely the creation of a common basis, generating ideas and writing the composition, and presentation, publication, or recording. The creation of this lesson schedule, which consists of seven distinct composing activities, was guided by dual agendas, those of teacher and researcher, and embodied my conjectures about student learning in terms of the elements of music and piano technique, as well as anticipated learning of compositional techniques. The data collection and analysis methods used have also been described, as have details of participant selection and information about the participants themselves. Some implementation challenges that arose from the context of implementation have also been discussed, which sensitised me to specific themes of interest to be addressed in the analysis phase. The designed lesson schedule presented here constitutes the first incarnation of the intervention used in this study, the enactment of which will be discussed in the following chapter, along with the analysis of the data collected, resultant findings, and details of the intervention's redesign.

CHAPTER 6

ANALYSIS: ITERATION 1

Introduction

In DBR, model-building is an important outcome, in which interventions are designed that may be applied, or adapted for application in situations other than those in which they were developed (Gorard and Taylor 2004). This task requires the researcher to place “in illuminating connection” (Geertz 1974, 29) both experience-near and experience-distant concepts, in other words, theorising from the specific to the general. This allows the design to be transported to other contexts for use by other practitioners because it clarifies “the relationship between results and the context in which data was produced” (Mandran *et al.* 2022, 9584). The enactment and analysis cycles of the three iterations are described in the next three chapters, along with reflections on how these relate to the study’s theoretical underpinnings. I have chosen to provide brief synopses of lessons, not only to document the intervention, but also to make it possible to trace analysis themes back to their originating contexts, which are consistent with reporting methods in dissertations presented in education research using DBR (Hillaire 2021; Goff 2016; Getenet 2015).

This study was conducted in three iterations in which successive cycles of design, implementation and analysis were undertaken. The first and second iterations were implemented with the same five participants, but the design used in each of these two teaching cycles was fundamentally different. The third iteration employed a refined version of the intervention used in the second iteration, although with a new cohort of participants. Each iteration, being thus distinct in terms of participants and/or designed intervention, was treated individually and data collected in each teaching cycle was analysed in a new NVivo project, to prevent data from one cycle influencing that of another, which would skew results.

Summary of enactment

The first iteration was enacted as a series of ten lessons from July to November 2022 (including pre- and post-intervention interviews), encompassing the third and fourth school terms. In the following section, each participant’s lessons are briefly described with emphasis on interactions that prompted observations that informed analysis. These descriptions are not exhaustive because it is impossible to reduce the volume of data collected into short synopses, yet it is important to present these contextual interactions in a design-based study (Barab and Squire 2004; The Design-Based Research Collective 2003). It is for this reason that more comprehensive accounts of each participant’s interaction with the intervention, compiled from lesson transcripts and field notes, are presented as appendices (see Appendices G-K).

Gloria: summary of observations

Gloria seemed uninhibited in asserting herself and exercising her agency in changing the rules of activities, whether in terms of the theme used as a compositional prompt or setting herself rules related to pitch intervals. She occasionally struggled to develop motivic material from her free play and I was able to help her overcome this obstacle by selectively imposing parameters on the number of notes to be used. There were also instances where this difficulty in moving from divergent to convergent thinking was ameliorated by her autonomously manipulating the notes symbolically, writing them down and reorganizing them on the page before testing the result on the piano. Notation was managed in several ways throughout the enactment, by writing finger numbers, combining finger numbers with letter names, her own use of staff notation, or my transcription of her music when the pitch ranges were beyond her ability to notate. It is also worth noting that I chose not to use the Piano2Notes mobile app because my own experiments with this software had not yielded notations that were sufficiently faithful to the music it was meant to represent, which had implications for the third, presentational step in Hogenes' model. I observed that the lesson schedule, as originally planned, could not comfortably be accommodated in the time allocated and there were several instances where I made spontaneous changes to the design to maintain a trajectory of composing activity, which is consistent with "rapid prototyping" (Joseph 2004, 236) strategies employed in DBR. These included small alterations to task parameters, for instance, reducing the required number of pitches in creating a new melody, or larger alterations such as the decision to abandon the *Siyahamba* lead sheet activity due to lack of time.

Jane: summary of observations

There were three occasions where endogenous factors limited lesson time, which is typical of this teaching context, including Jane forgetting her lesson time and needing to be collected from her classroom, certain standard lesson components requiring more time than anticipated, absenteeism, and a rescheduled school assembly that encroached upon her lesson. Jane's own notation of her work was also time-consuming, which led to her being unable to complete certain activities within the allocated time and these tasks being carried over to subsequent lessons. This prompted me to assume the role of scribe for some of the tasks, which was an effective time-saving strategy. I frequently observed that Jane was rather decisive in her approach and did not struggle to transition from divergent to convergent thinking, although she often created long sequences of notes that she struggled to remember. I assisted her in this regard by asking her to limit the number of notes and adding to them once they had been written down. The second activity, which involved writing a walking tune, caused her to recall a fond memory of a walk she had taken with her family while on holiday. This personally meaningful experience presented an opportunity to utilise this recollection as an authentic compositional prompt, which differed from the prompt articulated in the lesson schedule. I thus made a spontaneous adaptation to the design to include her own experience in her composing work, which may have contributed to the

high level of engagement I observed in her approach to the task. As had been the case in Gloria's interaction, the *Siyahamba* lead sheet task was abandoned. In addition, she had not been able to attempt the final tone poem activity, resulting in a significant difference between the HLT and the ALT, owing to an overly ambitious lesson schedule.

Maggie: summary of observations

Maggie's lessons were subject to a variety of contextually imposed time constraints, as had been the case with other participants, so I was very conscious of time throughout her lessons. She seemed to enjoy exploring pitches during free play, but frequently found it difficult to settle on motifs because she tended to create sequences of notes that she could not recall. This problem was solved by my suggesting to her that she choose just a few notes, to which more could be added once they had been notated, and by asking her to repeat a new phrase several times until it was familiar. Maggie tended to forget her work between lessons, so a significant amount of time was devoted to revising the prior week's material before it could be extended. This prompted me to suspect that this purely collaborative model was not entirely feasible in this teaching situation, and that an approach in which material could be practised and/or developed by participants at home might be better suited to this context. In this way, independent work could supplement the collaborative creative activity undertaken in lessons in a manner similar to standard lesson components, such as scales and repertoire, which might serve to further integrate composition into the piano teaching paradigm. The time lost to contextual constraints and the extensive revision of previously written work resulted in Maggie completing only five of the seven tasks in the lesson schedule, as had been the case in Jane's interaction.

Saira: summary of observations

Saira demonstrated a great deal of agentive control of the rules in her approach to composing activities by suggesting alternative compositional prompts, imposing her own parameters regarding pitch choices, and in one case, deciding to start her melody at the end and working backwards. In her free play, I observed that she initially seemed a little intimidated by the proliferation of possibilities available to her, so I suggested that she choose just a few notes at first, which proved to be a useful composing tool that she later appropriated and used in subsequent tasks without my prompting. Another interesting aspect of Saira's interaction with the intervention was her methodical approach to pitch selection, in which she systematically chose notes through a process of elimination. She also exhibited a concern for notational accuracy and although she initially wanted me to write her music, she gradually took over the task of notating new material. When approaching the mood activity, Saira mentioned a recent family holiday abroad, and that thinking about it made her feel excited. I therefore changed the design of the task to explore just this one emotion, instead of the three required by the lesson plan. She responded positively to this suggestion and immediately set about creating a mind map of her favourite aspects of

the holiday, which she used to generate text to which she assigned notes. Because there was insufficient time to complete the text in her lesson, I asked to complete it at home, which she did, returning the following week eager to start writing a melody. This indicated to me that allowing her to take the lead and approaching the task in her own way had been a powerful motivator, and that assigning certain tasks to be completed independently at home could be a useful strategy in managing the ubiquitous challenge of time.

Tammy: summary of observations

In the first lesson, Tammy chose not to use ice cream as a compositional prompt, which was consistent with the approach adopted by the majority of the participants. She also chose to experiment with pitches on the piano before creating the text for her tune, an approach that she autonomously adopted later in the intervention. She frequently seemed to struggle to make the transition from divergent free play to convergent decision-making in structured play, which I facilitated by suggesting that she select just a few notes to create a short pattern, to which further notes could be added. She also seemed to enjoy notating her own work and exhibited a clear preference for staff notation over alternative methods. This fascination with staff notation enabled me to introduce certain theoretical concepts well in advance of my planned teaching of them, most significantly the functions of accidentals. Tammy's approach to the creative process was also noteworthy because on one occasion we did not work collaboratively to create a melodic motif. Instead, she chose to use an idea that she had invented at home. I observed that she seemed to experience a deep sense of ownership of her work once this motif had been incorporated into the composing task, which suggested that independent work could support our collaborative endeavours without undermining them. As had been the case with the other participants, task introductions and the revision of previously written material encroached upon the available lesson time and not all tasks in the lesson schedule were completed, resulting in the *Siyahamba* lead sheet activity being abandoned in favour of the unstructured tone poem task.

Analysis of iteration 1

Learning trajectories

All five participants had interacted with the same design, although there were differences in how they had approached tasks and how much time was required to complete them. Comparing the HLT with the ALT revealed that the first five activities were completed by all five participants, although some took longer than others. When an activity could not be completed within the lesson allocated, it was carried over to the following lesson, a trend that had implications for subsequent activities in the designed lesson schedule. For example, Activity 4 was allocated one lesson, but all participants required three lessons to complete this task. This meant that by the end of the fourth lesson I already knew that the design was too ambitious to be comfortably enacted within the 10 weeks allocated. As a result, I made

the decision to alter the design mid-implementation and abandon one of the tasks. Activity 6, which involved creating a lead sheet for *Siyahamba*, was therefore not attempted by any of the participants because I had chosen to use the unstructured tone poem (Activity 7) instead. This decision was guided by literature that suggests a balance between free and structured tasks (Hogenes *et al.* 2014a; Bolden 2009; Ruthmann 2008; Smith 2008; Gould 2006; Dogani 2004; Miller 2004). In addition, Jane and Maggie managed to complete only five of the seven tasks that had originally been planned. Comparing the HLT with the ALT (as shown in Figure 5 below) was therefore an important step in preparing for the detailed analysis of lesson transcripts and field notes because it revealed how time had been a significant factor.

Figure 5. HLT vs. ALT, iteration 1.

Lesson	HLT	ALT				
		Gloria	Jane	Maggie	Saira	Tammy
1	Activity 1. Pitch. Create a short melody about ice cream.	1. Completed. Changed rules: used fire instead of ice cream.	1. Completed.	1. Completed.	1. Completed. Changed rules: used gran instead of ice cream.	1. Completed. Wrote about her gran's milk tart.
2	Activity 2. Duration. Walking melody (crotchets) with LH accompaniment (minims).	2. Completed. Used semibreves in LH instead of minims.	2. Created a long RH melody.	2. Created a RH melody.	2. Created a RH melody.	2. Completed. Used semibreves in LH instead of minims.
3	Activity 3. Pitch, duration, articulation. Walking tune with bird (staccato).	3. Completed.	2. Added LH minims to the first 8 RH crotchets.	2. Completed. Used semibreves in LH instead of minims.	2. Completed. Added LH minims to RH crotchets.	3. Completed.
4	Activity 4. Form. Beginning middle and end. <i>Twinkle Twinkle Little Star</i> .	4. Made a beginning.	2. Completed. Finished adding LH minims to RH crotchet melody.	3. Completed.	3. Completed.	4. Made a beginning.
5	Activity 5. Form, timbre (part 1 of 4). Create a tune that expresses a mood.	4. Made a middle.	3. Completed.	4. Made a beginning.	4. Made a beginning. She added LH harmony.	4. Made a middle.
6	Activity 5. Form, timbre (part 2 of 4). Create a 2 nd section to express a different mood.	4. Completed. Made an end.	4. Made a beginning.	4. Made a middle.	4. Made a middle. She added LH harmony.	4. Completed. Made an end. She had worked it out at home before the lesson.
7	Activity 5. Form, timbre (part 3 of 4). Create a 3 rd section.	5. Created a 1 st mood tune.	4. Made a middle.	4. Completed. Made an end.	4. Completed. Made an end. She added LH harmony.	5. Made 1 st mood tune. She added staccato.
8	Activity 5. Form, timbre (part 4 of 4). Arrange the sections into a finished piece, adding linking sections if needed.	5. Created a 2 nd mood tune.	4. Completed. Made an end.	5. Made a 1 st mood tune.	5. Made a mind map of things she liked about her holiday. No music. She turned these words into lines at home.	5. Made 2 nd mood tune.
9	Activity 6. Texture. Create a lead sheet for "Siyahamba" using primary triads.	5. Completed. Created a 3 rd mood tune.	5. Made a 1 st mood tune.	5. Made a 2 nd mood tune.	5. Completed, although due to the end of term approaching, it was only one mood. She also added staccato.	5. Completed. Made 3 rd mood tune.
10	Activity 7. Timbre. Create a "watery" piece.	7. Completed.	5. Completed. Made a 2 nd mood tune.	5. Completed. Made a 3 rd mood tune.	7. Completed.	7. Completed.

Analysis was driven by the overarching research question: how can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape? Answering the how in this question involved the first two goals of this research, namely the development of an intervention, and the adoption of Hogenes' model for teaching composition. A driving force in DBR is the iterative redesign of an intervention, so it was essential that the intervention's strengths and weaknesses were identified so that the second iteration's design retained those elements that worked, while those that did not could be changed or discarded. Initial open coding was guided by themes identified in lesson observations, resulting in broad code categories, and subsequent coding using the constant comparative method generated subordinate codes, as shown in Figure 6, which explicates the developed coding vocabulary that was cross-sectionally applied to all the data.

Figure 6. Coding vocabulary, iteration 1.

Code category	Code	Number of references
Design strengths	Autonomy - Rules	24
	Bring prior knowledge or music into the piece	9
	Enjoyment	47
	Manipulation via notation	12
	Personal meaning	6
	Revision	14
Teaching moments	Consolidate concepts	29
	New notes or concepts	12
	Piano technique	6
Design weaknesses	Lack of time	37
	Motivic development struggle	38
	Too long	57
Strategies	Changes to design	15
	DW ² asks guiding questions to make decisions	4
	DW asks to repeat phrase	3
	DW demonstrates	2
	DW introduce parameters ³	18
	DW notates	35
	Finger numbers	12
	John Thompson or other pieces as reference	23
	Sets own parameters	1
	Theory book as reference	10
	Wants staff notation	6
	Words no	14
	Words yes	8

Design strengths

In their interactions with the intervention, the participants exercised their agency in changing the rules of the activity with which they were engaged. It was important to attend to this autonomy because it is a factor that is necessary in the cultivation of agentic music learning ecologies. One example of this

² DW refers to the researcher/teacher, Donovan Wynne.

³ Parameters introduced included limiting the number of pitches, defining the region of the piano to be used, or suggesting the repetition of a phrase.

was Gloria's decision to change the theme of the first activity from ice cream to fire (see Appendix G, lesson 1). I therefore created a code called Autonomy – Rules, to which interactions were coded that showed evidence of participants' agency and control over the rules of their interaction. Another factor that had helped participants complete tasks had been the use of prior musical knowledge or specific pieces of music, one example being Jane's account of a musical interaction with her sister, in which Jane had learnt a melodic motif from her younger sibling while playing together (see Appendix H, lesson 7). The code Bring Prior Knowledge or Music into the Piece was therefore created.

Enjoyment was of critical importance in this study because for an activity to be considered playful, it must be enjoyable. Evidence of this enjoyment was found in the lesson transcripts, where participants spontaneously started to laugh (Maggie 2022b), and in my observations (see Appendix H, lesson 4). Furthermore, all five participants confirmed that they had enjoyed composing their own music in their post-intervention interviews (see Appendix L).

Both Gloria and Maggie had used notation as a means of conceptually manipulating notes and arranging them into patterns that they found pleasing. The code Manipulation via Notation was created to track moments when this had occurred. Coding revealed that this strategy had been useful, to varying degrees, with all participants except Jane, who had notated only once throughout the intervention. Notation, as an organisational tool, was therefore an important factor that needed to be included in the redesign, possibly as part of an explicated toolset.

As anticipated, personal meaning was important to the successful completion of tasks and coding transcripts to this category showed that the participants' work frequently drew upon personal experience, such as Jane's walk with her family (see Appendix H, lesson 2), or Saira's holiday abroad (see Appendix J, lesson 8). The second iteration's design would therefore need to include elements that promoted participants' integration of lived experience into their own compositions, possibly through compositional prompts that made these affordances.

The second step in Hogenes' model includes three processes: generating musical ideas, writing the composition, and revision of work. This revision was most prevalent with Gloria, Maggie, and Saira, and was notable because the vast majority of the instances that were coded to this theme revealed that this revision was instigated by the participants, through self-reflection that required time. The new design would therefore need to be broad enough to accommodate not only the creation of musical ideas, but also their revision, which had not always been possible in the small, insular tasks that constituted the first design. I conjectured that a larger project, to be completed over an extended period of time, would grant participants the time and perspective necessary for reflection and revision, which is consistent with project-based orientations in music education (Merkow 2012).

There were several instances of interactions that presented opportunities for teaching moments, which became apparent during the coding process. These included moments in which I, as teacher, exploited certain situations to consolidate concepts that had recently been taught, or in which I taught new concepts that became necessary in order to facilitate the participants' composing, usually in advance of when these concepts would ordinarily have been covered. There were also instances where aspects of piano technique were modelled and discussed, usually when participants were having trouble playing their work. These teaching moments were coded according to their focus, namely Consolidate Concepts, New Notes or Concepts, and Piano Technique. The first of these codes produced the most references, in which the participants' own compositions had presented opportunities for me to consolidate recently learnt concepts by drawing attention to them and their links with other areas of the participants' piano tuition. I conjectured that my sensitivity to these teaching moments was therefore a significant factor in leveraging the intervention's ability to support musical learning and should be retained in the second iteration as an awareness of when and how to point out relationships between participants' compositions and prior musical knowledge.

Design weaknesses

The presence of these design strengths, as evidenced by coding references to these attributes, suggested that the intervention had successfully addressed these themes. Most significantly, evidence of participant autonomy, enjoyment, and personal meaning confirmed that the intervention was aligned with a playful approach, while text coded to Manipulation via Notation confirmed that participants had appropriated this tool in their activity, as predicted by CHAT. The intervention had therefore made manifest the interaction of the three components of tool-mediated activity (subject, tool, object), as articulated by Engeström and Sannino (2021), through the implantation of the CHAT-based model proposed by Hogenes. However, there was a conflict between the theoretical underpinnings of the intervention and the practicality of its enactment. The third step of Hogenes' model involves presentation of the completed work. The initial design sought to satisfy this imperative by recording new compositions and sharing these audio files with parents. However, as already mentioned, time was a significant obstacle and the participants did not have the opportunity to rehearse and polish their work for the purpose of producing fair recordings. Furthermore, the participants' efforts, being limited as they were to insular tasks, yielded short fragments of material that did not lend themselves to performance. In this sense the intervention had failed to successfully address all aspects of the model so the subsequent redesign would need to resolve this shortcoming and make provision for a performance opportunity.

The issue of time was a worry both before and during the enactment of the intervention. As a teacher I was concerned that the new composing element might not easily be accommodated in lessons that were

already very busy, so composition tasks were done at the end of each lesson, after the customary lesson components had been covered. This was done to ensure that the institutionally mandated lesson components, as determined by the music report, were not displaced and incomplete composing tasks could be carried over to subsequent lessons. Indeed, this was frequently the case and resulted in one activity being abandoned altogether due to lack of time. Two coding categories were created, Lack of Time and Too Long, which grouped utterances and observations relating to this time quandary. Although these categories seem synonymous, they are quite distinct in terms of their contextual origins.

Cross-referencing the references to Lack of Time with my field notes revealed that these observations were made when endogenous factors had reduced the amount of time available for the completion of composing tasks. These factors included special assemblies, stage productions, sporting events, choir practices running overtime, and participant tardiness. There were also several instances of mandatory lesson components requiring more time than usual, for instance, when Jane was taught a new approach to sight-reading for the first time (see Appendix H, lesson 8), or when I had introduced a new theory workbook in Maggie's lesson (see Appendix I, lesson 10). These endogenous factors were embedded in the teaching context and therefore independent of the teaching experiment and hence beyond the ambit of my influence as researcher.

On the other hand, Too Long was a category that grouped utterances that correlated with exogenous design factors, in this case excessive length of time spent on composing tasks. Some evidence of this was found in lesson transcripts, where participants yawned or mentioned that they were tired (Gloria 2022b, 2022c), but the most significant evidence came from my lesson observations, in which I observed that the composing activities were too long to be accommodated in the available lesson time, particularly because the initial task introduction or recap of prior work were excessively time consuming. To gain a clearer understanding of this relationship between task introduction (or recap) and total composing time, the amount of time devoted to each was calculated, as shown in Figure 7.

Figure 7. Time comparisons, iteration 1.

Lesson	Gloria		Jane		Maggie		Saira		Tammy	
	Comp. time	Intro	Comp. time	Intro	Comp. time	Intro	Comp. time	Intro	Comp. time	Intro
1	00:14:42	00:04:31	00:10:02	00:01:49	00:18:05	00:02:15	00:16:00	00:01:37	00:13:20	00:07:10
2	00:22:06	00:02:33	00:20:23	00:06:29	00:13:24	00:04:38	00:13:39	00:08:40	00:12:39	00:05:10
3	00:18:39	00:03:24	00:25:01	00:12:09	00:29:22	00:15:38	00:16:22	00:03:31	00:12:55	00:03:03
4	00:16:25	00:04:14	00:12:49	00:04:52	00:15:42	00:02:48	00:10:41	00:02:37	00:14:46	00:05:40
5	00:06:49	00:01:49	00:14:02	00:03:10	00:13:30	00:04:46	00:21:18	00:07:57	00:13:18	00:02:52
6	00:15:46	00:02:43	00:12:21	00:04:03	00:14:05	00:04:20	00:16:34	00:04:33	00:11:48	00:03:27
7	00:15:49	00:03:41	00:07:18	00:02:02	00:13:58	00:03:45	00:14:31	00:05:26	00:15:00	00:04:34
8	00:10:08	00:01:39	00:09:16	00:01:10	00:12:10	00:04:56	00:08:42	00:02:27	00:09:10	00:03:07
9	00:09:44	00:02:10	00:09:58	00:02:50	00:09:05	00:03:36	00:16:08	00:02:41	00:10:25	00:01:15
10	00:08:37	00:03:22	00:12:04	00:01:54	00:12:25	00:02:45	00:10:57	00:04:20	00:14:05	00:05:38
Total	02:18:45	00:30:06	02:13:14	00:40:28	02:31:46	00:49:27	02:24:52	00:43:49	02:07:26	00:41:56
Ave	00:13:52	00:03:01	00:13:19	00:04:03	00:15:11	00:04:57	00:14:29	00:04:23	00:12:45	00:04:12
	Comp. time	Intro								
Gross ave	00:13:55	00:04:07								

Lesson Schedule	
Activity 1	Ice cream song
Activity 2	Walking tune
Activity 3	Staccato tune
Activity 4	Form (twinkle)
Activity 5	Changing mood
Activity 7	"Watery" piece

The average amount of time devoted to composition across all five participants was 13 minutes and 55 seconds. Of this, the average time spent introducing the task and revising prior work was 4 minutes and 7 seconds. Because this time quandary emerged due to a design flaw, it was exogenous, and therefore within my ability to resolve in the design of the second version of the intervention. Eliminating this introductory element would result in the composition portion of the lesson lasting a maximum of 9 minutes, which from my perspective as teacher would be more practical. Calculating the amount of time spent introducing new tasks, or revising prior work, and comparing these figures with the total amount of time spent composing in each lesson indicated that the next iteration's design would require the participants to practise their new work at home, in the same way that repertoire is prepared between lessons. However, these insular collaborative tasks within a linear lesson schedule did not lend themselves to revision at home, so I began to suspect that a larger project, to be completed over several weeks, would likely solve this problem. A framework would therefore need to be devised in which a single piece of music could be composed during the course of a school term and could be regarded as a fourth piece, which would essentially integrate the intervention into the participants' customary practice routines.

Motivic development

A problem faced by all participants was the struggle to develop motifs, which manifested in various ways. Participants frequently struggled to settle on a musical idea because they played long sequences of notes that were incoherent and any patterns of notes that may have been useful were difficult to isolate and recall. Each time these obstacles were encountered, I made suggestions that helped to move the process forward. A coding category called Strategies was created, which contained subordinate codes that represented each strategy that had been helpful. I therefore recoded the lesson transcripts with a particular focus on all references to Motivic Development Struggle, and coded these references to the specific strategies that were employed in each case. Once this was complete, I ran a coding query to see which strategies were used, which generated a list of strategies that corresponded to references to Motivic Development Struggle, as shown in Figure 8.

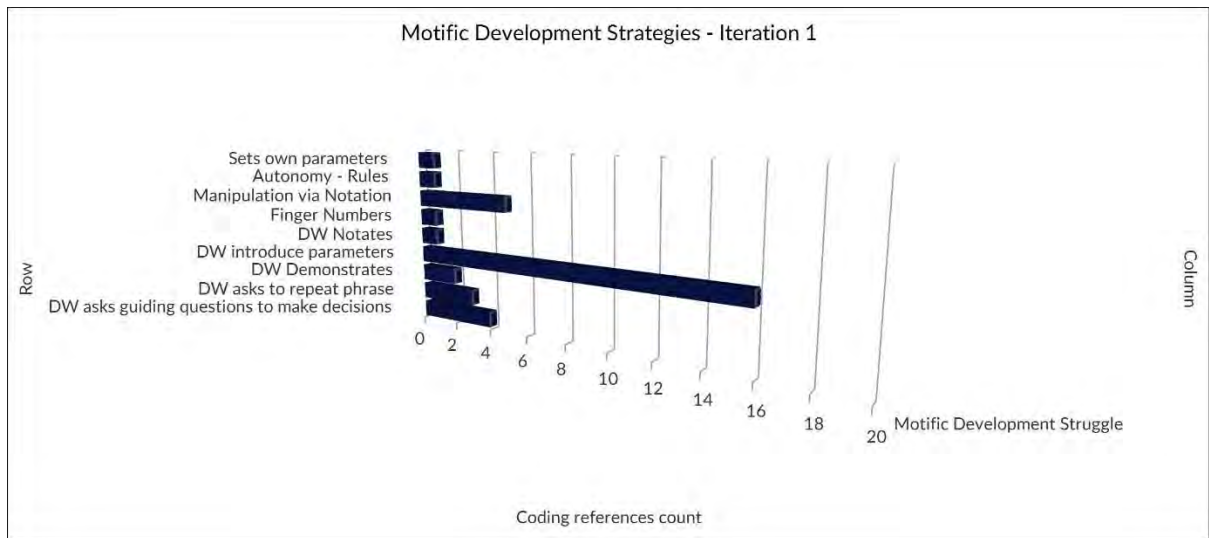


Figure 8. Motivic development strategies, iteration 1.

The introduction of parameters was clearly the most effective strategy for helping participants develop motivic material, which is consistent with Koops’ assertion that “establishing limits helps students focus their creativity instead of being overwhelmed by options” (Koops 2013, 157). A re-examination of the data revealed that there were two main types of parameters, both of which were aimed at limiting the scope of divergent processes. The first involved isolating a specific section of the piano to be used and deciding whether the tune should be given to the right hand or left. The second type of parameter involved restricting the participants’ activity even further and encouraging them to find a short tune, essentially assembling four pitches into a pattern as a starting point.

I also sought to gain a broader perspective of useful strategies, beyond the Motivic Development Struggle lens, so I ran a query that generated a visualisation of all strategies employed and their comparative frequency of use, as illustrated in Figure 9.

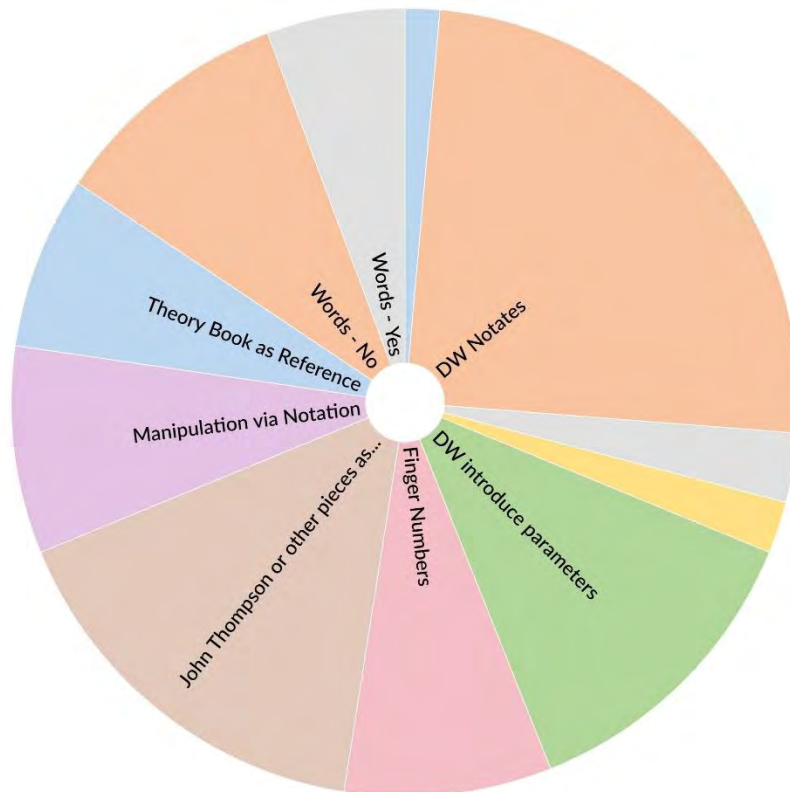


Figure 9. Pie chart of useful strategies, iteration 1.

DW Notates refers to instances where I notated the participants' work and this was clearly the most frequently adopted strategy, which confirmed what I had frequently observed during the teaching cycle. Two other strategies that were helpful were Theory Book as Reference and John Thompson or Other Pieces as Reference. Both of these strategies involved the use of endogenous elements (the children's music books) that were inherent in the lesson context, which served to integrate exogenous and endogenous elements to some extent. For example, referring to the *John Thompson* tutor book or other repertoire with which they were familiar helped participants to explore possible note combinations, as when Gloria referred to another piece of repertoire that contained triads (Gloria 2022a). At other times, referring to alternative sources was helpful in generating rhythmic figures, for example, when Saira was inspired by a rhythmic ostinato that she had encountered in her *John Thompson* book, saying, "I really liked that we were using this note and then using quavers" (Saira 2022). However, the majority of cases in which reference was made to alternative repertoire or the theory workbook involved facilitating the participants' notation of their own work, for example, when Maggie was unsure of how to draw the note B, to which I responded, "Okay. Let's find one to help us. Let's find a nice B in your John Thompson book, that we can look at for help" (Maggie 2022a).

Results

The introduction of parameters, for example, limiting the number of pitches, suggesting a starting point, or defining the region of the piano to be used, was clearly the most frequently used strategy so I knew that this, along with the others employed, would need to be included in the design of the second iteration. These parameter suggestions, which will be discussed in the next section, were informed by my composing experience in prior postgraduate studies and were offered on an *ad hoc* basis as necessary during the teaching phase. Considering that the sixth research goal was to render this approach transferrable to other contexts for use by other teachers who may not have composition experience, I knew that these suggestions would need to be codified in some way and included in a set of physical teaching materials. This also presented an opportunity to reify these compositional choices in such a manner as to be transparent for the benefit of the participants, which would likely be helpful to them when they were working independently, and it would introduce the language of composition.

Investigations using DBR are focused on the evolution of the design, in this case a framework for composition activity in piano lessons (Joseph 2004). Sandoval (2004) argues that “educational designs embody conjectures about learning that can be empirically refined” (Sandoval 2004, 213). He defines an embodied conjecture as “a conjecture about how theoretical propositions might be reified within designed environments to support learning. Designed environments include tools (like software), materials, and activity structures” (Sandoval 2004, 215). In this instance, the design conjecture was that my thinking, in other words, my decision-making suggestions informed by composing experience, if made visible, would become available to the participants as conceptual tools to be appropriated.

Embodying this conjecture required the reification of tacit knowledge so that it might be embodied in teaching materials to facilitate the creative process in the second iteration of the study. Analysis showed that the introduction of parameters was the most common strategy used in assisting the participants. This occurred at both macro and micro levels. On the macro level, defining the task was initially intended to provide a starting point and a direction that was understood by both the participant and the teacher, thereby satisfying the first step of Hogenes’ model, which requires the creation of a common basis. In certain tasks, like the form-oriented activity involving *Twinkle Twinkle Little Star*, the ternary nature of this starting point also imposed a parameter that compelled the participant to conceptualise the task as the creation of three short sections as opposed to one long piece of music, which made the activity approachable for these young composers. This type of macro-level parameter proved useful and therefore needed to be embodied in the design of lesson materials to be used in the second iteration of the study. Micro-level parameters were introduced as they became necessary, most frequently when participants encountered difficulties in developing motific material. This challenge indicated an underlying struggle among participants in making the transition from divergent free play to convergent structured play. In most cases, I was able to ease this transition by introducing procedural suggestions

such as shortening long pitch sequences, writing down just a few notes, or repeating a phrase until it was familiar. Knowing that these suggestions had been effective in supporting the participants' creative work prompted me to conjecture that these procedural parameters should also be embodied in the design of the second iteration's intervention. Of equal significance was the fact that the presentational third step in Hogenes' model was not successfully implemented. This failure to adequately address all three steps in the model led me to speculate that a performance opportunity needed to be created in the second teaching cycle.

Time was a significant factor in the enactment of the first iteration and it was found that a quarter of the available composing time was devoted to task introductions and revision of prior work. I conjectured that a single composing project, to be completed over the course of one school term, would solve this problem. The task would therefore need to be introduced only once, and each participant's project would essentially constitute a fourth piece of repertoire to be practised at home, which would eliminate the need to revise prior work in lessons. In this way, composing would be more fully integrated into the piano lesson and new concepts could be learnt as they are needed, as had occurred with Gloria (see Appendix G, lesson 6), Jane (see Appendix H, lesson 2), and Tammy (see Appendix K, lesson 5). I theorised that this form of functional integration of music concepts would further align the design with African musical aesthetics, in which the participants learn about music through a collaborative engagement in a creative process (Oehrle 1991a). A single composing project would also serve as a framework within which participants would be able to compose in a manner with which they are comfortable, as opposed to following a predefined series of activities in a lesson schedule, as had been the case in the first iteration. This non-linear mode of composing had appeared in the first teaching cycle, one of the clearest examples being Saira's approach to the mood activity (see Appendix J, lessons 8-9). Instead of selecting and conveying three moods, she had written a piece about the one mood that had been inspired by her holiday abroad, and had appropriated tools to express it, specifically the use of a mind map, and including *staccato* articulation. By following her lead, I had departed from my planned activity and collaborated with her in the creation of a piece of music over which she had control, and which was therefore meaningful to her.

Redesign

The introduction of parameters had been enormously helpful and had occurred at macro and micro levels. I decided that the second iteration's intervention design would present these macro-level parameters in the form of themed pages in a booklet, where each page suggests a theme and a rule to follow (see Appendix M). This decision was made in response to the perceived need for a larger composing project, emerging from the first iteration's analysis, and each themed page constituted an invented framework within which participants would be invited to create their music. It was anticipated

that these themed pages would serve as compositional prompts that satisfied the first step of Hogenes' model (creating a common basis) while simultaneously creating opportunities for participants to draw on their lived experiences. Figure 10 provides a brief overview of the themed pages presented in this booklet and includes the rationale behind each page.

Figure 10. Overview of themed pages designed for iteration 2.

Page name	Rule	Rationale
Together	Create a piece using the notes within the scope of Middle C position.	To accommodate participants who are comfortable in Middle C position. Restricting activity to this familiar position had proved useful in the first design, in terms of helping participants to generate musical ideas and in their notation.
Apart	Create a piece in which the left hand is placed one octave lower than the right.	Participants had frequently chosen to include low notes in their work in the first design, so this rule was intended to help them explore the bass clef and introduce the left hand's accompanying role.
Rhythm	Create a piece that is based on a rhythmic motif.	Both Jane and Saira had used rhythmic stimuli when completing Activity 4, which had served as a scaffold to which pitches were affixed. It was felt that this method should be made available to all participants.
Five Notes	Create a piece using only five pitches.	This extreme restriction had been a useful exercise in my own composition training, and it had been an effective strategy in the first iteration, so it was reified in a themed page, which might appeal to young composers who may feel intimidated by the apparently limitless possibilities available to them when approaching a new composing task.
Memory	Create a piece about a favourite memory.	Analysis revealed that some participants had found words helpful in getting started. This page encourages participants to write a few lines of text about a memory, which serve as a structural starting point based on lived experience.
Faces	Create a theme and variations that convey different moods, as indicated by drawing faces on the page.	Mood had been an effective stimulus in the first design, so it was retained and presented as a theme and variation activity.
Free choice	Create your own rule for this piece.	This page was intentionally left blank, apart from the proviso that a new rule should be invented to inform the creation of a new piece. This page was included to accommodate those participants who may wish to attempt a completely unstructured task. This page could also be used if the others do not appeal to the participant.

Micro-level parameters, which were strategies that had been introduced throughout the lessons on an *ad hoc* basis, could also be presented in this booklet. These process-oriented suggestions had been made to assist participants when they had encountered difficulties in forging motific material from their free music-play, in other words, facilitating participants' transition from divergent to convergent processes. Analysis of data collected during the first iteration showed which of these strategies had been most helpful. In many cases, writing down just a few notes often helped a phrase to emerge, as had repeating

a phrase until it was easy to remember. These are two examples of strategies that could be codified in lesson materials in the form of icons and presented as a page of Helpful Ideas (see Appendix M, Helpful Ideas). Similarly, creative decisions such as determining which hand to use, or in Saira's case, the use of an ostinato (see Appendix J, lesson 5), could be codified as icons and presented as a page of Creative Ideas (see Appendix M, Creative Ideas). In the first iteration, Jane had been prompted to reflect upon her own work when I had played her music in the eighth and ninth lessons, resulting in her revising her work and affording me the opportunity to draw her attention to aesthetic elements. I surmised that revision, an important part of Hogenes' second step, could be encouraged in the second iteration by including icons that suggested that participants could ask the teacher to play their music. Participants had also found it helpful to make decisions about whether their music should be loud, soft, *legato*, or *staccato*, which are elements that were initially included in the lesson schedule. These pianistic elements could also be presented as a page of icons called Piano Technique (see Appendix M, Piano Technique). These three pages presented not only the Italian terms associated with elements of piano technique, but also constituted a toolkit of concepts designed to introduce the vocabulary of composition. It was felt that the visual nature of icons would elucidate their meanings and make them user-friendly for young composers, with the potential to be used independently of a teacher. This last consideration was necessary because, as previously mentioned, time was a factor and it became apparent that some of the work would need to be completed at home in the second iteration. This would curtail the level of collaboration between teacher and participant to some degree, on the one hand, but promote participant agency on the other, a compromise that seemed acceptable.

By designing the help pages (see Appendix M, Piano Technique, Creative Ideas, Helpful Ideas) and a set of themed pages from which to choose, the intervention's design was transformed from a rigid, linear schedule to a loose framework within which participants are free to explore and experiment with sound, yet also guided by both the teacher and the parameters imposed by the materials. Hogenes' model had thus been reinterpreted and applied over a broader timeframe, where one piece could be written over the course of a school term, instead of the multiple composing activities that constituted the first iteration's intervention, in which the model was repetitively applied. This framework also made possible a performance opportunity, the third step of Hogenes' model that was not sufficiently addressed in the first teaching cycle. I conjectured that if the participant chose one themed page and focused their compositional efforts on writing this piece throughout one school term, this would result in a substantial piece of music that could be performed for others. A performance opportunity was therefore envisaged in the form of a Piano Party, where the participants would be able to enjoy some snacks, play their pieces for each other, and discuss the features of each composition.

The transition from a lesson schedule to a creative framework had implications for the creation of a HLT, in that it would not be possible to predict how participants might interact with the new design.

Instead of working through a predetermined series of lesson plans, each participant would have autonomy over which themed page they chose to use, and the way they went about creating their new piece. The only predictions that were possible to make were those relating to how the enactment of the second iteration might unfold over the course of a school term. These notions were explicated in the new lesson schedule, which served more as a weekly guide for me to follow as the teacher than an articulation of hypotheses about learning (see Appendix N). It was anticipated that the first lesson would be devoted to introducing the composition booklet and explaining each of the icons through a demonstration of the concepts depicted. Work on the participants' compositions would start in earnest in the second lesson and would continue for the next seven weeks, culminating in a completed work that would be performed for other students at an informal performance class, or piano party. The second iteration was therefore anticipated to last nine weeks, which would allow the participants to complete and perform their compositions within one school term, and which made affordances for lessons lost to absenteeism or school events. I decided that the performance arena should be aligned with the principles of supportive engagement upon which the intervention had been designed, so an informal gathering that emulated a child's party seemed appropriate, where participants could enjoy snacks and soft drinks while listening to each other's work and engaging in group discussions of each piece's features.

It is important to note that issues of task differentiation, whether in terms of levels of imposed structure (Hogenes *et al.* 2014a; Bolden 2009; Ruthmann 2008; Smith 2008; Gould 2006; Dogani 2004; Miller 2004), or levels of pupil ability (Leung 2008; Miller 2004), were simultaneously addressed in the new design. Because each participant was given a choice of themed pages, and because each participant brings with her a unique musical identity and combination of abilities, which are culturally and historically determined by musical engagement within piano lessons and beyond, each individual's interaction with the design would be necessarily unique and task differentiation would thus be effected through each interaction.

Conclusion

This chapter described the enactment of the first intervention, a linear lesson schedule, in the authentic teaching context for which it was designed. Analysis of the data collected during the first teaching cycle has also been discussed. Initial open coding yielded four broad coding categories, namely Design Strengths, Design Weaknesses, Teaching Moments, and Strategies. These categories were then populated with subordinate codes using the constant comparative method, and subsequent coding was done to saturate these codes. Data coded within the Design Strengths category suggested that the intervention had indeed promoted meaningful learning within an agentive music learning ecology and that it had successfully employed a play-based approach. Furthermore, the Teaching Moments category showed that these had occurred throughout the teaching phase, many of which served to integrate the

exogenous intervention with the endogenous context. Design Weaknesses was a category that identified two fundamental flaws in the intervention's design: the difficulties participants faced in inventing motivic material and issues of time. The former were investigated through an examination of data coded within the Strategies category, which identified those strategies by which participants' composing had been successfully supported. However, issues of time required a broader analytical focus. Observations made during the teaching phase had alluded to this problem, which was further explored by comparing the HLT and the ALT. This comparison showed that the lesson schedule had been too ambitious to be comfortably accommodated within the established format of piano lessons, and none of the participants had managed to complete all the tasks. The third, presentational step in Hogenes' model was also not adequately addressed. These problems were solved by reinterpreting Hogene's model and applying it on a broader scale. The initial lesson schedule was therefore discarded, and certain elements were retained in the new design, which was conceived as a framework model for composing in lessons, in which one piece of music would be written throughout a school term. The presentational imperative in Hogenes' model was addressed through the creation of a performance opportunity, in which all participants would present their compositions to each other at the end of the school term. Analysis of the first intervention's data revealed certain strategies that had supported participants' composing, including asking the participant to repeat a phrase, prompting them to write some of the notes before they were forgotten, and introducing certain restrictive parameters, such as limiting the number of pitches in a phrase. I conjectured that these strategies, if embodied in lesson materials, might constitute compositional tools to be appropriated by participants in the second iteration. These strategies were reified as icons and presented as a resource, in the form of a composition booklet, which also included compositional prompts as themed pages. It was anticipated that this booklet, which embodied conjectures about supporting student composition, would enable participants to write music in a manner that was more easily integrated into their piano lessons in the second iteration, which will be discussed in the next chapter.

CHAPTER 7

ANALYSIS: ITERATION 2

Summary of enactment

Those participants who had interacted with the first design also interacted with the second, which was enacted during the first school term, from January to March 2023. The new design required participants to select one of the compositional prompts presented as themed pages in a booklet, and to compose this piece of music throughout the term. Compositional tools, such as repetition and theme and variation were reified as icons and presented as a resource in the booklet's help pages (see Appendix M), to be used by participants as needed. This model offered participants an enabling framework within which to compose, which differed from the linear lesson schedule used in the first iteration. All five participants completed their compositions within seven lessons, which afforded them ample time to practise playing their pieces ahead of the performance class at the end of the term. As before, brief summaries of observations made during the second teaching cycle are presented here to facilitate the tracing of analytical themes back to their originating contexts, while more comprehensive accounts of enactment are provided as appendices (see Appendices O-S).

Gloria: summary of observations

In the first lesson, I introduced the themed pages and help icons in the composition booklet, and explained to Gloria that she would be composing a piece that she would perform at the end of the term, at the piano party. We started composing in the second lesson and she chose to use the first themed page called Together because, in her opinion, it was best to start at the beginning of the book. She initially created long sequences of notes that were difficult to recall, as she had done in the previous teaching cycle, so I referred her to the help icon that suggested selecting just a few notes to start making a pattern. This seemed to help and she invented a short motif, although she seemed hesitant to settle on a satisfactory version of her idea and continued to experiment with alternative note choices. I decided to intervene and affirmed one of the versions of her idea that I thought was most aesthetically pleasing, owing to the fact that it established a tonal centre. I observed that in doing so, I had assumed a stance within the collaborative paradigm that was more assertive than my interaction in the first iteration had been, which had been more passive. In essence, I had participated in Gloria's zone of play as more knowledgeable play partner, which allowed her to create a motif in less time than would have been required without my intervention. I also observed that the help pages were indeed beneficial, and Gloria would frequently turn to this resource without my prompting. In addition, there were occasions when Gloria's choice of icon did not provide sufficient impetus to move the process forward, so I suggested that we combine her choice with one of my own. This was an unanticipated benefit because the visual nature of the icons made their meanings immediately apparent, enabling a mutual understanding of

concepts without having to resort to lengthy explanations, which allowed Gloria to swiftly consider the implications and value of my contributions before accepting or rejecting them. The framework design used in this iteration appeared to have been more successful than the lesson schedule used in the first, and Gloria was able to complete her 20-bar composition in only seven lessons (see Appendix T), which left ample time to polish its performance before the piano party.

Jane: summary of observations

Jane's interaction with the second version of the intervention was similar to Gloria's in that the first lesson was used to introduce the composition booklet and help pages, both participants completed their compositions in seven lessons, and I interacted more directly in collaborative work by affirming ideas as they emerged from divergent experimentation. Another example of my influence was the setting of short-term goals in each composing episode, essentially demarcating micro-level objectives that incrementally scaffolded Jane's composing activity within the framework of the macro-level task represented by the themed page, such as adding a few new bars, or writing some left-hand notes to accompany a melodic phrase. She chose to use the Memory page to write her piece, and although she used some of the strategies reflected in the help icons, she did not always turn to the help pages, which suggested that some of these conceptual tools had been internalised and were available to her without requiring them to be introduced by means of an external source. There were also two emergent strategies that proved useful, which were not reflected in the help pages, namely, repeating material with a minor alteration, and writing text to which notes could be assigned, and I suspected that including these strategies in the next version of the design might be beneficial. Another significant aspect of Jane's interaction with the intervention was her use of dotted rhythms in her piece (see Appendix U), a rhythmic device that she had not yet been taught, which enabled me to introduce the notation of dotted crotchet and quaver groups far in advance of when this would normally have been covered in her lessons.

Maggie: summary of observations

Maggie's first lesson in the second iteration also constituted an introduction of the composition booklet and help pages, as had been the case with Jane and Gloria, and her composition was also completed in seven lessons. She chose to use the Five Notes page because she deemed it the most difficult, in which a theme was suggested that essentially embodied the restrictive parameter that had been helpful to her in the first iteration, which confined her note palette to only five pitches. I observed that I tended to set short-term goals in the lessons, as I had done with the other participants, which seemed to be helpful to Maggie in that it established the objective for each composing episode and directed her activity. Maggie chose to include E flat in her chosen set of five pitches (see Appendix V), a note that she had not yet encountered, which presented me with the opportunity to teach her the function of the flat sign well in

advance of when I would normally have introduced this concept. She seemed very comfortable working within the restrictive confines of the five-note rule and although I occasionally made suggestions, this advice was considered but frequently discarded. A new composing strategy emerged in Maggie's lessons, in which the notes used in one bar were rearranged into a new pattern, an approach that I noted for inclusion in the intervention's redesign. When she did occasionally find herself at an impasse, I found that selecting and combining two help icons was helpful, for example, combining Repeat and Bass Clef, which suggested that prior material be restated in the left hand. This schematic approach seemed to help Maggie maintain her composing momentum, and it indicated to me that the help icons could be used more flexibly than I had initially anticipated.

Saira: summary of observations

After the introductory lesson, Saira set about writing a piece using the Faces page, in which facial expressions could be drawn that determined the shifting moods expressed in the music. She seemed to be in full control of the creative process and did not require much assistance in developing motific material. I also observed that Saira was able to make a connection between the duration of one of her notes with a theory exercise she had recently completed. As a teacher, I appreciated this opportunity to consolidate this concept, particularly because the connection was being made between the sound and the symbol in an activity that did not originate from her theory workbook. There were several instances where Saira drew on other sources in her work, including theoretical concepts that had recently been taught in prior lessons, and fragments of chordal and melodic material from other repertoire. Although Saira did not make much use of the help pages, I suspected that her tendency to refer to other material, which had been an effective strategy for her, might constitute a valuable addition to the help pages' icons. Setting homework tasks proved to be a useful means of maintaining positive momentum because new sections of the piece were added through independent work and previously composed material was familiar because it had been practised at home. This eliminated the lengthy revisions that had characterised the first intervention's lessons and allowed Saira to complete her composition in only six lessons (see Appendix W).

Tammy: summary of observations

Tammy chose to write a piece using the Rhythm page, which required her to invent a rhythmic stimulus that would constitute the foundation of her composition. She created the initial rhythm quite easily but seemed apprehensive about the prospect of translating it into pitch on the piano. I referred her to the help pages and drew her attention to icons in the Creative Ideas and Helpful Ideas pages that were designed to guide initial decision-making, specifically Treble Clef, Bass Clef, Decide First, and Starting Note. It occurred to me that these icons were all oriented towards getting started, but they were not grouped together in a manner that might facilitate this process, so I resolved to examine the grouping

of icons in the help pages and reorganise their arrangement in the intervention's redesign. At a later stage, Tammy found herself struggling to remember a long sequence of notes that she had created, so I pointed out three help icons that might resolve the problem. Of the three suggested, she chose Make a Short Pattern, which she interpreted as having a truncating function. I observed that by choosing this strategy, Tammy had selected a rule to follow and I was able to help her because this rule had been made explicit by its reification as an icon, meaning that I knew what the rule was. In other words, the use of the help icon had not only helped Tammy by imposing an enabling parameter, but it had also made this parameter clear to me, so I was able to follow her rule and guide her creative process. Tammy also exercised autonomy over the rules in other ways, for instance, when she changed her rhythm halfway through the piece (see Appendix X), which constituted a change to the fundamental rule governing activity in this themed page. I chose not to intervene by insisting that she conform to her initial rhythmic pattern, because this rhythmic variation seemed to be a fitting way to include a sense of novelty and interest in her composition. As had been the case with Saira, Tammy completed her piece in six lessons, which allowed ample time to practise it before performing it at the piano party.

Performance

The preceding analysis cycle had exposed a design flaw, the fact that the third, presentational step of Hogenes' model had not been realised in the first teaching cycle. A performance opportunity was therefore conceived and implemented at the end of the second teaching cycle, on 30 March 2023, in which the five participants played their compositions for each other in my teaching room. I had set out chairs and a small table laden with snacks and soft drinks, which the children enjoyed while listening to each other play. I led a group discussion after each performance, asking questions about the features they had noticed in each piece, which prompted them to listen analytically. This prevented them from merely expressing opinions and required deeper listening, in which observations needed to be verbalised in the form of constructive feedback. I observed that although some of the participants were a little anxious about performing, the convivial atmosphere of this piano party eased their nerves and each child seemed to be enjoying herself.

Analysis of iteration 2

Framework feasibility

The design used in the second iteration of this study was successfully implemented with all five participants, who each composed a piece of music during the school term and performed it for other students, thereby adequately addressing all three steps of Hogenes' model. This differed from the first iteration, in which participants did not perform their work as required by the third step. In addition, this composing work did not intrude upon other lesson elements due to the time-saving strategies that had been identified in the first iteration's analysis and which were embodied in the new framework design.

These strategies allowed each participant to complete her composition in advance of the piano party, meaning that the framework design had been comfortably accommodated within the time limitations imposed by endogenous factors associated with the teaching context. Furthermore, all five participants had found it easier to compose their own work in the second iteration, as indicated in their post-intervention interview responses (see Appendix Y).

I was satisfied that the framework design was sound because it had addressed all six research goals. The design constituted an intervention that was based on Hogenes' model for teaching composition, thereby achieving the first two research goals, although observations made during enactment suggested the need to refine the design. The third goal, relating to promoting the role of the piano in students' musical identities had also been achieved, as evidenced by the participants' post-intervention interview responses (see Appendix Y). When asked whether composing had fostered a deeper affinity for the instrument, Gloria, Jane, and Tammy said that this was indeed the case, while Maggie and Saira said that there had been no change because they had always liked the piano. Tammy presented an interesting perspective on this sentiment because, after the first iteration, she had said that although she liked the piano more after composing for the instrument, she wished to take up violin lessons instead (see Appendix L). However, at the end of the second iteration she did not mention the violin in her interview and had in fact continued with her piano lessons beyond her participation in the study. While this apparent change of heart does not constitute direct evidence of the piano being more meaningful to her as a result of the intervention, it allowed me to speculate that this may have been the case. The fourth goal was to render musical learning personally meaningful through composing, which was most clearly demonstrated by Jane, who used a fond memory as a compositional prompt, and Saira, who called her piece *Me!*, which indicated that the changes in mood in her work reflected her own capacity for shifting emotions. The fifth goal sought to create an approach that was successful with different participants, who each represented unique worldviews and musical identities. While the framework design had achieved this goal, it was important to remember that these participants had been selected because of their similarity in terms of age and length of tuition, so achieving this research goal with absolute cogency would require the implementation of this design with a diverse cohort of new participants in the third iteration. Claims of transferability between students were therefore tentative and required the design to be trialled with a broader range of participants. The sixth goal involved transferability between teachers. The framework design and the strategies devised to facilitate its implementation had been presented in the form of a booklet, which had been designed to be user-friendly for the benefit of students and teachers. In the second iteration, the participants had found the help pages useful, as had I, although it would be impossible to claim that the design could be readily adopted by other teachers in their respective teaching contexts without additional trials, which were beyond the practical scope of this study. I surmised that the creation of the booklet had been an important first step in achieving this goal, although further attention to teacher approach was necessary in the second analysis cycle.

Retrospective analysis of data collected during the second iteration's teaching cycle was therefore focused on three factors, namely the design itself, agency, and time. The first of these required an analysis of the help items presented in the booklet to determine which strategies had been employed and the frequency of their use. Understanding how the design had fared in practice would inform revision of the design and the materials in which it was embodied. The second area of focus, agency, involved an examination of the actions taken in composing activities and by whom. This would serve to show activity trends that would inform conjectures about how to support productive activity in the next teaching cycle. The third area, time, was once again important because in order to successfully integrate composing tasks into an existing lesson framework, it cannot be allowed to displace established lesson components. It was therefore necessary to establish whether the framework design had contributed to time being saved as anticipated, and whether any additional time-saving strategies might be identified for inclusion in the third version of the design. Analysis being thus oriented to these main objectives would inform the redesign of the intervention into a more streamlined framework, and it would afford a better understanding of the dynamics of shared agency between teacher and student.

Help items

The three help pages contained icons that were loosely grouped according to their purpose. The first page contained items related to aspects of piano technique, such as dynamics (*forte*, *piano*, *crescendo*, *diminuendo*), articulation (*legato*, *staccato*), tempo (*allegro*, *moderato*, *adagio*), and the sustain pedal, which were intended to provide the participants with a palette of options that might be useful in making decisions about how their music is to be played. Although these are musical ideas that can assist composers in the creation of musical expressions, they were deliberately grouped together in the Piano Technique page because they are more closely aligned with technical facility than pitch organisation. Of the 10 items presented on the piano technique page, only three appeared in the lesson transcripts and field notes, *staccato* being the most prevalent as shown in Figure 11.

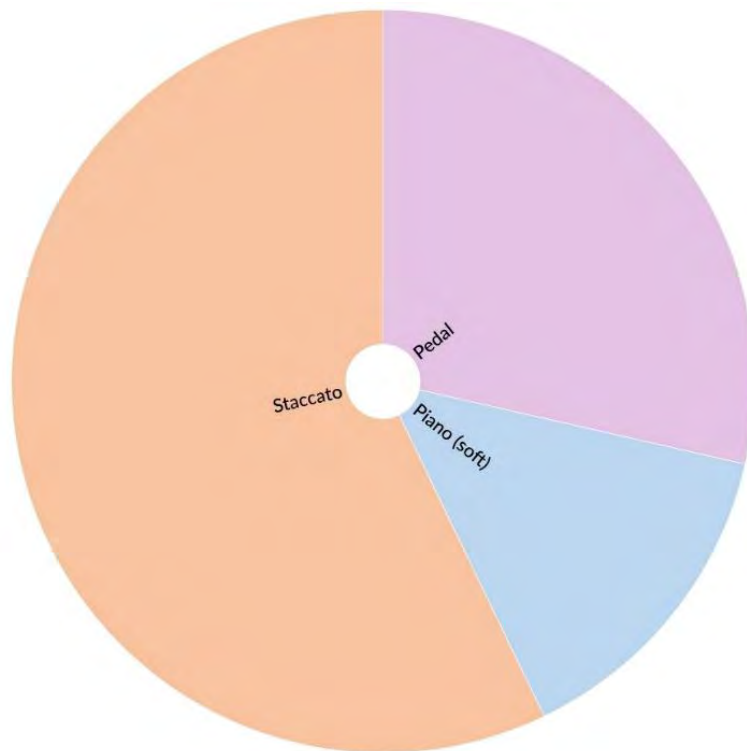


Figure 11. Pie chart of Piano Technique help icons used, iteration 2.

However, in their post-intervention interviews, the participants recalled using more of these items, including *forte*, *legato*, and *adagio* (see Appendix Y). These three items did not appear in the lesson transcripts, field notes, or the compositions, so these responses were not coded in order not to skew the results, but their presence in the interview responses led me to believe that these items and the others not explicitly mentioned in lessons, might nevertheless be useful to retain as creative options for future participants.

The second page of help items was called Creative Ideas and included structural compositional devices (repeat, theme and variation, ostinato), as well as some more conceptual musical elements related to pitch, melody, and harmony (treble clef, bass clef, chords) to guide decision-making. Analysis of references to these items and comparisons of their frequency in the data (see Figure 12) showed that this help page was used more extensively than the piano technique page.

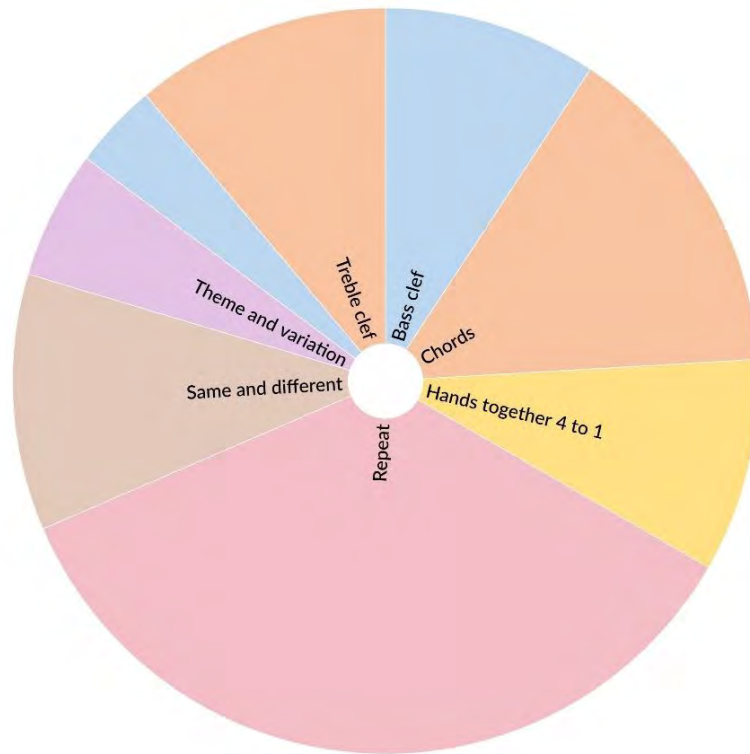


Figure 12. Pie chart of Creative Ideas help icons used, iteration 2.

Of the 10 items on the creative ideas page, only two were not used (Ostinato, Hands Together 2:1), and Repeat was the most popular option. The extensive use of the icons on this page indicated that they had been useful in the participants' work and should be retained in the next version of the design.

The third page was devoted to Helpful Ideas, which embodied the procedural options available to the pupil, including ideas for getting started (Starting Note, Make a Short Pattern, Sing Your Idea First) and some items that involved the teacher (Ask the Teacher to Play, Ask the Teacher to Write). Coding references for these items were compared (see Figure 13) and the results indicated that most of the strategies had been used or discussed in lessons, with Decide First being the most frequently referenced icon.

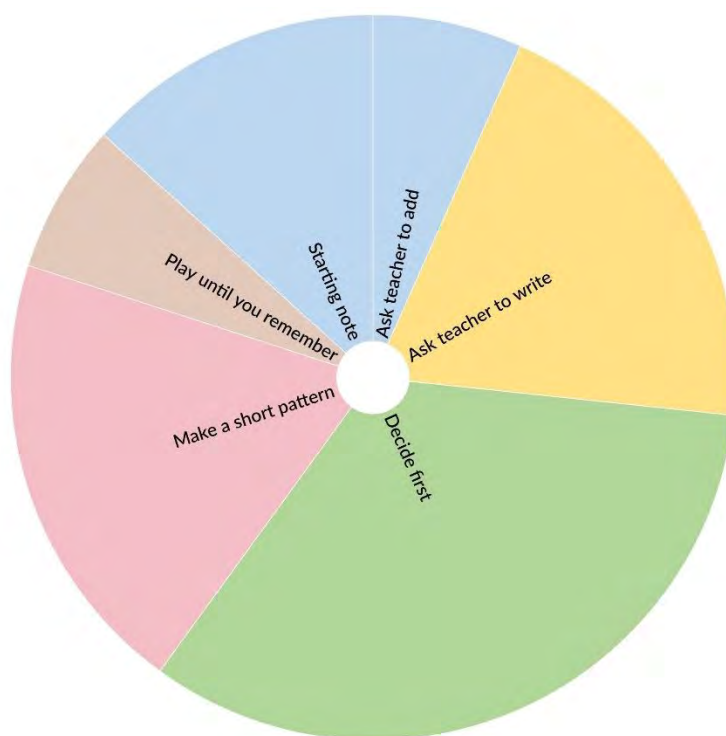


Figure 13. Pie chart of Helpful Ideas help icons used, iteration 2.

A comprehensive list of all three help pages' icons was generated (see Figure 14), which includes the number of references made to each item in the data.

Figure 14. Help icon coding references, iteration 2.

Page	Item	References
Piano Technique	Adagio	0
Piano Technique	Allegro	0
Piano Technique	Crescendo	0
Piano Technique	Diminuendo	0
Piano Technique	Forte (loud)	0
Piano Technique	Legato	0
Piano Technique	Moderato	0
Piano Technique	Pedal	4
Piano Technique	Piano (soft)	2
Piano Technique	Staccato	8
Creative Ideas	Bass clef	5
Creative Ideas	Chords	8
Creative Ideas	Hands together 2:1	0
Creative Ideas	Hands together 4:1	5
Creative Ideas	Ostinato	0
Creative Ideas	Repeat	19
Creative Ideas	Same and different	6
Creative Ideas	Theme and variation	3
Creative Ideas	Treble and bass together	2
Creative Ideas	Treble clef	6
Helpful Ideas	Ask the teacher to add	1
Helpful Ideas	Ask the teacher to play	0
Helpful Ideas	Ask the teacher to record	0
Helpful Ideas	Ask the teacher to write	3
Helpful Ideas	Decide first	5
Helpful Ideas	Make a short pattern	3
Helpful Ideas	Play until you remember	1
Helpful Ideas	Sing it first	0
Helpful Ideas	Starting note	2
Helpful Ideas	Write what you've got	0

What immediately became apparent was a discrepancy between my observations and the coding of the data in terms of notation. I had notated a significant amount of the participants' work during the second iteration, but this was not apparent in the data because it had not originated with the participants' request for me to do so, as presented in the icon Ask the Teacher to Write Your Idea. Instead, I had made the decision to notate for reasons related to time constraints, or because I had deemed the notes too difficult for the participants to write themselves at that time. This prompted me to consider creating a separate page for the teacher in the third version of the design, which might contain all the icons related to teacher activity, as observed during Maggie's third lesson (see Appendix Q, lesson 3), and which might therefore better guide teachers.

Emergent items

In my lesson observations, I frequently made mention of new help items that might be valuable additions to the help pages, so the transcripts and field notes were recoded to identify them. Four such approaches were found, which had assisted the participants, but which were not represented in the help pages. These were labelled Emergent Help Items and their frequency of use compared (Figure 15).

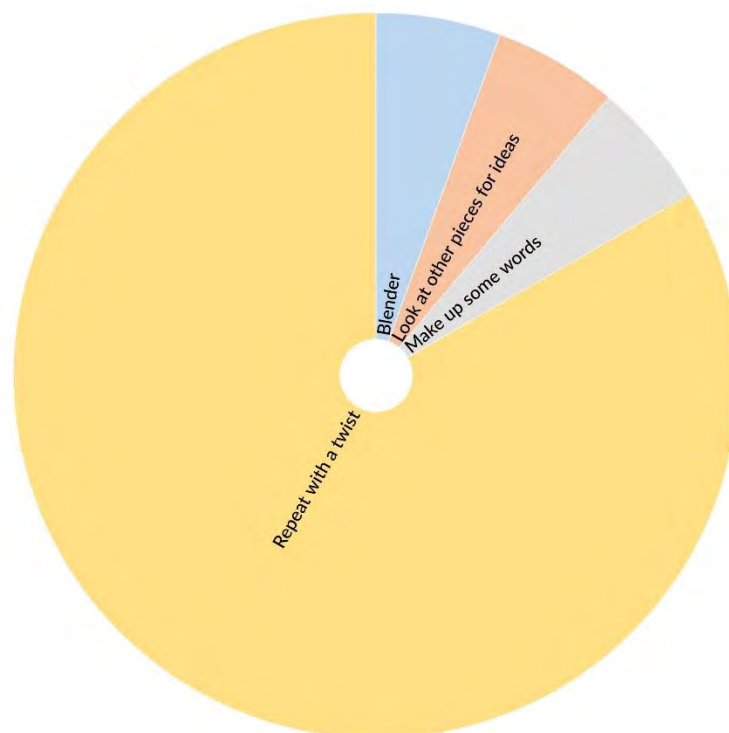


Figure 15. Pie chart of Emergent Help Items, iteration 2.

Repeat With a Twist was the most frequently used emergent item, which involved repeating a portion of material with small changes. The other items were Blender, in which a note pattern was deconstructed and the notes rearranged in a new order, Make Up Some Words, in which text was used as a starting point (which had been used in the first iteration's lesson schedule), and Look at Other Pieces for Ideas, where other repertoire being learnt in the lessons might be examined for possible solutions to creative

problems. This last item, although not utilised as frequently as Repeat With a Twist, seemed to be a valuable addition because it suggested an additional mechanism through which endogenous and exogenous elements might be integrated.

Agency

Collaborative activity has been identified as a crucial factor in play-based learning, through which the teacher, as knowledgeable play partner, establishes the conditions necessary for the child to acquire new knowledge and skills through assisting them to achieve goals within the child's zone of proximal development. Brown (1992) asserts that teachers are frequently faced with the dilemma of deciding whether to intervene, or to let the child wrestle with a problem, and that the best course of action is typically found in the mid-point between these two extremes, which she calls "guided discovery" (Brown 1992, 169). I sought to identify how this had been manifested in the enactment of the second iteration, so the data were recoded with particular emphasis on who did what in the composing episodes. Two coding categories were created, namely Teacher's Approach and Pupil's Approach, which each contained subordinate codes relating to specific strategies employed by these actors, with the intention of identifying those approaches that had been helpful. Together, these two categories constituted the coding vocabulary used to investigate agency in the second iteration's analysis. Knowing that these strategies had been successful in the second iteration, due to their emergence from the data, prompted me to speculate that they might be likewise helpful with other participants and possibly by other teachers. These theoretical conjectures might therefore be embodied in the design and reified in the form of new help icons.

Teacher's activity, in other words the actions taken and suggestions made by me to assist the participants' efforts, was identified in the data as 10 distinct codes (Figure 16).

Figure 16. NVivo screenshot showing Teacher's Approach codes, iteration 2.

Name	Files	References	Created on	Created by	Modified on	Modified by
DW sets easy comp. homework tasks	22	40	2023/04/05 1	DW	2023/04/06 1	DW
DW notates	23	36	2023/04/05 1	DW	2023/04/06 1	DW
DW sets goal for that lesson	22	25	2023/04/05 1	DW	2023/04/06 1	DW
DW treats comp. as fourth piece	20	23	2023/04/05 1	DW	2023/04/06 1	DW
DW points out aesthetics	13	14	2023/04/06 1	DW	2023/04/06 1	DW
DW refers to other pieces	8	13	2023/04/05 1	DW	2023/04/06 1	DW
DW combines pupil idea with his	9	12	2023/04/05 1	DW	2023/04/06 1	DW
DW asks guiding questions	10	12	2023/04/05 1	DW	2023/04/06 1	DW
DW makes decisions	8	11	2023/04/05 1	DW	2023/04/06 1	DW
DW affirms new notes	8	9	2023/04/05 1	DW	2023/04/06 1	DW

The comparative frequency of references to these codes can be visualised as a pie chart (Figure 17).



Figure 17. Pie chart of Teacher's Approach coding, iteration 2.

The four most frequently referenced approaches were my setting of manageable composing tasks to be completed at home, my notation of participants' work, setting short-term goals for each lesson, and treating the composition as a fourth piece of repertoire. While these strategies had certainly been useful in assisting the participants to complete their compositions, they did not help me understand how I had

intervened and helped pupils overcome specific obstacles. Contextual examination of text coded to DW Combines Pupil Idea With His was more illuminating. These references showed that this combination of ideas had occurred in instances where the participant had made a decision about what to do next, but the result would be too difficult for them to play (see Appendix O, lesson 5), their choice of item would not be enough of an impetus to move the creative process forward (see Appendix O, lesson 3), or it allowed me to incorporate an idea that the participant had had earlier in the lesson but not yet used (see Appendix Q, lesson 6). In each case, I, as collaborative play partner, had chosen an item and combined it with the participant's item, and presented this as a potential solution to the problem.

DW Points Out Aesthetics was another emergent theme that, upon closer examination, revealed that these were moments where I encouraged the participant to take a step back and evaluate their work from a broader perspective, which often yielded a solution to a particular problem. In other words, I was drawing participants' attention to aesthetic ideas such as cohesion, balance, or a sense of conclusion, which prompted the participants to consider how these elements might be demonstrated in their compositions (see Appendix Q, lesson 2; Appendix S, lesson 4). The analysis also confirmed certain observations that I had made during the lessons, which emerged as two closely related codes, namely DW Makes Decisions and DW Affirms New Notes. The former related to instances in which I had exercised my agency, as bestowed by CHAT, to intervene and articulate solutions to problems faced by participants in their creative endeavours. Contextual examination of these occurrences revealed that in each case I had offered a solution that incorporated elements of the participants' own work. Instead of autocratically deciding what should be done, participants' prior work was reframed as suggestions for what could be done, with the understanding that the ultimate decision lay with the participant. The latter approach, DW Affirms New Notes, referred to instances where participants' free play was excessively long and there did not appear to be the inevitable movement towards a convergent orientation to this exploration. These affirmations were manifested in my utterances of phrases such as, "I like that tune" (Gloria 2023), or, "that was cool" (Tammy 2023), which served to expediate the free play and generate motific material that had been played by the participant in this exploration.

Pupil activity, in other words the self-initiated actions that participants used in their composing activity, was categorised as nine distinct codes (see Figure 18).

Figure 18. NVivo screenshot showing Pupil's Approach codes, iteration 2.

Name	Files	Reference	Created on	Created by	Modified on	Modified by
Pupil notates	17	32	2023/04/05 13:48	DW	2023/04/06 15:50	DW
Pupil makes decisions	18	30	2023/04/05 13:48	DW	2023/04/06 15:53	DW
Pupil uses help pages	11	17	2023/04/06 09:30	DW	2023/04/06 15:49	DW
Pupil uses prior comp. experience	7	14	2023/04/06 09:30	DW	2023/04/06 15:48	DW
Pupil has practised	9	13	2023/04/06 09:31	DW	2023/04/06 15:54	DW
Pupil changes rules	5	6	2023/04/05 13:54	DW	2023/04/06 15:28	DW
Pupil refers to other pieces	3	6	2023/04/05 14:30	DW	2023/04/06 13:27	DW
Pupil refers to theory book	4	4	2023/04/05 14:30	DW	2023/04/06 12:57	DW
Pupil discovers new concepts	4	4	2023/04/06 10:36	DW	2023/04/06 13:17	DW

These coding frequencies were compared and can be visualised as a pie chart (Figure 19).

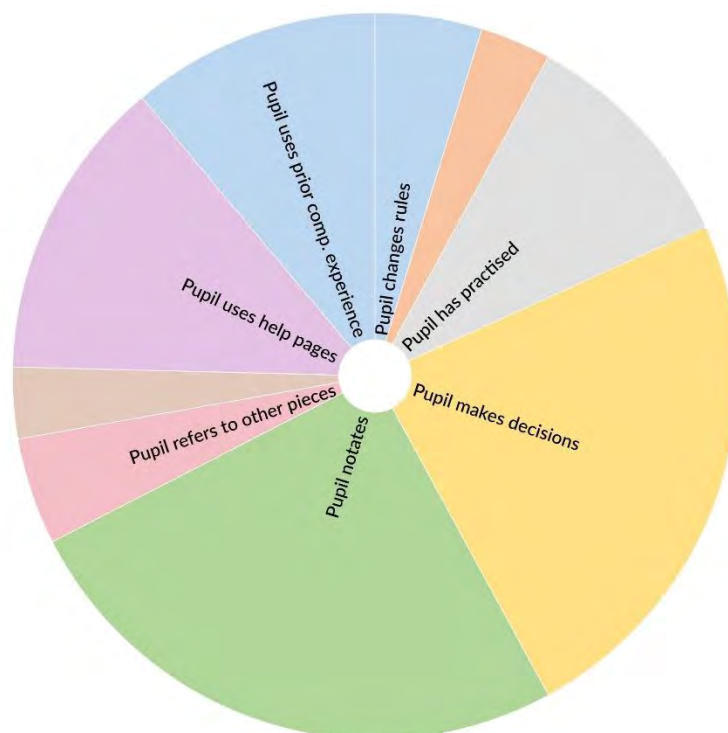


Figure 19. Pie chart showing Pupil's Approach coding, iteration 2.

As can be seen, the two most prevalent codes were those referring to the pupil notating and making decisions. These were activities in which the participants exercised their agency, as predicted by CHAT, and were expected. Other codes, despite having attracted fewer references, also confirmed the presence of transformative agency being exercised by the participants, namely Pupil Uses Help Pages and Pupil Changes Rules. These four themes represented participant agency and constituted the majority (67%)

of all text coded within the superordinate category labelled Pupil’s Approach, which was sufficient evidence for me to conclude that this version of the design was conducive to the creation of an agentive music learning ecology. The code Pupil Refers to Other Pieces, however, was not expected, and this correlated to the same approach appearing in the teacher activity code list, where the teacher had referred to other pieces. The fact that both parties had engaged in this practise was an indication that this approach was important and should be included in the booklet in the upcoming design cycle.

Time

Analysis of the first iteration had revealed that time was a significant factor. Endogenous contextual elements, such as school events or participant tardiness, had encroached upon lesson time. In addition, exogenous elements related to the design of the lesson schedule, for example, multiple tasks requiring introduction and elaboration, or unrealistic time allocation, had also limited composing time. Time-saving strategies had been embodied in the new framework format for the enactment of the second iteration, although I suspected that it would be advantageous to maintain an analytical focus on time and to determine whether it was possible to streamline the design to further limit the time spent on composing. This was important because the third iteration was going to be enacted with new participants of varying ability and age, including exam candidates who would have the added pressures of preparing for external graded examinations. The amount of time spent composing in each lesson was calculated and compared across participants (Figure 20).

Figure 20. Time comparisons, iteration 2.

Lesson	Gloria Comp. time	Jane Comp. time	Maggie Comp. time	Saira Comp. time	Tammy Comp. time
1	00:11:14	00:10:05	00:11:38	00:11:38	00:12:43
2	00:06:59	00:09:56	00:12:06	00:09:23	00:07:49
3	00:07:24	00:09:27	00:09:46	00:11:01	00:06:46
4	00:08:20	00:06:54	00:09:30	00:09:41	00:16:37
5	00:07:12	00:12:41	00:13:19	00:14:22	00:11:47
6	00:08:12	00:11:47	00:15:24	00:13:45	00:10:24
7	00:04:04	00:08:40	00:08:20		
Sum:	00:53:25	1:09:30	1:20:03	1:09:50	1:06:06
Ave:	00:07:38	00:09:56	00:11:26	00:11:38	00:11:01
Average per lesson across participants:					00:10:20

In the second iteration, the average amount of time spent composing was 10 minutes and 20 seconds, which was significantly less than the time required in the first intervention, which was nearly 14

minutes. This reduction was anticipated because the new framework design eliminated the need to repeatedly introduce new tasks, as had been the case in the lesson schedule used in the first iteration. Furthermore, participants were encouraged to practise their own compositions at home and to regard them as additional pieces of repertoire, which reduced the amount of time required to revise work written in prior lessons. In this sense, the framework design had been successful, although I felt that it was important to determine whether it was possible to further reduce the amount of time required for composition in the third iteration. This was necessitated by the fact that the third iteration would involve some participants who were preparing for their external examinations, who would need a significant amount of lesson time to prepare repertoire prescribed in the ABRSM syllabuses, so I hoped to be able to decrease the time required to less than 10 minutes. Data analysis was therefore refocused to investigate how time had been saved in the second intervention and to identify the specific strategies that had led to this reduction.

Lesson transcripts and field notes were coded to identify those instances in which time had been saved, as well as the specific strategies that had been employed in achieving this outcome. The coding category Time Saved was created and the data were recoded to find connections between the coding categories already established and time reduction. 17 strategies were identified and the number of coding references to each were compared, using a matrix coding query, which resulted in the graph depicted in Figure 21 below.

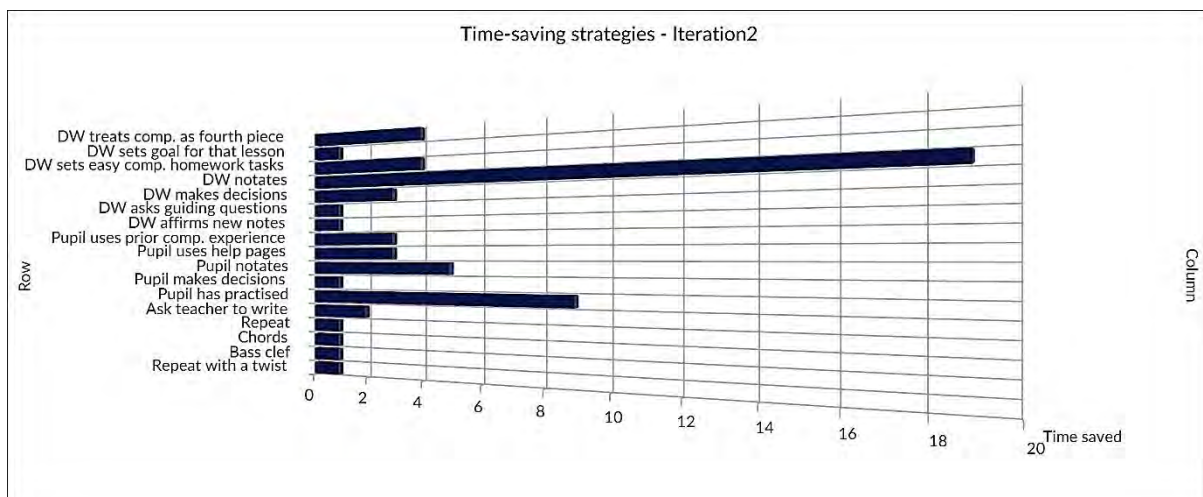


Figure 21. Time-saving strategies, iteration 2.

The five most effective time-saving strategies were:

1. DW Notates
2. Pupil Has Practised
3. Pupil Notates

4. DW Treats Composition as Fourth Piece
5. DW Sets Easy Composition Homework Tasks

The first strategy, involving me notating for the participant, was anticipated because I had been conscious of the time-saving affordance of this practice during the enactment of the intervention. The second coding category referred to time being saved because participants had practised their compositions at home, which also saved time. This, too, had been anticipated because it was a theoretical conjecture that had been embodied as a feature of the framework design of the intervention. The third category, however, was initially surprising because I recalled that participants tended to take rather a long time to notate their work themselves. A closer examination of the text coded to this category revealed that in each case I was asking the participant to create and notate material at home. This approach was fundamentally consistent with the second, fourth, and fifth categories, which denoted my treatment of participants' compositions as additional repertoire items to be practised, and extended, as part of their regular piano homework. I surmised that these four categories (numbers two to five), being thus derived from a single design feature, could be grouped together and their combined number of references (22) outweighed the 19 references belonging to the first category. The greatest reduction in composition time required in lessons could therefore be traced back to the nature of the design, which took the form of a framework as opposed to a linear lesson schedule. Pupil Uses Help Pages indicated that the help pages had not only facilitated the creative process but had also saved time in lessons. The graph shows that my involvement in making decisions was equally useful in saving time, which suggested that this should be included in the teacher's help page in the third iteration's design. There were occasions where I had observed that participants' use of prior composition experience had also streamlined the process. However, the drawing upon this historicity was not an approach that could be reified in the booklet for the new cohort of participants, but would develop with their own activity.

Results

During enactment, I had observed that the participants seemed to enjoy their composing activities and all five expressed the desire to start composing a new piece in the following school term, beyond their participation in this study (see Appendix Y). Analysis confirmed that they had exercised their agency within collaborative activity, which had empowered them to make decisions and to compose music in their own way. The intervention had therefore succeeded in facilitating composition, using a play-based approach, within the parameters of an established piano teaching context in a government primary school. This suggested that the framework design and physical materials devised to support its implementation had performed their functions. Analysis of help icons affirmed their value and although they were not all used in the second iteration, I surmised that they should be retained as potential strategies available to new participants. Emergent strategies were also identified, to be codified in

teaching materials for the third iteration, and it became clear that the icons should be reorganised according to their purpose and a page added for the teacher's benefit. This last addition was informed by an analysis of participant and teacher activity, and although teacher action served primarily to guide and support the participant, teacher agency also facilitated the creative process and helped to integrate the design into the teaching context. Adopting a slightly more assertive stance as knowledgeable collaborative partner had supported collective activity, not constrained it, and had been instrumental in the creation and revision of musical ideas. The amount of time required for composing had been reduced in the second iteration, owing to the framework design eliminating the need for frequent introductions to new tasks and participants' compositions being treated as standard repertoire, requiring independent work between lessons. The performance opportunity, at the end of the teaching cycle, further legitimised participants' compositions and adequately addressed the first iteration's failure to implement the third step of Hogenes' model.

Redesign

My observations suggested that the icons presented in the pupils' help pages should be rearranged according to their purpose. I decided to group together those items that were most aligned with the process of getting started, and to group together the other items that were most helpful once a composition was underway (see Appendix Z, Getting Started, Creative Ideas). The items related to piano technique were retained because although they had not all been helpful to the participants in the second teaching cycle, I did not have cause to suspect that they might not be of benefit to a new group of participants of diverse ages and lengths of piano tuition, so this page remained unchanged. Analysis revealed that new strategies had been useful and had emerged through the participants' interaction with the design, namely repetition with a slight change, rearranging a pattern of notes that had already been composed, referring to other repertoire for ideas, and the creation of text to which to set notes. These strategies were codified as new icons, namely Repeat With a Twist, Blender, Look at Other Pieces for Ideas, and Make Up Some Words.

Analysis had identified teacher's approaches that had been helpful and I suspected that they should be reified in the design, in the form of a help page compiled specifically for the teacher's benefit. Because the participants had not chosen to use the teacher-related icons, I chose to remove them from the pupils' help pages and to include them in the teacher's page, along with a set of five guidelines that had been informed by the analysis of teacher approach in iteration 2 (see Appendix Z, Teacher's Page).

The themed pages had elicited observable interest in the participants and I suspected that they had found the variety of themes appealing. Two participants had made mention of the narrative elements in their work (Jane 2023; Saira 2023), so I decided to add two new themed pages, namely Story and Movie,

which suggested a narrative orientation, and which were intended to provide participants with an opportunity to draw on their imaginations as a starting point for composition, which was consistent with the advice offered by Hickey (2012).

A HLT was once again impossible to predict, particularly because I did not know how the new participants would interact with the design in the third iteration. These participants were known to me and I had a fair sense of their work on the piano in terms of reading ability and practice habits, so I was able to anticipate progress on their standard lesson components, but they had never composed in their lessons before, so I had no prior knowledge upon which to base notions of how they would go about creating music, or how easy or challenging they might find this new work. The lesson schedule was therefore unchanged for the third iteration, serving as a rough guideline for the teacher to follow without attempting to include predictions of learning or progress as these would have been baseless conjectures.

Conclusion

Analysis of data collected during the second teaching cycle sought to determine the feasibility of the new framework design, examine the balance of agency within the teacher/pupil dyad, and to evaluate the utility of the help pages. Coding categories were therefore generated that related to strategies that had enabled the intervention to be accommodated within the established piano lesson format, the types of actions taken by teacher and participants, and the use of icons presented in the help pages (including emergent items). The new design provided participants with a guiding framework within which to compose, enabling them to complete their compositions well in advance of their performances. This design had therefore adequately addressed all three steps of Hogenes' model because in each case, a common basis had been established, music had been written through the generation and revision of musical ideas, and the compositions had been performed. Furthermore, each participant's composition was treated as a fourth item of repertoire, which required independent work at home between lessons, whereas this had not been required in the first iteration. This shift integrated the exogenous composing intervention into the endogenous conventions of music tuition to some degree, and the time saved ensured that the intervention did not compromise the standard lesson elements that were required by the school. An examination of agency within the teacher/pupil dyad revealed that both parties had exercised agentive control of the creative process, but more significantly, that participants had adopted approaches in which they assumed agentive control. This suggested that the framework model had been successful in fostering an agentive music learning ecology, which was one of the primary goals of this research. The help pages' icons were also scrutinised and while there was insufficient evidence to warrant the exclusion of any items, emergent strategies were encountered, which were reified as new icons in the intervention's redesign. The icons were also reorganised according to their purpose so that each page was aligned with participants' needs, in which icons that were helpful in the initial stages of

composing were grouped together, and those that supported later stages were presented separately. The five participants who had interacted with the first two versions of the design were similar in terms of age and piano experience, so claims of the intervention's transferability across participants were tentative at best. It was therefore necessary to trial the refined framework model with a new cohort of participants in the study's third iteration, who more accurately represented the range of learners who typically take piano lessons in this context. The enactment and analysis of the third iteration are discussed in the following chapter.

CHAPTER 8

ANALYSIS: ITERATION 3

Summary of enactment

The third iteration was enacted with four new participants during the second school term, from April to June 2023. Five participants had initially been recruited and had joined the study, but one of them discontinued her piano lessons at the beginning of the teaching cycle. This did not pose a problem because the research design had made provision for unforeseen dropout and the implementation of the third iteration could proceed. In the second iteration, I had devoted the first lesson to an introduction of the composition booklet, in which the help icons were elaborated and connected to prior knowledge, but I chose to change my approach in the third teaching cycle and to introduce the booklet and start composing in the first lesson. This decision was motivated by the fact that the participants' mid-year exams were scheduled to be written in the second term, which would disrupt music lessons, as would the public holidays that fell within this school term. I believed that by covering the booklet's introduction and starting the composing process in the same lesson, these anticipated losses could be partially mitigated. As with the two prior iterations, lesson observations made during enactment have been summarised and are presented below, although comprehensive descriptions are included as appendices (see Appendices AA-DD).

Alex: summary of observations

Alex chose to use the Together page to write her piece (see Appendix EE), which limited the scope of available notes to Middle C position. She had been taking lessons for over four years and she was therefore accustomed to reading and playing these notes, but I was struck by how foreign they seemed to her in this novel composing context, in which familiar pitches now seemed alien when they could be manipulated and not merely read. She seemed initially apprehensive about creating a motif, which was overcome through the use of the Getting Started page, which enabled me to scaffold this first step and to frame the process as a series of small, incremental problems to be solved. She seemed particularly intrigued by the Blender icon, which she used as a revision tool, not as a means of creating new material as I had intended, which indicated that the icons could be used in various ways, depending on participants' subjective interpretations of them. I observed that Alex seemed to prefer working independently at home and our collaborative work tended to be limited to discussions about what to do next or focused on notating her music accurately. My contribution to her composition was therefore as advisor and notation assistant, not as collaborative co-creator, which was in stark contrast to approaches I had encountered with prior participants.

Emma: summary of observations

Emma also chose to use the Together page and I observed that she eagerly engaged in free play, explored patterns, and experimented with black notes. However, she seemed to struggle to make the transition from divergent experimentation to convergent decision-making and seemed a bit indecisive about settling on a motif. I therefore drew her attention to the Getting Started page, and we used the first five icons sequentially to create the beginning of her piece. Emma's approach changed after overcoming this initial hurdle and she required less assistance as the lessons progressed. She did not struggle to invent new material, so she did not need to use the help pages, and she began to direct the activity by setting short-term goals for herself. Her approach thus evolved from tentative indecision, where she required extensive assistance, to being autonomous and in full control of the creative process. The notation of her work followed a similar trend. I transcribed her work at first, but this soon became a shared task and I noted that Emma appeared to enjoy writing the notes herself. Emma completed her piece (see Appendix FF) in only four lessons, which was much faster than I had anticipated, leaving ample time to rehearse it ahead of the piano party.

Khanya: summary of observations

Khanya chose the Rhythm page and soon invented a rhythmic stimulus for her composition, which we then transferred to the piano. Her motif included a dotted rhythm, which we had not yet covered in her lessons, so this was a fortuitous opportunity to introduce the notation of this figure. Khanya's melody was initially notated as letter names, although she eventually chose to convert these into staff notation, a task that was shared and occasionally completed independently. Having limited access to a piano, Khanya was not able to practice as much as she would have liked, but I observed that her composing work seemed to receive more attention than the scales and pieces being taught as standard lesson elements. She did not appear to struggle to create new material, so the help pages were not needed, and Khanya managed to complete her piece (see Appendix GG) in only four lessons, as Emma had done.

Neela: summary of observations

Neela chose to use the Together page, as Alex and Emma had done, because, as she told me, Middle C position was familiar to her. This pragmatic reasoning characterised her approach to the task as a whole and I noted that she required very little assistance. She managed to invent her initial motif without having to use the help icons and she seemed to prefer working independently, without teacher input. She mentioned that she had used the icon called Write What You've Got So Far, while working at home, and she had adopted this method for writing the entire piece, selecting and writing the notes one at a time. In only three lessons, Neela had essentially written her piece independently and notated it accurately (see Appendix HH), despite having taken piano lessons for only a short while. Her autonomous interaction with the design prompted me to suspect that it might be beneficial for students

to start composing at the beginning of their piano tuition. I theorised that Neela, being new to the piano and staff notation, had been enabled by the creative process to view notes as sonic materials to be manipulated, whereas Alex, who had been taking lessons for four years, had had to be re-acquainted with them and needed to be shown that she possessed this manipulative agency.

Analysis of iteration 3

Orientation

Iteration 3 had been successful, an observation based on the fact that each of the four participants had composed a piece of music for the piano and performed it for other students within the second school term. Endogenous factors, such as absenteeism, public holidays, and academic examinations had once again limited the time available for composing, but each participant had nevertheless completed her composition before the performance class that took place at the end of the school term, on 8 June 2023. The third analysis cycle would include an examination of the time required to complete composition tasks, to determine whether this varied cohort of participants had required more or less time than those who had interacted with the framework design in the second iteration. In terms of materials used, I suspected that design revisions, made after the second iteration, had been helpful to the participants, specifically the grouping of help icons according to their purpose in terms of initiating the creative process or supporting the development of a work in progress. I intended to examine the transcripts and field notes to determine whether this hunch was accurate. Knowing that the intervention had been successful with this diverse group of children indicated that the framework design had performed its function and needed no further revision. Each child had adopted a unique approach in her interaction with the intervention and I intended to analyse this interaction in terms of the theoretical tenets underpinning the design with particular focus on agency to determine who had exercised the greatest agentive control in the teacher/student dyad.

Time

I chose to introduce the book and start composing in the first lesson, as opposed to the staggered approach used previously. This decision was driven by endogenous contextual factors that limited the amount of time available for composition. For example, Emma, Khanya, and Neela had each lost one piano lesson to public holidays and Khanya had lost a further lesson due to absenteeism. These losses were exacerbated by the school's examination timetable, which disrupted the music teaching programme for two weeks and caused further losses of contact time. Examinations had not been a factor in the first teaching experiment cycle, despite having been conducted during the fourth term of the 2022 academic year because Gloria, Maggie, Saira, and Tammy had been in Grade 3, and Jane had been in Grade 2. These grades fall within the Foundation Phase and are therefore not subject to formal examinations. The third iteration, however, was enacted with participants in Grades 4, 6, and 7, which

fall in the Intermediate and Senior Phases, in which examinations are written twice each year in all South African public primary schools. However, each participant had succeeded in composing a piece despite these time limitations and it was necessary to determine whether there had been a reduction in composition time in the third iteration. The amount of time required for each participant to complete her composition was therefore calculated and compared (Figure 22).

Figure 22. Time comparisons, iteration 3.

Lesson	Alex Comp. time	Emma Comp. time	Khanya Comp. time	Neela Comp. time
1	00:16:00	00:17:04	00:16:33	00:13:25
2	00:08:23	00:09:19	00:03:35	00:03:00
3	00:11:43	00:08:01	00:08:37	00:06:16
4	00:08:41	00:06:30	00:08:10	
5	00:03:24			
6	00:07:36			
Sum:	00:55:47	0:40:54	0:36:55	0:22:41
Ave:	00:09:18	00:10:14	00:09:14	00:07:34
Average per lesson across participants:				00:09:05
Average total composing time per participant:				00:39:04

In the third iteration, the average amount of time spent composing in piano lessons was just over nine minutes per lesson across participants. This was 10 percent less than the time that had been required in the second iteration, which indicated that the framework design had once again saved time. The overall time, in terms of the number of lessons required to complete a composing project, had also been reduced: an average of 6,6 lessons had been required in the second iteration, while an average of 4,2 lessons had been needed in the third iteration, showing that participants in the third teaching cycle had also needed fewer lessons to complete their projects than their predecessors. The average amount of time that participants spent writing their pieces in lessons was one hour and seven minutes in the second iteration, while only 39 minutes had been required in the third iteration, a further indication that the framework design could easily be assimilated into the established structure of piano lessons.

Icon grouping

Grouping the help icons according to purpose had seemed helpful at the time of conducting the teaching experiment, but I wanted to ascertain whether this observation was confirmed by the data. Each participant's lesson transcripts were reviewed to determine how the help icons had been used. In Alex's first lesson, I had helped her to overcome her initial apprehension by framing the process of getting started as a series of small problems that could be solved by making choices, using the Getting Started

page as a toolkit. I had started by asking her whether she would prefer to start with one hand or both, then asking her to select a starting note, which allayed her apprehension and reduced the task to manageable step-by-step decisions (see Appendix AA, lesson 1). In Alex's second lesson, I had referred to the second help page (Creative Ideas), which contained icons that were intended to help develop a piece beyond an initial idea (see Appendix AA, lesson 2). This had been a fruitful exercise because it had introduced an array of possible approaches and provided a means of mediating a shared understanding of what each of us meant. As the piece progressed in the following weeks, two help items that were depicted in the Creative Ideas icons emerged as Alex's chosen approaches, namely Blender and Repeat With a Twist (see Appendix AA, lessons 3-4). Emma had also required some prompting in the first lesson, in which I referred to the icons presented in the Getting Started page (see Appendix BB, lesson 1). However, her work became more self-directed after the first lesson and she did not seem to get stuck, so we did not need to refer to the help pages again after the initial Getting Started phase.

Khanya had approached her composition quite differently. She had selected the themed page called Rhythm, meaning that her piece had emerged from a rhythmic impetus that she had invented. Once she had created her initial rhythm, she constructed her piece in sections, without needing to refer to the help pages. This indicated that the icons in the lesson materials might not necessarily be useful to all students and that their use should be encouraged only when the creative process floundered.

Neela had not required the Getting Started page in her first lesson and in fact did not require my assistance when making the transition from divergent exploration to convergent decision-making. However, when discussing her completed homework task in the second lesson, she told me that she had used a Getting Started help icon at home, but not those in the Creative Ideas page (see Appendix DD, lesson 2). Once her piece had been completed, I encouraged her to consider articulation and directed her attention to the third help page that was populated with icons that represented articulation, dynamics, and tempo. The fact that these icons had been grouped together facilitated our discussion about these ideas.

Overall, the participants in the third iteration had not used the help pages' icons as extensively as those in the second iteration, although the grouping of the icons into three categories that corresponded with the piece's development had seemed to be useful to creative discussions and there was no data to suggest that the layout of the help pages needed to be changed.

Agency

Knowing that the design was effective was not sufficient. DBR seeks to determine not only whether interventions are successful, but why (Bakker and Van Eerde 2015). Viewing composition from the

perspective of CHAT designated each participant as an actor, who, in conjunction with me as a collaborative actor, had engaged in tool-mediated activity towards a common object. These tools had been material (piano, composition booklet) and conceptual (musical ideas) and had been manipulated by both the participants and me in zones of free and structured play that operated within the boundaries of the framework design. I sought to investigate how the designed intervention had made affordances for this to occur by examining the nature of the activity undertaken within the teacher/student dyad. Lesson transcripts and field notes were coded using a deliberately restrictive set of five categories to chart which approaches had been most prevalent in each lesson.

These coding categories were divided into two groups: task-setting and activity. The first related to who had set the task for each lesson. Text coded to Teacher Sets Task denoted instances where I had framed the activity as a set of problems that needed solving incrementally. This was articulated as short-term goals, such as suggesting what should be done next, for example, when I asked Khanya, “now what are we going to do? Should we make an ending?” (Khanya 2023b). Another manifestation of teacher task-setting was framing tasks as small problems and drawing a participant’s attention to specific strategies represented in the help pages as potential solutions, as when I had asked Emma, “how about we use your help pages?” (Emma 2023). Setting homework tasks was another form of teacher task-setting, which was usually limited to adding a few bars to the composition.

Conversely, text that was coded to Pupil Sets Task indicated instances where the participant had decided what should be done next. One example of the pupil setting the task occurred in Alex’s second lesson, when she said, “I think we could add a chord if I did another line. I want to add another line” (Alex 2023a). Another example is when I was questioning Khanya about what she would like to do next, to which she responded, “I think let’s start writing” (Khanya 2023a).

The second group of coding categories related to the activity undertaken in accomplishing these tasks, specifically with regards to who had assumed the more dominant role. Three coding categories were created: Teacher-Led Activity, Pupil-Led Activity, and Collaborative Activity.

Text coded to Teacher-Led Activity denoted activities in which I had assumed a leading role through approaches that included referring to the help pages and demonstrating ideas on the piano, which had been particularly helpful when helping Khanya to convert her rhythmic motif into a melodic one (see Appendix CC, lesson 1). Text coded to Pupil-Led Activity referred to instances where the participant had exercised her autonomy in making decisions about her piece, as Alex had done when she said, “maybe we can do chords for the right hand” (Alex 2023b). Another example of pupil-led activity was Neela’s description of how she had chosen to use a help icon called Write What You’ve Got So Far, while working independently at home.

The coding category called Collaborative Activity denoted instances where the responsibility for creative decisions was more equally apportioned, for example, when ideas were combined, or when I asked a series of questions in order to scaffold the development of a participant’s musical idea without imposing my own pitch choices.

These five coding categories constituted the coding vocabulary used in the analysis of the third iteration’s data. Examination of each participants’ aggregate coding revealed the extent to which these coding categories were distributed across lessons, and hence, the dominant forms of task-setting and activity that were manifested throughout each participant’s interaction in the third iteration, as depicted in Figures 23-26, which will be discussed in the following section.

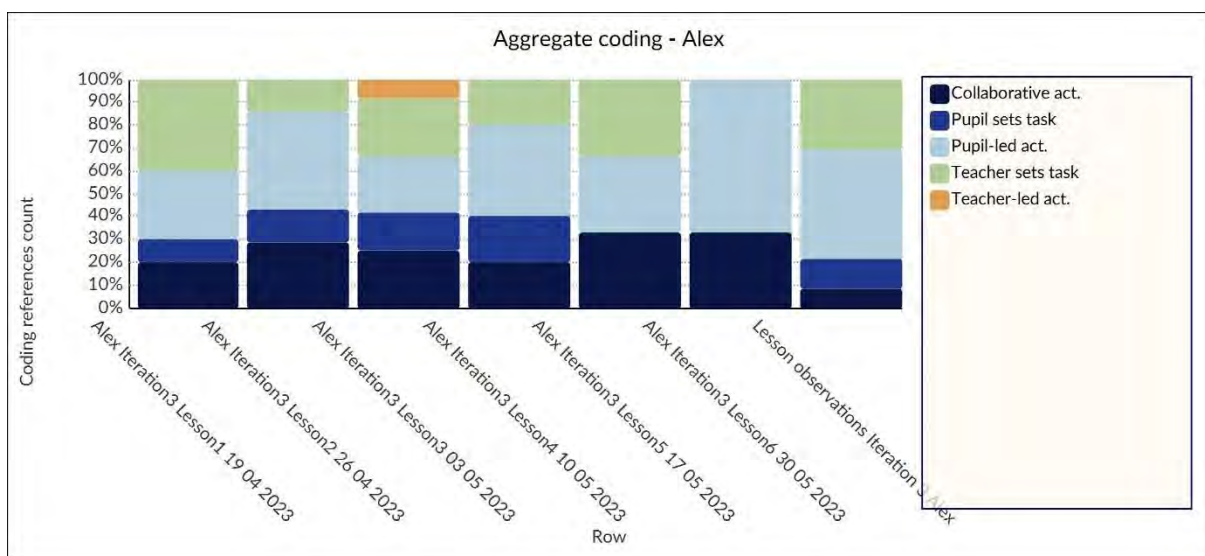


Figure 23. Aggregate coding diagram for Alex, iteration 3.

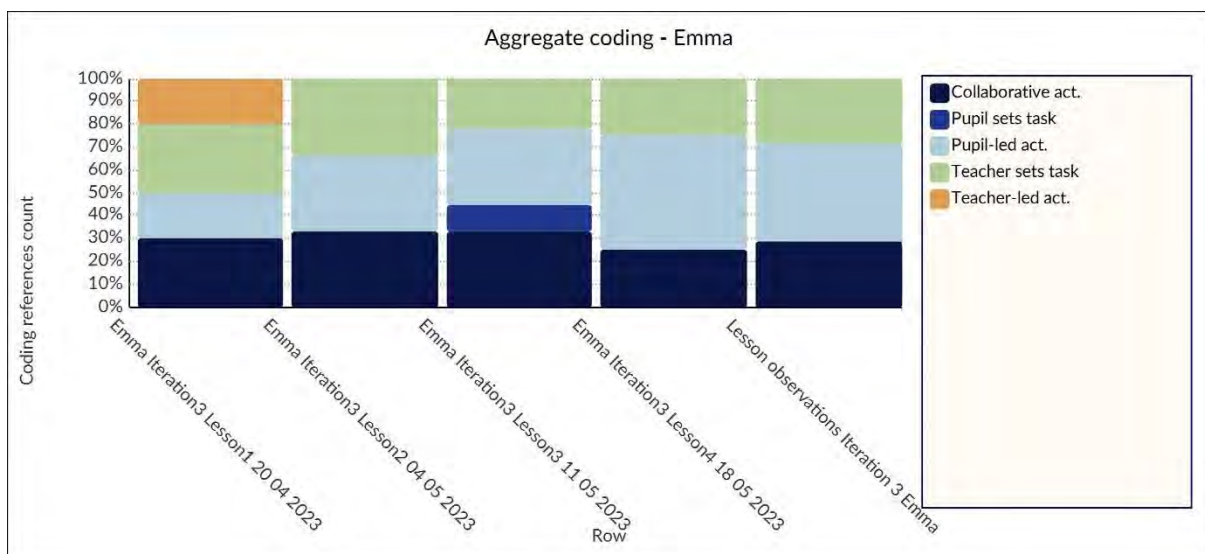


Figure 24. Aggregate coding diagram for Emma, iteration 3.

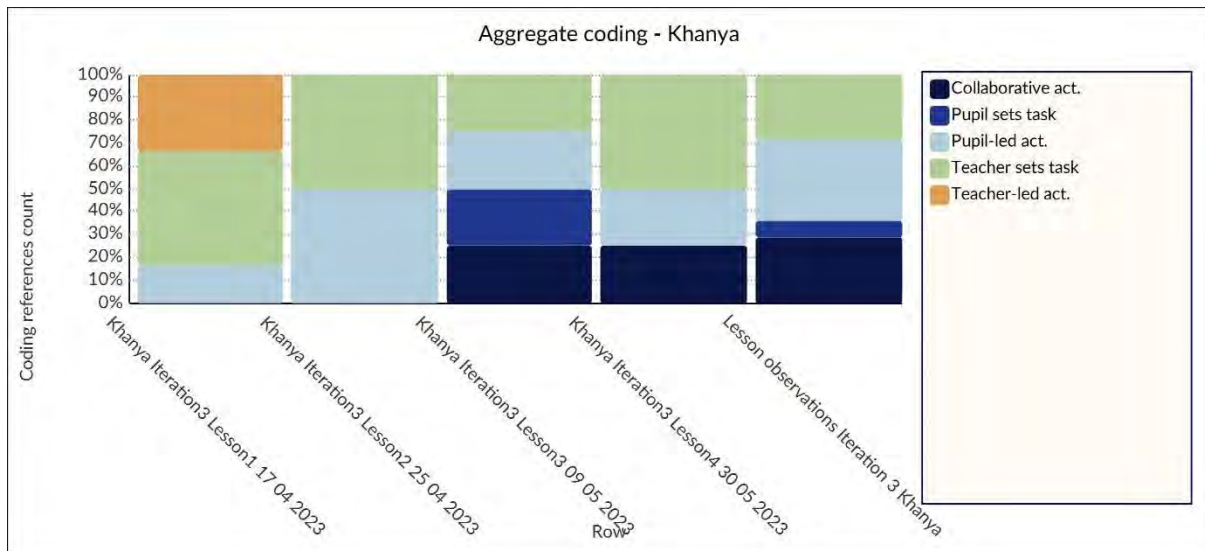


Figure 25. Aggregate coding diagram for Khanya, iteration 3.

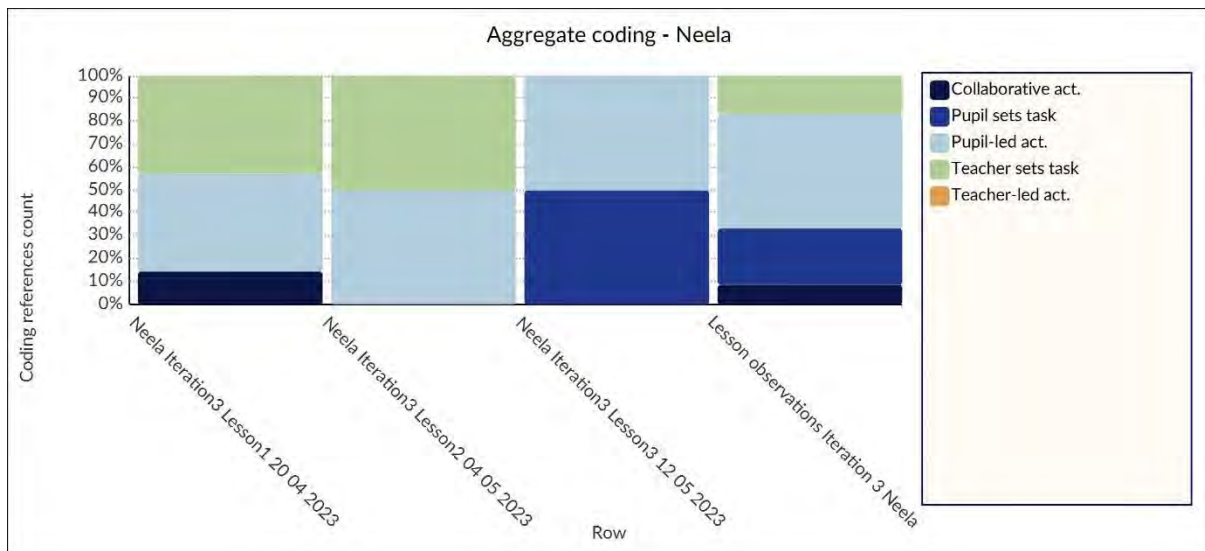


Figure 26. Aggregate coding diagram for Neela, iteration 3.

Results

Alex required some teacher input throughout the course of the third iteration, specifically in the form of tasks set by the teacher, which helped to focus her efforts on the development of her piece. This trend persisted throughout her composing trajectory apart from the sixth and final lesson, in which the teacher's contribution was limited to collaborative activity. Neela's interaction was similar in that she became more autonomous as her composition evolved, although she wrote her piece in only three lessons, at which time there was no teacher input whatsoever because she had decided to complete her composition on her own. This pattern of waning teacher input suggested that both Alex and Neela had been enabled to work independently during the initial stages of the process. Emma's trajectory also displayed this trend. As previously noted, she initially struggled to shift from divergent to convergent

actions, an obstacle that was overcome through my intervention. This observation is borne out by the coding, which shows that roughly half of the activity in her first composing session was teacher-directed (see Figure 24). In contrast, her fourth and final lesson reveals that the dominant activity was pupil-led, suggesting that she had required a significant amount of support from the teacher at the outset and that although teacher-set tasks featured in all her lessons, she had developed compositional competencies as the process progressed. Khanya's interaction differed from the other participants and her aggregate coding graph (see Figure 25) shows that roughly half of her final lesson was directed by the teacher, although the proportion of both pupil-led and collaborative activity had increased over time.

Each participant's aggregate coding was condensed into a single pie chart to generate a visual representation of their activity trends (Figures 27-30).

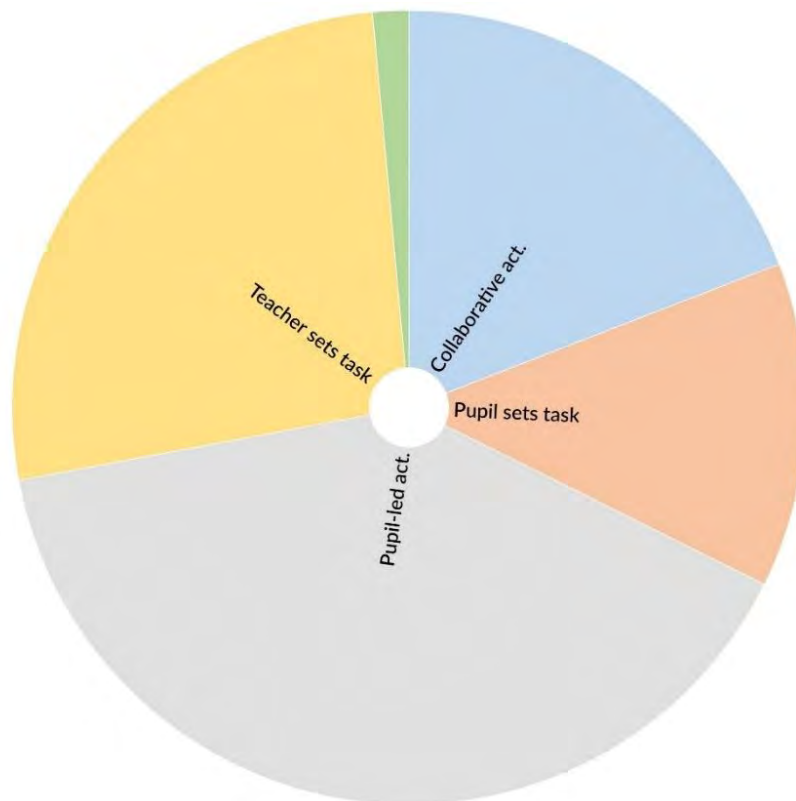


Figure 27. Pie chart showing activity overview for Alex, iteration 3.

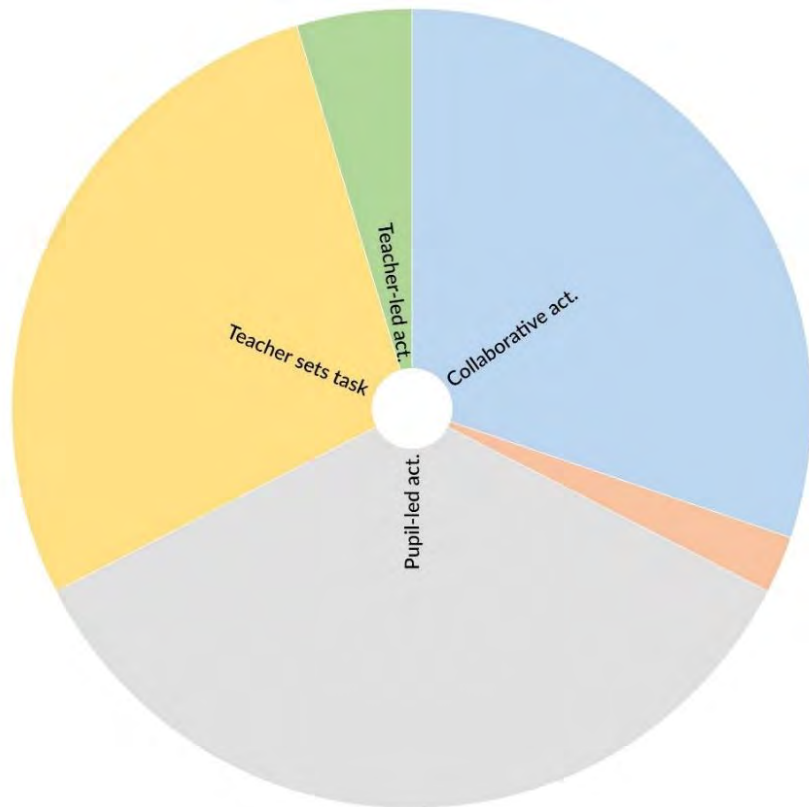


Figure 28. Pie chart showing activity overview for Emma, iteration 3.

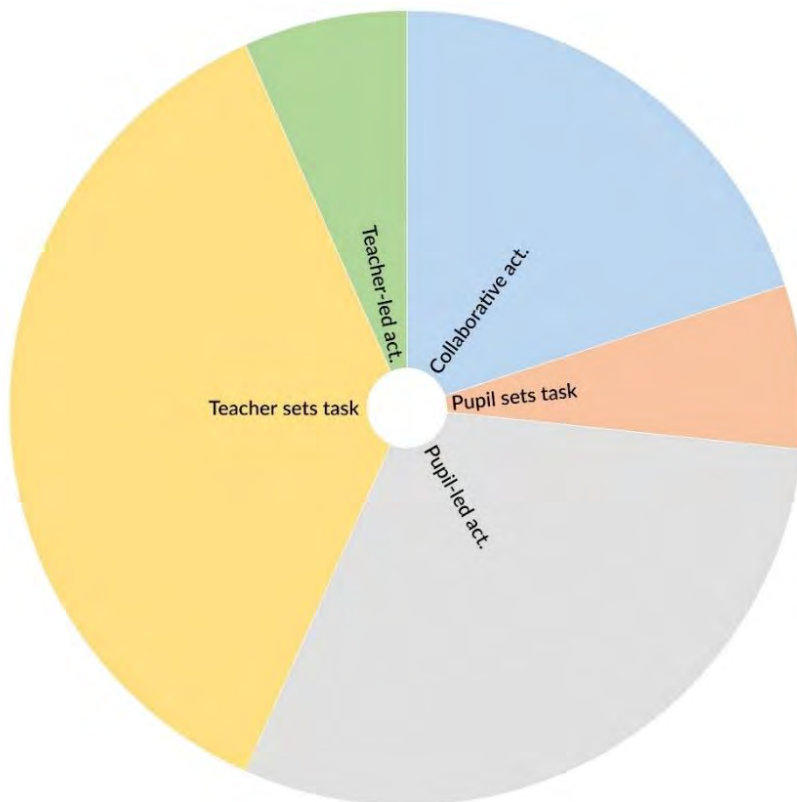


Figure 29. Pie chart showing activity overview for Khanya, iteration 3.

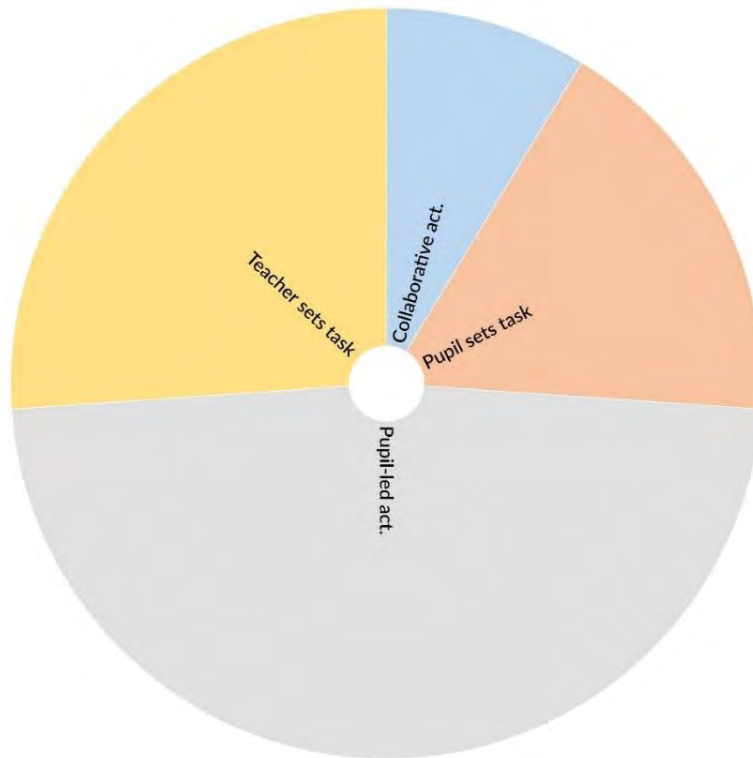


Figure 30. Pie chart showing activity overview for Neela, iteration 3.

When these activity patterns were combined, it was possible to visualise the overall activity trends across participants in the third iteration, as shown in Figure 31 below.

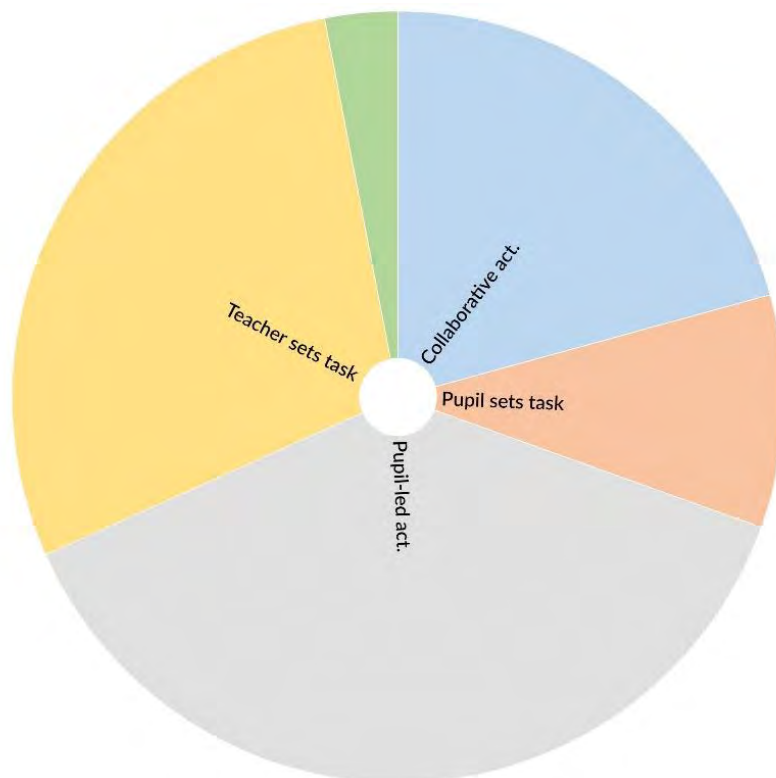


Figure 31. Pie chart showing activity overview across participants, iteration 3.

It was clear that the dominant approach was characterised by pupil-led activity, the teacher setting tasks, and collaborative activity. The individual aggregate coding diagrams show that each participant's lessons involved a slightly different approach, with varying proportions of these activities, but the dominant activity pattern is clear. However, the variations in approach are important to consider because they show that participants engaged differently and were free to change the rules of the activity, affordances theoretically embedded in the design by virtue of its derivation from Høgenes's CHAT-based teaching model. The framework was flexible enough to allow for these individual preferences and for the participants to exercise their autonomy. This overall picture is therefore consistent with theory, in which the teacher guides a collaborative process through task-setting and the pupil is afforded the agency she needs to engage in the activity with a degree of autonomy that enables her to take the lead.

Analysis of the third iteration was much simpler than the prior iterations due to the smaller sample size, and the fact that I was not seeking to improve the design. Furthermore, I was looking for a dominant trend in lesson activity so only five codes emerged, which is in stark contrast to the second iteration's analysis, which generated 25 coding categories.

Conclusion

Analysis of data collected in the third teaching cycle showed that the framework design had been successful with a new cohort of participants who varied in terms of age and length of piano study. Time-saving strategies embedded in the framework model's design, and the integration of the composing task into the learning ecology, allowed the intervention to be enacted in less time than had been required in the two prior iterations. Not only had the average time required for composing in each lesson been reduced, but the number of collaborative episodes necessary for the creation of a new piece of music had been diminished. The regrouping of icons according to their purpose had also been beneficial in terms of scaffolding participants' creative decision making. However, the primary analytical focus was whether this intervention, which had been successful in terms of achieving the overarching research question, was also successful in addressing the broader theories that had inspired its creation. The third iteration's analysis was therefore aimed at examining the modes of interaction that had occurred and to what extent they aligned with the tenets of CHAT. Findings suggest that collaborative tool-mediated activity was indeed productive and resulted in the composition of new cultural artefacts that had meaning for these young composers, although the balance between collaboration and independent work varied between participants. This flexibility allowed each participant to interact with the design in her own way and to engage in music creation according to her own procedural imperatives, which is indicative of participants' control over the rules of their activity. Autonomous manipulation of rules is a fundamental principle of play-based learning, and a key component of goal-directed activity as perceived from the theoretical perspective of CHAT. In the following chapter, the attainment of the

study's objectives will be discussed with particular emphasis on how they relate to these theoretical frameworks.

CHAPTER 9

DISCUSSION

Introduction

The intervention developed in this study was based upon Hogenes' three-step model for teaching composition, which integrated the three fundamental characteristics of play in a framework that was aligned with CHAT. Participants were designated the roles of cultural agents (Van Oers 2012) who engaged in collaborative, tool-mediated activity (Engeström and Sannino 2021) that made affordances for their autonomous use of rules, allowed them a degree of freedom over the activity, and fostered a deep sense of involvement (Hogenes *et al.* 2023). These agentic affordances correlate with the characteristics of agentic music learning ecologies, in which students are deeply connected to their musical learning through creative processes in the learning contexts in which they are embedded and which they reciprocally produce (O'Neill 2017). CHAT was used as a theoretical framework that allowed composing activity between teacher and pupil to be conceived as actions taken towards a common object that involved the appropriation of tools and was governed by rules within the broader activity system of a primary school. DBR methods drove cycles of design, enactment, and retrospective analysis, allowing me to draw conclusions in response to the study's primary research question and six subordinate research goals, which are discussed in this chapter.

Objectives

The research question that drove this study was: how can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape? To answer this question, six goals were developed that addressed key areas in terms of the investigation's theoretical underpinnings and the practicalities of its implementation in a real-world context.

First goal was to design an intervention that successfully integrated compositional activity with traditional piano teaching methods. In studies using DBR, "investigations are centered around the evolution of the designed artifact" (Joseph 2004, 236). In this case, the investigation was focused on the development of a teaching intervention. The challenge was to design, enact, and refine this artefact within an established school-based piano teaching system that does not recognise composing as a significant activity, as evidenced by its exclusion from the music report. This document constitutes the system's primary regulatory tool that governs teaching and assessment, and its constitution is determined by those occupying elevated positions in the hierarchy of individuals responsible for managing the system's activities. If one superimposes upon this system the second-generation CHAT model, previously presented in Figure 2, the music report can be viewed as the tool used by the

management structure to regulate teachers' (subjects) activity, which in this instance is piano teaching (object).

The fact that composition is not included in the regulatory tool exposes a contradiction between two nodes of the model, namely the rules and the object. The tool is merely a mediating artefact, which can be changed by those members of the community that are tasked with management and policy-making according to established conventions in division of labour. In order to resolve the contradiction between rules and object, these policy-makers require evidence that this fundamental gap can be filled by innovations in piano teaching embodied in research findings such as those described in this dissertation, and systemic reform can be achieved by re-negotiating contextual boundaries (Barab and Squire 2004, 12).

This evidence was acquired through a design-based inquiry that iteratively sought to integrate endogenous and exogenous components, where composing was included in standardised piano lessons in the form of an experimental intervention, initially in the form of a linear lesson schedule. However, certain endogenous factors, particularly those relating to time availability, imposed constraints upon intervention implementation. This was anticipated and was consistent with the findings of Jan and colleagues (2010), who concluded that contextual factors, including school-imposed limitations, significantly influenced the design of their intervention in their game-based curriculum research. These limitations constituted another instantiation of the rule/object contradiction described above, although in this case the object differed because my perspective had changed from that of teacher to researcher. The school's timetable (tool) regulated lesson times in accordance with the rules established by school management, and sanctioned changes such as fire drills, special assemblies, and lessons shortened to accommodate stage productions, affected intervention implementation (object). This second rule/object contradiction was resolved through exogenous means, by adapting the intervention, whereby the linear lesson schedule of the first iteration was transformed into a framework design, which mitigated the time issue and allowed participants to complete work at home independently. In this way, contextual tensions were resolved in this study because they were "problematized and examined as part of [the] design work, helping to lend both ecological and consequential validity" (Barab and Squire 2004, 12).

Another time-related contradiction was notation, which from a CHAT perspective occurred between the symbolic system for recording music (tool) and the object of the activity. Lesson observations documented the many instances of participants' limited notational skill influencing the time spent interacting with the design. Examination of lesson transcripts revealed that this contradiction was resolved in three ways: 1) by me adopting the role of scribe; 2) by involving participants in the notation of their work and limiting this to those elements that were within their ability; and 3) by exploiting the affordance made for independent work in the framework design in the second and third iterations.

Notation was therefore not an obstacle and instead of using invented notation systems as suggested by Hickey (2012), which would require time for me to explain, or for the participant to explain to me, the use of staff notation was scaffolded within each child's zone of proximal development and writing tasks were therefore aligned with what each child could notate with assistance. I observed that participants saw the logic in the system and the reason for its use, gradually taking over the task of writing the music where they were able, which was consistent with predictions in the literature (Hogenes *et al.* 2014b; Woodward 2009; Odam 2000; Elliott 1995; Vygotsky 1978). Notational skill was further developed through independent work, a characteristic inherent to the framework design of the second and third iterations.

Researchers conducting DBR must take care not to adopt a stance that privileges exogenous factors, but should rather view intervention implementation from an ecological perspective (Tabak 2004). Focusing exclusively on exogenous design narrows the field of view and limits researchers' ability to recognise valuable insights emerging from endogenous contexts. Using CHAT as a theoretical framework allowed the intervention (tool) to be woven into the fabric of the context in which it was enacted and exposed contradictions between endogenous and exogenous components. These contradictions were sites of innovation and can be regarded as "*illuminative hinges* that can open new vistas of understanding" (Foot 2014, 337, italics in original). Taking a broader perspective of the activity system model and examining the contradiction between intervention enactment (object) and the contextually imposed time limitations (rules), prompted adaptations to the design (tool) that simultaneously resolved this tension and engendered a framework-oriented design that was stable throughout the second and third iterations.

The second goal was to establish whether Hogenes' three-step model for teaching composition was effective in piano lessons in a primary school in the Eastern Cape. Hogenes' play-based model was used as the template in the design of the intervention in the first iteration, in which seven composing activities were developed to be presented sequentially, as a linear lesson schedule, during a 10-week teaching cycle. Hogenes' model was manifested at a micro level in the first version of the design in that each activity embodied the three steps, namely, 1) creation of a common basis; 2) creating ideas and writing the composition; and 3) presentation, publication, or recording (Hogenes *et al.* 2023, 2014a, 2014b). Observations made during implementation suggested that the third step of the model was not being adequately realised in practice, and retrospective analysis of data collected during the first teaching cycle revealed that time was the cause of this failure in terms of contextual time constraints, the amount of time required to introduce new activities, and the length of time required by participants to complete the activities. Furthermore, these time-related hindrances prevented the intervention from being enacted in its entirety with all five participants, as evidenced by the fact that none of the participants managed to successfully complete all seven activities within the 10-week timeframe.

The challenge was therefore to transmute my interpretation of Hogenes' three-step model, which was achieved by reimagining the model's scale and enacting each step at a macro level. This upscaling was embodied in the redesign of the intervention, in which the linear lesson schedule, composed of seven distinct activities, was transformed into a single composing project to be completed during the second 10-week teaching cycle. The new design was reified in the form of a composing booklet containing themed pages from which participants could choose and help pages containing useful composing strategies codified as icons. This second design successfully ameliorated the time-related problems identified in the first iteration and all five participants managed to compose a new piece of piano music within the allocated time. The third step of the model, involving performance, was realised in the form of a performance class, where the participants performed their compositions for each other and offered constructive evaluative feedback. I observed that this performance opportunity, and the concomitant group discussions, served as a motivator because it provided an external purpose for the activity, which is consistent with Hogenes' advocacy of this third step (Hogenes *et al.* 2014b). It also legitimised these children as composers, which is consistent with the notion of ethical idealisation proposed by Elliot and Silverman (2017). In addition, this performance class afforded the participants an opportunity to critically reflect on their own and others' work, and it is this combination of performing and listening that is of immense educational value because it "gives students a firsthand, practical experience of the materials and the procedures of musical discourse in specific musical-cultural practices" (Martin 2009, 167). The success of the second version of the design meant that no major alterations were necessary and only minor changes were made to facilitate its use, for example, reorganising the help icons and adding new themed pages. The framework design was trialled once again in the third iteration with a new cohort of four participants, who differed in terms of age, length of piano tuition, and cultural background, although they were similar in that none had previously received composition lessons. The success of the second iteration was replicated in the third, confirming that Hogenes' three-step model is indeed a suitable approach to teaching composition in the Eastern Cape, far from the Netherlands where it was devised, if applied as a composing framework for one large composing project.

The third research goal was to determine whether composition, as an instructional activity on the piano, can contribute to children's opinions about the piano and music literacy. In my teaching experience I have come to understand that the piano is often not a parent's first choice of instrument when considering enrolling their child for music lessons and few households contain pianos. Of those children who are fortunate enough to have access to the instrument beyond their piano lessons, many experience waning motivation to practise because the piano is usually not a significant constituent of their musical identities, in other words, the instrument does not play a role in the performance of their musical self-narratives. O'Neill (2017) suggests that a music learning ecology that is fundamentally agentive will cultivate in students a deep sense of connection to their musical learning. Based upon this premise, I suspected that the piano, if designated as the site of an agentive music learning ecology's construction,

would be afforded a central role in children's musical identities because the connectedness established in this ecology would be rooted in engagement with the instrument. To do this, an intervention was enacted in piano lessons and iteratively refined, which was characterised by children composing their own music, an agentic activity. Post-intervention interviews were conducted with the participants and when asked whether composing had increased their affinity for the piano, their responses indicated that this had indeed been the case (see Appendix L, Y, II). Of the 14 responses to this question, 11 indicated a positive change in sentiment, while the remaining three responses reported no change to sentiments that were already positive. Tammy was one of the five participants who had been involved in both the first and second iterations and her responses to this question differed. After the first iteration she had said that although composing had caused her to enjoy the piano more than before, she wished to start learning to play the violin instead. However, after the second iteration she did not mention this desire, which was confirmed by the fact that she continued with her piano lessons after her participation in the study had concluded. Overall, the interview responses suggested that composing music for the piano had led to participants feeling more connected to the instrument.

The fourth goal was to determine whether the integration of music composition into piano lessons could facilitate musical learning and render these lessons intrinsically meaningful to the students, as suggested by CHAT. Theoretical music concepts such as note values, time signatures, and bar-lines were consolidated throughout the three iterations with all participants, usually at the point of notation. As a teacher, I appreciated these opportunities to develop my pupils' understanding of these concepts in contexts other than those in which they were usually presented, namely their scales, repertoire, and theory workbooks. Another significant benefit was the participants' discovery of concepts in advance of my planned teaching of them. Notable examples of this include Jane learning to draw a crotchet rest (see Appendix H, lesson 2) and how to read dotted rhythms (see Appendix P, lesson 6), Gloria's discovery of octave leaps (see Appendix G, lesson 6), Tammy's curiosity about learning to draw accidentals (see Appendix K, lesson 5), Maggie's discovery of E flat (see Appendix Q, lesson 2), Khanya's first encounter with dotted rhythms (see Appendix CC, lesson 1), and Neela learning to write the notes in Middle C position for the first time (see Appendix DD, lesson 1). The intervention was therefore successful in facilitating musical learning through consolidation of familiar concepts and the discovery of new ones as they became necessary in participants' own compositions, in advance of my teaching of them.

Van Oers' (2012) interpretation of CHAT predicted that not only would learning occur, but that it would be meaningful to the learner because this process is rooted in the learner's own activity in a collaborative partnership with a knowledgeable other, and that the mechanism of this learning would be the appropriation and manipulation of tools (musical concepts) in the production of cultural artefacts (pieces of music) that have personal meaning for them (Van Oers 2012). This had been demonstrated

during the intervention and most explicitly manifested in the pieces written by Emma (*Memories of my Granpa*), Jane (*Hogsback*), and Saira (*Excitement*), which embodied emotions evoked by these participants' memories of people and lived experiences. Analysis of the data confirmed that all participants had manipulated the tools (both material and symbolic) in socially mediated activity towards the activity's object (composing), findings that were aligned with CHAT. This theoretical lens also allowed me to closely examine the nature of the activity in the third iteration's retrospective analysis, which revealed a prevailing trend across participants characterised by pupil-led activity, teacher-set tasks, and collaborative activity. However, it was discovered that these characteristics were not equally distributed in the data between participants, further confirming that the participants engaged in the activity according to their own agentic imperatives.

These findings support the assertion made by Van Oers (2012), which argues that domain-specific cultural learning is made personally meaningful through imitative participation, in which authentic cultural practices are reconstructed and enacted by the teacher/student dyad. This socially mediated participation in cultural processes is also aligned with the turn to African musical aesthetics in music education advocated by Oehrle (1991a), in which learning practices characterised by active participation are encouraged. This alignment with African music philosophies was further developed in this research by intentionally avoiding assessment of participants' compositions and maintaining focus on the process of collaborative composition instead of the product throughout the successive cycles of design, implementation, and analysis.

The fifth goal was to explore how a play-based compositional tool can be tailored to meet each child's creative needs. The design of the intervention used in the first iteration was implemented with five participants with limited success. None of the participants managed to complete all seven tasks in the lesson schedule and the third step in Hogenes' model was not realised in practice. The intervention underwent significant redesign and a framework was developed to replace the linear lesson schedule, which was successfully implemented with all participants in the second and third iterations. Success was measured in terms of outcomes achieved, in that each child had composed a new piece of piano music through a cultivated process of intersubjectivity and had performed this work within the allocated timeframe of one school term. The second iteration involved a cohort of participants interacting with the framework design who were similar in terms of age, length of piano study, and composing experience, although their cultural backgrounds differed. The third iteration's participants were selected to represent a broader differentiation of age, length of piano study, and cultural background, their only commonality being their lack of composing experience. The fact that both the similar and differentiated cohorts achieved the desired outcome suggested that the intervention was indeed transferrable across participants. Each child represents a unique worldview that, according to Bronfenbrenner's ecological theory of human development, is constructed over time through interactions within expansive ecologies

of development (home, school, neighbourhood) (Zapata Restrepo and Hargreaves 2017; Rosa and Tudge 2013; Lamont 2002). According to CHAT, these culturally and historically informed perspectives influence individuals' actions (Foot 2014) and retrospective analysis of data collected during the third iteration supports this view.

Each participant interacted with the same design, embodied in the composition booklet, but each individual's mode of interaction was unique. This was evident in the differentiated activity trends between participants, in which varying proportions of pupil-led activity, teacher-led activity, and collaborative activity were identified. In other words, each participant interacted with the design in her own way and faced her own challenges. One example of this was Alex's interaction, which was characterised by the apparent unfamiliarity of familiar notes. I observed that she was unaccustomed to the process of manipulating these familiar pitches, suggesting that prior musical knowledge was not readily transferred into the context of a novel activity. This is consistent with Jensen's (2005) assertion, in his neurologically based discussion on cognition, that knowledge and skills might not easily transcend the context in which they were acquired, and that one possible solution may be to encourage independent work. Barrett (2009) similarly speculates that children's musical knowledge and skills may be so deeply embedded in their originating domains that their creativity may be impeded when tasked with improvising and composing in novel contexts. Alex's interaction exhibited signs of this impediment, which was overcome by her choosing to do the bulk of her composing independently at home, an approach made possible by affordances inherent in the design feature, originally devised in the interests of time efficiency, that required some independent work. Considering the issue of transferability of the design not only confirmed that it can be implemented with different pupils, but also gave rise to the unexpected theoretical conjecture that its reliance, to some degree, upon children's independent work may ameliorate composing challenges brought about by intercontextual transfer of prior musical knowledge and skills. This solution imposed limitations upon the collaborative imperative embedded in the design, but evidence shows that in this study, the compromise between individual and collaborative activity was differentially manifested across participants and was ultimately necessary.

The sixth research goal was to develop a play-based compositional approach that could be utilised by other piano teachers, particularly those who may not have compositional training or experience. The design of the intervention was based on principles aligned with the three characteristics of play-based activity, as articulated by Hogenes and colleagues (2023). These are the use of rules, affording learners a degree of freedom over the activity, and their involvement in the activity (Hogenes *et al.* 2023). In the first iteration, certain rules were externally imposed by the brief of each task in the lesson schedule, which served as boundary laws, and participants were encouraged to manipulate sonic materials within these boundaries according to operational rules that they themselves devised. One example of this was Gloria's approach to the form task, which required a piece to be written that had a clear beginning,

middle, and end. In achieving this goal, she set herself a rule that regulated note choice, resulting in a motif that consisted of octave leaps. When working on the same form task, Saira also imposed a rule, although in her case the rule imposed rhythmic constraints and her work featured a rhythmic ostinato. Both examples are evidence of participants autonomously imposing regulatory rules within an activity structure defined by broader rules. This setting of internally imposed rules was also evidence of the participants assuming a degree of control that afforded them a measure of freedom in their activity. Although this autonomy presupposed their involvement, the third characteristic of play-based methods, the insular nature of the lesson schedule resulted in short fragments of material that did not constitute complete compositions, and the participants did not perform their work, meaning that the design had failed to fully reconstruct this cultural practice.

The framework design employed in the second and third iterations also included externally imposed rules, embodied in the themed pages, but participants were able to choose the piece they wished to write, giving them a degree of freedom over these boundary-defining rules in addition to the internally imposed rules that emerged from their engagement in the activity. For example, Tammy chose the themed page called Rhythm in the second iteration, which required her to invent a rhythmic stimulus and use this rhythm throughout the piece. However, she chose to make variations of this rhythm as the work progressed, indicating that she was exercising control over the fundamental rule governing this activity. Apart from granting greater freedom, this new version of the design also allowed participants to compose pieces of music that were more substantial and created a performance opportunity, which successfully realised the third step in Hogenes' play-based model for teaching composition and fostered the deep sense of involvement that characterises playful activity.

Retrospective analysis conducted after the first iteration generated theoretical conjectures about how to support participants' creative processes, with particular emphasis on helping them overcome difficulties in motific development. Helpful strategies identified included choosing a starting note, making a short pattern, creating text to which to set notes, repetition, and rearranging note order, which were codified as icons that were presented as a resource in the form of help pages and served to embody these theoretical conjectures in the design. The second analysis cycle informed the revision of the help pages, which assisted participants' composition in the third iteration. These materials provided a palette of creative ideas from which to choose, with the unanticipated benefit of mediating meaning in creative discussions, for example, Alex's reinterpretation of the Blender icon and our mutual reference to the icons to clarify intended meaning. The embodiment of theoretical conjectures in the form of lesson materials had therefore contributed to the environment in which the activity was undertaken, leading to deep involvement of both participant and teacher, the third characteristic of playful activity.

The intervention had therefore successfully integrated the three characteristics of play and had created conditions that supported learner participation in a socio-cultural practice. Analysis resulted in findings that suggested that the approach embodied in the framework design was transferrable between participants, but the matter of transferability between teachers remained to be resolved. Learning to compose music is dependent upon the creative affordances of the learning environment, particularly as manifest in the reflective and goal-directed interaction between student and teacher (Elliott 1995). In this interaction, students' efforts are scaffolded (Wiggins and Medvinsky 2013) and teacher language, described as predictive analysis (Berkley 2004), is supportive, evaluative, and prompts both divergent and convergent thinking. Observations made during implementation were recorded and developed into theoretical conjectures about how the teacher might support participants' composition. Notable examples include instances where I encouraged free play, affirmed the products of structured play, combined a participant's idea with one of my own, or drew participants' attention to elements of their work that demonstrated aesthetic principles. I conjectured that these teacher-centred strategies, if codified as the participant-centred ones had been, might be useful to other teachers and were therefore presented as guidelines and icons in a teacher's page in the composing booklet. This study involved one teacher/researcher and claims of the design's transferability for use by other teachers cannot be made without being trialled in other contexts with other practitioners. However, this teacher-centred research goal sensitised me to the need to develop theoretical conjectures from my findings and articulate them in a user-friendly format that would be familiar to music educators, in this instance a composition booklet. Furthermore, knowing that music teachers in government schools are under constant pressure in terms of time and limited financial resources, I sought to streamline the materials so that they would be cost effective and could be used without any additional training or research. It is therefore reasonable to suspect that other practitioners may experience similar success with the design if implemented in similar conditions. Musical learning "requires both many hours of practice and a close and sustained attachment to a responsive and appreciative teacher" (Trevarthen 2012, 274). This environment is generally assumed in piano teaching contexts, and if enacted in these supportive conditions, I suspect that the intervention will be likewise successful in other teaching contexts.

Conclusion

This design-based study was aligned with the tenets of DBR, where the designed intervention evolved through iterative cycles of analysis and redesign and was responsive to the naturalistic context within which it was enacted. The dual imperatives of DBR were addressed in this study through the iterative development of an intervention that promoted learning and the provision of a contextualised account of the means through which this learning was supported. Analysis showed that the framework design was not only successful with all participants, but also documented how each participant interacted with the design. It is therefore reasonable to claim that the intervention was successful because the evidence

shows a causal relationship between the design and desired learning outcome. Each participant interacted with the design and as a result created her own composition, which according to Hogenes is defined as “a planned and deliberate realization of a creative process with a new piece of music as the outcome” (Hogenes *et al.* 2023, 255). In addition, sensitivity to local context and attention to mechanisms of implementation affords these findings ecological validity (Bakker and Van Eerde 2015) as well as consequential validity (Barab and Squire 2004) because all participants composed new pieces of music within a real-world piano teaching situation with its concomitant affordances and constraints. Endogenous factors, particularly those that imposed time limitations, negatively influenced implementation and theoretical conjectures about how to overcome these difficulties were embodied in the intervention through successive cycles of redesign. Reinterpretation of the teaching model upon which the intervention was based led to the development of a framework design that successfully integrated endogenous and exogenous components. This integration facilitated implementation and generated evidence that confirmed the viability of productive pedagogical practices within the established conventions of piano tuition in this context.

CHAPTER 10

CONCLUSION

Introduction

This chapter summarises the purpose of the study as well as the means through which its objectives were achieved. The research question and goals are restated, along with a brief description of research findings and their contribution to the field. Limitations are also identified and recommendations for further research suggested.

This study was undertaken with the aim of investigating the practicalities and feasibility of a turn from reproductive teaching practices to productive ones in piano lessons. The literature advocates this turn and suggested approaches include the adoption of African traditions of knowledge transmission (McConnachie 2016; Oehrle 2013, 1991a, 1991b; Nzewi 1999), the cultivation of agentic music learning ecologies (O'Neill 2017), imitative participation in cultural practices (Van Oers 2012), and play-based pedagogical approaches (Yi 2021; Marsh and Young 2015; Niland 2009). These approaches emphasise not only children's creativity, but also their agency in collaborative modes of activity, which is supported by studies in social neuroscience. These studies suggest that the intersubjectivity fostered in collaborative activity integrates the MNS and MENT neural structures, which facilitates socially mediated learning and promotes motivation by recruiting the brain's dopaminergic reward system (Clark and Dumas 2015; Redcay *et al.* 2010; Sivan, 1986). These recommendations prompted me to speculate that this agentic equity might be encouraged in piano lessons through the introduction of composition, an inherently productive activity. However, piano teaching traditions in the Eastern Cape are teacher-centric and predicated upon established reproductive practices. To understand how the change to a productive orientation might be achieved, I posed the following research question:

How can composition, as an instructional activity, be utilised to cultivate an agentic music learning ecology in piano lessons in a primary school in the Eastern Cape?

Answering this question required the development of six research goals that directed the investigation. The first two involved intervention design, the third and fourth were related to musical identity and meaning, and the fifth and sixth goals were aimed at intervention transferability between children and teachers.

Intervention design

The first goal was to devise an intervention that incorporated composition into piano lessons. DBR was chosen as a suitable methodology because it made affordances for intervention design and testing, which was done iteratively for 12 months in a naturalistic context. The second goal was to determine whether

Hogenes' (Hogenes *et al.* 2023, 2016) three-step model for teaching composition was an appropriate template for intervention design. CHAT was used as a theoretical framework for analysis, which exposed tensions between endogenous elements of the teaching context and exogenous elements of the intervention. Theoretical conjectures were embodied in the intervention's redesign, in which Hogenes' model was reinterpreted as an activity framework, instead of the initially devised linear lesson schedule, which was iteratively refined. Hogenes' model was found to be an effective model if thus adapted to be accommodated in this context.

Musical identity and meaning

The third goal was to determine if composition, as an instructional activity on the piano, could contribute to children's opinions about the piano and music literacy. Participants' post-intervention interview responses suggested that the instrument, being positioned as the nexus of agentic musical experience, was afforded a more prominent place in their musical worldviews. This is consistent with O'Neill's (2017) assertion that children's sense of connectedness to their musical learning is developed through the cultivation of an agentic learning ecology. The fourth goal was to determine whether composing in piano lessons could facilitate musical learning and render this learning personally meaningful. Vygotsky's socio-cultural theory of human development is a cornerstone of CHAT, which views human activity as collaborative action taken in achieving specific outcomes and takes into account the cultural historicity of both actors and tools used (Sannino and Engeström 2018; Foot 2014). From an educational perspective, learning environments that are aligned with the principles of CHAT are able to facilitate meaningful learning, in which domain knowledge acquired becomes personally meaningful to the learner through agentic participation in the reconstruction and enactment of cultural practices (Van Oers 2012). The composing framework (the second and final version of the composing booklet) developed in this study successfully facilitated learners' acquisition of musical knowledge in the creation of their own music in advance of my planned teaching of these concepts, and the music created was in many cases inspired by participants' relationships and lived experiences. These findings suggest that meaningful learning had occurred, which supports Van Oers' (2012) interpretation of CHAT.

Transferability

The fifth goal required the development of an approach to teaching composition that could be successfully employed with participants who differed in terms of age, length of piano tuition, and cultural background. Each participant's musical identity was unique and each represented a different level of acquired musical knowledge. Furthermore, each participant interacted with the design in her own way, so finding a single approach to teaching composition was a challenge. One of the benefits of DBR is that it leverages the clarity of hindsight and through iterative cycles of enactment, analysis, and

redesign, problems faced by participants were identified and theoretical conjectures about their solutions were embodied in the design. This resulted in a robust framework design that successfully facilitated composition with a diverse group of participants in the third teaching cycle. The sixth goal was similarly oriented towards transferability, but between teaching contexts. It was necessary to produce an output that could be readily adopted by teachers in other settings who may not have composing experience themselves. The literature suggests that one of the main hindrances to teaching composition is teachers' limited compositional competency and confidence (Berkley 2004; Dogani 2004; Odam 2000), a problem that I suspected could be ameliorated by presenting the developed composing framework as a user-friendly resource. Composing strategies that had assisted the participants were codified as icons and grouped together for their use, enabling teaching strategies that had supported student composing were likewise presented for the teacher's use, and compositional prompts were reified in the form of themed pages from which the participants could choose. A composing booklet was thus developed that embodied the strategies for supporting student composition that had been trialled in this study, which constitutes a resource designed to be used by teachers in similar contexts without having to seek compositional training.

Findings

This study demonstrated how composition can be included in an established piano teaching situation in the Eastern Cape and produced an output that constitutes a suggested mechanism through which this may be achieved in similar contexts. A play-based approach to teaching composition was employed, in which pupils engaged in creative activity that was governed by rules, allowed them a degree of freedom over the use of these rules and the activity itself, and fostered a deep sense of connection to the learning environment through shared agency. The successful composition of piano music by all participants supports assertions made in the literature that advocate the productive potential of play-based methods. Knowledge of music was acquired through its creation in a mode of participation characterised by pupil agency that designated these children as cultural agents and architects of cultural artefacts through a process that they controlled. This affirms Van Oers' (2012) assertion that meaningful learning is dependent upon agentic participation in the reconstruction and enactment of authentic cultural practices. Findings suggest that the inclusion of composition facilitates apperception of musical knowledge across domains, in which learnt concepts are consolidated and new ones taught in novel knowledge frameworks, leading to intercontextual transferability of content knowledge. Being thus equipped with knowledge and a broad understanding of its potentials empowers students as critical thinkers and problem solvers, which is a fundamental imperative in the development of 21st-century skills.

Furthermore, this study shows that composition can be included in piano lessons and that this inclusion need not displace standard lesson components, which has implications for school policy in terms of restructuring the music report. Standard lesson elements were not compromised in this investigation, so their retention in the music report, and subsequently in lessons themselves, is assured. However, the inclusion of composition in piano lessons and the music report, the regulatory tool devised by school management, allows the teacher to align teaching methods and objectives with syllabus innovations made by ABRSM and Trinity College. The syllabuses of these external examining boards are frequently the benchmarks against which musical learning is assessed in South Africa and they guide teachers' self-developed curricula and pedagogical approaches. The fact that these examining boards now accept self-composed repertoire confirms a global turn to productive music learning practices, and the composing framework presented in this study offers teachers a practical means of aligning their teaching with this trend.

An emergent and unanticipated finding in this research involved a necessary compromise between collaboration and independent work. Collaborative activity is crucial to play-based approaches, 21st-century skills development, and the establishment of the zone of proximal development within which intersubjective interaction allows the teacher to scaffold learning and enables students to accomplish more than they would have without this assistance. Collaborative work was therefore a fundamental principal in the design of the first version of the intervention and each task in the lesson schedule was intended to be completed collaboratively in lessons. However, this was not feasible in practice and some tasks were abandoned due to time constraints. Analysis and redesign led to the creation of a composing framework that was better adapted to the teaching context, but required students to complete some work independently at home. At first glance, this appeared to conflict with collaborative imperatives asserted in the literature (Yi 2021; Hogenes *et al.* 2016, 2014a; Sætre 2011; Leung 2008; Berk *et al.* 2006; Gould 2006; Dogani 2004; Odam 2000; Vygotsky 1978). However, this tension is resolved if one reframes collaborative activity to include episodes of independent action that are guided by teacher input, for example, the setting of homework tasks. In this study, collaborative activity therefore became more closely aligned with the notion of guided discovery (Brown 1992), in which composing was done in alternating episodes of mutual and independent action. This musical apprenticeship (Van Oers 2012; Elliott 1995) is inherently creative because it occurs in a learning environment in which challenges are presented in the form of accessible goals that are achieved through a measure of independent problem solving using musical materials (Custodero 2012). Analysis of participant interaction showed that composing did not require continuous teacher involvement, but rather a learning environment in which teacher and student were reciprocally embedded and constituent, which is consistent with the characteristics of agentic music learning ecologies (O'Neill 2017).

Limitations

Data collection methods must be “feasible to administer” (Cobb *et al.* 2003, 12) and in this study the research design required the recruitment of participants from a population of piano students in an authentic primary school context. Data collection methods included lesson observations and audio recordings of piano lessons, which were transcribed. Transcription was an immensely time-consuming enterprise and as sole teacher/researcher I knew that it would not be practical to recruit more than five participants at any one time. The first and second iterations were enacted with a cohort of five participants of similar age and level of piano expertise, while the third iteration was enacted with a new cohort of four participants that were more diverse. Sample size was thus deliberately limited for pragmatic reasons and although the data collected were sufficient for analysis and the drawing of conclusions, claims of generalisability of findings are tentative. This study therefore provides evidence of an intervention that was successfully enacted in the context in which it was implemented and it is this contextualisation, although methodologically valuable in terms of ecological validity, that imposes limitations on generalisability.

Recommendations

The approach to teaching composition as an additional lesson component, developed and trialled in this study, successfully promoted the development of an agentic learning ecology in this context. This constitutes one small step towards a productive piano pedagogy, and to establish its efficacy in other contexts, its implementation in similar schools is suggested. This could establish whether the design is easily integrated into learning environments that are similar to the one in which it was developed, and if this is the case, it could be used as a tool for including composition in piano lessons in similar South African primary schools. To investigate broader applicability, further studies using DBR methods and this composing framework as a starting point might be conducted in diverse learning environments, which might include secondary schools and under-resourced institutions both locally and internationally. Such studies might aim to determine whether the activity patterns discovered in the current investigation are reproduced in other settings, or gauge how useful the design proves to be to teachers who had no part in its construction, akin to the *gamma* testing phase in software development. Such research could determine whether the design is flexible enough to be implemented in an array of contexts, but more importantly, conflicts between endogenous and exogenous elements can be identified. It is these tensions that drive innovation in DBR and through rapid prototyping *in situ*, and by embodying analytically derived theoretical conjectures in successive cycles of redesign, these studies might be able to not only demarcate the contextual boundaries that constitute the minimum ontology in which the design is effective, but also engineer the changes necessary to make it so.

Another suggested area of inquiry is to establish how this design might be adapted for use in lessons for instruments other than the piano. The current study was focused on developing a productive approach to piano lessons, but the theoretical underpinnings are not instrument specific. The socially constructed tool-mediated activity described by CHAT and the characteristics of agentive music learning ecologies are certainly not limited to teaching interactions centred around one instrument, so it might be useful to investigate how the design that emerged from the current study can be altered for use by teachers and students of other instruments. Findings of such research might enable music educators to facilitate students' transformative musical journeys (O'Neill 2017) through agentive participation in a productive approach to the learning of any instrument.

Assessment is ubiquitous in education, and in music education, instrumental students' progress is measured by assessing the performance of repertoire prepared for this purpose. This is typically a reproductive approach because the repertoire performed is selected from syllabuses curated by established examining boards, or from extant instrumental literature by the teacher, and the student is hence not the composer of the material presented. However, ABRSM and Trinity College are two examples of international examining boards that have included student compositions as optional examination requirements. The current study used Hogenes' three-step model as the foundation of the designed intervention, in which the steps are the creation of a common basis, drafting ideas and writing the composition, and presenting the composition through publication, performance, or recording (Hogenes *et al* 2023). A suggested area of inquiry is to investigate whether a fourth, evaluative step might be included in the model. However, this question presents a philosophical dilemma. Hogenes' model is aligned with the principles of playful activity, one of them being an emphasis on process, not product. This is also characteristic of African philosophies of music-making. If assessment were to be introduced as the fourth step, this focus on product might undermine the structural integrity of the model, caused by tensions between these diametrically opposed philosophical orientations. The current study sought to integrate a novel approach to productive musical learning with established institutional conventions and their concomitant contextual constraints. Findings suggest that a productive approach is possible in this context and further research that seeks to reconcile the opposing forces generated by a paradoxical dual emphasis on process and product might complete the model's alignment with institutional and international assessment imperatives as well as African musical aesthetics. This is particularly important in the South African context because from the perspective of transgressive learning, this espousal of African aesthetics in an agentive learning paradigm where children's creative imperatives are given precedence, each child's creative self-actualisation might constitute one of the multiple beginnings that can seed a decolonial future through actions in the present that are emancipatory (Kulundu-Bolus *et al.* 2020).

Conclusion

The intervention developed in this research successfully integrated composition into the established piano lesson structure inherent in the naturalistic context of a primary school in the Eastern Cape. A composing framework, based on Hogenes' play-based model for teaching composition, was developed through iterative cycles of enactment, analysis, and redesign, resulting in participants exercising autonomy over tool-mediated activity and through this transformative agency composed new pieces of piano music. This framework and its successful implementation in one context constitute a small step towards a novel productive piano pedagogy and points to the possibility of agentive music education praxis in instrumental lessons that privileges learner creativity and facilitates the acquisition of musical knowledge and skills through composition.

REFERENCES

- ABRSM. (2023). *Music performance grades: piano syllabus (section 3) 2023 & 2024* [online]. Available from: <https://za.abrsm.org/media/67033/14-performance-grades-qual-spec-piano-2023-2024-230303.pdf> [accessed 26 September 2023].
- Adams, T.E. and Jones, S.H. (2018). The art of ethnography. In: Leavy, P., ed. *Handbook of arts-based research*. New York: The Guilford Press, pp. 141-164.
- Agawu, K. (2001). African music as text. *Research in African Literatures* [online], 32(2), pp. 8-16. Available from: <https://www.jstor.org/stable/3820902> [accessed 24 January 2024].
- Allsup, R.E. (2013). The compositional turn in music education: from closed forms to open texts. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 57-70. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199832286.003.0004> [accessed 5 July 2023].
- Anderson, T. and Shattuck, J. (2012). Design-based research: a decade of progress in education research? *Educational Researcher* [online], 41(1), pp. 16-25. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/full/10.3102/0013189X11428813> [accessed 27 January 2022].
- Bakker, A. and Van Eerde, D. (2015). An introduction to design-based research with an example from statistics education. In: Bikner-Ahsbals, A., Knipping, C. and Presmeg, N., eds. *Approaches to qualitative research in mathematics education* [online]. Dordrecht: Springer, pp. 429-466. Available from: https://0-link.springer.com.wam.seals.ac.za/chapter/10.1007/978-94-017-9181-6_16 [accessed 22 February 2022].
- Barab, S. and Squire, K. (2004). Design-based research: putting a stake in the ground. *The Journal of the Learning Sciences* [online], 13(1), pp. 1-14. Available from: https://learnlab.org/wiki/images/a/ab/2004_Barab_Squire.pdf [accessed 2 February 2022].
- Barrett, M. (2009). A systems view of musical creativity. In: Elliott, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 177-195. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.003.10> [accessed 9 February 2024].

Barrett, M.S. and Gromko, J.E. (2007). Provoking the muse: a case study of teaching and learning in music composition. *Psychology of Music* [online], 35(2), pp. 213–230. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/0305735607070305> [accessed 19 April 2021].

Berger, A.A. and Cooper, S. (2003). Musical play: a case study of preschool children and parents. *Journal of Research in Music Education* [online], 51(2), pp. 151-165. <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.2307/3345848> [accessed 29 March 2021].

Berk, L., Mann, T. and Ogan, A. (2006). Make-believe play: wellspring for development of self-regulation. In: Singer, D.G., Golinkoff, R.M., and Hirsh-Pasek, K., eds. *Play = learning: how play motivates and enhances children's cognitive and social-emotional growth* [online]. Oxford University Press, pp. 74-100. Available from: <https://0-oxford.universitypressscholarship.com.wam.seals.ac.za/view/10.1093/acprof:oso/9780195304381.001.0001/acprof-9780195304381-chapter-5> [accessed 13 April 2021].

Berkley, R. (2004). Teaching composing as creative problem solving: conceptualising composing pedagogy. *British Journal of Music Education* [online], 21(3), pp. 239-263. Available from: <https://0-www.cambridge.org.wam.seals.ac.za/core/journals/british-journal-of-music-education/article/teaching-composing-as-creative-problem-solving-conceptualising-composing-pedagogy/8B50953B253FBFEBF7DDBCA13DCEDC49> [accessed 22 May 2022].

Biggs, M. and Büchler, D. (2010). Communities, values, conventions and actions. In: Biggs, M. and Karlsson, H., eds. *The Routledge companion to research in the arts* [online]. London: Routledge, pp. 82-98. Available from: https://0-scholar.google.co.za.wam.seals.ac.za/scholar?hl=en&as_sdt=0%2C5&q=Biggs%2C+M.+and+B%2C3%BCchler%2C+D.+%282010%29.+Communities%2C+values%2C+conventions+and+actions&btnG= [accessed 8 March 2024].

Blacking, J. (1973). *How musical is man?* Seattle: University of Washington Press.

Bolden, B. (2009). Teaching composing in secondary school: a case study analysis. *British Journal of Music Education* [online], 26(2), pp. 137-152. Available from: <https://0-www.cambridge.org.wam.seals.ac.za/core/journals/174hodes174-journal-of-music-education/article/teaching-composing-in-secondary-school-a-case-study-analysis/BE184B55B7FE38CDF715BBA98FB2FD0D> [accessed 15 July 2023].

Borthwick, S. and Davidson J.W. (2002). Developing a child's identity as a musician: a family 'script' perspective. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 60-78.

Bosch, M. (2008). *Everyone can compose music* [online]. PhD thesis, Princeton University. Available from: <https://www.proquest.com/dissertations-theses/everyone-can-compose-music/docview/304498942/se-2> [accessed 15 July 2023].

Brown, A.L. (1992). Design experiments: theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences* [online], 2(2), pp. 141-178. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/pdf/10.1207/s15327809jls0202_2 [accessed 30 August 2023].

Burnam, E. (1957). *A dozen a day*. Florence, KY, USA: The Willis Music Company.

Burnard, P. and Younker, B.A. (2008). Investigating children's musical interactions within the activities systems of group composing and arranging: an application of Engeström's Activity Theory. *International Journal of Educational Research* [online], 47(1), pp. 60-74. Available from: <https://0-www.sciencedirect.com.wam.seals.ac.za/science/article/pii/S0883035508000177> [accessed 15 July 2023].

Carbonneau, K.J. and Marley, S.C. (2012). Activity-based learning strategies. In: Hattie, J. and Anderman, E.M., eds. *The international guide to student achievement* [online], pp. 282-284. London: Taylor & Francis Group. Available from: ProQuest Ebook Central [accessed 25 May 2021].

Chalkiadaki, A. (2018). A systematic literature review of 21st century skills and competencies in primary education. *International Journal of Instruction* [online], 11(3), pp. 1-16. Available from: <https://doi.org/10.12973/iji.2018.1131a> [accessed 18 July 2021].

Clark, I. and Dumas, G. (2015). Toward a neural basis for peer-interaction: what makes peer-learning tick? *Frontiers in Psychology* [online], 6(28), p. 1-12. Available from: <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2015.00028/full> [accessed 16 July 2021].

Clayton, M. (2016). The social and personal functions of music in cross-cultural perspective. In: Hallam, S., Cross, I. and Thaut, M., eds. *The Oxford handbook of music psychology*. 2nd ed. New York: Oxford University Press, pp. 47-59.

Cobb, P., Confrey, J., diSessa, A., Lehrer, R. and Schauble, L. (2003). Design experiments in educational research. *Educational Researcher* [online], 32(1), pp. 9-13. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.3102/0013189X032001009> [accessed 11 July 2022].

Collins, D. (2005). A synthesis process model of creative thinking in music composition. *Psychology of Music* [online], 33(2), pp. 193-216. Available from: <https://0-doi.org.wam.seals.ac.za/10.1177/0305735605050651> [accessed 10 April 2021].

Corbisiero-Drakos, L., Reeder, L.K., Ricciardi, L., Zacharia, J. and Harnett, S. (2021). Arts integration and 21st century skills: a study of learners and teachers. *International Journal of Education & the Arts* [online], 22(2), pp. 1-25. Available from: <http://doi.org/10.26209/ijea22n2> [accessed 17 July 2021].

Creswell, J.W. (2007). *Qualitative inquiry and research design: choosing among five approaches*. 2nd ed. Thousand Oaks, California: Sage Publications.

Cross, C.R. (1900). Historical notes relating to musical pitch in the United States. In: *Proceedings of the American Academy of Arts and Sciences April 1900* [online]. American Academy of Arts & Sciences, 35(22), pp. 453-467. Available from: https://0-www.jstor.org.wam.seals.ac.za/stable/pdf/25129957.pdf?refreqid=excelsior%3A31e3132de28e6188d31c8dede0a7bab5&ab_segments=&origin= [accessed 3 October 2023].

Curwen, A.J. (1913). *Mrs. Curwen's pianoforte method, the teacher's guide*. 29th ed. London: J. Curwen & Sons.

Custodero, L.A. (2012). The call to create: flow experience in music learning and teaching. In: Hargreaves, D., Miell, D. and MacDonald, R., eds. *Musical imaginations. Multidisciplinary perspectives on creativity, performance, and perception*. Oxford: Oxford University Press, pp. 369-384.

Davidson, C. (2009). Transcription: imperatives for qualitative research. *International Journal of Qualitative Methods* [online], 8(2), pp. 35-52. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/full/10.1177/160940690900800206> [accessed 5 March 2023].

De Bruin, L. R. (2018) Musical play, creativity and metacognitive processes in developing improvisational expertise: expert improvising voices. *International Journal of Play* [online], 7(3), pp. 248–265. Available from: <https://www.tandfonline.com/doi/full/10.1080/21594937.2018.1532708> [accessed 10 April 2021].

De Oliveira, M.O. and Charreu, L.A. (2016). Contributions from the methodological perspective of arts-based research and a/r/tography for research in education. *Educação em Revista* [online], 32(1), pp. 365–382. Available from: <https://0-www.scielo.br.wam.seals.ac.za/j/edur/a/YdsHyKtWKvFHHmKJGKyXpH/?lang=en> [accessed 23 March 2021].

De Villiers, A. (2023). Creativity and composition in South African school curricula. In: Devaney, K., Fautley, M., Grow, J., and Ziegenmeyer, A., eds. *The Routledge companion to teaching music composition in schools: international perspectives*. New York: Routledge, pp. 350-362.

De Villiers, F. (2010). The piano teaching situation from a student perspective: a South African qualitative study. *SAMUS: South African Music Studies* [online], 30(1), pp. 159-175. Available from: <https://0-hdl.handle.net.wam.seals.ac.za/10520/EJC133294> [accessed 16 July 2023].

Department of Education. (2011a). *Curriculum and assessment policy statement: grades 4-6: life skills* [online]. Available from: <https://www.education.gov.za/Portals/0/CD/National%20Curriculum%20Statements%20and%20Vocational/CAPS%20IP%20%20LIFE%20SKILLS%20GR%204-6%20%20WEB.pdf?ver=2015-01-27-161425-333> [accessed 27 September 2023].

Department of Education. (2011b). *Curriculum and assessment policy statement: grades 10-12: music* [online]. Available from: https://www.education.gov.za/Portals/0/CD/National%20Curriculum%20Statements%20and%20Vocational/CAPS%20FET%20_%20MUSIC%20_%20GR%2010-12%20_%20Web_84B0.pdf?ver=2015-01-27-154043-920 [accessed 27 September 2023].

Dibben, N. (2002). Gender identity and music. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 117-133.

Dogani, K. (2004). Teachers' understanding of composing in the primary classroom. *Music Education Research* [online], 6(3), pp. 263-279. Available from: <https://doi.org/10.1080/1461380042000281721> [accessed 15 July 2023].

Dolloff, L. (2009). Elementary music education: building cultures and practices. In: Elliot, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 281-296. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.003.15> [accessed 9 February 2024].

Doorman, M. (2018). Design-based research and local instruction theories in mathematics education. In: Rodríguez-Muñiz, L.J., Muñiz-Rodríguez, L., Aguilar-González, A., Alonso, P., García García, F.J. and Bruno, A., eds. *Investigación en Educación Matemática XXII* [online]. Gijón: SEIEM, pp. 84-93. <http://funes.uniandes.edu.co/13813/> [accessed 8 June 2022].

Dunin-Woyseth, H. and Nilsson, F. (2014). Design education, practice, and research: on building a field of inquiry. *Studies in Material Thinking* [online], 11 (August 2014), pp. 3-17. Available from: https://www.researchgate.net/profile/Fredrik-Nilsson-7/publication/265846412_Design_Education_Practice_and_Research_On_Building_a_Field_of_Inquiry/links/541da6750cf241a65a189836/Design-Education-Practice-and-Research-On-Building-a-Field-of-Inquiry.pdf [accessed 19 August 2023].

Elliott, D.J. (1995). *Music matters: a new philosophy of music education*. New York: Oxford University Press.

Elliott, D.J. and Silverman, M. (2017). Identities and musics: reclaiming personhood. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 27-45. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0002> [accessed 10 July 2023].

Elliott, D.J., ed. (2009). *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.001.0001> [accessed 9 February 2024].

Engeström, Y. and Sannino, A. (2010). Studies of expansive learning: foundations, findings and future challenges. *Educational Research Review* [online], 5(1), pp. 1-24. Available from: <https://0-www.sciencedirect.com.wam.seals.ac.za/science/article/pii/S1747938X10000035> [accessed 9 March 2024].

Engeström, Y. and Sannino, A. (2021). From mediated actions to heterogenous coalitions: four generations of activity-theoretical studies of work and learning. *Mind, Culture, and Activity* [online], 28(1), pp. 4-23. Available from: <https://doi.org/10.1080/10749039.2020.1806328> [accessed 28 May 2023].

Evans, P. and McPherson, G.E. (2017). Processes of musical identity consolidation during adolescence. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 213-231. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0012> [accessed 12 July 2023].

Ewing, R. (2011). Action research and professional learning: some reflections on inquiries that advance professional knowledge and practice. In: Markauskaite, L., Freebody, P. and Irwin, J., eds. *Methodological choice and design: scholarship, policy and practice in social and educational research* [online]. Methodos Series (Vol. 9). Dordrecht: Springer, pp. 71-77. Available from: https://0-link.springer.com.wam.seals.ac.za/chapter/10.1007/978-90-481-8933-5_6 [accessed 2 February 2022].

Fautley, M. (2005) A new model of the group composing process of lower secondary school students. *Music Education Research* [online], 7(1), pp. 39-57. Available from: <https://0-doi.org.wam.seals.ac.za/10.1080/14613800500042109> [accessed 15 July 2023].

Flavell, J.H. (1996). Piaget's legacy. *Psychological Science* [online], 7(4), pp. 200-203. Available from: <https://0-www.jstor.org.wam.seals.ac.za/stable/pdf/40062945.pdf> [accessed 24 January 2024].

Folkestad, G. (2002). National identity and music. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 151-162.

Foot, K.A. (2014). Cultural-historical activity theory: exploring a theory to inform practice and research. *Journal of Human Behaviour in the Social Environment* [online], 24(3), pp. 329-347. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/full/10.1080/10911359.2013.831011> [accessed 29 March 2021].

Fourie, W. (2020). Musicology and decolonial analysis in the age of Brexit. *Twentieth-Century Music* [online], 17(2), pp. 197–211. Available from: <https://doi.org/10.1017/S1478572220000031> [accessed 24 January 2024].

Fredricks, J.A., Blumenfeld, P.C. and Paris, A.H. (2004). School engagement: potential of the concept, state of the evidence. *Review of Educational Research* [online], 74(1), pp. 59-109. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.3102/00346543074001059> [accessed 13 July 2023].

Gardner, H. (2008). The five minds for the future. *Schools: Studies in Education* [online], 5(1/2), pp. 17–24. Available from: <https://doi.org/10.1086/591814> [accessed 27 June 2023].

Gaunt, H. (2010). One-to-one tuition in a conservatoire: the perceptions of instrumental and vocal students. *Psychology of Music* [online], 38(2), pp. 178–208. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/0305735609339467> [accessed 13 April 2021].

Geertz, C. (1974). “From the native’s point of view”: on the nature of anthropological understanding. *Bulletin of the American Academy of Arts and Sciences* [online], 28(1), pp. 26-45. Available from: <http://www.jstor.com/stable/3822971> [accessed 19 December 2023].

Getenet, S. (2015). *Enhancing mathematics teacher educators’ technological pedagogical content knowledge through collaborative professional development: Ethiopia* [online]. Unpublished doctoral dissertation, University of Tasmania, Launceston, Australia. Available from: <https://doi.org/10.25959/23240228.v1> [accessed 10 October 2023].

Goff, W. and Getenet, S. (2017). Design-based research in doctoral studies: adding a new dimension to doctoral research. *International Journal of Doctoral Studies*, 12 (2017), pp. 107-121. <https://www.informingscience.org/Publications/3761> [accessed 28 August 2023].

Goff, W.M. (2016). *Partnership at the cultural interface – how adults come together to support the mathematical learning of children making the transition to school* [online] [unpublished]. PhD thesis, Charles Sturt University, Bathurst, Australia. Available from: https://researchoutput.csu.edu.au/ws/portalfiles/portal/92489465/Goff_Wendy_thesis.pdf [accessed 10 October 2023].

Gorard, S. and Taylor, C. (2004). *Combining methods in educational and social research* [online]. Berkshire: McGraw-Hill Education. Available from: ProQuest Ebook Central. [accessed 15 June 2021].

Gorard, S., Roberts, K. and Taylor, C. (2004). What kind of creature is a design experiment? *British Educational Research Journal* [online], 30(4), pp. 577-590. Available from: <https://0-bera-journals.onlinelibrary.wiley.com.wam.seals.ac.za/doi/abs/10.1080/0141192042000237248> [accessed 5 July 2021].

Gould, E. (2006). Dancing composition: pedagogy and philosophy as experience. *International Journal of Music Education* [online], 24(3), pp. 197-207. Available from: <https://0-doi.org.wam.seals.ac.za/10.1177/0255761406069639> [accessed 15 July 2023].

Gracyk, T. (2004). Does everyone have a musical identity? *Action, Criticism, and Theory for Music Education* [online], 3(1), pp. 2-21. Available from: http://act.maydaygroup.org/articles/Gracyk3_1.pdf [accessed 11 July 2023].

Green, L. (1997). *Music, gender, education*. Cambridge: Cambridge University Press.

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

Green, L. (2012). Musical “learning styles” and “learning strategies” in the instrumental lesson: some emergent findings from a pilot study. *Psychology of Music* [online], 40(1), pp. 42-65. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/full/10.1177/0305735610385510> [accessed 9 March 2024].

Green, L. (2016). *Music, informal learning and the school: a new classroom pedagogy* [online]. Abingdon: Taylor & Francis Group. Available from: ProQuest Ebook Central [accessed 21 April 2021].

Gruhn, W. (2009). Understanding musical understanding. In: Elliot, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 98-111. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.003.05> [accessed 9 February 2024].

Hargreaves, D.J., Macdonald, R. and Miell, D. (2017). The changing identity of musical identities. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 3-24. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0001> [accessed 10 July 2023].

Hargreaves, D.J., Miell, D. and MacDonald, R.A. (2002). What are musical identities, and why are they important? In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 1-20.

Hawker, S. and Waite, M., eds. (2007). *Oxford paperback dictionary & thesaurus*. Oxford: Oxford University Press.

Hawkins, B. and Wilson, B. (2017). A fresh theoretical perspective on practice-led research. *International Journal of Art & Design Education* [online], 36(1), pp. 82–91. Available from: <https://0-onlinelibrary.wiley.com.wam.seals.ac.za/doi/full/10.1111/jade.12074> [accessed 20 March 2021].

Hickey, M. (2012). *Music outside the lines: ideas for composing in K-12 music classrooms* [online]. New York: Oxford University Press. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:osobl/9780199826773.001.0001> [accessed 14 July 2023].

Hickey, M. (2013). What pre-service teachers can learn from composition research. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 33-56. Available from: <https://doi.org/10.1093/acprof:oso/9780199832286.003.0003> [accessed 14 July 2023].

Hill, J. (2012). Imagining creativity: an ethnomusicological perspective on how belief systems encourage or inhibit creative activities in music. In: Hargreaves, D., Miell, D. and MacDonald, R. eds. *Musical imaginations. Multidisciplinary perspectives on creativity, performance, and perception*. Oxford: Oxford University Press, pp. 87-104.

Hillaire, G.E. (2021). *Understanding emotions in online learning: using emotional design and emotional measurement to unpack complex emotions during collaborative learning* [online]. PhD thesis, The Open University. Available from: <https://www.proquest.com/dissertations-theses/understanding-emotions-online-learning-using/docview/2570314652/se-2> [accessed 12 October 2023].

Hoadley, C.M. (2004). Methodological alignment in design-based research. *Educational Psychologist* [online], 39(4), pp. 203-212. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.1207/s15326985ep3904_2 [accessed 24 May 2022].

Hogenes, M. (2016). *Creative music making: music composition as social-cultural activity in the elementary classroom* [online]. PhD thesis, Vrije Universiteit Amsterdam. Available from: <https://research.vu.nl/ws/portalfiles/portal/42160021/complete+dissertation.pdf> [accessed 9 September 2023].

Hogenes, M., Van Oers, B. and Diekstra, R.F. (2014a). Noa, a 10-year-old composer: a case study. *Journal of Arts and Humanities* [online], 3(12), pp. 1-15. Available from: <https://theartsjournal.org/index.php/site/article/view/582> [accessed 29 June 2021].

Hogenes, M., Van Oers, B. and Diekstra, R.F. (2014b). Music composition in the music curriculum. *US-China Education Review A* [online], 4(3), pp. 149-162. https://www.researchgate.net/publication/282958889_Music_Composition_in_the_Music_Curriculum [accessed 29 March 2021].

Hogenes, M., Van Oers, B. and Diekstra, R.F. (2023). Music composition as playful activity: perspectives on teaching composing from the Netherlands. In: Devaney, K., Fautley, M., Grow, J. and Ziegenmeyer, A., eds. *The Routledge companion to teaching music composition in schools: international perspectives*. New York: Routledge, pp. 253-264.

Hogenes, M., Van Oers, B., Diekstra, R.F. and Sklad, M. (2016). The effects of music composition as a classroom activity on engagement in music education and academic and music achievement: a quasi-experimental study. *International Journal of Music Education* [online], 34(1), pp. 32-48. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/full/10.1177/0255761415584296> [accessed 25 March 2021].

Ilari, B. (2017). Children's ethnic identities, cultural diversity, and music education. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 527-542. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0029> [accessed 11 July 2023].

Impett, J. (2016). Making a mark: the psychology of composition. In: Hallam, S., Cross, I. and Thaut, M., eds. *The Oxford handbook of music psychology*. 2nd ed. New York: Oxford University Press, pp. 651-666.

Jan, M., San Chee, Y. and Tan, E. M. (2010). Unpacking the design process in design-based research. In: Gomez, K., Lyons, L., and Radinsky, J., eds. *Learning in the disciplines: proceedings of the 9th international conference of the learning sciences* [online]. Chicago IL: International Society of the Learning Sciences, pp. 470-471. Available from: <https://repository.isls.org/handle/1/2911> [accessed 2 September 2023].

Jensen, E. (2005). *Teaching with the brain in mind* [online]. 2nd ed. Alexandria, VA: Association for Supervision & Curriculum Development. Available from: ProQuest Ebook Central [accessed 29 March 2021].

Joseph, D. (2004). The practice of design-based research: uncovering the interplay between design, research, and the real-world context. *Educational Psychologist* [online], 39(4), pp. 235-242. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.1207/s15326985ep3904_5 [accessed 27 January 2022].

Kaschub, M. (1997). A comparison of two composer-guided large group composition projects. *Research Studies in Music Education* [online], 8(1), pp. 15-28. Available from: https://www.researchgate.net/profile/Michele-Kaschub/publication/249831064_A_Comparison_of_Two_Composer-Guided_Large_Group_Composition_Projects/links/571a408208ae408367bc86e4/A-Comparison-of-Two-Composer-Guided-Large-Group-Composition-Projects.pdf [accessed 15 July 2023].

Kaschub, M. and Smith, J. (2009). *Minds on music: composition for creative and critical thinking* [online]. Lanham: Rowman & Littlefield Publishers, Inc. Available from: ProQuest Ebook Central [accessed 29 June 2023].

Kaschub, M. and Smith, J. (2013). Embracing composition in music teacher education. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 3-18. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199832286.001.0001> [accessed 29 June 2023].

Kennedy-Clark, S. (2013). Research by design: design-based research and the higher degree research student. *Journal of Learning Design* [online], 6(2), pp. 26-32. Available from: <https://eric.ed.gov/?id=EJ1018597> [accessed 28 August 2023].

Kereluik, K., Mishra, P., Fahnoe, C. and Terry, L. (2013). What knowledge is of most worth: teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education* [online], 29(4), pp. 127-140. Available from: <https://0-doi.org.wam.seals.ac.za/10.1080/21532974.2013.10784716> [accessed 27 June 2023].

Kolb, D.A., Boyatzis, R.E. and Mainemelis, C. (2001). Experiential learning theory: previous research and new directions. In: Sternberg, R.J. and Zhang, L., eds. *Perspectives on thinking, learning, and cognitive styles* [online]. Mahwah: Taylor & Francis Group, pp. 227-247. Available from: ProQuest Ebook Central [accessed 9 August 2023].

Koops, A. (2013). Facilitating composition in instrumental settings. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 149-166. Available from: <https://doi.org/10.1093/acprof:oso/9780199832286.003.0008> [accessed 14 July 2023].

Krippendorff, K. (2004). *Content analysis: an introduction to its methodology*. 2nd ed. Thousand Oaks, California: Sage Publications.

Kruger, E.A. (2016). *An exploration of transformative piano teaching in Pretoria: a case study* [online] [unpublished]. Masters dissertation, North-West University, South Africa. Available from: <https://repository.nwu.ac.za/handle/10394/21078> [accessed 7 July 2021].

Kuhn, D. (1979). The application of Piaget's theory of cognitive development to education. *Harvard educational review* [online], 49(3), pp. 340-360. Available from: <https://0-meridian.allenpress.com.wam.seals.ac.za/her/article/49/3/340/31051/The-Application-of-Piaget-s-Theory-of-Cognitive> [accessed 1 August 2023].

Kulundu-Bolus, I., McGarry, D. and Lotz-Sisitka, H. (2020). Think piece: learning, living and leading into transgression – a reflection on decolonial praxis in a neoliberal world. *Southern African Journal of Environmental Education* [online], 36(2), pp. 111-130. Available from: <https://0-www.ajol.info.wam.seals.ac.za/index.php/sajee/article/view/197539> [accessed 18 June 2023].

Lamont, A. (2002). Musical identities and the school environment. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 41-59.

Lamont, A. (2017). Musical identity, interest, and involvement. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 176-196. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0010> [accessed 12 July 2023].

Larson, R.W. (2011). Positive development in a disorderly world. *Journal of Research on Adolescence* [online], 21(2), pp. 317-334. Available from: <https://0-onlinelibrary.wiley.com.wam.seals.ac.za/doi/full/10.1111/j.1532-7795.2010.00707.x> [accessed 13 July 2023].

Lennon, M. (1996). *Teacher thinking: a qualitative approach to the study of piano teaching* [online] [unpublished]. PhD thesis, University of London, Institute of Education. Available from: <https://discovery.ucl.ac.uk/id/eprint/10018933/> [accessed 28 January 2021].

Leung, B.W. (2008). Factors affecting the motivation of Hong Kong primary school students in composing music. *International Journal of Music Education* [online], 26(1), pp. 47-62. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/0255761407085649> [accessed 23 July 2023].

MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. (2002). *Musical identities*. Oxford: Oxford University Press.

MacDonald, R.A., Miell, D. and Mitchell, L. (2002). An investigation of children's musical collaborations: the effect of friendship and age. *Psychology of Music* [online], 30(2), pp. 148-163. Available from: <https://0-doi.org.wam.seals.ac.za/10.1177/0305735602302002> [accessed 15 July 2023].

Machi, L.A. and McEvoy, B.T. (2008). *The literature review*. Thousand Oaks, California: Corwin Press.

Major, A.E. and Cottle, M. (2010). Learning and teaching through talk: music composing in the classroom with children aged six to seven years. *British Journal of Music Education* [online], 27(3), pp. 289-304. Available from: <https://doi.org/10.1017/S0265051710000240> [accessed 15 July 2023].

Mandran, N., Vermeulen, M. and Prior, E. (2022). Thedre's framework: empowering PhD candidates to efficiently implement design-based research. *Education and Information Technologies* [online], 27(7), pp. 9563-9586. Available from: <https://o-link.springer.com.wam.seals.ac.za/article/10.1007/s10639-022-10993-x> [accessed 12 October 2023].

Marchetti, I. and Koster, E.H. (2014). Brain and intersubjectivity: a Hegelian hypothesis on the self-other neurodynamics. *Frontiers in Human Neuroscience* [online], 8(11), pp. 1-4. Available from: <https://doi.org/10.3389/fnhum.2014.00011> [accessed 7 July 2023].

Marsh, K. and Young, S. (2015). Musical play. In: McPherson, G.E., ed. *The child as musician: a handbook of musical development* [online]. 2nd ed. Oxford: Oxford University Press, pp. 462-484. Available from: <https://doi.org/10.1093/acprof:oso/9780198744443.003.0025> [accessed 7 June 2021].

Martin, J. (2009). Composing and improvising. In: Elliott, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 165-176. Available from: <https://o-link.springer.com.wam.seals.ac.za/article/10.1093/acprof:oso/9780195385076.003.09> [accessed 9 February 2024].

Mason, J. (2002). *Qualitative researching*. 2nd ed. London: Sage Publications.

Matthay, T. (1932). *The visible and invisible in pianoforte technique*. London: Oxford University Press.

McConnachie, B. (2016). *Indigenous and traditional musics in the school classroom: a re-evaluation of the South African Indigenous African Music (IAM) curriculum* [unpublished]. PhD thesis, Rhodes University, South Africa.

McMullin, C. (2023). Transcription and qualitative methods: implications for third sector research. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* [online], 34(1), pp. 140-153. Available from: <https://o-link.springer.com.wam.seals.ac.za/article/10.1007/s11266-021-00400-3> [accessed 3 October 2023].

McPherson, G. and Hallam, S. (2016). Musical potential. In: Hallam, S., Cross, I. and Thaut, M., eds. *The Oxford handbook of music psychology*. 2nd ed. New York: Oxford University Press, pp. 433-448.

Merkow, C. (2012). Philosophy of early childhood music education. *Connections* [online], 27(1), p. 5-10. Available from: <https://www.proquest.com/openview/edffe1b3871c565835162a270e132d79/1?cbl=1326335&parentSes=71Juk5Oep52H0MVsqFXO3CQ38MH7y%2BTTVIOsXn4Y4aY%3D&pq-origsite=gscholar&accountid=13504> [accessed 30 June 2021].

Miller, B.A. (2004). Designing compositional tasks for elementary music classrooms. *Research Studies in Music Education* [online], 22(1), pp. 59-71. Available from: <https://doi.org.wam.seals.ac.za/10.1177/1321103X040220010901> [accessed 15 July 2023].

Mills, J. and McPherson, G.E. (2015). Musical literacy: reading traditional clef notation. In: McPherson, G.E., ed. *The child as musician: a handbook of musical development* [online]. 2nd ed. Oxford: Oxford Academic, pp. 177-191. Available from: <https://doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780198744443.003.0009> [accessed 5 July 2023].

Mngoma, K. (1987). The teaching of music in South Africa. *Africa Insight* [online], 17(3), pp. 199-203. Available from: https://0-journals.co.za.wam.seals.ac.za/doi/pdf/10.10520/AJA02562804_585 [accessed 24 January 2024].

Moher, D., Hopewell, S., Schulz, K.F., Montori, V., Gøtzsche, P.C., Devereaux, P.J., Elbourne, D., Egger, M. and Altman, D.G. (2012). CONSORT 2010 explanation and elaboration: updated guidelines for reporting parallel group randomised trials. *International Journal of Surgery* [online], 10(1), pp. 28-55. Available from: <https://www.sciencedirect.com/science/article/pii/S1743919111005656> [accessed 24 September 2023].

Moore, M. (2011). Vygotsky's cognitive development theory. In: Goldstein, S. and Naglieri, J.A., eds. *Encyclopedia of child behavior and development* [online]. Boston: Springer, pp. 1549-1550. Available from: <https://link.springer.com/referencework/10.1007/978-0-387-79061-9> [accessed 23 June 2021].

Niland, A. (2009). The power of musical play: the value of play-based, child-centered curriculum in early childhood music education. *General Music Today* [online], 23(1), pp. 17-21. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/1048371309335625> [accessed 29 March 2021].

Noë, A. (2004). *Action in perception*. Cambridge, Mass: MIT Press.

Nzewi, M. (1999). Strategies for music education in Africa: towards a meaningful progression from tradition to modern. *International Journal of Music Education* [online], 33(1), pp. 72-87. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/025576149903300109> [accessed 4 July 2023].

Odam, G. (2000). Teaching composing in secondary schools: the creative dream. *British Journal of Music Education* [online], 17(2), pp. 109-127. Available from: <https://doi.org/10.1017/S0265051700000218> [accessed 4 July 2023].

Oehrle, E. (1991a). An introduction to African views of music making. *Journal of Aesthetic Education* [online], 25(3), pp. 163-174. Available from: <https://0-www.jstor.org.wam.seals.ac.za/stable/3333001> [accessed 9 January 2023].

Oehrle, E. (1991b). Emerging music education trends in Africa. *International Journal of Music Education* [online], 18(1), pp. 23-29. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/025576149101800103> [accessed 4 July 2023].

Oehrle, E. (2013). The talking drum: towards the dissemination of musics in South Africa. *Journal of Musical Arts in Africa* [online], 10(1), pp. 135-138. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/pdf/10.2989/18121004.2013.846991> [accessed 31 July 2023].

O'Neill, S.A. (2002). The self-identity of young musicians. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 79-96.

O'Neill, S.A. (2015). Transformative music engagement and musical flourishing. In: McPherson, G.E., ed. *The child as musician: a handbook of musical development* [online]. 2nd ed. Oxford: Oxford Academic, pp. 606-625. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780198744443.003.0033> [accessed 5 July 2023].

O'Neill, S.A. (2017). Young people's musical lives: learning ecologies, identities, and connectedness. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 79-104. Available from: <https://doi.org/10.1093/acprof:oso/9780199679485.003.0005> [accessed 2 October 2023].

Otchere, E.D. (2015). Music teaching and the process of enculturation: A cultural dilemma. *British Journal of Music Education* [online], 32(3), pp. 291-297. Available from: <https://0-www.cambridge.org.wam.seals.ac.za/core/journals/british-journal-of-music-education/article/music-teaching-and-the-process-of-enculturation-a-cultural-dilemma/B6E24D53811AB115EAB1E41D6FE7B531> [accessed 4 July 2023].

Pang, K. (2010). Creating stimulating learning and thinking using new models of activity-based learning and metacognitive-based activities. *Journal of College Teaching & Learning (TLC)* [online], 7(4), pp. 29-38. Available from: <https://doi.org/10.19030/tlc.v7i4.112> [accessed 25 May 2021].

Parncutt, R. (2016). Prenatal development and the phylogeny and ontogeny of musical behavior. In: Hallam, S., Cross, I. and Thaut, M., eds. *The Oxford handbook of music psychology*. 2nd ed. New York: Oxford University Press, pp. 371-386.

Philpott, C. (2015). Musical literacy: music as language. In: McPherson, G.E., ed. *The child as musician: a handbook of musical development* [online]. 2nd ed. Oxford: Oxford Academic, pp. 192-207. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780198744443.003.0010> [accessed 5 July 2023].

Piaget, J. (1999). *Play, dreams and imitation in childhood* [online]. London: Taylor & Francis Group. Available from: ProQuest Ebook Central [accessed 28 June 2023].

Priyono, P., Wena, M. and Rahardjo, B. (2017). Using activity-based learning approach to enhance the quality of instruction in civil engineering in Indonesian universities. In: *AIP Conference Proceedings (Vol. 1887, No. 1)* [online]. AIP Publishing, pp. 020008-1–020008-8. Available from: <https://doi.org/10.1063/1.5003491> [accessed 19 August 2021].

Redcay, E., Dodell-Feder, D., Pearrow, M.J., Mavros, P.L., Kleiner, M., Gabrieli, J.D. and Saxe, R. (2010). Live face-to-face interaction during fMRI: a new tool for social cognitive neuroscience. *Neuroimage* [online], 50(4), pp. 1639-1647. Available from: <https://0-www.sciencedirect.com.wam.seals.ac.za/science/article/pii/S1053811910000741> [accessed 7 July 2023].

Reimann, P. (2011). Design-based research. In: Markauskaite, L., Freebody, P. and Irwin, J., eds. *Methodological choice and design: scholarship, policy and practice in social and educational research* [online]. Methodos Series (Vol. 9). Dordrecht: Springer, pp. 37-50. Available from: https://0-doi.org.wam.seals.ac.za/10.1007/978-90-481-8933-5_3 [accessed 2 February 2022].

Reimann, P. (2016). Connecting learning analytics with learning research: the role of design-based research. *Learning: Research and Practice* [online], 2(2), pp. 130-142. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/full/10.1080/23735082.2016.1210198> [accessed 22 February 2022].

Riis, K. and Groth, C. (2020). Navigating methodological perspectives in doctoral research through creative practice: two examples of research in crafts. *FormAkademisk* [online], 13(3), pp. 1-25. Available from: <https://openarchive.usn.no/usn-xmlui/handle/11250/2720739> [accessed 20 March 2021].

Rosa, E.M. and Tudge, J. (2013). Urie Bronfenbrenner's theory of human development: its evolution from ecology to bioecology. *Journal of Family Theory & Review* [online], 5(4), pp. 243-258. Available from: <https://0-onlinelibrary.wiley.com.wam.seals.ac.za/doi/full/10.1111/jftr.12022> [accessed 11 July 2023].

Ruthmann, S.A. (2008). Whose agency matters? Negotiating pedagogical and creative intent during composing experiences. *Research Studies in Music Education* [online], 30(1), pp. 43-58. Available from: <https://0-doi.org.wam.seals.ac.za/10.1177/1321103X08089889> [accessed 15 July 2023].

Sætre, J.H. (2011). Teaching and learning music composition in primary school settings. *Music Education Research* [online], 13(1), pp. 29-50. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/full/10.1080/14613808.2011.553276> [accessed 25 March 2021].

Sandoval, W.A. and Bell, P. (2004). Design-based research methods for studying learning in context: introduction. *Educational Psychologist* [online], 39(4), pp. 199-201. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/pdf/10.1207/s15326985ep3904_1 [accessed 2 February 2022].

Sandoval, W.A. (2004). Developing learning theory by refining conjectures embodied in educational designs. *Educational Psychologist* [online], 39(4), pp. 213-223. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.1207/s15326985ep3904_3 [accessed 24 May 2022].

Sannino, A. and Engeström, Y. (2018). Cultural-historical activity theory: founding insights and new challenges. *Cultural-Historical Psychology* [online]. 14(3), pp. 43-56. Available from: https://psyjournals.ru/en/journals/chp/archive/2018_n3/chp_2018_n3_Sannino_Engestrom_en.pdf [accessed 29 March 2021].

Shulman, L. (1987). Knowledge and teaching: foundations of the new reform. *Harvard Educational Review* [online], 57(1), pp. 1-23. Available from: <https://0-meridian.allenpress.com.wam.seals.ac.za/her/article/57/1/1/31319/Knowledge-and-Teaching-Foundations-of-the-New> [accessed 20 August 2023].

Sivan, E. (1986). Motivation in social constructivist theory. *Educational Psychologist* [online], 21(3), pp. 209-233. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.1207/s15326985ep2103_4 [accessed 7 July 2023].

Small, C. (1998). *Musicking: the meanings of performing and listening* [online]. Middleton, CT: Wesleyan University Press. Available from: ProQuest Ebook Central [accessed 10 July 2023].

Smith, J. (2008). Compositions of elementary recorder students created under various conditions of task structure. *Research Studies in Music Education* [online], 30(2), pp. 159-176. Available from: <https://doi.org/10.1177/1321103X08097505> [accessed 15 July 2023].

Spencer, M.B., Dupree, D. and Hartmann, T. (1997). A phenomenological variant of ecological systems theory (PVEST): a self-organization perspective in context. *Development and Psychopathology* [online], 9(4), pp. 817-833. Available from: <https://0-www.cambridge.org.wam.seals.ac.za/core/journals/development-and-psychopathology/article/phenomenological-variant-of-ecological-systems-theory-pvest-a-selforganization-perspective-in-context/4E4052FA6A8D383CB2629931C42ED47E> [accessed 13 July 2023].

Stetsenko, A. and Arievitch, I.M. (2004). The self in cultural-historical activity theory: reclaiming the unity of social and individual dimensions of human development. *Theory & Psychology* [online], 14(4), pp. 475-503. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.1177/0959354304044921> [accessed 29 March 2021].

Sutton-Smith, B. (2008). Play theory: a personal journey and new thoughts. *American Journal of Play* [online], 1(1), pp. 80-123. Available from: <https://eric.ed.gov/?id=EJ1068966> [accessed 29 March 2021].

Sykes, J.B., ed. (1976). *The concise Oxford dictionary of current English*. 6th ed. Oxford: Oxford University Press.

Tabak, I. (2004). Reconstructing context: negotiating the tension between exogenous and endogenous educational design. *Educational Psychologist* [online], 39(4), pp. 225-233. Available from: https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.1207/s15326985ep3904_4 [accessed 24 May 2022].

Tarnowski, S. (1999). Musical play and young children. *Music Educators Journal* [online], 86(1), p. 26-29. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.2307/3399573> [accessed 2 April 2021].

Tarrant, M., North, A.C. and Hargreaves, D.J. (2002). Youth identity and music. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 134-150.

Taylor, S.J., Bogdan, R. and DeVault, M. (2016). *Introduction to qualitative research methods: a guidebook and resource* [online]. 4th ed. New Jersey: John Wiley & Sons. Available from ProQuest Ebook Central [accessed 14 September 2023].

The Design-Based Research Collective. (2003). Design-based research: an emerging paradigm for educational inquiry. *Educational Researcher* [online], 32(1), pp. 5-8. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/abs/10.3102/0013189X032001005> [accessed 6 June 2022].

Thompson, J. (1955). *John Thompson's easiest piano course*. Ohio: The Willis Music Co.

Torgerson, C.J. (2009). Randomised controlled trials in education research: a case study of an individually randomised pragmatic trial. *Education 3–13* [online], 37(4), pp. 313-321. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/full/10.1080/03004270903099918> [accessed 20 July 2021].

Trevarthen, C. (2002). Origins of musical identity: evidence from infancy for musical social awareness. In: MacDonald, R.A., Hargreaves, D.J. and Miell, D., eds. *Musical identities*. Oxford: Oxford University Press, pp. 21-38.

Trevarthen, C. (2012). Communicative musicality: the human impulse to create and share music. In: Hargreaves, D., Miell, D. and MacDonald, R., eds. *Musical Imaginations. Multidisciplinary perspectives on creativity, performance, and perception*. Oxford: Oxford University Press, pp. 259-284.

Trinity College London. (2023a). *Piano syllabus: piano/piano accompanying: face-to-face assessment qualification specifications for graded exams from September 2023* [online]. Available from: <https://www.trinitycollege.com/resource/?id=9079> [accessed 26 September 2023].

Trinity College London. (2023b). *Digital graded exams: classical & jazz syllabus qualification specifications from July 2023* [online]. Available from: <https://www.trinitycollege.com/resource/?id=9166> [accessed 26 September 2023].

UNISA. (2016). *Piano syllabus 2016 until further notice: piano, piano duet & two pianos (four hands)* [online]. Updated 22 January 2019. Available from: https://www.unisa.ac.za/static/corporate_web/Content/About/Directorate%20Music/Documents/Piano_2016_syllabus%2020190122.pdf [accessed 26 September 2023].

Van Oers, B. (2012). Meaningful cultural learning by imitative participation: the case of abstract thinking in primary school. *Human Development* [online], 55(3), pp. 136-158. Available from: <https://karger.com/hde/article-abstract/55/3/136/157942/Meaningful-Cultural-Learning-by-Imitative> [accessed 15 June 2021].

Varvarigou, M. and Green, L. (2015). Musical ‘learning styles’ and ‘learning strategies’ in the instrumental lesson: the ear playing project (EPP). *Psychology of Music* [online], 43(5), pp. 705-722. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/full/10.1177/0305735614535460> [accessed 3 May 2021].

Veblen, K.K. (2009). Community music and praxialism: narratives and reflections. In: Elliot, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 308-328. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.003.17> [accessed 9 February 2024].

Veraksa, N.E., Veresov, N.N., Veraksa, A.N. and Sukhikh, V.L. (2020). Modern problems of children's play: cultural-historical context. *Cultural-Historical Psychology* [online], 16(3), pp. 60-70. Available from: https://www.researchgate.net/publication/346279918_Modern_Problems_of_Children's_Play_Cultural-Historical_Context [accessed 15 April 2021].

Vygotsky, L.S. (1978). *Mind in society: the development of higher psychological processes*. Cambridge, Mass: Harvard University Press.

Walker, R. (2011). Design-based research: reflections on some epistemological issues and practices. In: Markauskaite, L., Freebody, P. and Irwin, J., eds. *Methodological choice and design: scholarship, policy and practice in social and educational research* [online]. Methodos Series (Vol. 9). Dordrecht: Springer, pp. 51-56. Available from: https://0-doi.org.wam.seals.ac.za/10.1007/978-90-481-8933-5_4 [accessed 2 February 2022].

Wallas, G. (1945). *The art of thought*. London: Watts.

Webster, P.R. (2002). Creative thinking in music: advancing a model. *Creativity and Music Education* [online], 1(33), pp. 1-18. Available from: <http://peterrwebster.com/pubs/WillinghamBook.pdf> [accessed 10 April 2021].

Webster, P.R. (2013). Music composition intelligence and creative thinking in music. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 19-32. Available from: <https://doi.org/10.1093/acprof:oso/9780199832286.003.0002> [accessed 4 July 2023].

Webster, P.R. (2016a). Creative thinking in music, twenty-five years on. *Music Educators Journal* [online], 102(3), pp. 26-32. Available from: <https://doi.org/10.1177/0027432115623841> [accessed 10 April 2021].

Webster, P.R. (2016b). Pathways to the study of music composition by preschool to precollege students. In: Hallam, S. Cross, I. and Thaut, M., eds. *The Oxford handbook of music psychology*. 2nd ed. New York: Oxford University Press, pp. 681-707.

Wellard, S. and McKenna, L. (2001). Turning tapes into text: issues surrounding the transcription of interviews. *Contemporary Nurse* [online], 11(2-3), pp. 180-186. Available from: <https://0-www.tandfonline.com.wam.seals.ac.za/doi/abs/10.5172/conu.11.2-3.180> [accessed 28 July 2022].

Wiggins, J. and Medvinsky, M. (2013). Scaffolding student composers. In: Kaschub, M. and Smith, J., eds. *Composing our future: preparing music educators to teach composition* [online]. New York: Oxford University Press, pp. 109-126. Available from: <https://doi.org/10.1093/acprof:oso/9780199832286.003.0006> [accessed 14 July 2023].

Woodward, S.C. (2009). Critical matters in early childhood music education. In: Elliot, D.J., ed. *Praxial music education: reflections and dialogues* [online]. New York: Oxford University Press, pp. 249-266. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780195385076.003.13> [accessed 9 February 2024].

Yamagata-Lynch, L.C. and Haudenschild, M.T. (2009). Using activity systems analysis to identify inner contradictions in teacher professional development. *Teaching and Teacher Education* [online], 25(3), pp. 507-517. Available from: <https://0-www.sciencedirect.com.wam.seals.ac.za/science/article/pii/S0742051X08001698> [accessed 19 February 2024].

Yi, G.J. (2021). Music-play in the guided music setting. *General Music Today* [online], 34(3), p. 20-28. Available from: <https://0-journals.sagepub.com.wam.seals.ac.za/doi/pdf/10.1177/10483713211002147> [accessed 12 July 2022].

Zachariou, A. and Whitebread, D. (2015). Musical play and self-regulation: does musical play allow for the emergence of self-regulatory behaviours? *International Journal of Play* [online], 4(2), pp. 116-135. Available from: <http://dx.doi.org/10.1080/21594937.2015.1060572> [accessed 13 April 2021].

Zapata Restrepo, G.P. and Hargreaves, D.J. (2017). Musical identities, resilience, and wellbeing: the effects of music on displaced children in Colombia. In: MacDonald, R., Hargreaves, D.J. and Miell, D., eds. *Handbook of musical identities* [online]. Oxford University Press, pp. 736-750. Available from: <https://0-doi.org.wam.seals.ac.za/10.1093/acprof:oso/9780199679485.003.0040> [accessed 12 July 2023].

Lesson transcripts

Alex (2023a). Piano lesson taught by the author: iteration 3, lesson 2. Makhanda, South Africa (26 April).

Alex (2023b). Piano lesson taught by the author: iteration 3, lesson 3. Makhanda, South Africa (3 May).

Emma (2023). Piano lesson taught by the author: iteration 3, lesson 1. Makhanda, South Africa (20 April).

Gloria (2022a). Piano lesson taught by the author: iteration 1, lesson 1. Makhanda, South Africa (17 August).

Gloria (2022b). Piano lesson taught by the author: iteration 1, lesson 2. Makhanda, South Africa (24 August).

Gloria (2022c). Piano lesson taught by the author: iteration 1, lesson 8. Makhanda, South Africa (19 October).

Gloria (2023). Piano lesson taught by the author: iteration 2, lesson 2. Makhanda, South Africa (1 February).

Jane (2023). Piano lesson taught by the author: iteration 2, lesson 2. Makhanda, South Africa (31 January).

Khanya (2023a). Piano lesson taught by the author: iteration 3, lesson 3. Makhanda, South Africa (9 May).

Khanya (2023b). Piano lesson taught by the author: iteration 3, lesson 4. Makhanda, South Africa (30 May).

Maggie (2022a). Piano lesson taught by the author: iteration 1, lesson 3. Makhanda, South Africa (17 August).

Maggie (2022b). Piano lesson taught by the author: iteration 1, lesson 8. Makhanda, South Africa (12 October).

Neela (2023). Piano lesson taught by the author: iteration 3, lesson 1. Makhanda, South Africa (20 April).

Saira (2022). Piano lesson taught by the author: iteration 1, lesson 5. Makhanda, South Africa (27 September).

Saira (2023). Piano lesson taught by the author: iteration 2, lesson 2. Makhanda, South Africa (30 January).

Tammy (2022). Piano lesson taught by the author: iteration 1, lesson 2. Makhanda, South Africa (18 August).

Tammy (2023). Piano lesson taught by the author: iteration 2, lesson 3. Makhanda, South Africa (9 February).

APPENDICES

Appendix A. Lesson schedule: iteration 1

Lesson 1					
	Lesson element	Content	Time (mins)	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 1&2	2		
2	Sight-reading	Paul Harris: Grade 1: p. 4, No. 2&3	2		
3	Aural	Clapping triple time; echo singing	2		
4	Scales	Recap C, G, D Majors	4		
5	Pieces	JT: The Paratrooper: to end	3		
		JT: Marching Up and Down: to end	3		
		JT: Rag-time Raggles: to b. 8	5		
6	Theory	JT: mark p. 12, No. 4 (crotchets), then give homework: p.12, No. 4 complete the line (write semibreves, minims, crotchets).	2		
7	Composition	Goal: to explore pitches using the notes within Middle C position. Consolidate connections between finger numbers and notes in this position. Extend this concept to include all fingers.			
		<u>Step 1: Create common basis.</u> Explain that the task is to write a short tune, a “song” about ice cream. Encourage the pupil to invent a bizarre flavour. If she struggles, assist by eliciting “I love ice cream, it’s so (cold/sweet), (flavour) is the best treat”, or something similar.	27		
		<u>Step 2: Generate and revise ideas. Write the music.</u> First come up with words, then give each word a note. Write finger numbers to notate the music. Rhythmic accuracy not crucial yet.			
		<u>Step 3: Present, record or publish.</u> Record the song on my cell phone. Save on my computer and share with the child’s parents via email.			

Potential problems: notation.

Solution: allow the use of letter names and finger numbers.

Lesson 2					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 1-3	2		
2	Sight-reading	Paul Harris: Grade 1: p. 4, No. 2&3	2		
3	Aural	Identify melodic change; listen for features in a short extract (piano, forte, legato, staccato)	2		
4	Scales	Learn F Major	5		
5	Pieces	JT: The Paratrooper: complete	2		
		JT: Marching Up and Down: complete	2		
		JT: Rag-time Raggles: to end	4		
		JT: The Chimes: to end	3		
		JT: Funny Faces: to b. 4	3		
6	Theory	JT: mark p. 12 No. 4 (complete line), then give homework: p.15 No. 1 (letter names in treble clef C-E, bar-lines).	2		
7	Composition	Goal: Duration Explore the relationship between crotchets and minims (2:1 ratio), much like second-species counterpoint.			
		<u>Step 1: Create common basis</u> Tap crotchets on right knee, and minims on left knee. Demonstrate stepwise RH (right hand) melody in crotchets against LH (left hand) minim accompaniment. It may be useful to ask her to describe a recent walk. Condense the description to a few lines and then help her to assign a crotchet to each syllable for the RH. The LH walks slower.	23		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Create RH and LH parts together (can go beyond C position). Pupil can choose how to notate this. She may want to write finger numbers as before.			
		<u>Step 3: Present, record or publish.</u> Pupil can choose whether to record as before, or write neatly and paste into notebook.			

Potential problems: coordination and notation.

Solution: play one part for her initially, allow the use of letter names and/or finger numbers

Lesson 3					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 1-4	2		
2	Sight-reading	Paul Harris: Grade 1: p. 5, No. 4&5	2		
3	Aural	Clapping quadruple time; echo singing	2		
4	Scales	Recap C, G, D, F Majors	4		
5	Pieces	JT: Rag-time Raggles: to end (check counting)	3		
		JT: The Chimes: complete	2		
		JT: Funny Faces: to b. 8	3		
		JT: Old MacDonald: to b. 8	3		
6	Theory	JT: mark p. 15 No. 1, then give homework: p.15 No. 2 (letter names in treble clef C-E, bar-lines).	2		
7	Composition	Goal: Articulation Explore legato/staccato contrast. <i>Legato</i> and <i>staccato</i> are already familiar from Dozen a Day exercises.			
		<u>Step 1: Create common basis</u> Returning to the walking theme, in which the pupil imagines taking a walk, write a melody in which the pupil is accompanied by a little bird. Demonstrate <i>legato</i> for smooth steps (the pupil's) and <i>staccato</i> (for the bird).	27		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Create a tune together. If it's in C position, assist the pupil in writing it herself. If not, write it for her. She will draw the <i>staccato</i> dots herself.			
		<u>Step 3: Present, record or publish.</u> Pupil can choose whether to record as before, or write neatly and paste into notebook.			

Potential problems: notation over broad pitch range.

Solution: notate for her.

Lesson 4					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 3-5	2		
2	Sight-reading	Paul Harris: Grade 1: p. 5, No. 6&7	2		
3	Aural	Identify a rhythmic change (dotted rhythm); listen for features in a short extract (piano, forte, legato, staccato)	2		
4	Scales	Recap C, G, D, F Majors (make sure fingering is correct)	3		
5	Pieces	JT: Rag-time Raggles: complete	2		
		JT: Funny Faces: to b. 12	4		
		JT: Old MacDonald: to end	3		
		MMP: My Black Cat: HS to end	5		
6	Theory	JT: mark p. 15 No. 2, then give homework: p.15 No. 3 (letter names in treble clef C-E, bar-lines).	2		
7	Composition	Goal: Repetition and variation, form			
		<u>Step 1: Create common basis</u> Play “Twinkle twinkle little star” on the piano and ask the pupil to identify beginning, middle, and end, as well as which sections are the same or different.	25		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Allow the pupil to engage in free play to create the first section of the piece. Then work together to create a section that is different, and end the piece with a repetition of the beginning. Give the new melody a name.			
		<u>Step 3: Present, record or publish.</u> Encourage the pupil to write the melody herself (staff notation or finger numbers) and record it using my cell phone. Save on my computer and share with the child’s parents via email.			

Potential problems: this melody will be longer, therefore it will take too long for her to write.
 Solution: Record on cell phone.

Lesson 5					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 5&6	2		
2	Sight-reading	Paul Harris: Grade 1: p. 5, No. 8&9	2		
3	Aural	Clapping duple time; echo singing	2		
4	Scales	Learn A Minor	5		
5	Pieces	JT: Funny Faces: to end	4		
		JT: Old MacDonald: complete	2		
		JT: Blow the Man Down: to b. 8	3		
		MMP: My Black Cat: HT to end	3		
6	Theory	JT: mark p. 15 No. 3, then give homework: p.15 No. 4 (letter names in bass clef C-A, bar-lines).	2		
7	Composition	Goal: Mood. Explore how mood and character can be created on the piano. This is phase 1 of 4, leading to a larger work than has previously been attempted.			
		<u>Step 1: Create common basis</u> Play Chopin's Mazurka in A minor (Op. 68, no. 2), questioning to elicit understanding of cheerful, sad, dreamy, etc.)	25		
		<u>Step 2: Generate and revise ideas. Write the music.</u> The pupil will choose a mood that she wants to convey. Work together to create a short melody in the right hand. Assist her to write it in staff notation.			
		<u>Step 3: Present, record or publish.</u> Record this first melody on my cell phone. Share it with her parents via email, and ask her to practise playing it at home.			

Potential problems: none, as this activity has been allocated ample time.

Lesson 6					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 5-7	2		
2	Sight-reading	Paul Harris: Grade 1: p. 6, No. 1&2	2		
3	Aural	Identify a melodic change; listen for features in a short extract (piano, forte, legato, staccato)	2		
4	Scales	Recap C, G, D, F Majors and A Minor	4		
5	Pieces	JT: Funny Faces: complete	2		
		JT: Blow the Man Down: to end	3		
		JT: The Church Organ: to end (add dynamics)	3		
		MMP: My Black Cat: complete	2		
6	Theory	JT: mark p. 15 No. 4, then give homework: p.15 No. 5 (letter names in bass clef C-A, bar-lines).	2		
7	Composition	Goal: Mood and form. Explore how mood and character can be created on the piano, and how different sections in one work can vary in mood. This is phase 2 of 4, leading to a larger work than has previously been attempted.			
		<u>Step 1: Create common basis</u> Revise last week's mood tune. Make sure that the pupil can play it.	28		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Work together to create a new section that is based on the first idea, but conveys a different character, through the introduction of black notes, playing it higher or lower, or using pedal. Try to avoid articulation as this parameter is used in the next lesson. Assist her to write it in staff notation.			
		<u>Step 3: Present, record or publish.</u> Record this second section on my cell phone. Share it with her parents via email, and ask her to practise playing both sections at home.			

Potential problems: none, as this activity has been allocated ample time.

Lesson 7					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 6-8	2		
2	Sight-reading	Paul Harris: Grade 1: p. 6, No. 1-3	2		
3	Aural	Clapping triple time; echo singing	2		
4	Scales	Recap C, G, D, F Majors and A Minor (make sure fingering is correct)	4		
5	Pieces	JT: Blow the Man Down: complete	2		
		JT: The Church Organ: complete	2		
		JT: Yankee Doodle: to end.	3		
		JT: Carry Me Back Home: to b. 4	3		
		PS: Start the Music: to b. 8.	4		
6	Theory	JT: mark p. 15 No. 5, then give homework: p.15 No. 6 (letter names in bass clef C-A, bar-lines).	2		
7	Composition	Goal: Mood, form, articulation. Explore how mood and character can be created on the piano, how different sections in one work can vary in mood, and how repetition of prior sections can restore the original mood. Explore how changes in articulation can affect the character. This is phase 3 of 4, leading to a larger work than has previously been attempted.			
		<u>Step 1: Create common basis</u> Revise the two previous mood melodies.	24		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Work together to create a new section (or two if possible) based on the earlier ideas. Try to explore a different character, as well as whether returning to the original idea works. Assist her to write the new idea/ideas in staff notation.			
		<u>Step 3: Present, record or publish.</u> Record the new section/sections on my cell phone. Share with her parents via email, and ask her to practise playing all sections at home, and to work out how these can be rearranged to make the whole piece fit together well.			

Potential problems: none, as this activity has been allocated ample time.

Lesson 8					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 7-9	2		
2	Sight-reading	Paul Harris: Grade 1: p. 7, No. 1&2	2		
3	Aural	Identify a rhythmic change; listen for features in a short extract (piano, forte, legato, staccato)	2		
4	Scales	Recap C, G, D, F Majors and A Minor (make sure fingering is correct and focus on evenness).	4		
5	Pieces	JT: Yankee Doodle: complete	2		
		JT: Carry Me Back Home: to b. 8	3		
		PS: Start the Music: to b. 12	3		
6	Theory	JT: mark p. 15 No. 6, then give homework: p.22 No. 1&2 (writing C and D).	2		
7	Composition	Goal: Mood, form, articulation. Explore how sections of a piece can be arranged to create a cohesive work. This is phase 4 of 4, leading to a larger work than has previously been attempted.			
		<u>Step 1: Create common basis</u> Play the pupil's ideas from the previous three lessons in order. Ask her to play them in the order she devised at home. If necessary, create a new section or linking passages. This is the final draft.	30		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Ask the pupil to give the piece a name and assist her in writing the entire work on manuscript paper. She will likely need to complete writing the work at home.			
		<u>Step 3: Present, record or publish.</u> Record the entire piece on my cell phone. Share with her parents via email, and ask her to paste the completed piece into her music book, along with the title, and possibly an illustration if she so wishes.			

Potential problems: none, as this activity has been allocated ample time.

Lesson 9					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 8-10	2		
2	Sight-reading	Paul Harris: Grade 1: p. 7, No. 3&4	2		
3	Aural	Clapping quadruple time; echo singing	2		
4	Scales	Recap C, G, D, F Majors and A Minor (make sure fingering is correct and focus on evenness).	4		
5	Pieces	JT: Carry Me Back Home: to b. 12	3		
		JT: Down a River: to b. 8.	3		
		PS: Start the Music: to end	4		
6	Theory	JT: mark p. 22 No. 1&2, then give homework: p.22 No. 3&4 (writing C and B).	2		
7	Composition	Goal: Harmony (primary triads)			
		<u>Step 1: Create common basis</u> Sing “Siyahamba” together. Make sure that the pupil can sing it reliably in C Major. She now knows C, F, and G, which are the primary triads in C Major. Show her how these notes can be turned into triads (in root position).	28		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Working together, sing and/or play the melody while she works out where each of the three triads works best. I might need to play the triads at first. Assist her in writing the letters C, F, and G above the printed words to create the lead sheet, as she finds appropriate.			
<u>Step 3: Present, record or publish.</u> Record the song on my cell phone and share with parents. Also ask her to paste the lead sheet into her music book.					

Potential problems: triads might be tricky for her to play.

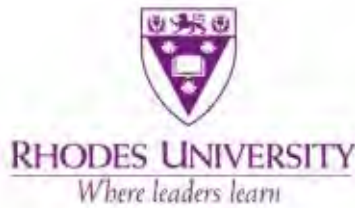
Solution: play them for her initially, but make sure that she is choosing which ones to use.

Lesson 10					
	Lesson element	Content	Time	Complete (✓ or x)	Comment
1	Technical Exercises	A Dozen a Day: Group I: 9-11	2		
2	Sight-reading	Paul Harris: Grade 1: p. 7, No. 5&6	2		
3	Aural	Identify a melodic change; listen for features in a short extract (piano, forte, legato, staccato)	2		
4	Scales	Recap C, G, D, F Majors and A Minor (make sure fingering is correct and focus on evenness). These scales must be well known before a new scale can be introduced next term.	4		
5	Pieces	JT: Carry Me Back Home: to end	3		
		JT: Down a River: to end	3		
		PS: Start the Music: complete	2		
6	Theory	JT: mark p. 22 No. 3&4, then give homework: p.22 No. 5 (writing letter names, time values and bar-lines).	2		
7	Composition	Goal: creating a tone poem			
		<u>Step 1: Create common basis</u> Show the pupil an underwater picture of a coral reef and play "The Aquarium" by Saint Saens. Ask her how music can be made to sound "watery" (quick rippling notes, pedal, soft dynamics)	30		
		<u>Step 2: Generate and revise ideas. Write the music.</u> Working together, create a short piece that sounds "watery". Any part of the piano may be used. Encourage use of dynamics and pedal. Emphasise the need to be able to play it the same way each time. It will need a title.			
		<u>Step 3: Present, record or publish.</u> Using the mobile app "Piano2Notes", record the piece and use the software to generate the score. Print this out and ask the pupil to paste it into her music book. The pupil can draw and colour a picture to accompany her piece at home.			

Potential problems: complete freedom might generate many different versions.

Solution: emphasise that she must stick to patterns and play them the same way each time.

Appendix B. Letter from Rhodes University, granting ethical clearance



Rhodes University Human Research Ethics Committee

PO Box 94, Makhanda, 6140, South Africa

t: +27 (0) 46 603 7727

f: +27 (0) 46 603 8822

e: ethics-committee@ru.ac.za

NHREC Registration number: RC-241114-045

<https://www.ru.ac.za/researchgateway/ethics/>

9 May 2022

Donovan Wynne

Email: g00w0553@campus.ru.ac.za

Review Reference: 2022-5247-6721

Dear Donovan Wynne

Title: Productive piano pedagogy: towards a compositional approach to piano lessons in a South African primary school in Makhanda, Eastern Cape.

Researcher: Mr Donovan Wynne

Supervisors: Dr Boudina McConnachie

This letter confirms that the above research proposal has been reviewed and **APPROVED** by the Rhodes University Human Research Ethics Committee (RU-HREC). Your Approval number is: 2022-5247-6721

Approval has been granted for 1 year. An annual progress report will be required in order to renew approval for an additional period. You will receive an email notifying you when the annual report is due.

Please ensure that the ethical standards committee is notified should any substantive change(s) be made, for whatever reason, during the research process. This includes changes in investigators. Please also ensure that a brief report is submitted to the ethics committee on the completion of the research. The purpose of this report is to indicate whether the research was conducted successfully, if any aspects could not be completed, or if any problems arose that the ethical standards committee should be aware of. If a thesis or dissertation arising from this research is submitted to the library's electronic theses and dissertations (ETD) repository, please notify the committee of the date of submission and/or any reference or cataloguing number allocated.

Sincerely,



Prof Arthur Webb

Chair: Rhodes University Human Research Ethics Committee, RU-HREC

cc: Ms Danielle de Vos - Ethics Coordinator

Appendix C. Permission letter from the school principal

Mr. D Wynne
Rhodes University
Drostdy Road,
Grahamstown,
6139

Dear Mr Wynne

Re: request to conduct research at [REDACTED] under the title: Productive piano pedagogy: towards a compositional approach to piano lessons in a South African primary school in Makhanda, Eastern Cape.

I hereby grant permission for you to use our facilities and conduct your research at [REDACTED] on condition that the study is conducted in private piano lessons, does not affect the teaching and learning taking place in the classroom, and that the appropriate permissions have been obtained from the participants' parents. These piano lessons are offered as an extra-curricular activity, for which parents pay music fees, and are therefore not related to the teaching or assessment of the national curriculum.

Yours sincerely

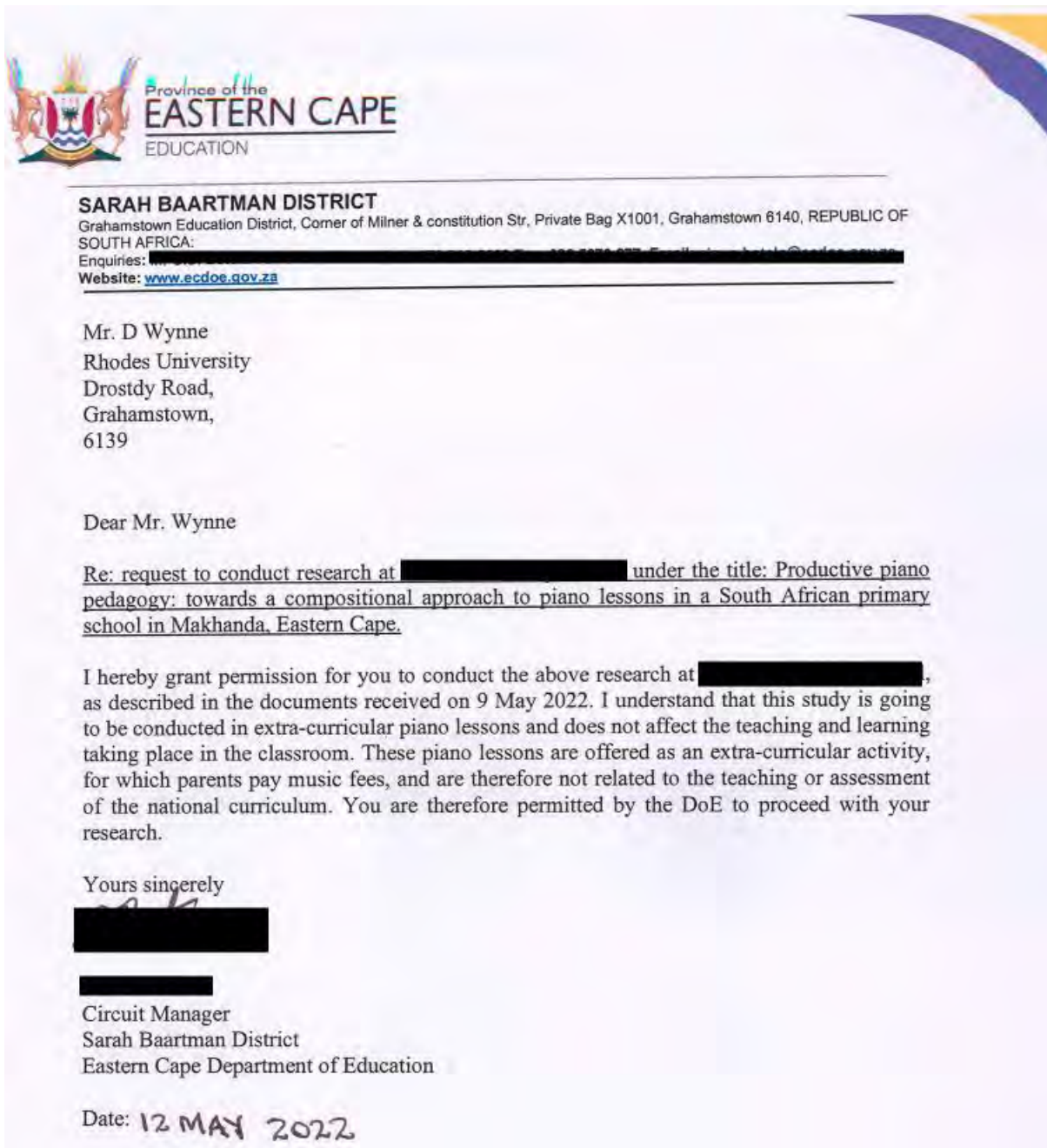
[REDACTED]

[REDACTED]

Principal

Date: 2022-05-13

Appendix D. Permission letter from the Eastern Cape Department of Education



Appendix E. Summary of pre-intervention interview responses: iteration 1

	Question	Gloria	Jane	Maggie	Saira	Tammy
1	Think of the music you hear at home. Can you tell me a bit about it?	It's fun. I like beats and rhythm.	Music on TV, Dad's classical music, Mom's mixed CDs.	Mom sometimes plays piano. Otherwise music that plays at home (TV/radio)	Hip-hop, feel-good music, I also listen to opera.	Music on TV, pop music in the car, violin and piano music as well.
2	What kind of music do you like best?	Rhythm music.	I don't know.	I like all kinds of music.	Music I can sing to.	Violin music.
3	Do you have a favourite song?	I like all the songs.	No.	Possibly "Cheerleader".	Come Out Now.	Old town road.
4	Do you have a piano at home? Or a keyboard?	Keyboard.	Keyboard.	Keyboard.	Keyboard	Keyboard.
5	Does anyone else in your family play a musical instrument?	Sister used to play violin.	No.	Mom plays flute and piano (or used to).	No	Granddad played the guitar.
6	Why did you start learning to play the piano?	Because I like music.	I just wanted to and Mom signed me up.	Mom signed me up, because she wishes she had continued.	My mom wants me to play the beat of her favourite song.	I heard good songs and the piano can play anything.
7	Do you like playing the piano? Can you tell me why?	Yes. I like the notes.	Yes. I don't know, I just love it.	Yes. It can make lots of different sounds.	Yes. I like the way it sounds and I like the challenge.	I love it. Because I'm better at it than before I started lessons.
8	Think of the piano pieces you play in your lessons. Do you have any favourites? What do you like about them?	Solid Rock. Rhythm and chords.	Springtime, because of the pedal.	The Chimes (because of the harmony), and My Black Cat (it's easy and soft)	Princess Waltz. I like the sound and it's challenging.	Black Cat because of the harmony. Lazy Mary because it reminds me of my Granddad and I like to sleep.
9	Are you good at playing the piano?	(Interviewer omitted this question)	Yes.	Yes.	I don't know.	Yes.
10	What other instruments do you like the sound of?	Xylophone, guitar, violin.	Recorder, guitar.	Flute and xylophone	Ukelele, guitar.	xylophone, violin.
11	How long do you think you would like to keep learning to play the piano?	Until Gr. 8	Forever.	Until university	Until I master it.	Until I'm out of school.
12	Have you ever made up a song of your own? Or made up a tune?	No.	No.	Unclear.	Yes, but I can't remember it.	Yes.

Appendix F. Summary of pre-intervention interview responses: iteration 3

	Question	Alex	Emma	Khanya	Neela
1.	Think of the music you hear at home. Can you tell me a bit about it?	Not much music at home, sometimes pop instrumental (no lyrics), Ed Sheeran, Taylor Swift	Loud. Radio.	Soft and slow. Phone	Ethiopian music on TV
2.	What kind of music do you like best?	Upbeat music	Pop	Classical	Pop
3.	Do you have a favourite song?	Fancy Like	Flowers by Miley Cyrus	No	Stick together
4.	Do you have a piano at home, or a keyboard?	Piano	Keyboard	Neither	Keyboard
5.	Does anyone else in your family play a musical instrument?	No. But Mom used to play piano	No	I don't think so	No
6.	Why did you start learning to play the piano?	I wanted to play the classical pieces I used to hear Mom play	I liked playing on the piano at my old preschool	I was interested	I like music, wanted to learn to play the keyboard since my dad bought it
7.	Do you like playing the piano? Can you tell me why?	Yes. I don't know	Yes. It's relaxing	Yes. It's very nice	Yes. I like to hear myself, and to progress
8.	Think of the pieces you play in your lessons. Do you have any favourites?	Hansel and Gretel. Spanish guitar.	All of them	No	Start the music
9.	What do you like about them?	Hansel: it's fast, different and challenging. Spanish guitar: it reminds me of Rome and gladiators.	They're calm	No	It has lyrics
10.	Are you good at playing the piano?	I think so	Yes	Yes	I think so
11.	What other instruments do you like the sound of?	Guitar and violin	Guitar and violin	Violin	Guitar and violin
12.	How long do you think you would like to keep learning to play the piano?	Forever	Always	I don't know	Until next year
13.	Have you ever made up a song of your own? Or made up a tune?	Yes, during lockdown, made up short songs about my dogs.	No	No	Yes.

Appendix G. Gloria: summary of enactment, iteration 1

Lesson 1: Activity 1- write a tune about ice cream (17 August 2022)

To satisfy step 1 of Hogenes' model, creating a common basis, the ice cream theme was introduced as a stimulus. However, Gloria immediately rejected this idea and decided that she wanted to write about fire instead. Once she had written her words in her manuscript book, she seemed to struggle to assign notes to them. To facilitate this process, I helped her to count the syllables in each word and encouraged her to assign a finger number to each one, each number representing a note in the right hand in Middle C position. This seemed to solve the problem and she required very little assistance thereafter. Although the task was to create a melody for the right hand, Gloria decided to include left-hand notes as well, which created a notation problem: since only finger numbers were being used to record the notes, each number from two to five could potentially represent two different pitches. Gloria autonomously identified the problem and then solved it by writing "L" to indicate the notes that should be played by the left hand. She managed to complete the task during the lesson, but there was insufficient time to make a recording, as stipulated in the lesson schedule.

Lesson 2: Activity 2 - write a walking tune in crotchets with minims in the left hand (24 August 2022)

The composing portion of the lesson began with Gloria playing a new tune that she had invented at home, which I did not prevent (despite being conscious of time constraints) because I felt that it was important to encourage this interest in creative work. We started the activity by walking around the room, and then returning to our seats and tapping our knees. I suggested that she create a walking tune of 16 notes, four at a time, and that she writes them herself, in staff notation. She seemed a little sceptical regarding her ability to notate, but I knew that she was capable, so I encouraged her to refer to her theory and *John Thompson* books for reference. This was successful but time-consuming, so I reduced the required length of the melody to eight notes. I also decided that the left-hand notes should be semibreves, not minims as stipulated in the lesson schedule, in order to save time. There were two aspects of Gloria's interaction that were particularly interesting. The first related to her unprompted revision of the completed right-hand melody while adding left-hand notes, in which she was satisfying Hogenes' second step on her own volition. The second was that I noticed that she seemed to be writing notes to organise them, in other words, she was using notation to conceptually manipulate the notes, not merely to record them.

Lesson 3: Activity 3 - write a tune and add staccato (31 August 2022)

As before, Gloria wished to play a tune that she had previously composed, which she was permitted to do, and I noticed that she had practised a great deal since her last lesson. After walking around the room, and spotting the figurine of the bird, we returned to our seats and started working on a new walking tune. She seemed to be losing track of the notes she had tried during the initial free play part of the process, so I suggested that she settle on the first few and write them down before moving on. This seemed to help and she became more enthusiastic, quickly finishing her tune. I observed that although she was comfortable writing notes in Middle C position, her ability to notate these pitches might be limiting her scope to this position, a restriction that might have been avoided if I had been notating.

Lesson 4: Activity 4 - explore form and create a tune with a beginning, middle, and end (14 September 2022)

Gloria had missed last week's lesson because it had coincided with the school's Interhouse Athletics day. After identifying the ternary structure of the song *Twinkle Twinkle Little Star*, Gloria quickly settled on patterns of Cs that alternated in pitch. However, she was as yet only able to write Middle C, so I assisted as she wrote the first bar, and thereafter suggested that we write an instruction to repeat Cs in a descending pattern. This staff/text hybrid notation seemed sufficient to record her work. I observed that one lesson would not allow her sufficient time to complete this activity, so it was carried over to the next lesson.

Lesson 5: Activity 4 – continued (21 September 2022)

The composition portion of the lesson was shortened because Gloria had arrived late, due to her having to return to class after choir practice to collect her music books. After revising last week's Cs, she quickly decided that she wanted to play Ds in a similar pattern. I observed that playing these melodic intervals (octaves) is an implicit rule that she had set for herself. She initially wanted to use Bs but found these difficult to locate, so she switched to Ds, thereby satisfying her own rule while creating this middle section of her piece. I surmised that, although these octaves do not really constitute a melody, they were nevertheless useful to her musical learning in terms of developing her familiarity with the geography of the piano. As before, a staff/text hybrid notation was used, and this time I wrote the notes for her due to time limitations.

Lesson 6: Activity 4 – continued (28 September 2022)

While exploring notes to make her ending, Gloria suddenly had a moment of inspiration in which she invented a new idea based on repeated harmonic intervals, quite different from the two preceding sections of her piece. However, she repeated this idea in different octaves, thereby satisfying her own rule. I noticed that she was becoming more accustomed to finding pitches in different octaves and she was starting to use both hands to navigate these leaps. This was significant because she was dealing with octave-playing, a technical skill that was meant to be introduced many months later in her *A Dozen a Day* book.

Lesson 7: Activity 5 - create a piece that expresses different moods (12 October 2022)

I played sections of Chopin's *Mazurka* (Op. 68, No. 2) on the piano to demonstrate how a single piece of music can express different moods. Gloria decided that her mood would be Waiting for Something Mysterious to Happen, which we shortened to Anticipation. She seemed to have difficulty inventing a motif, so I intervened by asking some guiding questions regarding her intended pitch range and articulation, and initially restricting her to only three notes. She then made decisions easily and came up with an idea that was rather tonally ambiguous, because it included the closely related F sharp major and D sharp minor triads. Gloria chose to use notes that she had not yet seen or played and were therefore beyond her ability to notate, so I wrote them for her.

Lesson 8: Activity 5 – continued (19 October 2022)

After revising last week's mood, Anticipation, we started working on a new section that Gloria wanted to sound Happy. During exploratory free play, she produced several sequences in which there were too many notes for her to remember. I suggested that she start by choosing just a few, to create a short pattern that was easier to recall. This approach proved useful, as it had in the previous lesson, and she soon completed the Happy section. At the end of the lesson, she expressed a desire to change the Anticipation section from the previous week, but there was insufficient time to make these alterations.

Lesson 9: Activity 5 – continued (26 October 2022)

Gloria still wished to change the first section of the piece because she was not able to find the notes that I had notated for her on the piano. She decided to change the first mood from Anticipation to Sad, and this time chose to use the notes around Middle C. This indicated to me that she was beginning to understand the value of notation, which was confirmed when she checked my notation and pointed out that I had omitted a C from the pattern. After completing the new section, she decided to end the piece with a repetition of the middle, Happy section, with an additional right-hand doubling of the notes one octave higher, a section that she called Happier.

Lesson 10: Activity 7 - create a tone poem (9 November 2022)

Gloria missed last week's lesson because her class had attended another school's stage production on that day. She had therefore missed two piano lessons due to school-related events and this, coupled with the fact that the fourth activity had required an additional two lessons to complete, prompted me to abandon the sixth activity (the lead sheet task) and proceed to the final activity in the lesson schedule. This decision was guided by my desire to create a balance between free and structured tasks. Much of Gloria's work had thus far been confined within structural parameters and had been oriented toward notation. I therefore chose to conclude the lesson schedule with the seventh activity, which imposed no restrictions, and in which no need for manual notation was anticipated. I introduced the Watery theme by playing a YouTube video of *The Aquarium* by Saint-Saëns, and by showing her pictures of coral reefs on my computer, obtained via a Google search. After discussing the music and the possible reasons that it sounded watery, Gloria was encouraged to explore the piano to try to emulate this effect. She produced several versions of a tone poem that sounded quite similar to each other, and once she had settled on one, it was recorded using my cell phone. This recording was sent to her mother after the lesson had ended. I chose not to use the Piano2Notes mobile app because my own experiments with this software had not yielded notations that were sufficiently faithful to the music it was meant to represent. I observed that she seemed to enjoy the freedom inherent in this activity that made no structural or notational demands.

Appendix H. Jane: summary of enactment, iteration 1

Lesson 1: Activity 1 - write a tune about ice cream (15 August 2022)

The lesson started 14 minutes late because Jane had forgotten to come to her lesson, and I had had to fetch her from her classroom. After explaining the task and writing down her words about ice cream in her manuscript book, I asked her to experiment with right-hand notes in Middle C position to start making a tune. This free play generated a pattern that she promptly refined on her own and I was struck by the manner in which she transitioned from free play to structured play without assistance. She notated her melody by writing finger numbers above the words and although I had planned to record the tune, there was insufficient time due to our delayed start.

Lesson 2: Activity 2 - write a walking tune in crotchets with minims in the left hand (22 August 2022)

Jane recalled a particularly long mountain walk she had taken with her family while on holiday and she seemed to enjoy recounting the details of that experience. I therefore decided to introduce this activity in a manner other than that described in the lesson schedule. Instead of walking around the room to establish a walking beat in crotchets, we started by writing down words that described her remembered walk. I anticipated that we would be able to add a left-hand part, in minims, once the walking tune (in crotchets) had been completed. After I had written the words, Jane appeared eager to start setting notes to the syllables and she created the tune systematically, by testing notes on the piano and writing down finger numbers to indicate the notes she had chosen. This tune was much longer than I had initially planned, so it required all the available time to complete. We were unable to add a slower left-hand part in this lesson, so this would be carried over to the next lesson. There were two unanticipated teaching moments that occurred. The first emerged from the rhythm of the words, which indicated natural pauses. I pointed these out and showed her how crotchet rests could be drawn to notate them, which is far in advance of when she would ordinarily have learnt to draw crotchet rests in her theory book. The second teaching moment occurred at the end of the lesson, while we were reflecting on the tune, in which I drew her attention to the melodic repetition and the sighing motif (descending minor third) that were evident in her melody.

Lesson 3: Activity 2 – continued (29 August 2022)

I had planned to complete the walking tune in this lesson, in which Jane was to write a second part for the left hand, in minims. I asked her to write her melody in staff notation in her manuscript book and assisted her in this task, frequently referring to her *John Thompson* and theory books. This was a slow process, so to save time I suggested that she notate only the first phrase. I then showed her how right-hand crotchets and left-hand minims could be tapped, after which she started adding left-hand minims to her melody. This required a significant amount of time because she struggled to coordinate her hands in this 2:1 ratio. By the end of the lesson, she had added minims to this first phrase, and I decided that the remainder of the melody would have to be notated and harmonised in the following lesson. Although this would mean changing the design of the lesson schedule again, I did not want to leave it unfinished. I wanted her to feel a sense of accomplishment when the piece was eventually finished, and I wanted her to know that her work was important.

Lesson 4: Activity 2 – continued (12 September 2022)

Jane missed her lesson last week because she was absent from school, and she needed to be fetched again for this lesson, so we started late. I was therefore very conscious of time and offered to notate her walking tune for her, to which she agreed. This helped to speed the process and, being unencumbered by the difficulty of writing the notes, she could focus on exploring the sounds of the harmonic intervals produced by adding left-hand minims. I observed that Jane seemed to enjoy this process and she was fully engaged in testing the intervals. She completed the activity today and appeared to be excited when I asked her if I could play her piece, which she titled *Hogsback*.

Lesson 5: Activity 3 - write a tune and add *staccato* (19 September 2022)

I introduced the walking theme and while we were walking around the room, I pointed out the figurine of the little bird to introduce the *staccato* element that she would later add to her tune. When asked whether she liked using words as a starting point she indicated that she did not, which I found interesting because this strategy had been useful in previous lessons. Jane chose to use pitches at the extremes of the piano, which she would not have been able to notate, so I wrote the notes for her. She used the lowest notes of the piano for the *legato* tune, and the highest notes for the bird's melody, to which she added the *staccato* dots. I observed that her use of extremely low and high pitches allowed her to explore these regions of the piano, and my eliciting the letter names of these notes for notation purposes was good practice in moving forward and backward through the alphabet.

Lesson 6: Activity 4: - explore form and create a tune with a beginning, middle, and end (26 September 2022)

I used *Twinkle Twinkle Little Star* to elicit ternary form, before inviting her to explore the piano to find the site of the beginning, the creation of which was the task for this lesson. After playing every key, she chose to use pitches

at the upper end of the piano and produced a series of notes that was too long for her to remember. I suggested that she try to shorten it, which she managed well, and which I wrote in her manuscript book. I observed that while I was notating her tune, Jane decided to work on a new pattern independently, for the middle section of her piece, which included black notes. I also noticed that she seemed to particularly enjoy this activity.

Lesson 7: Activity 4 – continued (17 October 2022)

After revising the beginning that Jane had created in the previous lesson, I suggested that she try to invent a middle section. She immediately played the figure she had played the previous week, containing black notes, which she said that her little sister had taught her at home. She seemed to like this motif, and the fact that she could easily recall these notes suggested that she had played the pattern quite often. Jane chose to play this pattern in two different registers, with a rhythmic variation the second time, which I notated.

Lesson 8: Activity 4 – continued (24 October 2022)

Jane chose to create a new motif for the ending of her piece. The preceding lesson components had taken longer than anticipated, particularly sight-reading, so we did not have much time to complete this task. I therefore decided to save revision time by playing the beginning and the middle for her, particularly because the notation would have been beyond her ability to read. She chose to make a new motif for the ending, which was initially set in the lower region of the piano, although when reflecting on her work she later reconsidered the register and decided that it should be moved higher. I was also able to point out that although she had used different notes for this ending, the rhythm was the same as the beginning she had created two weeks prior.

Lesson 9: Activity 5 - create a piece that expresses different moods (31 October 2022)

I played two differing sections from Chopin's *Mazurka* (Op. 68, No. 2) and Jane correctly identified their moods as sad and happy. She chose to create a happy beginning for her own piece and easily came up with a motif with very little assistance. Once again, I decided to notate her melody to save time, after which I played what had been written and asked her to confirm that the notation was accurate. It was at this point that Jane decided to include articulation, in the form of *staccato*, which she added herself. This exchange showed me that when I played the melody, Jane was able to listen to and reflect upon her own work, which caused her to make this revision in the form of added articulation to ensure that it sounded as intended.

Lesson 10: Activity 5 – continued (7 November 2022)

Because this was the final lesson of the intervention, I decided that Jane should add a second section to her mood piece and that this would be its conclusion. Our lesson time was reduced due to the school assembly, which followed Jane's lesson, being scheduled earlier than usual. In order to save time, I played Jane's work from the previous lesson to avoid a prolonged recap, which seemed reasonable considering that the melody consisted of dotted rhythms and notes more than an octave above Middle C, both of which were beyond her reading ability. She chose to express Angry in this section and immediately started using the piano's lowest notes. The new pattern emerged quickly and I once again notated it for her. I speculated that one possible explanation for the speed with which the pattern evolved might be that Jane seemed to be adopting an evaluative stance in her creative process, and that she independently ascertained that her sequence of notes was too long to be cohesive. Jane's observation, about the pattern being too long, was reminiscent of advice I had given her and other participants during the course of the intervention, in which I had suggested that very long patterns might be shortened to make them easier to remember. Because Jane's Angry melody took shape quickly, there was enough time at the end of the lesson to make a recording of it, which I sent to her mother shortly after.

Appendix I. Maggie: summary of enactment, iteration 1

Lesson 1: Activity 1 - write a tune about ice cream (3 August 2022)

Maggie arrived 10 minutes late for her lesson, which made me very conscious of the composing time we would have available at the end of her lesson. She eagerly contributed to our discussion about ice cream, and although she did not seem interested in using the words as a starting point, they were nevertheless helpful as a framework of syllables to which notes could be assigned. She seemed to enjoy experimenting with the right-hand pitches in Middle C position, although I noticed that her understanding of the relationships between notes and fingers was tenuous, which was further exacerbated by limited finger independence. I assumed at this point that she would limit her choice of pitches to those whose execution would be most comfortable, for example, C, D, and E. However, this was not the case, and she chose to also use F and G (requiring the use of the fourth and fifth fingers), which she found particularly challenging. I surmised that this uninhibited exploration of Middle C position, in which she tested various configurations of these notes, might constitute valuable practice in this position and eventually lead to a better understanding of the finger/note relationships, as well as an improvement in finger independence. Maggie's limited finger dexterity prolonged the process of settling on a pattern and I often needed to point out that the pattern had changed, and that she should repeat it until she could reproduce it. She notated the tune herself by writing finger numbers above the words she had chosen, after which I offered to record her work. She declined and indicated that she would prefer to play the tune for her mother herself.

Lesson 2: Activity 2 - write a walking tune in crotchets with minims in the left hand (10 August 2022)

Knowing that Maggie's limited finger dexterity prolonged her creative process, I decided not to spend time walking around the room to introduce this lesson. Instead, I asked her to recall a walk she had recently taken and encouraged her to tap a walking pulse on her knee. She wanted to use words today, which I thought was favourable because they had proven useful in the previous activity. I noted that the procedure of assigning notes to syllables was easier in this lesson, probably because it was familiar. However, she struggled to remember the notes she had tried, so she decided to write them down, in the form of finger numbers, as she progressed. By the end of the lesson, she had produced a melody for the right hand, although we had not yet been able to start adding left-hand minims, so this task would have to be completed in the following lesson.

Lesson 3: Activity 2 – continued (17 August 2022)

We started by revising last week's walking tune. I then suggested that she convert her finger numbers into notes on the staff, which she managed with assistance. Although I intended for her to use minims to add a second part for the left hand, she chose to use semibreves, which worked out quite well as using these longer notes saved time, while still allowing her to explore the harmonies created by adding a second part. Maggie was concerned about the correct placement of her bar-lines and although I explained that they were not required at this stage, she was determined to draw them.

Lesson 4: Activity 3 - write a tune and add *staccato* (24 August 2022)

The lesson started a few minutes late because Maggie took a long time to make her way from the classroom to the music department. I decided to introduce this activity by walking around the room to help Maggie understand the regularity of crotchet beats through an embodied sense of this pulse. I then pointed out the figurine of the bird to introduce the *staccato* element. I asked her to choose eight notes to create a walking pattern and it was in this initial free play that she started getting confused because she could not recall the notes she had already tried. I suggested that she select only four notes to begin the tune and then add to them, which seemed to help her transition to structured play. This allowed her pattern to emerge, to which she added the *staccato* dots to those notes that represented the little bird. By the end of the lesson, she had completed the activity, but we did not have enough time to rehearse and record the melody, so I suggested that she play it for her mother at home.

Lesson 5: Activity 4 - explore form and create a tune with a beginning, middle, and end (31 August 2022)

The lesson started late again and I noted that this was a recurring trend that limited available composing time. I started by explaining that stories have a beginning, middle, and end, and that the song *Twinkle Twinkle Little Star* has the same structure. Maggie understood this and chose to set the beginning section of her tune in a high register. When asked whether she wanted to use words she said that they confused her, which was unexpected because she had found them useful in the second lesson. I once again observed that she easily forgot the notes she had played and therefore struggled to settle on a pattern that she found pleasing. However, she solved this problem by autonomously adopting the strategy that I had suggested in the previous lesson, in which she selected the first few notes and wrote them down. Maggie then proceeded to select and notate notes incrementally, using finger numbers, through which she recorded the pitches and manipulated their order symbolically.

Lesson 6: Activity 4 – continued (14 September 2022)

Maggie did not have her lesson last week due to the school's Interhouse Athletics day. I had therefore not seen her for two weeks and the work that she had done (creating a beginning) was not familiar. This meant that we had to devote some of the lesson time to revising the beginning, after which Maggie started working on a middle section. She seemed to enjoy the free play and then used the same strategy as before to form a pattern. She wrote finger numbers to keep track of the notes she liked and then systematically tested and added new notes one at a time. She completed the middle section in this lesson, so we would be able to work on the ending in her next lesson.

Lesson 7: Activity 4 – continued (21 September 2022)

After revising the beginning and middle, which took time, Maggie tried out various ways to end her piece. She chose to use low notes and included a black note, B flat, which she had recently encountered when learning the F major scale. I observed that although this activity required three lessons to complete, as opposed to the single lesson allocated in the lesson schedule, Maggie had successfully engaged in form as a musical element and that she had explored high and low notes, and even used black notes for the first time. Her efforts resulted in one line of music, which I notated for her in staff notation. I observed that the revision of prior work resulted in reduced composing time and I suspected that this might be ameliorated by treating the composition as another one of her pieces, which require practice at home.

Lesson 8: Activity 5 - create a piece that expresses different moods (12 October 2022)

Maggie missed last week's lesson because she was absent from school, and she was late once again this week. After playing her the different sections of the Chopin *Mazurka* (Op. 68, No. 2) to elicit moods, I encouraged her to think of a mood that she would like to express. She chose Excited and decided to use high notes, although she struggled to invent a pattern because her free play produced long strings of notes that she could not remember. I suggested that she try making short patterns instead and this parameter proved useful. I decided to write the notes for her to save time, an approach that was necessary due to our delayed start.

Lesson 9: Activity 5 – continued (19 October 2022)

Revising the previous section was once again time consuming, although Maggie successfully created a new section, in which she expressed a new emotion, Bored, which she chose because that was the emotion she had been feeling before coming to her piano lesson. While exploring the notes during free play, Maggie limited herself to short patterns, which allowed her to develop and refine an idea. I wrote the notes for her, which saved time and allowed her to focus on her pattern.

Lesson 10: Activity 5 – continued (26 October 2022)

Maggie arrived late again and I became concerned that she might not complete this activity in this lesson, which was the last one available to us. This lack of time was exacerbated by the length of time devoted to the introduction of her new theory workbook earlier in the lesson. While recapping the first two moods, she expressed a desire to play the melodies herself, although this proved too time consuming, so I intervened and played them for her. She chose Scared as her third and final mood, and once again used black notes in her motif. She seemed to have a great deal of difficulty remembering her phrase, so I encouraged her to play it several times. This repetition helped her to remember the pattern, allowing her to make decisions about note duration. I notated for her again, which afforded us enough time to complete the activity, but we were unable to make a recording of the whole piece.

Appendix J. Saira: summary of enactment, iteration 1

Lesson 1: Activity 1 - write a tune about ice cream (23 August 2022)

Saira did not want to write words about ice cream and initially wanted to write about pickles, but then changed her mind and decided to write about her grandmother. She seemed to enjoy the free play portion of the activity, but seemed a bit apprehensive about making definitive decisions that would concretise the notes. I encouraged her to count the syllables in her words and assign one note to each, which appeared to alleviate this apprehension and she soon settled into the process and completed the activity without difficulty. Despite the fact that this was a structured task, Saira initially struggled to settle on notes because there were multiple options available and she seemed to be trying to conceive of the entire melody before committing it to notation. I observed that my role involved guiding her through questioning, specifically about where she wanted the melody to end, and encouraging her to work on small sections, systematically writing finger numbers for notes as they were selected.

Lesson 2: Activity 2 - write a walking tune in crotchets with minims in the left hand (6 September 2022)

Saira had been absent from school the previous week, so she had missed that lesson. After introducing the walking theme for this task, I asked her whether she had found words helpful in the previous activity. She said that she had, so I encouraged her to picture herself walking in an imaginary place. She decided to walk in a magical garden and quickly invented a few lines of text to describe it. I reminded her of the approach she had used in the previous activity, of counting syllables and assigning notes to them, which she readily adopted, although this time she chose to begin at the end, not the beginning. I observed that at one point, she noticed the similarity between two of the phrases she had created. By the end of the lesson, she had created a melody for the right hand, but there was not enough time to start adding left-hand minims, so the design had to change to allow this part of the task to be carried over to the following lesson.

Lesson 3: Activity 2 – continued (13 September 2022)

When deciding which left-hand notes to combine with the right-hand melody, Saira methodically tested each pitch and selected her notes through a process of elimination. I initially offered to notate for her, which she liked, although she gradually became involved in writing certain details and eventually took over the notational role. She seemed particularly concerned with the accuracy of her notation and wanted to ensure that the time signature and bar-lines were correctly drawn. I observed that Saira was fully engaged in this activity and that she seemed to be enjoying the task.

Lesson 4: Activity 3 - write a tune and add *staccato* (20 September 2022)

After using the figurine of the little bird to elicit *legato* and *staccato*, I asked Saira to create a pattern of notes that would serve as her walking tune. She experimented briefly and invented two phrases in Middle C position that I notated for her, to which she then added the *staccato* dots. When playing through the tune, she inserted a pause between the phrases, a fact that I pointed out and which allowed me to consolidate the crotchet rest. Saira did not seem to struggle with this task and she completed it very quickly, possibly because she was now accustomed to inventing note patterns. Furthermore, both phrases had been conceived as short phrases and she therefore did not struggle to recall them. Another possibility was that I was notating for her, but this seemed unlikely because notation was not something that troubled her, so it would not have caused her any difficulty in completing this task, particularly since the melody had been written in the familiar Middle C position.

Lesson 5: Activity 4 - explore form and create a tune with a beginning, middle, and end (27 September 2022)

In order to create a common basis, I used the analogy of a story to elicit a structure that had a beginning, middle, and end. I then used the song *Twinkle Twinkle Little Star* to show how this structure could be musically applied. Saira chose to use high notes for her beginning, and her free play was quick and productive. I suspect that this was partly due to her setting herself a rule at the outset, dictating that she may not explore notes lower than Middle C. However, she autonomously imposed another parameter, in which her music needed to conform to a rhythmic ostinato similar to that of a piece she had started learning earlier in the lesson in her *John Thompson* book. Saira seemed to enjoy working within the boundaries of these parameters that imposed restrictions in terms of pitch and rhythm. This activity was too long to be completed in one lesson, so it had to be carried over to be completed in subsequent lessons.

Lesson 6: Activity 4 – continued (11 October 2022)

After revising the beginning that Saira had created in her previous lesson, she started working on the middle section of her piece. She decided to continue using the rhythmic ostinato she had used for the beginning and systematically tested and selected right-hand notes through the same process of elimination that she had used when completing the second activity. I observed that Saira did not require my input as a collaborative partner in

this lesson because she was comfortable with her process and my role was therefore a supportive one in which I notated the music, guided the process through questioning, or affirmed her note choices. Saira reflected on her work at the end of the lesson and changed certain notes, essentially making minor revisions to her composition. She also noticed that the time signature was missing and wanted to add one, demonstrating the same concern for notational accuracy that I had observed in the third lesson.

Lesson 7: Activity 4 – continued (25 October 2022)

Saira missed the lesson that was scheduled for the previous week because she had been absent from school, which resulted in a protracted recap of the beginning and middle sections written thus far. Once she had familiarised herself with the piece, she decided that the rhythmic figure she had used in the left hand should be transferred to the right hand for the ending. While deciding which notes to use for this section, I noticed that she had some difficulty remembering exactly which pitches she had tried. I suggested multiple repetitions of the phrase to help her remember it, which proved beneficial, and she was able to complete the task.

Lesson 8: Activity 5 - create a piece that expresses different moods (1 November 2022)

The lesson started 12 minutes late because my choir rehearsal, which preceded the lesson, had run overtime. As with the other participants, I played portions of Chopin's *Mazurka* (Op. 68, No. 2) to elicit the different moods that were expressed in this music. However, Saira had recently had an exciting holiday abroad and I wanted to find a way to include her own experiences in her work, so I changed the design of the lesson and encouraged her to create a piece that expressed the mood she felt when she thought about the trip. She responded positively to this suggestion and immediately started creating a mind map of the things she experienced on her holiday. By the end of the lesson, she had selected five items from her mind map to use in making a new piece of music, so I asked her to write a few short lines about these things for homework, which we could use to start making the piece in the next lesson.

Lesson 9: Activity 5 – continued (8 November 2022)

Saira had completed her text at home and was eager to get started on the melody, which she wanted to set an octave above Middle C. She said that she chose this part of the piano because it sounded Excited, which was her chosen mood for this activity. Although the design of this task required two or more moods to be expressed, I decided that Saira should only work on one because she was highly motivated to work with this particular emotional prompt. While writing her melody, she decided to include articulation in the form of *staccato* notes, which she said she had noticed in the piano playing of the teacher in her general music class. She had been able to identify this articulation in that teacher's playing because she had previously learnt about it in her piano lessons with me, but she had applied this knowledge to another musical experience. Saira then spent some time choosing notes that would sound more excited when played *staccato*, and although this was not the crux of the activity, I felt it was important to allow her to use this element in her melody. I observed that Saira was highly motivated to compose and that this activity was meaningful to her, possibly because I had followed her lead and allowed her to engage with the task in her own way. She chose to call her piece *Excitement*, because that is what she felt when she thought of her holiday with her family.

Lesson 10: Activity 7 - create a tone poem (16 November 2022)

Saira had once again missed the previous week's lesson because she was absent from school. This was the final lesson in the enactment of the intervention and, as had been the case with Gloria, I chose to omit the lead sheet activity in favour of the tone poem because it was an unstructured task. After listening to *The Aquarium* by Saint-Saëns and examining pictures of coral reefs, I encouraged Saira to freely explore the piano and to create a piece that sounded equally watery. She was initially apprehensive about the lack of restrictions, possibly feeling overwhelmed by the potentially limitless possibilities inherent in this unstructured task, so she started imposing some limitations of her own. She decided that the music should be composed of patterns created using only six pitches (three white notes and three black notes), and that it should be set at the upper end of the piano. These parameters seemed to set her at ease and she soon had a short piece that she liked, which I recorded using my cell phone.

Appendix K. Tammy: summary of enactment, iteration 1

Lesson 1: Activity 1 - write a tune about ice cream (11 August 2022)

I started by encouraging Tammy to engage in free play in Middle C position, after which I introduced the ice cream topic. She decided that she would rather write words about her grandmother's milk tart, so she wrote two sentences on this theme. This took quite a long time because she wanted to write the words in cursive, which was still relatively new to her. She easily assigned notes to her syllables, needing very little creative input from me, and she wrote the notes for her two phrases as finger numbers above the words.

Lesson 2: Activity 2 - write a walking tune in crotchets with minims in the left hand (18 August 2022)

Tammy took quite a long time to make her way to the music rooms, so our lesson started late, a fact that I knew might necessitate a slight alteration to the designed lesson plan. I introduced the theme (going for a walk) and suggested that she start by inventing some words to help get started, but she changed the rules of the activity by choosing to explore notes on the piano before writing any words. This musical free play, occurring before the generation of text, may have been the reason that she created her pattern of notes as quickly as she did. Due to our delayed start, I decided that Tammy should find semibreves for the left hand instead of minims, which halved the time required for adding the left-hand part and allowed her to complete the activity in this lesson. In addition, I suggested that she use a combination of finger numbers and letter names to notate her work, instead of staff notation, which also saved time.

Lesson 3: Activity 3 - write a tune and add *staccato* (1 September 2022)

Tammy did not have her lesson last week as I had been away, but fortunately this did not have an impact upon this task as it was new and there was nothing to revise. I started by introducing the walking theme and pointing out the little bird figurine, after which Tammy created a walking tune composed of crotchets. Although I notated the melody for her, using staff notation, I decided to involve her in this process by asking her to draw the treble clef and the double bar-line, which we had recently covered in her theory workbook, because they were elements that were within her ability to notate. I also encouraged her to add the *staccato* dots, using a familiar exercise in her *A Dozen a Day* book as an example. I played Tammy's melody at the end of the lesson, which she seemed to enjoy, so I conjectured that this might be something I should do more often.

Lesson 4: Activity 4 - explore form and create a tune with a beginning, middle, and end (8 September 2022)

We had a delayed start due to a special assembly that took place prior to this lesson. I used the analogy of a story to elicit beginning, middle, and end, and played *Twinkle Twinkle Little Star* as a musical example of this structure. I observed that Tammy once again expressed a preference for working without text, so I did not ask her to invent words for this task. She also indicated that she preferred writing her notes using staff notation, instead of using finger numbers. Our delayed start, and my recent experience with other participants, made it clear that this task required more than one lesson to complete, so I told Tammy that we would focus on creating only a beginning in this lesson and that we would complete her piece in subsequent lessons.

Lesson 5: Activity 4 – continued (15 September 2022)

After revising the beginning from the previous lesson, I encouraged Tammy to freely explore the notes to find some that would constitute a middle section. I observed that this free play turned into structured play quite quickly because she soon found a pattern that she liked, which included a few black notes. However, she struggled to finalise the pattern because it changed every time she tried to play it, so I suggested writing the first few notes down so that she did not have to try to remember the whole sequence. This seemed to help and she managed to select notes that completed the phrase to her satisfaction. I was struck by her interest in black notes, because although she had played them in her scales, she had not yet encountered them in her pieces, so their appearance in notation was new to her. Tammy seemed very curious about this, which was evident when she asked me to show her how to draw a natural sign.

Lesson 6: Activity 4 – continued (22 September 2022)

After revising the beginning and middle sections of her tune, Tammy told me that she had invented an ending at her grandmother's house. She played this ending and I noticed that it was very similar to her beginning section, which I mentioned to her and to which she agreed. Having already created the melody independently, she required my help as a notational assistant only, not as a collaborator.

Lesson 7: Activity 5 - create a piece that expresses different moods (29 September 2022)

The school's stage production was scheduled immediately after Tammy's lesson, which would need to be shortened to allow her enough time to change into her costume. I introduced the theme by playing two sections of Chopin's *Mazurka* (Op. 68, No. 2) that expressed different moods and asked her to choose a mood for her own

piece. She seemed distracted by her upcoming performance in the production and changed her mind several times, before finally settling on Angry. I observed that her free play produced long sequences of notes that she was unable to remember, which prevented her from developing a motif. I suggested that she shorten the pattern to four notes, which seemed to help, and to which she added one note to complete the motif. She decided to repeat this pattern, although she wanted it to be played *staccato* the second time. The pitches she chose were lower than those she had previously encountered in her tutor book, so I notated the melody for her, although she added the articulation herself.

Lesson 8: Activity 5 – continued (13 October 2022)

After revising the Angry section that Tammy had composed in her previous lesson, she chose to create a new section that was Happy and decided that Middle C position was an appropriate setting for this section. I once again observed that she struggled to develop a motif because she forgot the notes she had tried. I suggested that she select a pattern that she liked and repeat it until she could remember it accurately. This seemed to help her to invent her tune, which I notated, after which I drew her attention to the fact that both the first and second sections ended on the same note and that this was an excellent feature.

Lesson 9: Activity 5 – continued (20 October 2022)

The lesson started late because Tammy had had to retrieve her music books from her classroom after choir practice, which once again made me very conscious of our remaining lesson time. I therefore offered to play the two sections of the piece for her to save time, after which she started working on a third and final mood. She chose to use Sad and decided to set this part of her piece in the piano's upper register. Tammy's new tune came together quickly, possibly because it was very similar to the pattern she had created in the previous lesson, and I notated it for her because these high pitches were beyond the scope of the notes with which she was familiar. During this lesson, I was struck by the notion that the participants should play their compositions for each other in order to see how others had approached each task, and to satisfy the third step of Hogenes' model, which calls for presentation of work, and which I was aware was not being adequately addressed.

Lesson 10: Activity 7 - create a tone poem (27 October 2022)

As had been the case with Gloria and Saira, Tammy had two remaining activities to complete by the time she reached the tenth lesson in the planned schedule. As with these other participants, I chose to abandon the lead sheet activity in favour of the tone poem in an attempt to create a balance between structured and unstructured tasks. I also wanted to determine whether Tammy would use any of the approaches to her prior tasks in one that imposed no restrictions. After introducing the Watery theme by playing a recording of *The Aquarium* by Saint-Saëns and showing her pictures of coral reefs, I encouraged her to try to make her own watery piece. She immediately gravitated toward the upper end of the piano and quickly invented three short patterns. I suspected that she had learnt from prior activities that limiting her phrase lengths made it easier for patterns to emerge.

Appendix L. Summary of post-intervention interview responses: iteration 1

	Question	Gloria	Jane	Maggie	Saira	Tammy
1	Out of the music that you made, which was your favourite piece? Can you tell me why?	The watery piece (Act. 7), because it sounded watery.	The Hogsback piece (Act. 2). I don't know why, I just like it.	Feelings (Act. 5). Because I used black notes and a wide range of the keyboard.	Bright Light (Act. 4). Because it reminds me of a movie and it sounds nice.	The emotions piece (Act. 5). Because it had different sections.
2	Did you find it easy to make up your own music, or was it difficult?	A little difficult.	Difficult.	In the middle (a tiny bit hard, yet easy).	It wasn't difficult, but finding the notes was hard.	A little difficult.
3	Did you like using words to make up your music?	No.	Not really.	Yes.	Yes.	Yes.
4	Did you like writing the notes, or was it better when I was writing them?	When you were writing.	When you were writing.	I liked writing myself, but it mustn't be all that I do.	When you were writing.	When you were writing.
5	Next term, how can I help make it easier to make up your own music?	There's nothing.	I don't know.	I can't think of anything.	There's nothing.	I don't know.
6	Who have you shared your music with? Did you play your songs to anyone or show them your creative book?	Parents.	Dad and grandparents.	Parents and grandparents.	Mom.	Parents and grandmother.
7	What did they think of it?	They said it was fine.	They liked it.	They loved it.	She said they were really nice.	They said they were proud of me.
8	Did making up your own music make you like the piano more?	Yes.	Yes.	Not really because I always liked the piano.	No, because I always liked the piano.	Yes. But I still want to do violin.
9	Did you enjoy making up your own music?	Yes.	Yes.	Yes.	Yes.	Yes.
10	Are you good at playing the piano?	Kind of.	Yes.	Yes.	Yes.	Yes, a bit.
11	What was your favourite part of your piano lessons this term?	Repertoire in the big book.	Starting John Thompson book 2.	Composing and scales.	Composing.	Springtime (in the big book).
12	What was your least favourite part of your piano lessons this term?	Scales and Dozen a Day.	Theory.	Keeping up with starting new John Thompson pieces all the time.	John Thompson.	Nothing.

Composition Book



Name:

Piano Technique



Legato



Staccato

Pedal

Hold down the sustain pedal

p

piano (soft)

f

forte (loud)



Crescendo
(Getting louder)



Diminuendo
(Getting softer)

Allegro

Fast





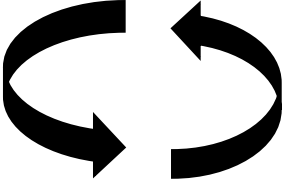




Moderato

At a moderate speed (medium)

Adagio

Slow

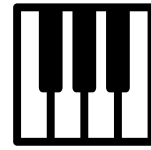
Creative Ideas

 <p>Treble clef (high notes/RH)</p>	 <p>Bass clef (low notes/LH)</p>
 <p>Treble and Bass clefs together</p>	 <p>Chords</p>
 <p>Repeat</p>	 <p>Ostinato (Repeated pattern)</p>
 <p>Hands together (2:1)</p>	 <p>Hands together (4:1)</p>
 <p>Same and Different</p>	 <p>Theme and Variation</p>

Helpful Ideas



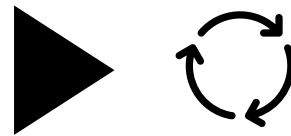
Decide first:
High/low, fast/slow, white notes/black notes.



Starting note:
Pick one note and find a few that sound good with it.



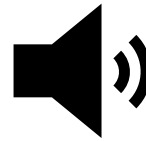
Make a short pattern.



Play your idea until it's easy to remember.



Write what you've got so far.



Sing your idea first.



Ask the teacher to add something.



Ask the teacher to write your idea.



Ask the teacher to play your idea.



Ask the teacher to record your idea.

Together

Place both hands in Middle C position and make a piece using these notes.

.....

The page contains 18 blank musical staves, each consisting of five horizontal lines, arranged vertically for writing a musical piece.

Apart

Place your RH 1st finger on Middle C and your LH 5th finger on C one octave lower.

.....

A series of 16 blank musical staves, each consisting of five horizontal lines, arranged vertically for musical practice.

Rhythm

Clap a pattern that sounds good and then play it on the piano.

.....

A series of 12 blank musical staves, each consisting of five horizontal lines, arranged vertically for writing a rhythm pattern.

Five Notes

Choose five notes on the piano and make a piece using only these notes.

.....

A series of 15 blank musical staves, each consisting of five horizontal lines, arranged vertically for writing a piece of music.

Memory

Think of a favourite memory to turn into music. You can make up some words to help get started.

.....

Handwriting practice lines consisting of multiple sets of horizontal lines for writing.

Faces

Make a theme (tune) and use different expressions to create variations.

.....

The page contains 12 groups of horizontal lines for musical notation. Each group consists of three parallel lines, providing a staff for writing a melody. The groups are arranged vertically down the page, with a dotted line above the first group.



Free choice:
create your
own rules for
this piece.

.....

A series of horizontal lines for writing, organized into groups of three lines each. There are 15 such groups, providing a structured space for text.

<p>Lesson 3</p> <p>Date:</p> <p>Time:</p>	<p>Continue working on the piece.</p>	
<p>Lesson 4</p> <p>Date:</p> <p>Time:</p>	<p>Continue working on the piece.</p> <p>Aim to have two lines done by the end of the lesson.</p> <p>Homework: Practise the piece.</p>	

<p>Lesson 7</p> <p>Date:</p> <p>Time:</p>	<p>Complete work on the piece today.</p> <p>Make sure it has a name.</p> <p>Check for cohesion and give feedback.</p> <p>Homework: Practise the completed piece.</p>	
<p>Lesson 8</p> <p>Date:</p> <p>Time:</p>	<p>Performance the piece for the other learners.</p> <p>Interview will take place next week.</p>	

Appendix O. Gloria: summary of enactment, iteration 2

Lesson 1 (25 January 2023)

The focus of this first lesson was the introduction of the composition booklet, explaining the themed pages, checking whether the concepts illustrated by the icons in the help pages were understood, and informing her about the end-of-term piano party. Gloria was already familiar with most of the concepts depicted by the icons and seemed very comfortable demonstrating what they meant on the piano. I observed that she was eager to get started on a new piece and she told me that her initial preference was the page called Faces, which we planned to start writing in the following lesson.

Lesson 2 (1 February 2023)

Gloria changed her mind about which piece to write. Although she initially indicated that she wanted to start Faces, she wanted to try Rhythm, but then changed her mind again, to Together, because she wished to start at the beginning of the book. While trying to invent a motif, she told me that she was forgetting her notes, so I referred her to the help icon that suggests making a short pattern. This seemed to help, and I observed that she experimented with many versions of her motif. Based on prior experience I suspected that she might continue to experiment without settling on a pattern, so I pointed out a particularly cohesive one when it emerged (beginning and ending on F). Affirming this note sequence as a valuable one seemed to legitimise it and Gloria was satisfied with her tune, which I wrote for her. By the end of the lesson, she had composed two bars of her melody, and I asked her to continue this work on her own and to write two more bars at home.

Lesson 3 (8 February 2023)

Gloria had done her homework, which was to invent and notate two more bars of melody. She told me that she had referred to her theory workbook to help her write the notes, which indicated to me that in this iteration, the composing activity was more fully integrated into her musical learning because she was drawing on the other work that was done in her lessons, essentially appropriating these tools autonomously. I suggested that she add to her melody, but she was immediately at a loss, so she turned back to the help pages. She chose *staccato* as a solution, but this merely suggested an articulation, not a way to develop her material, so I suggested that she repeat the bars she had already completed, making them *staccato* notes the second time around. In this way, we had each selected an item from the help pages and combined these ideas. She managed to do this with one bar during the lesson, so her homework was to write the next three bars with *staccato* dots.

Lesson 4 (15 February 2023)

Gloria had once again completed her composing homework and had in fact seemed to have done more work on her own piece than the others she was supposed to practise. The two lines she had written were therefore familiar to her and very little time was required to recap this material. When I asked her what she wanted to do next, she immediately turned to the help pages and selected the Chords icon. She experimented with harmonic intervals and created a pattern of four chords for the right hand that she liked. I observed that she had clear preferences and avoided dissonant intervals. After writing these chords, I set her a homework task, which was to create a left-hand melody that would complement these chords.

Lesson 5 (22 February 2023)

Gloria had completed her homework and added left-hand semibreves to the right-hand chords. I asked her what she wanted to do next, and we discussed various options. She initially chose the *staccato* icon and intended to apply this articulation to the chords she had written. I was concerned about this creating long silences that would cause the music to lose its momentum. She then suggested using black notes, but I suspected that including accidentals would make the piece too difficult for her to play comfortably, owing to the fact that the chords were already quite tricky to find. I suggested that she combine her first idea with the Repeat icon, meaning that each long chord could be repeated at shorter intervals to create a pulse. I asked Gloria to invent a title for her piece at home, and to add long accompanying notes to the melody in the second and third bars.

Lesson 6 (1 March 2023)

This lesson started late due to an extended staff meeting that had preceded the lesson, so I was very conscious of time. Gloria had chosen a title for her piece, *Different Notes and Places*, but had not added the left-hand notes, so we started by including them. She then played the piece and I suggested that she add one more line. She immediately turned to the help pages and when she did so I observed that these pages might be more helpful if their icons were arranged according to purpose, for instance, grouping them according to whether they were most helpful in getting started, or supporting the composer in the development and revision of ideas later on. Gloria chose the Pedal icon, which did not provide any help in terms of creating or extending her musical material, so I suggested that we combine her choice with Repeat. A plan was thus devised for the fourth line of the piece, in

which the material from the first line would be repeated, but this time with the use of the sustain pedal. For homework, I asked Gloria to add some left-hand notes to the third line, which remained incomplete.

Lesson 7 (8 March 2023)

Gloria had done her homework and completed the third line, and she had practised the whole piece. There was nothing left to add, so the project was complete. I asked her to continue to practise it so that she could perform it at the piano party at the end of the school term.

Appendix P. Jane: summary of enactment, iteration 2

Lesson 1 (24 January 2023)

Jane arrived late for the lesson because choir practice had run overtime, but this did not pose a problem because this lesson was devoted to introducing the composition booklet, which did not require much time. As had been the case with Gloria, Jane was familiar with most of the concepts presented through the icons in the help pages and seemed eager to demonstrate their meanings on the piano. For the items that were less familiar, I referred to the pieces in her tutor book, as well as her prior compositions, to show her instances of how these compositional devices could be used. I asked Jane to look through the booklet at home and decide which piece she would like to write.

Lesson 2 (31 January 2023)

Jane indicated that she wanted to do *Hogsback* again, possibly because she had enjoyed the process of writing that piece in the first iteration, and because it represented a fond memory. I pointed out that the Memory page was essentially the same idea, so that is the page she chose. She created a few lines of text that described her memory, after which she assigned notes to the syllables, as she had done before. I observed that I played an active role in pointing out suitable motifs generated during her musical free play. Once the first pattern had been established, I notated it for her to save time, checking with her to ensure that what I wrote accurately captured her intentions. After notating this two-bar melody, I set Jane the task of adding left-hand accompanying notes, to be completed at home.

Lesson 3 (7 February 2023)

Jane had not completed the assigned homework task, so these left-hand notes were added first. The notes that she chose were within her ability to notate, so I asked her to write them herself. I observed that she had settled into a four-four meter, so I also asked her to add the time signature. We then started setting notes to the next phrase of text, which Jane managed to do without assistance. I observed that she seemed to be very comfortable with this process and she found a suitable pattern without any input from me. I wrote the new phrase to save time, and once again asked her to add two left-hand notes at home.

Lesson 4 (14 February 2023)

This time, Jane had done her homework, which was to add left-hand notes to two bars, and she was able to play them without too much trouble because they were familiar, having been practised at home. We continued the task of setting notes to her text. While experimenting, Jane noticed that her new phrase was the same as the first and was about to discard it, but I thought that a partial repetition would lend a measure of cohesiveness to the melody, so I suggested that she include this repeated phrase, but make a small change so that it was not exactly the same. I noted that this strategy had not only helped Jane write this section of her piece, but it had also improved the quality of her composition in terms aesthetics. I felt that Jane was sufficiently comfortable with her method of setting notes to attempt the next phrase independently, so that was what I asked her to do at home.

Lesson 5 (21 February 2023)

Jane had been away over the weekend and had not been able to complete her homework task, so we added the new melodic phrase in her lesson, after which she wrote a new sentence about her memory to extend the piece. I observed that Jane seemed to be more comfortable experimenting with notes than she had in the first iteration, and more significantly, when she identified a new pattern that she liked, she played it many times over, presumably to help her remember it. This is something that she learnt to do in the previous iteration, which was now embodied in the help pages, that seemed to have become internalised. I also noticed that I was using help icons without referring to the help pages, such as asking Jane whether the new phrase should be played by the right or left hand. For homework, I asked Jane to think of a title for her piece and to add a left-hand accompaniment for the new melodic phrase.

Lesson 6 (28 February 2023)

Jane had done her homework and created the accompaniment for the melody she had written in her last lesson. She was familiar with the piece and able to play it reasonably well, having practised it at home, so very little recap time was required. I suggested that she write one more line to complete the piece, and asked if she would like to make up some words for this final section. She indicated that she would, which caused me to suspect that the creation of text might be a useful addition to the help page icons. She found a melody for the final section very quickly, so we were able to go back and start adding a left-hand accompaniment to the third line, which she seemed to do through a process of elimination. I observed that she liked using dotted rhythms, which I had not yet taught her, so they must have been part of her musical experiential landscape and therefore drawn into her own work.

This also meant that her own piece was more rhythmically demanding than the pieces she was learning to play in her tutor book. For homework, I asked Jane to complete the third line's accompaniment.

Lesson 7 (7 March 2023)

Once again, Jane had done her homework and added left-hand notes to the third line's melody, so this lesson was devoted to writing an accompaniment for the fourth line. As had been the case in the previous lesson, Jane's familiarity with her piece was due to her engaging with it at home, which had the benefit of shortening the recap time required. Once this was complete, I pointed out a few notation errors that had been made, specifically the positioning of the notes in the bass clef. She rewrote these notes herself and then scanned the score to find others that needed to be corrected. Jane completed the project in this lesson, with ample time to practise it ahead of the piano party.

Appendix Q. Maggie: summary of enactment, iteration 2

Lesson 1 (24 January 2023)

I introduced the new composition booklet and while discussing the help pages, I observed that Maggie easily made connections between the icons and concepts that had been learnt in prior work. Maggie said that she wanted to do the hardest page first, which in her opinion was Five Notes, which we would start writing in the following lesson.

Lesson 2 (31 January 2023)

Maggie selected five pitches to use in her new piece, including E flat, which she had not yet encountered in her pieces or scales. I observed that she tended to consider every decision very carefully, which prolonged the process, and as a result she created a short pattern using only three of her five notes by the end of the lesson. This pattern first appeared as fragments that were played in different octaves between the hands and therefore not quite melodic. I pointed out that it might be best to consider working on a tune for one hand in one pitch range, avoiding extreme leaps, which would be more melodic. The lesson schedule indicated that the goal for this lesson was to have at least two completed bars by the end of this lesson, but Maggie had managed only one, and although she was not aware of this suggested benchmark, I was concerned that she would fall behind, so I asked her to write a second bar at home.

Lesson 3 (7 February 2023)

Maggie had created a second bar at home, and she told me that her mother had helped her. I suggested that we create two more bars together and she started arranging the pitches in a new order. Maggie seemed very comfortable experimenting within the strict confines of the parameter imposed by the five-note rule, and she did not need to refer to the help pages because she did not get stuck. I made a few suggestions, which she considered, but I observed that she seemed very much in control of her process. However, despite the fact that she did not use my suggestions, I began to wonder whether this form of teacher input might be a useful addition to the help pages for the third iteration. By the end of the lesson she had created one new bar, which she had notated herself, so I asked her to complete the task and create another bar at home.

Lesson 4 (14 February 2023)

Maggie had forgotten to complete the homework bar, so we did this first and while discussing the options available, I suggested that she use the same pitches as the previous bar, but rearrange their order. She did not use this idea because she had thought of a different approach, but I made a note of this as a potentially useful strategy to include in the next design cycle. Once again, I set the task for the lesson, which was to add a second line to the piece. Maggie seemed apprehensive about this task, so I suggested that she combine two help icons (Repeat and Bass Clef) to establish a simple scheme to follow, which appeared to set her at ease. For homework, I set Maggie the task of extending this new section, using finger numbers to notate the pitches because she had not yet learnt how to write these lower notes.

Lesson 5 (21 February 2023)

Maggie had completed the homework task and had in fact notated the melody herself using staff notation, which was possible because she had decided to set it within range of Middle C, with which she was familiar. I then assigned the task for this lesson, which was to create one new bar of melody. Maggie seemed to be seeking a sense of cohesion by repeating certain sections of her melody, which was a simple and effective strategy that saved time and allowed us to approach the creation of an accompaniment in this lesson. To do this, I referred her to the icon called Hands Together (4:1), which suggested adding left-hand semibreves to a right-hand crotchet pattern. I observed that this idea seemed familiar to her, possibly because she had recently played a piece that features this form of accompaniment. She experimented to find the first two left-hand notes, which she chose to notate herself. For homework, I asked her to continue this process with the next two bars.

Lesson 6 (28 February 2023)

In this lesson, I assigned Maggie the task of creating a fourth line for her piece and she chose to repeat the third line one octave lower. I mentioned that this was a repetition with a difference, to which she responded by pointing out the Same and Different icon in the help pages. This interpretation was not quite what I had intended when I made this icon, but it was nevertheless useful because it was being used as a mutually understood organising principle in our decision-making discussion. By playing F and C as a harmonic interval, we were able to combine an idea she had had (playing C) with the Same and Different icon because the addition of C represented the change. For homework, I asked Maggie to think of a title for her composition that might possibly reflect something of the structure, which featured repetition and sections that were quite different.

Lesson 7 (14 March 2023)

Maggie had missed her lesson the previous week because she had been absent from school. She had completed the homework task and given her piece a title, *Different*, to highlight the structural features of the piece in which motivic repetition alternated with sections that were different. The task for this lesson was the addition of an accompaniment for the last line, which she initially decided should be played in a lower register, but she changed her mind as she found these notes difficult to remember, due to the hand moving to a new position. Instead, she chose to repeat the accompaniment she had written for the third line. Maggie completed her piece in this lesson, two weeks ahead of the piano party.

Appendix R. Saira: summary of enactment, iteration 2

Lesson 1 (23 January 2023)

I introduced the new composition booklet in this lesson and Saira seemed very eager to look through it. She seemed to understand most of the concepts in the help pages and although she did not initially understand *crescendo*, the way in which was presented appeared to make the meaning clear to her. Saira chose the Faces page, which we would start in the next lesson. I observed that this introduction seemed rather long, but I was aware that we would not need to go through it again, which would ultimately save time.

Lesson 2 (30 January 2023)

Saira was in control of the creative process from the outset, establishing the rules of the activity and choosing which facial expression she wanted to use before starting to explore notes. This decision informed her choice of pitch range, because she associated the sad face with low notes. She experimented in a low register and played several versions of a theme before settling on one that she liked. I observed that she was quite comfortable doing this and did not require my assistance. This pattern was written as letter names because these pitches were beyond her ability to notate. Saira then decided that these notes actually sounded more angry than sad, so she changed the facial expression accordingly. She also mentioned that she intended to change the moods in her piece according to the emotions being felt by a character in a book that she was reading. By the end of the lesson, she had composed one bar, and in order to keep pace with the guideline suggested in the lesson schedule, I asked her to create a second bar at home.

Lesson 3 (6 February 2023)

We had a delayed start because Saira had forgotten her lesson and I had had to fetch her, so I was concerned that we might not have enough time to work on her composition. However, she had written a second bar and practiced both phrases at home, which saved time. I observed that Saira was able to make a connection between the duration of one of her notes (semibreve) with a theory exercise she had recently completed. As a teacher, I appreciated this opportunity to consolidate this concept, particularly because the connection was being made between the sound and the symbol in an activity that did not originate from her theory workbook. I notated the two phrases because Saira had not yet learnt to write these pitches in the bass clef, after which she chose to start working on a new, happy phrase, which she said should be played higher. She experimented with these higher notes and soon found a pattern that she felt was appropriate for the new section, and included *staccato* articulation for some of the notes. By the end of the lesson, she had added four new bars to the piece and I observed that I felt that this had been a particularly productive session. For homework, I asked her to draw angry and happy faces on the adjacent blank page so that they corresponded with the two lines of notated music, to practice these lines, and to start thinking about adding some accompanying notes for the angry section.

Lesson 4 (13 February 2023)

Saira had completed her assigned homework and seemed eager to start working on her own piece. She was able to play both lines without difficulty, which was evidence of her having practised them at home, and I observed that she seemed highly motivated to continue composing. She had also started planning the accompaniment for the first line and expressed a desire to write the notes herself, but she agreed to allow me to take over because they were beyond her ability to notate. Saira chose to use a new note (E flat) that she had recently encountered for the first time in one of the pieces she was learning to play, which was advantageous for two reasons. On one hand, as teacher, this presented an ideal opportunity to consolidate the notion of flats, while on the other hand, as researcher, I observed that Saira was drawing upon prior musical experience and using this knowledge in her own composition, as predicted by CHAT. As we approached the creation of the third line, we referred to the help pages for the first time and Saira selected two items, Pedal and *piano*, to create a new section that she called Scared. For homework, I asked her to draw her new expression and to add an accompaniment to the completed melody in the second line.

Lesson 5 (20 February 2023)

Saira had once again completed the homework task and practised her piece. She had written her accompaniment notes as letter names, which I notated for her. The task for this lesson was to create a new line of music and a corresponding facial expression, for which she chose Cool. While experimenting for this new line, Saira mentioned that she wanted to try using a dissonant chord, similar to one she had played in another piece of repertoire. Saira also made a decision about where on the piano to set this new line, based on the hand position she had encountered in another piece. I observed that she was drawing on prior musical experience, as had been the case in the previous lesson, except this time she was using ideas that had appeared in her other repertoire, and not her theory workbook. This caused me to consider the possibility of adding a help icon to the composition booklet for the third iteration, which suggests referring to other repertoire for ideas. I also observed that although

Saira did not need to turn back to the help pages, she was nevertheless using these ideas in her decision making, indicating that several of these codified strategies had become internalised and were available to her as conceptual tools. Saira seemed to be enjoying this task and was eager to invent new patterns and to revise certain notes. By the end of the lesson, she had nearly completed the fourth line, so I asked her to finish it at home and to give the piece a title.

Lesson 6 (27 February 2023)

Siara had done her assigned homework and completed the fourth line of the piece. She had also chosen to call it *Me!*, which indicated that she was expressing something of herself in this work. I suggested that she write a fifth line to complete the piece, which Saira decided should contain elements of the preceding lines. She chose to include material from the first and third lines, which seemed to me to be rather unifying, and which caused me to yet again consider adding Repeat With a Difference to the help pages for the third iteration. While working on this final line, Saira mentioned a feature from another piece that she was learning. This had happened before and, in the absence of any reference to other forms of musical experience, caused me to suspect that her musical identity being manifested in this work was shaped by her prior work on the piano more than other influences. By the end of the lesson, Saira had completed the piece four weeks ahead of the piano party.

Appendix S. Tammy: summary of enactment, iteration 2

Lesson 1 (26 January 2023)

I introduced the composition booklet in this lesson and Tammy understood most of the help items. She volunteered explanations for the concepts represented by the icons and recognised some of them as strategies she had used in the first iteration. I observed that she seemed to respond positively to this booklet, and she had a clear preference for the Rhythm page, which we would start in the following lesson.

Lesson 2 (2 February 2023)

This lesson started late because the electronic school bell had not rung due to loadshedding (national rolling blackouts), and I had had to collect Tammy from her classroom. She affirmed that she still wanted to write the piece on the Rhythm page, so I suggested that she begin by clapping a simple rhythm and then transferring it to the piano. She invented a short rhythm quite easily, but seemed a bit uncertain about playing notes in this rhythm. I showed her the icons on the help pages and this helped her to make decisions about whether to use high or low notes, and what the starting note should be. She then created a pattern quite quickly, which I notated for her because she had not yet learnt how to write these notes in the bass clef. The rhythm also contained quavers, to which she had only recently been introduced, and I was concerned that writing these new note values would monopolise the available time. I did, however, involve Tammy in the notation of these two bars by asking her to draw the time signature and eliciting the correct placement of the crotchet rests before I drew them. By the end of the lesson, she had composed two bars of melody for the left hand, each using the same rhythm, and I asked her to practise this beginning at home so that she would be able to remember it when we met for her next lesson.

Lesson 3 (9 February 2023)

This lesson started late due to a fire drill that had been conducted at the beginning of the school period. After briefly revising the two phrases that had been written in the previous lesson, I set the task of creating two more phrases. At one point, Tammy seemed to have difficulty remembering the notes she had used in her pattern, so I referred her to the help pages and pointed out three icons, of which she selected one. I observed that by choosing Make a Short Pattern, Tammy had selected a rule to follow and I was able to help her because this rule had been made explicit by its reification as an icon, meaning that I knew what the rule was. I felt that this had been a successful lesson because Tammy had managed to compose two new phrases and in order to maintain this momentum, I asked her to write two more at home.

Lesson 4 (16 February 2023)

Tammy had added the two bars for homework but she had not practised playing the piece, so we devoted a significant amount of lesson time to playing these bars so that they were sufficiently familiar. She had altered the rhythm slightly when writing the new bars, but I did not point this out because these were minor deviations and they did not detract from the music's overall character. Tammy seemed unsure about what to do next, so I referred her to the help pages. She suggested using black notes, which was not reflected in the help icons, and I did not think that this would help her with the left-hand melody she had written. I therefore pointed out the Treble Clef icon and suggested that she try adding some right-hand notes to accompany her melody, to create a sense of balance between the hands. Tammy seemed to enjoy experimenting with harmonic intervals and created chords for the right hand that complemented the melody being played by the left hand. She also decided to include black notes, her initial suggestion, and in doing so she combined both of our ideas. I observed that Tammy seemed a little reticent and less forthcoming than some of the other participants, and I suspected that she needed more intervention from me than they did. By the end of the lesson, she had completed the task of adding chords to her melody, so her homework was to practise the two lines that had been written.

Lesson 5 (23 February 2023)

Once again, Tammy had not practised enough to be able to play her piece comfortably, so we spent time going over it together. This lack of practice was possibly due to the recent change in her afternoon arrangements, which limited the amount of time in which she had access to a piano. When planning the next two bars, Tammy suggested that the new section should be a repetition of the first, but with small changes. This confirmed that Repeat With a Twist would be a useful addition to the help pages for the third iteration. Tammy chose to repeat the initial left-hand melody, but to change the right-hand chords, which I notated to save time. I observed that she seemed quite comfortable making these creative decisions and that she enjoyed the creative process, which was confirmed when she expressed a desire to start a new themed page after the completion of this one. For homework, I asked her to think of a title for her piece and to practise playing it.

Lesson 6 (2 March 2023)

Tammy had not yet decided on a title, but she had practised her piece, so she was able to play it. I set the task for this lesson and suggested that she add some chords to the melody in the fourth line. She chose to repeat two of the chords that had appeared earlier in the piece and wrote a third one that was new. I pointed out that the note F was quite prominent in this music, and that the final chord should probably contain this note. Tammy experimented with some notes and with a little guidance settled on a final chord that she decided should be written as semibreves. She also decided to call this piece *F Piece*, possibly because I had mentioned the importance of this note earlier in the lesson. Tammy had finished her piece four weeks before the piano party, which gave her ample time to practise it.

Appendix U. *Best Place Ever!* by Jane, iteration 2

Memory

Think of a favourite memory to turn into music. You can make up some words to help get started.

...Best...place...ever!.....

The image shows a handwritten musical score for a piece titled "Best Place Ever!". The score is written on six systems of grand staves (treble and bass clefs). The music is in 4/4 time and appears to be in a major key. The notation includes quarter notes, eighth notes, and rests. The first five systems contain the main melody and accompaniment, while the sixth system shows a double bar line, indicating the end of the piece. The handwriting is clear and legible.

Appendix V. *Different* by Maggie, iteration 2

Five Notes
Choose five notes on the piano and make a piece
using only these notes.

Different

piece

normal

1 3 4

lower

Appendix W. *Me!* by Saira, iteration 2

Faces
Make a theme (tune) and use different expressions to create variations.

ME!



The image shows a hand-drawn musical score for a piece titled "Me!". The score is written on five systems of two staves each (treble and bass clef). The title "ME!" is written in large, stylized letters at the top. Below the title, there are four hand-drawn faces with different expressions: a sad face with a frown, a happy face with a wide smile, a surprised face with wide eyes and an open mouth, and a cool face with sunglasses. The musical notation includes notes, rests, and dynamic markings such as "p" (piano) and "f" (forte). The first system is labeled "Eye below" and "Eye below." The second system is labeled "Eye below." The third system is labeled "Eye below." The fourth system is labeled "Eye below." The fifth system is labeled "Eye below." The score is written in a simple, hand-drawn style.

Appendix X. *F Piece* by Tammy, iteration 2

Rhythm
Clap a pattern that sounds good and then play it on the piano.

F piece.....

The musical score is written in 4/4 time and consists of six systems of piano accompaniment. Each system has a grand staff with a treble and bass clef. The first system includes a 4-measure rest in the treble clef and a bass line starting with a quarter note G2, followed by eighth notes A2, B2, C3, D3, E3, F3, G3, A3, B3, C4, D4, E4, F4, G4, A4, B4, C5, D5, E5, F5, G5, A5, B5, C6, D6, E6, F6, G6, A6, B6, C7, D7, E7, F7, G7, A7, B7, C8, D8, E8, F8, G8, A8, B8, C9, D9, E9, F9, G9, A9, B9, C10, D10, E10, F10, G10, A10, B10, C11, D11, E11, F11, G11, A11, B11, C12, D12, E12, F12, G12, A12, B12, C13, D13, E13, F13, G13, A13, B13, C14, D14, E14, F14, G14, A14, B14, C15, D15, E15, F15, G15, A15, B15, C16, D16, E16, F16, G16, A16, B16, C17, D17, E17, F17, G17, A17, B17, C18, D18, E18, F18, G18, A18, B18, C19, D19, E19, F19, G19, A19, B19, C20, D20, E20, F20, G20, A20, B20, C21, D21, E21, F21, G21, A21, B21, C22, D22, E22, F22, G22, A22, B22, C23, D23, E23, F23, G23, A23, B23, C24, D24, E24, F24, G24, A24, B24, C25, D25, E25, F25, G25, A25, B25, C26, D26, E26, F26, G26, A26, B26, C27, D27, E27, F27, G27, A27, B27, C28, D28, E28, F28, G28, A28, B28, C29, D29, E29, F29, G29, A29, B29, C30, D30, E30, F30, G30, A30, B30, C31, D31, E31, F31, G31, A31, B31, C32, D32, E32, F32, G32, A32, B32, C33, D33, E33, F33, G33, A33, B33, C34, D34, E34, F34, G34, A34, B34, C35, D35, E35, F35, G35, A35, B35, C36, D36, E36, F36, G36, A36, B36, C37, D37, E37, F37, G37, A37, B37, C38, D38, E38, F38, G38, A38, B38, C39, D39, E39, F39, G39, A39, B39, C40, D40, E40, F40, G40, A40, B40, C41, D41, E41, F41, G41, A41, B41, C42, D42, E42, F42, G42, A42, B42, C43, D43, E43, F43, G43, A43, B43, C44, D44, E44, F44, G44, A44, B44, C45, D45, E45, F45, G45, A45, B45, C46, D46, E46, F46, G46, A46, B46, C47, D47, E47, F47, G47, A47, B47, C48, D48, E48, F48, G48, A48, B48, C49, D49, E49, F49, G49, A49, B49, C50, D50, E50, F50, G50, A50, B50, C51, D51, E51, F51, G51, A51, B51, C52, D52, E52, F52, G52, A52, B52, C53, D53, E53, F53, G53, A53, B53, C54, D54, E54, F54, G54, A54, B54, C55, D55, E55, F55, G55, A55, B55, C56, D56, E56, F56, G56, A56, B56, C57, D57, E57, F57, G57, A57, B57, C58, D58, E58, F58, G58, A58, B58, C59, D59, E59, F59, G59, A59, B59, C60, D60, E60, F60, G60, A60, B60, C61, D61, E61, F61, G61, A61, B61, C62, D62, E62, F62, G62, A62, B62, C63, D63, E63, F63, G63, A63, B63, C64, D64, E64, F64, G64, A64, B64, C65, D65, E65, F65, G65, A65, B65, C66, D66, E66, F66, G66, A66, B66, C67, D67, E67, F67, G67, A67, B67, C68, D68, E68, F68, G68, A68, B68, C69, D69, E69, F69, G69, A69, B69, C70, D70, E70, F70, G70, A70, B70, C71, D71, E71, F71, G71, A71, B71, C72, D72, E72, F72, G72, A72, B72, C73, D73, E73, F73, G73, A73, B73, C74, D74, E74, F74, G74, A74, B74, C75, D75, E75, F75, G75, A75, B75, C76, D76, E76, F76, G76, A76, B76, C77, D77, E77, F77, G77, A77, B77, C78, D78, E78, F78, G78, A78, B78, C79, D79, E79, F79, G79, A79, B79, C80, D80, E80, F80, G80, A80, B80, C81, D81, E81, F81, G81, A81, B81, C82, D82, E82, F82, G82, A82, B82, C83, D83, E83, F83, G83, A83, B83, C84, D84, E84, F84, G84, A84, B84, C85, D85, E85, F85, G85, A85, B85, C86, D86, E86, F86, G86, A86, B86, C87, D87, E87, F87, G87, A87, B87, C88, D88, E88, F88, G88, A88, B88, C89, D89, E89, F89, G89, A89, B89, C90, D90, E90, F90, G90, A90, B90, C91, D91, E91, F91, G91, A91, B91, C92, D92, E92, F92, G92, A92, B92, C93, D93, E93, F93, G93, A93, B93, C94, D94, E94, F94, G94, A94, B94, C95, D95, E95, F95, G95, A95, B95, C96, D96, E96, F96, G96, A96, B96, C97, D97, E97, F97, G97, A97, B97, C98, D98, E98, F98, G98, A98, B98, C99, D99, E99, F99, G99, A99, B99, C100, D100, E100, F100, G100, A100, B100, C101, D101, E101, F101, G101, A101, B101, C102, D102, E102, F102, G102, A102, B102, C103, D103, E103, F103, G103, A103, B103, C104, D104, E104, F104, G104, A104, B104, C105, D105, E105, F105, G105, A105, B105, C106, D106, E106, F106, G106, A106, B106, C107, D107, E107, F107, G107, A107, B107, C108, D108, E108, F108, G108, A108, B108, C109, D109, E109, F109, G109, A109, B109, C110, D110, E110, F110, G110, A110, B110, C111, D111, E111, F111, G111, A111, B111, C112, D112, E112, F112, G112, A112, B112, C113, D113, E113, F113, G113, A113, B113, C114, D114, E114, F114, G114, A114, B114, C115, D115, E115, F115, G115, A115, B115, C116, D116, E116, F116, G116, A116, B116, C117, D117, E117, F117, G117, A117, B117, C118, D118, E118, F118, G118, A118, B118, C119, D119, E119, F119, G119, A119, B119, C120, D120, E120, F120, G120, A120, B120, C121, D121, E121, F121, G121, A121, B121, C122, D122, E122, F122, G122, A122, B122, C123, D123, E123, F123, G123, A123, B123, C124, D124, E124, F124, G124, A124, B124, C125, D125, E125, F125, G125, A125, B125, C126, D126, E126, F126, G126, A126, B126, C127, D127, E127, F127, G127, A127, B127, C128, D128, E128, F128, G128, A128, B128, C129, D129, E129, F129, G129, A129, B129, C130, D130, E130, F130, G130, A130, B130, C131, D131, E131, F131, G131, A131, B131, C132, D132, E132, F132, G132, A132, B132, C133, D133, E133, F133, G133, A133, B133, C134, D134, E134, F134, G134, A134, B134, C135, D135, E135, F135, G135, A135, B135, C136, D136, E136, F136, G136, A136, B136, C137, D137, E137, F137, G137, A137, B137, C138, D138, E138, F138, G138, A138, B138, C139, D139, E139, F139, G139, A139, B139, C140, D140, E140, F140, G140, A140, B140, C141, D141, E141, F141, G141, A141, B141, C142, D142, E142, F142, G142, A142, B142, C143, D143, E143, F143, G143, A143, B143, C144, D144, E144, F144, G144, A144, B144, C145, D145, E145, F145, G145, A145, B145, C146, D146, E146, F146, G146, A146, B146, C147, D147, E147, F147, G147, A147, B147, C148, D148, E148, F148, G148, A148, B148, C149, D149, E149, F149, G149, A149, B149, C150, D150, E150, F150, G150, A150, B150, C151, D151, E151, F151, G151, A151, B151, C152, D152, E152, F152, G152, A152, B152, C153, D153, E153, F153, G153, A153, B153, C154, D154, E154, F154, G154, A154, B154, C155, D155, E155, F155, G155, A155, B155, C156, D156, E156, F156, G156, A156, B156, C157, D157, E157, F157, G157, A157, B157, C158, D158, E158, F158, G158, A158, B158, C159, D159, E159, F159, G159, A159, B159, C160, D160, E160, F160, G160, A160, B160, C161, D161, E161, F161, G161, A161, B161, C162, D162, E162, F162, G162, A162, B162, C163, D163, E163, F163, G163, A163, B163, C164, D164, E164, F164, G164, A164, B164, C165, D165, E165, F165, G165, A165, B165, C166, D166, E166, F166, G166, A166, B166, C167, D167, E167, F167, G167, A167, B167, C168, D168, E168, F168, G168, A168, B168, C169, D169, E169, F169, G169, A169, B169, C170, D170, E170, F170, G170, A170, B170, C171, D171, E171, F171, G171, A171, B171, C172, D172, E172, F172, G172, A172, B172, C173, D173, E173, F173, G173, A173, B173, C174, D174, E174, F174, G174, A174, B174, C175, D175, E175, F175, G175, A175, B175, C176, D176, E176, F176, G176, A176, B176, C177, D177, E177, F177, G177, A177, B177, C178, D178, E178, F178, G178, A178, B178, C179, D179, E179, F179, G179, A179, B179, C180, D180, E180, F180, G180, A180, B180, C181, D181, E181, F181, G181, A181, B181, C182, D182, E182, F182, G182, A182, B182, C183, D183, E183, F183, G183, A183, B183, C184, D184, E184, F184, G184, A184, B184, C185, D185, E185, F185, G185, A185, B185, C186, D186, E186, F186, G186, A186, B186, C187, D187, E187, F187, G187, A187, B187, C188, D188, E188, F188, G188, A188, B188, C189, D189, E189, F189, G189, A189, B189, C190, D190, E190, F190, G190, A190, B190, C191, D191, E191, F191, G191, A191, B191, C192, D192, E192, F192, G192, A192, B192, C193, D193, E193, F193, G193, A193, B193, C194, D194, E194, F194, G194, A194, B194, C195, D195, E195, F195, G195, A195, B195, C196, D196, E196, F196, G196, A196, B196, C197, D197, E197, F197, G197, A197, B197, C198, D198, E198, F198, G198, A198, B198, C199, D199, E199, F199, G199, A199, B199, C200, D200, E200, F200, G200, A200, B200, C201, D201, E201, F201, G201, A201, B201, C202, D202, E202, F202, G202, A202, B202, C203, D203, E203, F203, G203, A203, B203, C204, D204, E204, F204, G204, A204, B204, C205, D205, E205, F205, G205, A205, B205, C206, D206, E206, F206, G206, A206, B206, C207, D207, E207, F207, G207, A207, B207, C208, D208, E208, F208, G208, A208, B208, C209, D209, E209, F209, G209, A209, B209, C210, D210, E210, F210, G210, A210, B210, C211, D211, E211, F211, G211, A211, B211, C212, D212, E212, F212, G212, A212, B212, C213, D213, E213, F213, G213, A213, B213, C214, D214, E214, F214, G214, A214, B214, C215, D215, E215, F215, G215, A215, B215, C216, D216, E216, F216, G216, A216, B216, C217, D217, E217, F217, G217, A217, B217, C218, D218, E218, F218, G218, A218, B218, C219, D219, E219, F219, G219, A219, B219, C220, D220, E220, F220, G220, A220, B220, C221, D221, E221, F221, G221, A221, B221, C222, D222, E222, F222, G222, A222, B222, C223, D223, E223, F223, G223, A223, B223, C224, D224, E224, F224, G224, A224, B224, C225, D225, E225, F225, G225, A225, B225, C226, D226, E226, F226, G226, A226, B226, C227, D227, E227, F227, G227, A227, B227, C228, D228, E228, F228, G228, A228, B228, C229, D229, E229, F229, G229, A229, B229, C230, D230, E230, F230, G230, A230, B230, C231, D231, E231, F231, G231, A231, B231, C232, D232, E232, F232, G232, A232, B232, C233, D233, E233, F233, G233, A233, B233, C234, D234, E234, F234, G234, A234, B234, C235, D235, E235, F235, G235, A235, B235, C236, D236, E236, F236, G236, A236, B236, C237, D237, E237, F237, G237, A237, B237, C238, D238, E238, F238, G238, A238, B238, C239, D239, E239, F239, G239, A239, B239, C240, D240, E240, F240, G240, A240, B240, C241, D241, E241, F241, G241, A241, B241, C242, D242, E242, F242, G242, A242, B242, C243, D243, E243, F243, G243, A243, B243, C244, D244, E244, F244, G244, A244, B244, C245, D245, E245, F245, G245, A245, B245, C246, D246, E246, F246, G246, A246, B246, C247, D247, E247, F247, G247, A247, B247, C248, D248, E248, F248, G248, A248, B248, C249, D249, E249, F249, G249, A249, B249, C250, D250, E250, F250, G250, A250, B250, C251, D251, E251, F251, G251, A251, B251, C252, D252, E252, F252, G252, A252, B252, C253, D253, E253, F253, G253, A253, B253, C254, D254, E254, F254, G254, A254, B254, C255, D255, E255, F255, G255, A255, B255, C256, D256, E256, F256, G256, A256, B256, C257, D257, E257, F257, G257, A257, B257, C258, D258, E258, F258, G258, A258, B258, C259, D259, E259, F259, G259, A259, B259, C260, D260, E260, F260, G260, A260, B260, C261, D261, E261, F261, G261, A261, B261, C262, D262, E262, F262, G262, A262, B262, C263, D263, E263, F263, G263, A263, B263, C264, D264, E264, F264, G264, A264, B264, C265, D265, E265, F265, G265, A265, B265, C266, D266, E266, F266, G266, A266, B266, C267, D267, E267, F267, G267, A267, B267, C268, D268, E268, F268, G268, A268, B268, C269, D269, E269, F269, G269, A269, B269, C270, D270, E270, F270, G270, A270, B270, C271, D271, E271, F271, G271, A271, B271, C272, D272, E272, F272, G272, A272, B272, C273, D273, E273, F273, G273, A273, B273, C274, D274, E274, F274, G274, A274, B274, C275, D275, E275, F275, G275, A275, B275, C276, D276, E276, F276, G276, A276, B276, C277, D277, E277, F277, G277, A277, B277, C278, D278, E278, F278, G278, A278, B278, C279, D279, E279, F279, G279, A279, B279, C280, D280, E280, F280, G280, A280, B280, C281, D281, E281, F281, G281, A281, B281, C282, D282, E282, F282, G282, A282, B282, C283, D283, E283, F283, G283, A283, B283, C284, D284, E284, F284, G284, A284, B284, C285, D285, E285, F285, G285, A285, B285, C286, D286, E286, F286, G286, A286, B286, C287, D287, E287, F287, G287, A287, B287, C288, D288, E288, F288, G288, A288, B288, C289, D289, E289, F289, G289, A289, B289, C290, D290, E290, F290, G290, A290, B290, C291, D291, E291, F291, G291, A291, B291, C292, D292, E292, F292, G292, A292, B292, C293, D293, E293, F293, G293, A293, B293, C294, D294, E294, F294, G294, A294, B294, C295, D295, E295, F295, G295, A295, B295, C296, D296, E296, F296, G296, A296, B296, C297, D297, E297, F297, G297, A297, B297, C298, D298, E298, F298, G298, A298, B298, C299, D299, E299, F299, G299, A299, B299, C300, D300, E300, F300, G300, A300, B300, C301, D301, E301, F301, G301, A301, B301, C302, D302, E302, F302, G302, A302, B302, C303, D303, E303, F303, G303, A303, B303, C304, D304, E304, F304, G304, A304, B304, C305, D305, E305, F305, G305, A305, B305, C306, D306, E306, F306, G306, A306, B306, C307, D307, E307, F307, G307, A307, B307, C308, D308, E308, F308, G308, A308, B308, C309, D309, E309, F309, G309, A309, B309, C310, D310, E310, F310, G310, A310, B310, C311, D311, E311, F311, G311, A311, B311, C312, D312, E312, F312, G312, A312, B312, C313, D313, E313, F313, G313, A313, B313, C314, D314, E314, F314, G314, A314, B314, C315, D315, E315, F315, G315, A315, B315, C316, D316, E316, F316, G316, A316, B316, C317, D317, E317, F317, G317, A317, B317, C318, D318, E318, F318, G318, A318, B318, C319, D319, E319, F319, G319, A319, B319, C320, D320, E320, F320, G320, A320, B320, C321, D321, E321, F321, G321, A321, B321, C322, D322, E322, F322, G322, A322, B322, C323, D323, E323, F323, G323, A323, B323, C324, D324, E324, F324, G324, A324, B324, C325, D325, E325, F325, G325, A325, B325, C326, D326, E326, F326, G326, A326, B326, C327, D327, E327, F327, G327, A327, B327, C328, D328, E328, F328, G328, A328, B328, C329, D329, E329, F329, G329, A329, B329, C330, D330, E330, F330, G330, A330, B330, C331, D331, E331, F331, G331, A331, B331, C332, D332, E332, F332, G332, A332, B332, C333, D333, E333, F333, G333, A333, B333, C334, D334, E334, F334, G334, A334, B334, C335, D335, E335, F335, G335, A335, B335, C336, D336, E336, F336, G336, A336, B336, C337, D337, E337, F337, G337, A337, B337, C338, D338, E338, F338, G338, A338, B338, C339, D339, E339, F339, G339, A339, B339, C340, D340, E340, F340, G340, A340, B340, C341, D341, E341, F341, G341, A341, B341, C342, D342, E342, F342, G342, A342, B342, C343, D343, E343, F343, G343, A343, B343, C344, D344, E344, F344, G344, A344, B344, C345, D345, E345, F345, G345, A345, B345, C346, D346, E346, F346, G346, A346, B346, C347, D347, E347, F347, G347, A347, B347, C348, D348, E348, F348, G348, A348, B348, C349, D349, E349, F349, G349, A349, B349, C350, D350, E350, F350, G350, A350, B350, C351, D351, E351, F351, G351, A351, B351, C352, D352, E352, F352, G352, A352, B352, C353, D353, E353, F353, G353, A353, B353, C354, D354, E354, F354, G354, A354, B354, C355, D355, E355, F355, G355, A355, B355, C356, D356, E356, F356, G356, A356, B356, C357, D357, E357, F357, G357, A357, B357, C358, D358, E358, F358, G358, A358, B358, C359, D359, E359, F359, G359, A359, B359, C360, D360, E360, F360, G360, A360, B360, C361, D361, E361, F361, G361, A361, B361, C362, D362, E362, F362, G362, A362, B362, C363, D363, E363, F363, G363, A363, B363, C364, D364, E364, F364, G364, A364, B364, C365, D365, E365, F365, G365, A365, B365, C366, D366, E366, F366, G366, A366, B366, C367, D367, E367, F367, G367, A367, B367, C368, D368, E368, F368, G368, A368, B368, C369, D369, E

Appendix Y. Summary of post-intervention interview responses: iteration 2

	Question	Gloria	Jane	Maggie	Saira	Tammy
1	Which piece did you choose to write?	Together	Memory	Five Notes	Faces	Rhythm
2	Why did you choose this one?	I wanted to do them in order	Reminds me of a good memory	Because it's challenging	Because there's repetition, which is easy	Making rhythms is fun, makes me happy
3	What did you call your piece?	Different notes and Places	Best place ever	Different	Me!	F Piece
4	Why did you call it that?	There are lots of different notes in different places	It's about my favourite place	It moves to different places on the piano	Because I can make those expressions	Because there are so many Fs
5	When you were making your piece, were there any parts of it that reminded you of other music that you've heard?	No	No	No	No	No
6	Did you like having the help pages?	Yes	Yes	Yes	Yes	Yes
7	Which things did you use most often in the help pages?	Repeat, staccato	Legato	Same but different	Forte, repeat	Legato, forte, adagio, short pattern, starting note
8	Was it easier to make up your own music this term compared to last term?	Yes	Yes	Yes	Yes	Yes
9	Why do you think so?	I don't know	Because I'm older	I knew what to expect each week	I've done it before	I know all of the notes
10	Did you enjoy making up your own music?	(Interviewer omitted this question)	Yes	Yes	Yes	Yes
11	How does it feel to write your own piece?	Fine	Fun	Scary but fun	Hard, but good when it's done	Makes me feel free because I can do whatever I want
12	Did making up your own music make you like the piano more?	Yes	Yes	Yes and no. Yes - I could choose what to play. No - I always liked it anyway.	No - I always liked it	Yes
13	How did you feel when you played your piece for the others?	Fine	Nervous	Like I was practising at home	Embarrassed - I felt mine was different to the others	Scared, I thought the others wouldn't like it
14	How do you think composing has helped you with your other work on the piano?	I don't know	Bouncing rhythms	Learnt more notes	The help pages have taught me new things	I don't know
15	What was your favourite part of your piano lessons this term?	John Thompson, Big book, Drunken Sailor	Learning quavers	Scales	Big book - Little Playmates	Composing
16	What was your least favourite part of your piano lessons this term?	Scales	Theory homework	John Thompson - felt like revision	John Thompson - Ten little Dancers	Theory homework
17	Would you like to make up a new piece next term?	Yes	Yes	Yes	Yes	Yes
18	Which piece would you like to try next?	Apart	Five Notes	Apart	Memory	Together
19	Why would you like to do this one?	Because it's next	Because it's challenging	Because Gloria's one had differences	I have good memories that would make a good song	I want to try with hands together
20	What advice would you give other girls to make it easier for them to make up their own pieces?	Use the help pages, try your best	It gets easier	Try again	Pick a few notes that sound good together, then change them	Try hard, don't give up

Composition Book

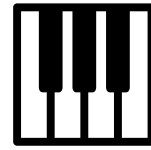


Name:

Getting Started



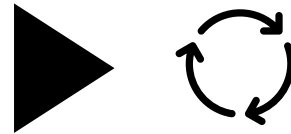
Decide first:
High/low, fast/slow, white notes/black notes.



Starting note:
Pick one note and find a few that sound good with it.



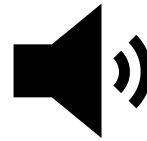
Make a short pattern.



Play your idea until it's easy to remember.



Write what you've got so far.



Sing your idea first.



Treble clef (high notes/RH)



Bass clef (low notes/LH)



Treble and Bass clefs together

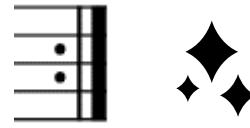


Repeat

Creative Ideas



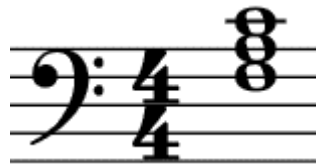
Make up some words



Repeat with a twist



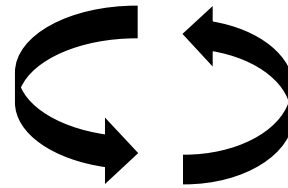
Blender: rearrange your idea



Chords



Look at other pieces for ideas



Ostinato
(Repeated pattern)



Hands together (2:1)



Hands together (4:1)



Same and Different



Theme and Variation

Piano Technique



Legato



Staccato

Pedal

Hold down the sustain pedal

p

piano (soft)

f

forte (loud)



Crescendo
(Getting louder)



Diminuendo
(Getting softer)

Allegro

Fast

Moderato

At a moderate speed (medium)

Adagio

Slow

Together

Place both hands in Middle C position and make a piece using these notes.

.....

A series of 18 blank musical staves, each consisting of five horizontal lines, arranged vertically down the page for writing a musical piece.

Apart

Place your RH 1st finger on Middle C and your LH 5th finger on C one octave lower.

.....

A series of 16 blank musical staves, each consisting of five horizontal lines, arranged vertically for musical practice.

Rhythm

Clap a pattern that sounds good and then play it on the piano.

.....

A series of 15 blank musical staves, each consisting of five horizontal lines, provided for writing a rhythm pattern.

Story

Make up a short story with a beginning, middle and end, and write music that tells this story.

.....

A series of horizontal lines for writing a story and music. The lines are arranged in groups of three, with a gap between each group. There are 12 groups of three lines each, providing a total of 36 lines for writing.

Five Notes

Choose five notes on the piano and make a piece using only these notes.

.....

A series of 15 blank musical staves, each consisting of five horizontal lines, arranged vertically for writing a piece of music.

Memory

Think of a favourite memory to turn into music. You can make up some words to help get started.

.....

Handwriting practice lines consisting of multiple sets of horizontal lines for writing.

Faces

Make a theme (tune) and use different expressions to create variations.

.....

A series of horizontal lines for musical notation, consisting of 20 groups of four lines each, providing a staff for writing a melody.

Movie

You are making the music for a movie. Imagine your movie first: think of characters, plot and what the movie looks like. Then write your music.

.....

A series of horizontal lines for writing music notation, consisting of 20 groups of four lines each, providing a staff for musical notation.



Free choice:
create your
own rules for
this piece.

.....

A series of horizontal lines for writing, organized into several groups of three lines each, separated by larger gaps.

Teacher's Page

Important guidelines:

1. Allow the pupil to take the lead and only intervene if necessary.
2. Free music-play should be encouraged.
3. Integrate composition into the term's work and into every lesson.
4. Set easy composition tasks for homework and ask the pupil to practise the new piece.
5. Draw the pupil's attention to the parts of their work that effectively demonstrate "good" composition: cohesion, novelty, balance and contrast.

Below are some useful strategies:



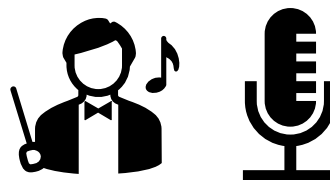
Teacher adds something.



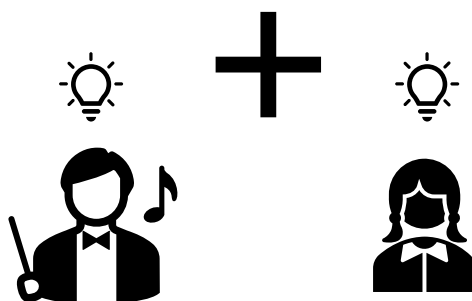
Teacher writes the idea.



Teacher plays the idea.



Teacher records the idea.



Combine two ideas

Appendix AA. Alex: summary of enactment, iteration 3

Lesson 1 (19 April 2023)

After I introduced the book, Alex quickly chose the Together page, because she believed that this was the easiest one. She seemed daunted by the prospect of inventing something new so I encouraged her to start experimenting with sounds in free play, which she did quite systematically, testing notes against each other to explore harmonic intervals. I was struck by how foreign the notes seemed to her, even though they were in the vicinity of Middle C, and although she had been playing these notes for years her approach to them indicated that they were somewhat alien. I observed that the free play had allowed her to get a sense of the sonic materials at her disposal, but she still seemed apprehensive about creating a tune, so I turned to the help pages and referred to the first few icons on the Getting Started page to generate a short pattern that constituted the first bar of her piece, which she notated herself. I noticed that Alex seemed to welcome the use of the icons as each presented a small problem that was easy to solve. Alex seemed to respond positively to the visually presented ideas that populated the Getting Started page and using these icons allowed her to engage in a systematic problem-solving approach that seemed to alleviate her initial apprehension, and promoted convergent processes in which she made decisions that resulted in a motif. For homework, I asked her to add another bar or two to the right-hand melody she had started, and to write them down.

Lesson 2 (26 April 2023)

This lesson started a few minutes late because the choir practice, which preceded it, had run overtime. Alex had forgotten her music books at home, so we could not write anything down, but she had done the homework and extended the right-hand melody. She played it from memory, which was not unusual for her because she had a tendency to memorise her work, so we were able to proceed without devoting much time to a recap. I suggested that we extend the piece and told Alex that since she had completed the first step, which was getting started, we should look at the next help page, Creative Ideas, to move the process forward. Alex set a short-term goal, which was to add a second line of melodic material. We went through this page systematically and selected five potential items that might be useful, and of these Alex chose Same and Different, which she interpreted as creating something different for the second line. I observed that she seemed to have a clear idea of what she wanted to do, which was to focus on the right-hand melody. In the absence of her composition booklet, I mentioned that this work would need to be completed at home, to which Alex responded by asking if she could go further than a second line on her own. This indicated to me that she enjoyed this work, which was confirmed by the fact that her own composition showed more evidence of preparation than her other work. This is not to say that she had neglected her other work as it had been well prepared, but her own piece seemed to have received a little more attention. In fact, I had passed her in the courtyard the previous afternoon, as she was making her way to a sports practice, and she had excitedly told me that she had added more notes to her melody, which had been the work she presented in this lesson.

Lesson 3 (3 May 2023)

The momentum that had been developed in the two previous lessons seemed to have been lost due to Alex having been away for the long weekend, during which time she had not had the opportunity to write the second line of melody as she had intended although she still remembered the first line, which saved us having to recap this material. Alex had changed her mind about the second line and no longer wished to have the right hand carry the melody. Instead, she chose to move the melody to the left hand, which we started but were unable to complete in the time available. For homework, I suggested that she complete the new left-hand melody. I observed that she seemed to be intrigued by the Blender icon and she mentioned that she would like to rearrange the first two bars of the right-hand melody so that it started on C, not D. This indicated to me that she was seeking a sense of symmetry between her two melodies, so I asked her to try this at home on her own as we had run out of time.

Lesson 4 (10 May 2023)

This lesson started late because Alex had forgotten her lesson time and I had had to collect her from her classroom. However, she had completed her composing homework and practised her piece, which saved time because we did not need to recap this work. In her previous lesson, she had shown an interest in

the Blender icon and had viewed this as an organisational tool on a micro level for revising the melody, not a tool to be used to make new material. She had in fact used this idea to make extensive revisions to the two lines she had written thus far, essentially applying the Blender idea at a macro level. She had adapted this tool and used it to suit her own creative imperatives and I observed that this had occurred in my absence. She had chosen to include repeats and chords, which were codified as icons, ideas that had been derived from the help pages and not through my direct input. She had written the notes herself and the only assistance she required from me in this lesson was to edit her work, correcting the notation to ensure that the music sounded as she intended. I noticed once again that familiar notes seemed foreign to her, which I suspected was due to them being approached in a novel way. In other words, these notes were no longer merely symbols to be interpreted and played, they were sonic materials that she was now manipulating. We had a discussion about what to do in the third line and used the help icons to clarify what we meant. It seemed that Alex intended to use the Repeat With a Twist icon and recycle a descending pattern from the second line to avoid the new section sounding entirely different. Towards the end of the lesson, she indicated that she would like to move beyond Middle C position in her next composition, which suggested to me that she was now comfortable working within this parameter and was ready to extend her work to a broader range of pitches.

Lesson 5 (17 May 2023)

Alex had forgotten to bring her music books to school and she had been very busy in the preceding week, preparing for her performance at a local music festival and participating in a number of sporting events. As a result, she had not yet completed the third line of her piece, so I was not able to assist her in this lesson. She played the first two lines and we discussed the options for the third, for which she still intended to use the Repeat With a Twist idea.

Lesson 6 (30 May 2023)

Alex had missed her piano lesson in the previous week because she was writing exams, but she had written the third line and memorised the piece. The notation of the new material was not entirely accurate, so I rewrote those parts to save time. She had also composed the ending independently at home, which I notated, so her composition, which she called *Changing Seasons* was complete.

Appendix BB. Emma: summary of enactment, iteration 3

Lesson 1 (20 April 2023)

I decided to introduce the booklet and start the piece in the same lesson to save time, as I had done with Alex, because this was an exam term, meaning that lessons would be lost once the learners started writing their mid-year exams. There were also public holidays scheduled for this term, which would lead to further lost lessons, so I felt that it would be prudent to spend extra time on the composing segment in this first lesson. Emma chose the Together page and I observed that she engaged in free play without any apprehension, and she easily started exploring patterns and experimented with black notes. However, she seemed a bit indecisive about settling on a motif, so I turned to the Getting Started page and together we worked through the first five icons, which seemed to facilitate the process. She started with a section for the hands to play together, which I notated, after which she extended the right-hand melody, which she wrote down herself, using her tutor book as reference. For homework, I asked her to write a few bars of melody for the left hand.

Lesson 2 (4 May 2023)

Emma had missed her previous lesson because that day had been a public holiday. She had completed her homework task and added a new line for the left hand, but some of the notes were written incorrectly, so I rewrote them with her guidance, checking to make sure that I was recording the notes that she had intended. I set the task for this lesson and asked her to write a third line. She decided that she wanted to write a section where the hands once again played together and without much experimentation she quickly settled on four bars in which the hands played in contrary motion. By the end of the lesson, she had written the right-hand notes herself, so for homework I asked her to write the left-hand part.

Lesson 3 (11 May 2023)

I observed that Emma had not practised her scales and other pieces much since her last lesson, but she had completed her composing homework, which was to add the left-hand notes to the new contrary-motion section. Some notes had been notated incorrectly, which I corrected, although I noted that there were fewer errors this time. Emma set the task in this lesson, which was to add two more notes. She seemed rather autonomous in her approach, and I observed that she was quite decisive and not very experimental. Emma did not struggle to invent new material, so the help pages were not used in this lesson. She wrote those notes that she was able to, and I notated the others, so notation was once again a shared task. I noticed that this piece had already progressed to a fourth line, which was much further than the two lines suggested in the lesson schedule. This rapid progress prompted me to assign a revision-oriented task for homework, which was to add a missing note to the sixth bar.

Lesson 4 (18 May 2023)

Emma had done her homework and had involved her mother by asking her to choose between two note options, which was most gratifying to me, as a teacher, because parental involvement is crucial to children's learning and their notions about the importance of their work. As a researcher, this indicated that Emma's composing work had transcended the school-based learning environment characterised by the pupil/teacher dyad and had infiltrated the home environment. Emma's piece was now four lines in length and was at the extreme limit of her reading ability. I surmised that if it became any longer she would begin to find it very arduous to play, so I suggested that we make only one last bar to finish it off. I observed that she was once again completely in control of the process and instinctively gravitated towards the C and E of the tonic triad, which I notated and used as an opportunity to consolidate concepts, namely note values and the double bar-line, that we had recently covered in her theory workbook. Emma completed her composition, called *Memories of my Granpa*, three weeks ahead of the piano party, leaving ample time to polish its performance.

Appendix CC. Khanya: summary of enactment, iteration 3

Lesson 1 (17 April 2023)

I chose to introduce the composition booklet and commence work on the composition in the same lesson, as I had done with Alex and Emma. Although this required a significant amount of time, I thought that this would be an efficient use of time, knowing that lessons would be compromised later in the term due to public holidays and academic exams. Khanya chose the themed page called Rhythm, and she seemed to be comfortable engaging in free play as she explored potential rhythmic patterns. She settled on a pattern that contained a dotted rhythm, which she had not yet encountered in her piano lessons, and which I had not planned to introduce this year. I wrote this pattern on the blank page adjacent to the themed page and then I guided her in transferring her rhythm to the piano incrementally, initially playing it on one pitch and then experimenting with others until she found a motif with which she was satisfied. I affirmed her motif to conclude this structured play so that we could proceed to the writing of the pitches, which she did in the form of letter names written beneath the note heads on the blank page. For homework, I asked her to invent a second melody, using the same rhythm as the first, and to write it down as letter names as she had done in the lesson.

Lesson 2 (25 April 2023)

Khanya had not prepared her other repertoire, so the majority of the lesson was devoted to this work, particularly the piece that she was meant to play at an upcoming music event. However, she had completed her composing homework, although she had created a new rhythm instead of a new melody using her previous rhythm. In the absence of sufficient time to work on this second motif, I assigned this task for homework and asked her to create a third one as well. I was aware that this was a fair amount of work for her to complete on her own, particularly since she had just begun composing in the previous lesson, but I had observed that she was very capable of independent creative work in our previous session, and I wanted her to make as much progress as possible because I knew that her next lesson would be lost due to a public holiday.

Lesson 3 (9 May 2023)

I had not seen Khanya the previous week due to the public holiday and she had not practiced her standard repertoire, but I noted that she had completed her composition homework, and she was able to play these three phrases with only a little assistance. Her work thus far had been notated as letter names on the blank page adjacent to the themed page and I knew that she would need to write her piece in staff notation at some point, so I offered her a choice. She could either notate her music on the staves or compose a new section to be written as letter names. She chose to notate the existing material on the staves, and I initiated this task by writing the first bar, after which she took over. By the end of the lesson, she had made a significant start on her own notation, so I asked her to complete this task for homework.

Lesson 4 (30 May 2023)

Khanya had missed the last two lessons because she had been absent two weeks prior to this lesson and had written mid-year exams the week after. This meant that she needed to complete her piece in this session because the piano party was scheduled for the following week. She had not practised for this lesson, but I once again noted that she had completed her composing homework. Although she had written her three phrases in staff notation, she seemed to find it easier to read from the letter names she had initially written. I set her the task of creating an ending, which she did by experimenting with various notes before settling on a pattern. She did not seem to find this difficult, and we did not need to refer to the help pages, so her ending came together rather quickly, which I notated to save time. Although Khanya had missed three lessons, she managed to complete her piece, called *The Princess Step*, in time for its performance at the piano party, although I felt that this lost time had limited the length and scope of her composition.

Appendix DD. Neela: summary of enactment, iteration 3

Lesson 1 (20 April 2023)

As had been the case with the other participants, the composing portion of this first piano lesson was rather long because I introduced the composing booklet and Neela started working on her chosen themed page in the same lesson. She chose the Together page because, as she told me, Middle C position was familiar to her. This was a pragmatic approach and I observed that she did indeed seem to be comfortable experimenting with these pitches during free play. Her exploration of the notes seemed to transition to structured play organically, without my assistance, and she settled on a motif without difficulty and was able to repeat it without errors. The help pages were therefore not necessary, and she chose to notate her work herself, which surprised me because she had been taking piano lesson for only three months. I had anticipated, because she was very much a beginner, that her lack of experience might cause some apprehension about notation because she had not yet attempted to write these pitches in her theory exercises and the task might seem daunting. But this was not the case, and by the end of the lesson, Neela had written three bars and I asked her to add two more at home.

Lesson 2 (4 May 2023)

Neela had missed her lesson in the previous week because it had fallen on a public holiday. She had left her music books at home, but it was clear that she had practised her piece because she had memorised it. I asked her if she had used any of the help icons while working independently and she confirmed that she had found Write What You've Got So Far helpful. I observed that Neela seemed to find composing very easy, and she told me that she had started working on the third line, which was much further than the two bars suggested by the guideline. In the absence of her book, we were unable to extend the piece in this lesson, so I asked her to complete the third line at home.

Lesson 3 (12 May 2023)

Our lesson started 12 minutes late because line-up announcements had taken longer than usual after breaktime. Neela had practised all of her standard work and she had done her composing homework. In fact, she had gone beyond the third line and completed the piece, consisting of six lines, which she called *A Night in a Big City*. She played the piece and I noted that her notation was accurate, meaning that each note's vertical position and duration had been written precisely as she had intended it to sound. She had omitted a few bar-lines, which she added, after which I drew her attention to the sense of balance she had created by using both long and short notes. I also encouraged her to consider how the piece should be played in terms of articulation and she chose the *legato* icon from the first help page that contained icons related to piano technique. Neela's composition was entirely monophonic and although I suspected that she might be capable of including a second, harmonic part, I did not want to undermine her autonomy by making this suggestion.

Appendix EE. *Changing Seasons* by Alex, iteration 3

Together
Place both hands in Middle C position and make a piece using these notes.

Changing Seasons.....

The image shows a handwritten musical score for a piece titled "Changing Seasons". The score is written on six systems of grand staves (treble and bass clefs joined by a brace). The key signature is one sharp (F#) and the time signature is 4/4. The notation is as follows:

- System 1:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a whole rest, followed by a series of eighth notes: G3, A3, B3, C4, D4, E4, F4, G4, A4, B4, C5.
- System 2:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a quarter note G3, quarter note A3, quarter note B3, quarter note C4, quarter note D4, quarter note E4, quarter note F4, quarter note G4, quarter note A4, quarter note B4, quarter note C5.
- System 3:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a quarter note G3, quarter note A3, quarter note B3, quarter note C4, quarter note D4, quarter note E4, quarter note F4, quarter note G4, quarter note A4, quarter note B4, quarter note C5.
- System 4:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a quarter note G3, quarter note A3, quarter note B3, quarter note C4, quarter note D4, quarter note E4, quarter note F4, quarter note G4, quarter note A4, quarter note B4, quarter note C5.
- System 5:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a quarter note G3, quarter note A3, quarter note B3, quarter note C4, quarter note D4, quarter note E4, quarter note F4, quarter note G4, quarter note A4, quarter note B4, quarter note C5.
- System 6:** Treble clef has a quarter note G4, quarter note A4, quarter note B4, quarter note C5. Bass clef has a quarter note G3, quarter note A3, quarter note B3, quarter note C4, quarter note D4, quarter note E4, quarter note F4, quarter note G4, quarter note A4, quarter note B4, quarter note C5.

Appendix FF. *Memories of my Granpa* by Emma, iteration 3

Together
Place both hands in Middle C position and make a piece using these notes ...

Memories of my granpa

The image shows a handwritten musical score for a piece titled "Memories of my granpa". The score is written in 4/4 time and consists of four systems of piano accompaniment. Each system has a grand staff with a treble and bass clef. The notes are simple, using only quarter and eighth notes, and are positioned in the middle C position. The first system has 8 measures, the second has 8 measures, the third has 8 measures, and the fourth has 8 measures. The piece ends with a double bar line in the final measure of the fourth system.

Appendix GG. *The Princess Step* by Khanya, iteration 3

Rhythm

Clap a pattern that sounds good and then play it on the piano.

The Princess Step.....

The image shows three systems of handwritten musical notation for a piano accompaniment. Each system consists of a grand staff with a treble clef on the upper staff and a bass clef on the lower staff. The time signature is 4/4. The first system has a treble staff with a melodic line and a bass staff with a simple accompaniment. The second system continues the melody and accompaniment. The third system concludes the piece with a final melodic phrase and accompaniment.

Appendix HH. *A Night in a Big City* by Neela, iteration 3

Together
Place both hands in Middle C position and make a piece using these notes.

A night in a big city...

The image displays a handwritten musical score for a piece titled "A Night in a Big City". The score is written on six systems of grand staves, each consisting of a treble and bass clef. The music is in 4/4 time and G major. The notes are simple, using quarter and eighth notes, and are arranged in a way that is easy for a child to play. The first system starts with a treble clef and a key signature of one sharp (F#). The melody in the treble clef moves up and down, while the bass clef provides a simple accompaniment. The piece concludes with a final chord in the bass clef.

Appendix II. Summary of post-intervention interview responses: iteration 3

	Question	Alex	Emma	Khanya	Neela
1	Which piece did you choose to write?	Together	Together	Rhythm	Together
2	Why did you choose this one?	It seemed easy	It seemed easy	Rhythms have a nice flow	I want to focus on this position and move further away when I'm more comfortable
3	What did you call your piece?	Changing Seasons	Memories of my Grandpa	The Princess Step	A night in a big city
4	Why did you call it that?	The sound of the different sections reminded me of seasons.	It sounds like memories	The sound reminds me of princess movies	It just came to me
5	When you were making your piece, were there any parts of it that reminded you of other music that you've heard?	Yes, but I don't know what	No	Not really	Yes, a song that was probably on TV but I can't remember which one
6	Did you like having the help pages?	A little	Yes	Yes	Yes
7	Which things did you use most often in the help pages?	Repeat	I can't remember	Clefs	Legato
8	Was it easy to make up your own piece of music?	Sort of	No	Sort of	Sort of
9	Why do you think so?	It became easier once I started	I couldn't write all the notes	I did it in steps	I really had to think about which notes to use
10	Did you enjoy making up your own music?	Yes	Yes	Yes	Yes
11	How does it feel to write your own piece?	Good	Beautiful	Very nice	Proud
12	Did making up your own music make you like the piano more?	Yes	Yes	Yes	Yes
13	How did you feel when you played your piece for the others?	Happy	Fine	Nervous	Excited
14	How do you think composing has helped you with your other work on the piano?	Not sure	To know where the notes are	To know where the notes are	To know the notes better
15	What was your favourite part of your piano lessons this term?	Exam pieces	Piano party	Composing	Composing
16	What was your least favourite part of your piano lessons this term?	Singing	There wasn't one	I don't know	Theory
17	Would you like to make up a new piece next term?	Yes	Yes	Yes	Yes
18	Which piece would you like to try next?	Story	Free choice	Together	Apart
19	Why would you like to do this one?	I like telling stories and it links with class work	I can move my hands anywhere	I can use both hands	Because now I'm used to the together position
20	What advice would you give me to make it easier for other girls to write their own pieces?	Keep it simple, details can be added	The teacher is there to help	Hear the sound in your head first, then clap it, then find notes	When writing notes, test new ones to see if they fit.