Using Music: From Spontaneous to Scientific Concepts in the Primary School Writing Classroom

Ruth Round
Auckland, New Zealand

Graham McPhail
University of Auckland, New Zealand

Abstract

Recent developments in the sociology of education highlight the importance of the school as a site for the transformation of students' everyday knowledge into a more ordered and systemised form that provides the means for the development of creative conceptual higher order thinking. However, in recent times there has been a shift towards a dedifferentiation between knowledge and experience in education as well as a shift in the conceptualisation of the role of the teacher from expert pedagogue to facilitator. In this paper we report on the work of one of the authors whose approach to music teaching in the primary school may be seen to exemplify Vygotsky's ideas about the purpose of education and the role of the teacher. In the former, the purpose of education is to provide the context for the exposure to a form of mediated learning. In the later, the teacher takes on the expert role of mediator in

assisting students in making developmental connections between spontaneous concepts and scientific concepts. Interestingly while achieving this within a literacy context, Round (the teacher in this study) also found students' musical knowledge was developed and enhanced.

Introduction

Recent developments in the sociology of education highlight the importance of the school as a site for the transformation of students' everyday knowledge into a more ordered and systemised form that provides the means for the development of creative conceptual higher order thinking (Young, 2009; Rata, 2015; Winch, 2013). Vygotsky expressed this idea through his theory of mediated learning and scientific concepts in which the role of teacher is pivotal (Vygotsky, 1934/1986; Karpov, 2003). But in recent times there has been a dedifferentiation of knowledge and experience in education (Muller, 2006; Rata, & Taylor, 2015), as well as a shift in the conceptualisation of the role of the teacher from expert pedagogue to facilitator (Biesta, 2012)[1]. To a large degree this has been driven by social justice and democratic educational aims; educators want to recognise students' prior knowledge as important, particularly their cultural knowledge, both in a therapeutic or affective sense, and also often as a source of knowledge in the curriculum itself. We suspect, however, that Vygotsky and Dewey – both often labelled as constructivists – would find the extent of these more recent developments towards equating socio-cultural knowledge and academic knowledge as troubling and a misinterpretation of the way in which they both theorised the relationship between experience and formal learning (Rata, 2015; McPhail, 2016).

In this paper we report on the work of one of the authors whose approach to music teaching in the primary school may be seen to exemplify Vygotsky's ideas about the purpose of education and the role of the teacher. In the former, the purpose of education is to provide the context for the exposure to a systemised form of mediated learning: introducing children to the collective symbolic knowledge of the society of which they are a part. In the latter, the teacher takes on the expert role of mediator in assisting students in making developmental connections between spontaneous concepts and scientific concepts. Interestingly while achieving this within a literacy context, Round (the teacher in this study) also found students' musical

---

[1] Dedifferentiation refers to the decreasing differentiation in constructivist education approaches between socio-cultural knowledge and disciplinary knowledge (Vygotsky's everyday and scientific concepts). See Muller (2006).

knowledge was developed and enhanced (Round, 2014).

Firstly, we examine in more detail Vygotsky's concepts of scientific and spontaneous knowledge and then we use Round's work in music to illustrate mediated learning in the form of the recontextualising of students' experiences as heading towards something more fully formed and conceptual.

Knowledge and experience – a theoretical background

The role that students' prior knowledge and the role that experiential learning should play in the curriculum has been an educational concern throughout the twentieth and twenty-first centuries. The American philosopher of education John Dewey is generally regarded as the champion of the modern progressive view that education should place the needs and interests of students at the centre of its concerns. This should be achieved by acknowledging and utilising students' prior learning and experiences through a student-centred pedagogy of active participation (Noddings, 2012). Nevertheless, Dewey (1938) was clear that (i) utilising experience was a complex rather than straight-forward challenge for teachers and (ii) that the content of the curriculum needed to retain an emphasis on disciplinary knowledge. This is the approach taken by the researchers in this paper. Two passages from Dewey's 1938 book *Knowledge and Experience* make these matters clear:

> The belief that all genuine education comes about through experience does not mean all experiences are genuinely or equally educative… for some experiences are mis-educative. Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience. (1938, p. 25)

Dewey continues:

> But finding the material for learning within experience is only the first step. The next step is the progressive development of what is already experienced into a fuller and richer and also more organised form, a form that gradually approximates that in which subject-matter is presented to the skilled, mature person. (1938, p. 73)

At around the same time as Dewey formulated his philosophy in the U.S., the Russian psychologist Lev Vygotsky was considering similar educational concerns in a very different socio-cultural context in the Soviet Union. One of Vygotsky's insights was to advance a non-individualist theory of human cognitive development. In contrast to Piaget, for example, Vygotsky argued that human psychological development could only be accounted for by acknowledging its sociality: "at the heart of Vygotsky's theory lies the understanding of human cognition and learning as social and cultural rather than individual phenomena"

(Kozulin, Gindis, Ageyev, & Miller, 2003, p. 1). Within this context of human development as a social process Vygotsky developed his doctrine of scientific and spontaneous concepts; a differentiation of knowledge comprising everyday, unstructured knowledge and experience on the one hand, and structured, disciplinary knowledge on the other. Spontaneous concepts "are the result of experience in the absence of systematic instruction … such concepts are unsystematic, not conscious, and often wrong" (Karpov, 2003, p. 65). Despite this problem with spontaneous concepts Vygotsky saw them as vital in establishing the foundations for the cognitive development required for understanding scientific concepts. The term *scientific* here is used by Vygotsky in a broad sense as referring to systemised forms of disciplinary knowledge, found not only in the sciences but also in the social sciences and humanities. Drawing directly on Vygotsky, Karpov (2003) and Rata (2015) argue that the acquisition of scientific concepts transforms students' thinking and their understanding of their spontaneous thoughts and experiences:

> Students' spontaneous concepts become structured and conscious … as a result, students' thinking becomes much more independent of their personal experience. They become 'theorists' rather than 'practitioners' and develop the ability to operate at the level of formal-logical thought. (Karpov, 2003, p. 66)

Moreover, as Rata (2015) points out, the role of the teacher and of instruction is significant in setting up the space for these transformations to take place:

> The idea that teachers start with scientific concepts or abstract concepts and then draw on everyday knowledge, which is itself transformed in the process, has profound consequences for teaching. It moves academic knowledge and the knowledgeable teacher to the central position at school, but *does not exclude the child's contribution to learning* (Rata, 2015, p. 177) [italics in original].

The teacher requires extensive knowledge of the epistemic structure of the area they are teaching, and the ability to transform this structure for epistemic ascent (Winch, 2013).

This approach is somewhat in contrast with much current constructivist literature (e.g., Fosnot, 2005; O'Connor & Greenslade, 2012) that appears to suggest students need to discover scientific concepts themselves. There is an important distinction to be made between constructivist ideas that are focused on pedagogy such as Vygotsky's, and those that endorse the idea of students actually constructing knowledge itself (Fosnot, 2005; O'Connor & Greenslade, 2012). The status of knowledge is quite different in these two scenarios (McPhail, 2016). In the first scenario knowledge exists as something real in the world, historically and culturally developed over time, tested, and then available to be encountered by students under

the guidance of the teacher (Popper, 1978). In the second, knowledge only exists as it comes into being in the mind of the knower (Fosnot, 2005).

These distinctions have major implications for pedagogy and the role of the teacher. In strong contrast to constructivist views of the teacher as a facilitator, and of knowledge as often constructed by students (Phillips, 2000), Vygotsky saw the teacher's role as one of mediator in the pedagogical manoeuvres required to take the child from the realm of experience towards understanding that experience. This is the role undertaken by the teacher in this research, for example she chooses the music for the students to listen to as they do not have the experience to do so. The justification for using classical instrumental music is twofold: one is for its abstract nature which may provide students' imagination free reign, and the other is that it is more likely to be outside the students' realm of experience thus it provides a new experience. As Muller (2001) suggests, in most instances the teacher needs to know the conceptual destination of the learning journey. Vygotsky (1986) wrote that "the only good kind of instruction is that which marches ahead of development and leads it" (p. 188). However, this is not didactic, rote learning, but a pedagogy in which students must engage with concepts and put them to work in some way (Karpov, 2003; Haenen, Schrijnemakers, & Stufkens, 2003). To achieve this recontextualising of the every-day or "horizontal knowledge" of the learner (Bernstein, 1999) the teacher requires a high level of disciplinary knowledge: knowledge of "scientific" concepts in the Vygotzkian sense. The teacher also needs the ability to recontextualise this knowledge in such a way that it is made available to students eventually through connections backwards and forwards between the experiential and conceptual realms. Vygotsky's concept of the zone of proximal development (ZPD) is useful here as a metaphor for imagining a space where "everyday concepts of the child meet 'scientific' concepts provided by the teacher" (Kozulin, et al., 2003, p. 3).

Karpov (2003) notes that Vygotsky did not develop his doctrine of knowledge types in any specific way related to curriculum enactment, and that this has been the task of many post-Vygotskian scholars and researchers (see for example Kozulin et al., 2003). Vygotsky's ideas "provide a good theoretical basis for the analysis of what the content and process of school instruction should be to meet educational goals" (Karpov, 2003, p. 66-67). We hope in the present study to contribute to the discussion of how such approaches might be enacted, in this case within the primary school classroom utilising music as a primary means for mediation of learning.

Method

The empirical data reported on in the following sections explore the approach of one of the authors in utilising music listening as an aid to literacy development in educational settings.

Hansen, Bernstorf, & Stuber (2004) and Thwaites (2008/2009) cite a range of research that supports this approach. Kerchener (2014) also cites research that identifies children's creative notations of musical sounds and makes parallels between creative writing and invented musical notations (pp. 88 - 89). The model used in this study is derived from Haenen, Schrijnemakers, and Stufken's (2003) application of Galperin's mental action theory**.** Figure 2 outlines the key dimensions of the model which are discussed more fully below.

The data were collected over an eight-week timeframe (one-hour teaching sessions twice a week) in an English speaking primary school in a context focusing on both poetic and narrative writing. The teacher visited as a specialist and utilised a number of approaches derived from Galperin's work in her pedagogical approach (Haenen, Schrijnemakers, and Stufken, 2003). Data were collected from nine students aged eight and nine years of age. These children were part of a class of twenty-four students who had returned permission slips allowing them to take part in the research. Data including graphic organisers (visual representation of facts, concepts, or ideas) and field notes were collected and two semi-formal individual interviews were conducted with nine students at the beginning and the end of the research period. The focus for this paper is the work of 'Billy', one of these students. The classroom teacher assigned national curricular levels for the students' writing derived from the National Curriculum and the school's benchmarks for unassisted student writing. These levels were assessed again after the research (*see* https://e-asttle.tki.org.nz/Teacher-resources/Marking-resources-for-as-asTTle-writing*)*. Analysing the children's work from their graphic organisers required a qualitative approach which was aligned with the information gathered in the two interviews. This was important so that a better understanding of the student's thinking could be reached. The key concepts for the analysis are derived from Vygotsky's theoretical writings (1934/1987), in particular, the concepts of spontaneous and scientific concepts, and Galperin's extension of Vygotsky's ideas concerning the lesson structuring approaches of orientation to task, use of models, and educational dialogue (Haene, Schrijnemakers, & Stufkens, 2003, p. 254).

Methodologically the present paper draws on a realist or conceptual approach to assert its validity, a methodology in which abstract concepts in interaction with the empirical data are utilised as tools for creating theoretical meaning (Sayer, 2000; Rata, 2012; Lourie & Rata, 2015; McPhail, G & Lourie, 2017; Popper, 1978). As well as the graphic organisers and interview responses, the self-reported experiences of the teacher and the reported experiences of students recorded as field notes, serve as the empirical qualitative data.

Results

We begin this section with a vignette (Suter, 2012) aimed at describing the author's work in action, where vignettes are understood as "very brief stories … commonly used by qualitative

researchers to support an assertion" (Suter, 2012, p. 43). We then discuss the connections between the author's approach to teaching and the way it exemplifies aspects of Vygotsky's ideas in action.

Vignette: The first listening to "Evening Prayer"

It is a Tuesday morning, and this is the second lesson with this class. In the first lesson I had introduced the music-assisted pedagogy to the students by discussing the different ways music accompanies our lives, and the fact that different areas of our brain are activated when we listen to music. I played the video clip *Brain conducts a neural orchestra* (Rate My Science, 2012) to the students to reinforce the concept of listening to music also as an educational tool. I also read them the book *Here Comes Frankie* (Hopgood, 2008) to introduce abstract symbolism with the listening experience. On this day the class teacher called the roll and settled the class for my special music teaching session. My teaching objective for the lesson is to introduce *Evening Prayer* by Englebert Humperdink (Humperdink, 1994) for the children to listen to, and then to get them to represent their thinking and ideas in various ways using a graphic organiser. I tell the class the composer's name, date of birth (1854), and country of origin (Germany). I don't tell the children the title of the music so as not to unduly influence their responses. I ask then to sit quietly and allow their minds to wander as they listen. The main intention for this part of the lesson is to encourage imaginative thinking to be represented in images and words; the class teacher has identified vocabulary development as a need for the class overall.

I turn the music on for the first time and notice many of the children sitting silently with their eyes closed until the music has finished. Some are 'conducting' in time, swaying to the music and at some stages, drawing shapes of the music in the air. As the music stops there is a palpable silence, which I eventually interrupt by asking the children what they were thinking about. Again, there is silence as 24 pairs of eyes look at me with not one hand being raised. Since the class teacher had identified the lack of confidence with sharing ideas and vocabulary as learning needs, I try to encourage the children by then asking if they could think of any words to describe the music or how it made them feel. Eventually a number of children share their thinking: it was "quiet", "calm". One student remembers hearing the music in a cartoon she had watched, while another states that "harmonies are the mood."

I give a demonstration of how I want them to fill in a graphic organiser before sending the children to their work tables. They can choose anything they like, i.e. colour palettes, illustration, words, write a draft of the poem (I see ..., I feel ... etc.) or colour in an emoticon. Quick to go to their self-selected tables and settle to the task while listening to the music again, I soon notice most of the students drawing pictures or colouring in their palettes. Not one child is copying anyone else as they set to work, with the quiet, introspective atmosphere

of the class reflecting the mood of the music they are listening to.

After the *Evening Prayer* has played three times, I ask the students to return to the mat on the floor. I gather in the graphic organisers while the children tidy up their work tables. I then begin to question the children again, to see if they have any responses that they want to share with the class. The children now show more confidence and some excitement, and they eagerly put up their hands. I am astounded to hear the wide variety and quality of the ideas and vocabulary. One child answers "calm", another says "settled". One child shares "sad" another replies "heartbroken and devastated". Other students describe the affect that the listening to music can invoke: "hidden and small", "powerful and strong". As a child announces that he felt "dehydrated" another responds by saying he could hear "chirping". Not only are the children coming up with a wide variety of words, but they are showing full understanding of the meanings of the words. The lesson ends with this sharing session. Two students help me to pack my resources away into my suitcase and then sit quietly on the mat waiting with the rest of the class. I thank them for their participation and wonderful work before handing over to the class teacher to continue the daily teaching programme.

Figure 1. Example of a child's graphic organiser to Evening Prayer

Mediated Learning

In New Zealand education, National Standards establish the expected level of writing abilities for students by years of schooling (Ministry of Education, 2009, p. 8). Some of the writing requirements expected of a student at the end of Year 4 (ages eight and nine) include using simple and compound sentences which vary in length and sentence starters, include words and

phrases which clearly convey ideas, experiences, or information, i.e., verbs, nouns, adverbs, and adjectives (Ministry of Education, 2009, p. 27). In Billy's pre-research writing – known as an unassisted recount (Ministry of Education, 2017) – he used basic adjectival phrases, simple verbs, and simple sentence structures, possibly reflective of his oral English language ability, which were often phonetically but incorrectly spelt. In accordance with the National Standards and the benchmarks set and levelled at the school, Billy's class teacher rated his writing to be at the beginning of his expected level. Based on information about the class as a whole I decided that the key learning points for the series of lessons using a music-assisted literacy approach would be to develop vocabulary, more descriptive imagery, and the use of a personal voice. The first step in this process involved the students recording ideas that were stimulated through listening to music onto a multi-modal graphic organiser.

Music-assisted literacy lessons are based on the premise that listening to music provides a stimulus for thought and ideas which are then further developed in the speaking and listening activities. Any music knowledge developed in this writing process is a learning by-product. The multi-modal graphic organiser (see Figure 1) provides the students with a semiotic tool to record and brainstorm their spontaneous and perceptual thinking throughout the listening experience. Subsequently ideas are developed through the cooperative speaking and listening activities. This music-aided process provides the opportunity to develop students' confidence to share and compare ideas in more detail. Hansen, Bernstorf, & Stuber (2004) and Thwaites (2008/2009) cite a range of research that supports this thinking. According to Kerchener (1996) listeners construct and assign meaning to musical relationships and patterns in imaginative ways, through mental representations of the music during repeated listening (p. 12).

The planned creative writing activities were designed to develop the scientific concepts of vocabulary and descriptive imagery in the children's writing and were based on Galperin's mental action theory as discussed in Haenen, Schrijnemakers, and Stufken, (2003, p. 247). Galperin's theory emphasises the importance of both the teacher and the student's peers on conceptual change in the learner. This change is an induced learning experience that begins with the prior knowledge in the student's mind (everyday concepts) and the importance of teacher planned activities to develop learning in the classroom (p. 247). It is hypothesised that listening to instrumental music selected by the teacher will help stimulate ideas and memories which are symbolised in a variety of ways into the graphic organiser. The title of the music is not revealed to the students until after they have completed their graphic organisers to reduce the likelihood of their responses being influenced by this. The graphic organiser is designed to be a tool for conceptual change where perceptions can be recorded, talked about, and then modified before writing. It is hoped that student agency will be developed as the originality of each student's ideas is encouraged and valued.

Galperin's mental action theory

Galperin's mental action theory comprises levels of abstraction at material, perceptual, verbal, and mental levels. Three key steps were utilised: (i) orientation to the task, (ii) use of models, and (iii) educational dialogue. Galperin argues that students need to be systematically oriented to a task in order for them to have an understanding of the intended learning.

Students' conceptual change in the vignette: developing academic concepts through listening to music based on Galperin's Four Levels of Abstraction (Haenen, Schrijnemakers, & Stufkens, 2003, p. 253)		
Empirical Social Process: spontaneous concepts of the learner	*Teacher as mediator of the music process organises the resources required to meet the learning objectives. These include the music for the children to listen to, graphic organisers, writing and drawing materials, and additional resources required to teach and support the music-assisted pedagogy.*	*Theoretical Academic Process: developing scientific concepts of the learner*
Unstructured knowledge and experience	**1. Materialized Level:** the action is performed with the use of physical objects e.g., pictures, diagrams. *Orientation to the task:* Use a scaffolded approach in the teaching process using a variety of resources e.g., picture books, charts. *The use of models:* The use of picture books and graphic organisers to introduce the use of colour, symbol, and visual imagery to record thinking generated through the listening process. The use of a graphic organiser as a multi-modal priming tool to signify perceptions and ideas generated through listening to the music i.e. **spontaneous concepts.** To record appropriate and authentic ideas by modifying and editing.	Transforming students' everyday knowledge into a more ordered and systematic form Understanding symbolised texts to represent knowledge in a multi-modal way
• Socio-cultural associations • Vocabulary, prior knowledge, symbolic representations • Affective experience / valence • Nostalgic awareness	**2. Perceptual Level:** the action is based on the information stored in images and performed without actual hands-on manipulation of physical objects. The teacher observes the students in their first listening experience e.g., air conducting and drawing shapes, swaying in time. To use a whole language and holistic approach, mind wandering, thoughts / ideas / imagination, using the 'materialized level' as a point of reference to construct from.	Creative writing in structured academic text
Independent thinkers	**3. Verbal Level:** The action is performed speaking aloud - no external objects are needed. Use of everyday language to encourage flexibility and divergence of ideas. Speaking and listening activities in paired, small group, whole class activities, and also the researcher to discuss and share ideas and interpretation of the music.	Students become practitioners in the creative writing process
	4. Mental Level: The action is performed exclusively "in the mind" where both external objects and audible speech are no longer necessary. Ideas and thinking are modified and transferred into independent formal writing i.e. **scientific concepts.**	

Figure 2. Galperin's mental action theory

The use of a graphic organiser (model) provides the students with an opportunity to visualise and externally represent their thinking which can be recorded and used in discussion in subsequent cooperative learning activities. Their developing thinking is also supported by educational dialogue (Haenen et al., 2003, p. 254). The importance of educational dialogue (speaking aloud with no other materials) is fundamental in this process of developing an awareness of the learning intentions and an understanding of the class activities. This dialogical approach with the teacher and with other students provides the opportunity to clarify understanding of the task. Whole class, small group, and paired discussion activities provide the opportunity for the students to share their thinking and develop the confidence to be more actively involved in the learning activities. Students can compare and share ideas as well as develop a wider bank of vocabulary for use in their work. The whole class discussion times enable the students to focus on listening and watching the teacher introduce and model the required skills and resources to be used.

Orientation to task: Scaffolding of students' understanding and use of supportive texts

Before each listening experience a book was read to the students as a stimulus and as a means to scaffold them towards the writing objectives. For example in the very first lesson (that preceded the vignette above) *Here Comes Frankie* (Hopgood, 2008) was used to introduce the students to the concept of colour to represent sound. In a subsequent lesson *On an Ordinary School Day* (McNaughton, 2005) was used to encourage independent imaginative thinking in the listening experience. The book provides an example of a young person whose imagination is stimulated by listening to music on an old gramophone and is therefore suggestive of the aims of the music enhanced lessons that the students in this research were about to experience. In lesson one the students also watched a brief video clip called *Brain conducts a neural orchestra* (Rate My Science, 2012), a short documentary that discusses the neural processing that accompanies listening to music. In other lessons Bach's *Toccata and Fugue* (Bach 1940/2011) on DVD and Malinowski's animated score of Vivaldi's *Spring* (Vivaldi, 2004) were also shown to introduce the concept of graphic notation. Two other activities were included later in the series of lessons to help develop awareness of different music sounds. "Sound Sizzlers", a game of transferring rhythms to different timbre sources, introduced the children to awareness of phonetic sounds and timbre. They were also shown a range of graphic notation cards and then divided into groups and given a card to interpret through creating a short soundscape using phonetic sounds and classroom instruments (Round, 2014, pp. 35 - 36).

Use of models and educational dialogue

In one of the lessons (see vignette) the children were required to write a senses poem to represent their thinking and feelings as a result of listening to *Evening Prayer* from the opera *Hansel and Gretel* by Englebert Humperdink (1994) who composed the music between 1891-92 before it was published in 1894. The music-assisted literacy pedagogy and the graphic organiser were introduced to the students using spoken instruction from the teacher in order to orient and provide clarity for what the students were about to do and learn. To develop student agency an emphasis was placed on the importance of the students recording their own ideas and not copying anyone elses. It was stressed that all responses that could be justified would be considered correct. It was most important for the students to have freedom of choice in filling in any part of the graphic organiser (see below).

Subsequent lessons developed the childrens' ability to write a narrative stimulated by a different piece of music, Telemann's *Affetuoso* in his *Essercizii Musiici* (Telemann, 2001). One of the music learning intentions was for the students to develop a more discerning ear by listening to the three distinct voices of the trio, i.e., the alto recorder, cello, and harpsichord, and then creating their own graphic notation of this. They were also shown a YouTube clip of

Bach's "Toccata and Fugue" in the Walt Disney's DVD *Fantasia (*Disney, 1940*),* and undertook the "Sound Sizzlers" activity (as described above). After listening and responding in this way they were given a variety of coloured graphic notation cards and asked if they could perform these using some of the untuned percussion instruments in the classroom. The book *Stephen's Music* (Laguna, 2007) was read to them as a way of introducing more descriptive imagery and literary devices such as simile. Discussion activities were also included to provide task clarity and to continue to develop confidence to share ideas. As the aim was also to create and provide examples of descriptive language and similes, students were given models and examples of these for their narrative writing.

The final few lessons required the children to independently fill in their graphic organisers and write a narrative with minimal or no teacher assistance. This was to determine how well they could work independently on the task and to see if the music-assisted pedagogy may have been helpful in some way in encouraging more descriptive writing. Handel's *La Réjouissance* (Handel, 1993) was used for this activity.

It is important to note that the students were given only 30 minutes to write their final stories, the same length of time as the unassisted recount. They were also asked to fill in a Music/Listening Response sheet so that they could identify the elements of music that influenced their ideas. They watched an animated score of Vivaldi's *Spring* on YouTube (Vivaldi, 2004) to help them get a visual idea of the different layers of orchestral voices so they could discuss their understanding of the elements of music and how these might influence their writing.

Billy's use of models: Conceptual change from perceptual to mental level (visualisation and symbolisation).

In the lesson described in the vignette above a graphic organiser allowed Billy to represent his thinking using colour, illustration, and writing. He recorded a range of emotion words, e.g., lonely, powerfl (*sic*), strong, sad, clam (calm), yet only the word "lonely" was used in his final poem. Billy used this adjective to describe the forest and used alliteration to describe the trees, i.e., "tall tree's" (*sic*). In discussion with the teacher Billy said that the word "sleepy" was crossed out because he changed his mind when listening to the music for the second time. Whether this was due to the state of his emotions on the day or the affective state of the music's progression is unclear. However, Billy was able to identify the way he edited and coloured coded words using the same colours in his palette to signify the dynamics in the music, i.e., blue/soft/ - green/medium/loud. The word "sad" is intentionally written in black (mood) which is the same colour as the stripes in his palette.

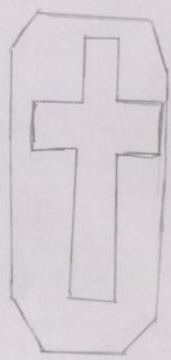*Figure 3.* Front of Billy's Humperdink graphic organiser

Figure 4. Back of Billy's Humperdink graphic organiser

A variety of past experiences are reflected in his graphic organiser. Billy describes how he wrote the word "lonely" because he was the only one in the forest, yet he writes a poem about

going camping with his parents. Although Billy draws a picture of a coffin (from his grandmother's funeral) and writes the word "sad", he does not mention this in his poem. Billy said that the music helped him to think of ideas, feelings, and which colours to use (Round, 2014, p. 26). Billy uses simile to describe the leaves and branches (on the trees in the forest) as being long and feeling like little insects. He is also very definite in the intentional use of colour (in his palette and words in the word box).

Telemann: Affetuoso

The graphic notation in Billy's Telemann graphic organiser is quite complex; it needed some explanation from him for me to understand his symbolic intentions. It is possible that the stars (cello) signify the night, and the grey and black block of watercolour (harpsichord) signify a stormy night. The background colours of green, the pink and blue patterns are much lighter and possibly represent the pitch of the instrument being played. These same colours are blended which suggests a layering of timbre and blending of the instrument sounds. Billy is able to explain that his graphic notation and illustration are intentional as they represented his thinking. He says that the sound helped to bring his ideas together. Although Billy only writes two sentences in his story, his intentions are obvious and strongly associated with his illustration. Billy uses the adjective "stomy" (*sic*) to describe the night and reinforces this with the descriptive phrase "with lots of stome (*sic*) in the sky".
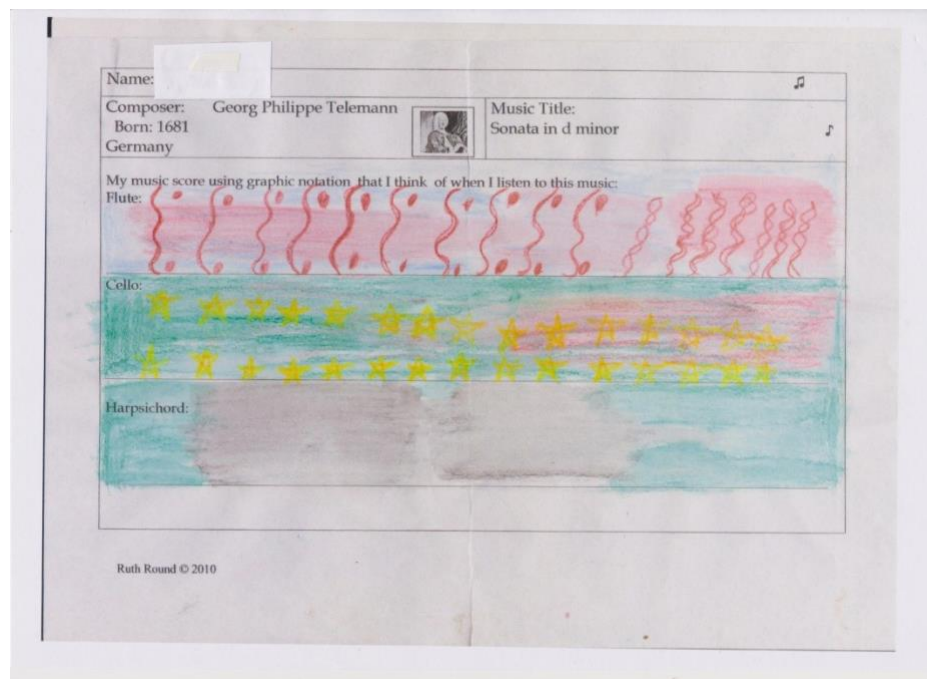

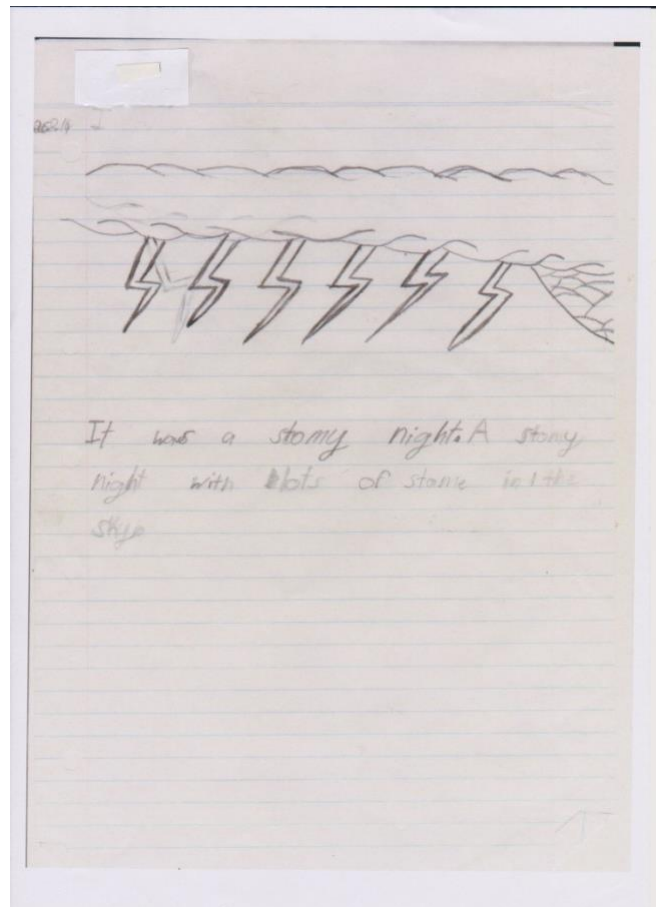*Figure 5.* Front of Billy's Telemann graphic organiser

Figure 2. Billy's writing to Telemann

Handel: La Réjoussance

In a further lesson after listening to Handel's *La Réjoussance* (Handel, 1993) Billy and another student sat with a teacher aide for fifteen minutes who helped them to talk about their ideas before writing. Despite there being less symbolism in his graphic organiser, Billy still writes a story about a racing car starting slowly at the starting line and then speeding like a jet plane going fast around a track, doing "drifts". He was able to justify his story's relation to the music by explaining that the car was going fast (tempo) and the long rhythms and high pitch represented speeding (Round, 2014, p. 56).

Figure 7. Front of Billy's Handel graphic organiser

Like the Humperdink, (except for the word "fast"), the words recorded in the graphic organiser are not used in his story but reflect the tempo, rhythm, and mood of the music. The same use of colours found in his other two graphic organisers are also used in his palettes, i.e., "playing" and smiley emoticon (blue) and other words in black (black stripes and grey background). The green used in the other palette is also found as a block of green in the "powerful verbs" box. At the end of research Billy said that "drawing illustrations and symbols, and using colour helped him get ideas" (Round, 2014, p. 56). He said that drawing helped to give him more ideas to write down and that associating the music with his story helped him to explain his thinking.

Educational Dialogue: the mediating role of speaking and listening activities

When discussing his work in both interviews with the researcher (after lesson four and at the end of the research), Billy either uses body language (i.e., shrug of the shoulders, shake of the head) or answers with one word (e.g. yep, yeah). Therefore a lot of careful rephrasing of questions is required to elicit a response with more depth and detail. It is possible that there is a connection between his role as a passive observer in the discussion activities and his minimal responses in both interviews. However it is most important to note that he is most definite about his responses when he does talk about his work and he does justify his thinking.

Interview 1:
Researcher: *I see you've got there a lonely forest (reads from body of response sheet "lonely forest"). And it's interesting that you have used some green. And then you say here that you feel like you are flying through the forest. And then you go even further and say "A forest with tall tree's [trees] and a river". And you're at camp ["At cap"] with your mum and dad. Did you actually feel like you were flying through the forest?*

Billy: ... yep ... and trees and the branch leaves

Researcher: What can you tell me about the trees and the branches and the leaves?

Billy: ...They're ... long.

Researcher: They're long?

Billy: Yep

Researcher: Did you feel them against your body when you were flying?

Billy: Yep

Researcher: You could actually feel them?

Billy: Yep

Researcher: What did they feel like?

Billy: ... Uum, little insects

Researcher: And little insects?

Billy: Yes

Billy shows an increasing ability to discuss aspects of his thinking. He identifies that "the illustrations, symbols, and colour used in his response sheets helped him to get ideas and the music brought these together." (Round, 2014, p. 67).

Interview 2:
Researcher: Look I can see here in the graphic organiser that you have done some wonderful

art and colour like this one with the cloud [Reads from narrative written on lined refill]: "It was a stormy night and on the stormy night there were lots of storms in the sky." I can see that you've used a lot of wonderful colour here and abstract symbols for the Telemann music [points to graphic organiser]. Did this sort of thing help you to put your ideas down?

Billy: ... yep

Researcher: It did. So how did using drawings like the cloud and the lightning [illustration on lined refill narrative to Telemann Sonata in d minor] and then the colour with the water colour pencils and the symbols [referring to Telemann graphic organiser], how did that help you to write your ideas down?

Billy: ... the sound

Researcher: How do you mean by the sound? So did it help to bring it together?

Billy: Yeah

Researcher: So the colour and the symbols and the pictures that you draw ... are they what you were thinking about in your head when you were listening to the music?

Billy: Yeah

Researcher: And the colour and the symbol, tell me about those because you know they aren't the sort of things we actually see. So how did you come to draw these lovely symbols here?

Billy: ...

Researcher: And use those colours. Do you know what helped you?

Billy: ... [shrugs shoulders]

Researcher: Shrugging your shoulders? Or was it just something you felt was right for the music?

Billy: Mmm ... it was right about the music

[Researcher: In my opinion this suggests there are deeper layers of processing in the mind

of the student which are not realised or understood at the surface levels of consciousness since Billy is able to justify his writing to the music. I hypothesise this indicates the presence of a higher level of tacit knowing in the student which is not made apparent and therefore cannot as yet be accessed by the class teacher.]

Awareness of the Self: recall of prior knowledge and socio-cultural association

Billy wrote words in his graphic organisers that suggest a strong sense of the self and recall of the time and place of different experiences. Although he writes descriptive words and powerful verbs that create a sense of mood in the graphic organiser, they are not used in the poem or stories. Billy writes about a "lonely forest" where he is at a camp with his mum and dad, but his actual intention is that the word "lonely" refers to him being the only one in the forest, despite the fact that he was at a camp with his parents. He told author that he could feel the trees, branches, and leaves which felt "like little insects" and he experienced the actual sensation of flying through the forest when listening to the music. The sensation of flying through the air is recorded in the graphic organiser, however the simile he uses to describe the vegetation in the interview is not (see previous paragraph). Billy's colloquial use of the word "drifts" is taken from his culture, as are the topics of his writing.

The discussions with the teacher suggest that Billy's use of symbolism and writing is intentional, appropriate to the music, and meaningful to him even though he finds it difficult to verbalise; his creative thinking in the music-assisted literacy pedagogy appears to be at a deeper and more complex level than his ability to talk and write. His ability to justify his work with the music suggests intentional signifying and writing which is also reflective of his social and cultural experiences. In his post-pilot recount, Billy includes more descriptive imagery with the use of onomatopoeia, alliteration, adjectival phrases, and a wider range of powerful verbs to convey his thinking. Billy has written both compound and simple sentences which are more grammatically correct, and the phonetic spelling is more accurate. His post-pilot recount was assessed by the class teacher at one level higher than his pre-pilot recount and therefore identifies him as still writing at the required standard for his age despite this progress. There appears to be a disconnect between the vocabulary, colour, and illustrations in his graphic organisers and the writing in both of his recounts and writing, and his participation in the whole class and small group activities in the lessons. A lot of Billy's ideas recorded onto the graphic organisers are not always transferred literally into his creative writing. The influence of the music literacy pedagogy is uncertain, however it is clear that Billy made progress over the eight weeks of the pilot study.

Analysis of Billy's conceptual change in developing academic concepts through listening to music based on Galperin's Four Levels of Abstraction		
(Haenen, Schrijnemakers & Stufkens, 2003, p. 253)		
Empirical Social Process: spontaneous concepts of the learner	Billy used basic adjectival phrases, simple verbs, and simple sentence structures in his pre-pilot unassisted recount - he is assessed as writing just 'at' the National Standard for his age. Identified key learning points for the music-assisted lessons are to develop vocabulary, more descriptive imagery, and use of personal voice.	*Theoretical Academic Process: developing scientific concepts of the learner*
Unstructured knowledge and experience	**1. Materialized Level:** the action is performed with the use of physical objects e.g., pictures, diagrams. Teacher introduces music-assisted literacy approach through the use of e.g., picture books, video clips, cds, percussion instruments, graphic organisers, watercolour pencils, colour pencils to the class. The Graphic Organiser is used as a multi-modal tool to record and symbolise ideas and thinking generated through listening to the music after repeated hearings. He used colour to represent the dynamics in the music (soft/loud), wrote quality adjectives that reflected mood, a range of socio-cultural experiences and a personal voice e.g., the lonely forest.	Transforming students' everyday knowledge into a more ordered and systematic form
↓	**2. Perceptual Level:** the action is based on the information stored in images and performed without actual hands-on manipulation of physical objects. Formation of ideas and thoughts when listening to the music e.g., mind wandering, imagination, affective experience, socio-cultural experiences, nostalgic awareness.	Understanding symbolised texts to represent knowledge in a multi-modal way
• Socio-cultural associations • Vocabulary, prior knowledge, symbolic representations • Affective experience / valence • Nostalgic awareness	**3. Verbal Level:** The action is performed "speaking aloud" - no external objects are needed. Use everyday language to encourage flexibility and divergence of ideas. Whole class discussions, small group and with a teacher before and after filling in the Graphic Organiser. The interviews with the researcher reveal Billy's work to be intentional, meaningful, and could be linked to the music. Billy used simile to describe the trees and branch leaves like 'little insects'. He described the physical feelings of trees and branches and the sensation of flying when listening to the music when speaking with the researcher.	Creative writing in structured academic text
↓ Independent thinkers	**4. Mental Level:** The action is performed exclusively "in the mind" where both external objects and audible speech are no longer necessary. Billy began to transfer and modify ideas and thinking into his independent formal writing through editing his graphic organisers. The graphic organiser is used as a scaffold towards formal writing as a range of ideas are recorded but not all used. Billy is assessed as writing at one level higher at the required writing standard in his unassisted post-pilot recount as he uses more descriptive imagery, uses onomatopoea, alliteration, adjectival phrases, a wider range of powerful verbs. He used compound and simple sentences which were more grammatically correct and more accurate spelling.	Students become practitioners in the creative writing process

Figure 8. Overview of Billy's progress using Galperin's Four Levels of Abstraction

Summary

While the academic literature widely asserts the importance of students' prior knowledge as the basis for learning, the difficulty of accessing students' current state and then planning subsequent steps for learning are less often discussed (Haene, Schrijnemakers, & Stufkens, 2003). Round's approach reflects a Vygotsky-inspired mediated learning space where music is utilised as a means to look more deeply into her students' cognitive development via their responses to music. She uses the students' written, verbal, and visual responses to help establish the level of their current knowledge and then uses this as a guide for the next learning steps. Round's aim in the series of lessons was not to introduce music scientific concepts (although this was sometimes a by-product) but to enable vocabulary development and opportunities for independent thinking. Although not an initial conscious decision, Round's approach utilises aspects of Galperin's extension of Vygotsky's ideas (Haene, Schrijnemakers, & Stufkens, 2003) in particular the lesson structuring approaches of orientation to task, use of models, and educational dialogue (Haene et al., 2003, p. 254). These structures have as their underlying aim the development of student response towards increased levels of abstraction via language development.

In relation to orientation to task it has become well recognised that learning is more likely to be enhanced if students are made aware of the aims and dimensions of the learning task they are about to undertake (Haene et al., 2003; Alton-Lee, 2003). Students "receive an advance organiser of the action and its goal" (Haene et al., 2003, p. 250). Round's description of the

task, the anticipation of listening with the raised curiosity fostered by the graphic organiser, "prime" the students and orient them to the task (Regelski, 2004). One aspect of the priming is to set up an appropriate affective value for the task (Haene et al., 2003; Regelski, 2004). Music may be a particularly effective tool for this purpose. The music is presented as a meaningful whole from the start and enhances the students' personal involvement in the learning process that follows.

The graphic organiser (a concrete activity) is formatted to allow each student to brainstorm ideas and words relevant to the writing genre such as senses poem, narrative (fiction), and recount (non-fiction), to systematically orient towards it, to retrieve thoughts, memories, understandings, vocabulary and the like, and to elaborate on these through repeated hearings of the music and speaking/listening activities. The graphic organiser is designed for students to record their responses in a variety of ways that will help them in the writing process, by modifying/editing (conscious attempts to rework their first brainstormed ideas, appropriation of skills and knowledge) for the formally published or completed piece of writing. The graphic organiser has been constructed to allow student choice to respond through different levels or layers of processing or mental action: i.e., the senses, words, illustration, visualisation, affect, nostalgic recall, or association of socio-cultural experiences. As varied and changeable as these may be (over repeated hearings), it is up to the student to decide what the intended result or end product will be.

The listening and speaking activities are essential for the sharing of ideas, developing vocabulary, developing confidence, and a sense of self-worth through sharing ideas and opinions that are different to others, developing competency in oral language, and discussing/critiquing a piece of music. From her considerable teaching experience, Round asserts that the use of music elicits more varied and richer responses than standard practices.

Conclusion

The approach outlined here could be used easily by non-specialist teachers thus providing a means for music to have a presence in the classroom. While not a practice-based musical approach, at the very least it opens up possibilities for students by exposing them to music listening that they might otherwise not experience. Round's teaching also demonstrates a number of dimensions worth careful consideration as the debate concerning what student-centred teaching might mean as the 21st century continues to develop (Choo, Sawch, Villanueva, & Vinz, 2017; O'Connor & Greenslade, 2012; OECD, 2012; Scott, 2015; Sulla, 2015). While 21st century discourse tends to promote problem-based learning and imagines the student as self-managed and capable of discovery learning, both Vygotsky and Dewey remind us about the centrality of the teacher. The teacher is far more than a facilitator co-constructing knowledge with students (Wells, 1994). There will be times when the teacher

plays the role of facilitator, but this should be a pedagogical manoeuvre where the conceptual or epistemic destination of the learning remains clear. What we see illustrated in this case study is the integration of "a student-centred approach with a form of deliberate teaching" (Haene, Schrijnemakers, & Stufkens, 2003, p. 249). This could well be described as progressive as it acknowledges the centrality of the learner and provides room for their personal and imaginative development while ensuring they have access to knowledge that can empower them for their futures.

References

Alton-Lee, A. (2003). *Quality teaching for diverse students in schooling: Best evidence synthesis.* Report prepared for the Ministry of Education. Wellington: Ministry of Education. Retrieved February 3, 2019, from: www.educationcounts.govt.nz/publications/series/2515/5959

Bach, J.S. (1940/2011). Toccata and Fugue [Recorded by The Philadelphia Orchestra conducted by Leopold Stokowski] On *Fantasia: the original classic [DVD].* California: USA.

Bernstein, B (1999). Vertical and horizontal discourse: An essay. *British Journal of Sociology of Education*, 20 (2), 157-173.

Biesta, G. (2012). Giving teaching back to education: responding to the disappearance of the teacher. *Phenomenology and Practice*, 6 (2), 35-49.

Choo, S., Sawch, D., Villanueva, A., & Vinz, R. (2017). Educating for the 21st Century: perspectives, policies and practices from around the world. Singapore: Springer.

Dewey, J. (1938/1997). *Experience and education.* New York, NY: Touchstone.

Disney, W. (1940). *Fantasia*. Walt Disney Studios Home Entertainment 2010.

Fosnot, C. (Ed.) (2005) Constructivism: theory, perspectives, and practice. New York, Columbia University Press.

Haenen, J., Schrijnemakers, H., & Stufkens, J. (2003). Sociocultural theory and the practice of teaching historical concepts. In In A. Kozulin, B. Gindis, V. Ageyev, & S. Miller (Eds.), *Vygotsky's Educational Theory in Cultural Context (pp.246-266).* Cambridge: Cambridge University Press.

Handel, G. (1993). La rejouissance, HWV 351:IV [Recorded by Capella Istropolitana, conducted by Bohdan Warchal]. On *The best of Handel*. Audio [CD]. Canada: Concerto Royale.

Hansen, D., Bernstorf, G., & Stuber, G. (2004). *The music and literacy connection.* VA: MENC.

Hopgood, T. (2008). *Here comes Frankie! Oxford*, UK: MacMillan Children's Books.

Humperdink, E. (1994). Evening Prayer. [Recorded by Sunset Strings]. Audio [CD; 2]. On *Golden family classics.* Australia: Reader's Digest.

Karpov, Y. (2003). Vygotsky's doctrine of scientific concepts: its role for contemporary education. In A. Kozulin, B. Gindis, V. Ageyev, & S. Miller (Eds.), *Vygotsky's Educational Theory in Cultural Context (pp.65-82).* Cambridge: Cambridge University Press.

Kerchener, J. (2014). *Music Across the Senses*: *Listening, Learning, and Making Meaning.* U.S.A.: Oxford University Press.

Kozulin, A., Gindis, B., Ageyev, V., & Miller, S (2003) (Eds.). *Vygotsky's Educational Theory in Cultural Context.* Cambridge: Cambridge University Press.

Laguna, S. (2007). *Stephen's music.* Sydney, Australia: Hachette Livre Australia.

Lourie, M., & Rata, E. (2016). Using a realist research methodology in policy analysis. *Educational Philosophy and Theory*. http://dx.doi.org/10.1080/00131857.2016.1167655

McNaughton, C. (2005). *Once upon an ordinary school day*. London, UK: Andersen Press.

McPhail, G. (2016). The fault lines of recontextualisation: the limits of constructivism in education. *British Journal of Educational Research,* 42(2), 294–313.

McPhail, G & Lourie, M. (2017). Getting real. Is realism a blind spot in research methodology? *New Zealand Journal of Educational Studies.* 52(2), 285-299.

Ministry of Education (2009). *Reading and writing standards for years 1-8.* Wellington, NZ: Learning Media.

Ministry of Education (2017). English Online. Retrieved February 3, 2019, from http://englishonline.tki.org.nz/English-Online/Planning-for-my-students-needs/Resources-research-and-professional-support/Features-of-text-forms/Recounts.

Muller, J. (2001). Progressivism redux: Ethos, policy, pathos. In A. Kraak & M. Young (Eds.), *Education in Retrospect: Policy and implementation since 1990* (pp. 59-71). Johannesburg: Human Sciences Research Council.

Muller, J. (2006). Differentiation and progression in the curriculum. In M. Young & J. Gamble (Eds.), *Knowledge, curriculum and qualifications for South African further education* (pp. 66–86). Cape Town: Human Sciences Research Council.

Noddings, N. (2012). *Philosophy of education*. Boulder: Westview Press.

OECD. (2012). The nature of learning: Using research to inspire practice—practitioner guide.

Innovative Learning environments Project: OECD. Retrieved February 3, 2019, from www.oecd.org/edu/ceri/50300814.pdf

O'Connor, N., & Greenslade, S. (2012). Co-constructed pathways of learning: a case study. *SET: Research Information for Teachers*, 1, 49-55.

Phillips, D. C. (2000). Constructivism in education: Opinions, and second opinions on controversial issues. Chicago: The University of Chicago Press.

Popper, K. (1978, April 7). The Tanner Lecture on Human Values, *Three Worlds*, presented at The University of Michigan. Retrieved February 3, 2019, from http://tannerlectures.utah.edu/_documents/a-to-z/p/popper80.pdf

Rata, E. (2012). The politics of knowledge in education. London: Routledge.

Rata, E. (2015). A pedagogy of conceptual progression and the case for academic knowledge. *British Journal of Educational Research,*

Rata, E., & Taylor, A. (2015). Knowledge equivalence discourse in New Zealand secondary school science. *New Zealand Journal of Educational Studies*, 50(2), 223–238.

Rate My Science. (2012). *Brain conducts a neural orchestra*. Retrieved February 3, 2019, from http://www.youtube.com/watch?v=1dtJDrbsc9g

Regelski, T. (2004). *Teaching general music in grades 4-8: A musicianship approach*. New York & Oxford: Oxford University Press.

Round, R. (2014). *Music signifiers: focussed listening to music as a stimulus to creative writing* (Unpublished master's thesis). Auckland, New Zealand: University of Auckland.

Sayer, A. (2000). *Realism and social science*. London: Sage.

Scott, C. L. (2015b). The futures of learning 3: What kinds of pedagogies for the 21st century? Paris: UNESCO, Education Research and Foresight. [ERF Working Papers Series, No. 15]. Retrieved from http://unesdoc.unesco.org/images/0024/002431/243126E.pdf

Sulla, N. (2015). *It's not what you teach but how*. New York & London: Routledge.

Suter, W.N. (2012). *Introduction to Educational Research: A Critical Thinking Approach*. Los Angeles: Sage.

Telemann, G. (2001). Affetuoso, TWV: 41d4 [Performer not identified]. On *Telemann: suites, sonatas, concertos.* [CD; 3] : Concerto Royale label.

Thwaites, T & Round, R. (2012). Expansive learning: multicurricular pedagogy and holistic development through a music-centred programme. *Curriculum Matters*, 8, 110-127.

Thwaites, T. (2008/2009). The musician in the classroom: Sylvia and a pedagogy of artistic knowing and meaning-making. *Waikato Journal of Education,* 14, 57-67.

Vivaldi, A. (2004). Concerto in E major, RV 269, "Spring" from The Four Seasons [Recorded by American Baroque]. On Vivaldi, The Four Seasons. California: USA Retrieved from http://www.youtube.com/watch?v=CcrrXHnN5uU

Vygotsky, L. (1986) *Thought and language*. Cambridge, MA: The MIT Press. (original work published 1934).

Wells, G. (1994). Learning and teaching "scientific concepts": Vygotsky's ideas revisited. Paper presented at the Conference "Vygotsky and the Human Sciences", Moscow, Sept. 1994. Retrieved February 3, 2019, from https://pdfs.semanticscholar.org/8534/3bfcf3011513bbf7262e64502b801adc08bd.pdf

Winch, C. (2013). Curriculum design and epistemic ascent. *Journal of Philosophy of Education*, 47(1), 128–146.

Young, M. F. D. (2009) What are schools for? In H. Daniels, H. Lauder & J. Porter (Eds.), *Knowledge, Values and Educational Policy*. London: Routledge.

Carpenter, B. S., & Taylor, P. (2003). Racing thoughts: Altering our ways of knowing and being in art through computer hypertext. Studies in Art Education, 45(1), 40 -45.

About the Authors

Ruth Round is a generalist primary school teacher based in two Auckland schools. Ruth has continued to expand on the research in her master's thesis by developing a music-assisted pedagogy as part of her teaching program with the classes she teaches. Ruth integrates her music-based pedagogy as part of the writing program in the classroom whenever possible.

Dr Graham McPhail is a senior lecturer in the School of Curriculum and Pedagogy, Faculty of Education and Social Work, University of Auckland. His research work is centred on the role of knowledge in the curriculum, in particular within 21st C schooling and music education contexts. He has is lead editor for NZ's first volume on secondary school music education *Educational Change and the Secondary School Music Curriculum in Aotearoa New Zealand* to be published by Routledge in 2018.