

What the Body Knows about Teaching Music

The specialist preschool music teacher's pedagogical content knowing regarding teaching and learning rhythm skills viewed from an embodied cognition perspective

Submitted by Melissa Lucie Viola Bremmer to the University of Exeter as a thesis for the degree of Doctor of Philosophy in Education in May 2015

What the Body Knows about Teaching Music

**The specialist preschool music teacher's pedagogical content knowing
regarding teaching and learning rhythm skills viewed from an embodied
cognition perspective**

Submitted by Melissa Lucie Viola Bremmer to the University of Exeter
as a thesis for the degree of
Doctor of Philosophy in Education
In May 2015

This thesis is available for Library use on the understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature:

Abstract

This thesis presents an investigation into the pedagogical content knowing (PCKg) of Dutch experienced specialist preschool music teachers with regard to teaching and learning rhythm skills viewed from an embodied cognition perspective. An embodied cognition perspective stresses the intimate relationship between body, mind and environment.

In a multiple case study the research methods – stimulated recall interviews, gesture analysis tasks, physical action analysis tasks, notebooks and semi-structured interviews – were used to elicit the PCKg of six specialist preschool music teachers regarding rhythm skills. The data of these different methods were inductively analysed but sensitising concepts derived from the literature review on PCKg were also used in the analysis. Furthermore, the data were triangulated to gain a comprehensive understanding of the participants' PCKg.

As for the nature of the specialist preschool music teachers' PCKg regarding rhythm skills the findings illustrated that PCKg is distributed over language, sound, gestures, body positioning and physical actions. Respecting the content of PCKg a new form of (non-verbal) knowledge was explored: “musical communication and musical interaction” that facilitates the learning of rhythm skills of preschoolers.

The study is first of all significant for offering a new perspective on the nature of the specialist preschool music teachers' PCKg: a multimodal and dynamic way of knowing that emerges from the interrelated role between the social, cultural and physical classroom environment, the teaching task and the teacher's body. Beyond the classroom, these teachers' bodies form a source for recalling, re-enacting and eliciting classroom experiences to develop and communicate their PCKg. Secondly, it offers a new perspective on the content of the specialist preschool music teachers' PCKg: these teachers' bodies take on different roles to mediate the preschoolers' learning process regarding rhythm skills. These findings have implications for further research, teacher education, practice and policy.

Acknowledgements

First of all, I would like to thank my supervisors, Dr. Susan Young and Dr. Ros Fisher. Susan, you have been analytical, encouraging and supportive, and I will never forget the “exotic places” where our supervision sessions took place. Ros, I really enjoyed our academic discussions in your “empty” office that combined critical questioning with a sense of humour.

I am grateful to Professor Folkert Haanstra: if it weren't for you it would never have occurred to me that a PhD was a possibility. Your thoughtful feedback during the research process has helped me greatly. I also would like to thank Professor Elizabeth Wood for her first year of supervision.

I am grateful to the head teachers for allowing my research to take place in their schools, the specialist preschool music teachers for welcoming me into their classrooms with openness and enthusiasm, the parents and preschoolers for allowing me to film the music lessons.

This research was financially supported by The Amsterdam School of the Arts for which I am very grateful. In that context I would like to thank Bridget Kievit, Jet de Ranitz, Hans van Beers, Janneke van der Wijk, Michel Dispa, Marianne Gerner and Jaap Vinken. A special thank you to Adri Schreuder, Maria Wüst and Michiel Schuijjer for their support.

Thank you to my colleagues Emiel Heijnen (who has been my multifunctional helpline), Carolien Hermans (for the inspiring discussions on embodiment in education), Reinhard Findenegg (for co-developing a questionnaire) and Edwin Paarlberg (for helping me translate music terminology).

I express my thanks to Constantijn Koopman (for your helpful comments at the beginning of my PhD), Luc Nijs (for your helpful comments at the end of my PhD), Ellen van Hoek (intercoder agreement), Benjamin Bremmer (filming and transcribing), the editors Radegunde Yanez and Marie-José Kommers, and Jaco Kruidenier (fabricating the DVD).

Last but not least, thank you Martijn, Luca and Matthies. My unique men. Life would be utterly dull without you.

Table of contents

Chapter 1 Introducing the study	21
1.1 Introduction	21
1.2 Rationale for this study	21
- 1.2.1 Rhythm skills in early childhood music education	21
- 1.2.2. Teaching and learning rhythm skills: theory and practice	22
- 1.2.3 In-between theory and practice: the voice of the specialist preschool music teacher	24
- 1.2.4 The concept of pedagogical content knowledge	25
- 1.2.5 Researching pedagogical content knowledge	27
1.3 Aim and relevance of the study	29
1.4 The research approach of the study	31
1.5 The context of the study	31
- 1.5.1 A brief history of Dutch preschool education	31
- 1.5.2 The Dutch National Curriculum and preschool music education	33
1.6 Overview of the study	35
1.7 Reading guide	36
Chapter 2 Perspectives on pedagogical content knowledge	37
2.1 Introduction	37
- 2.1.1 Literature on PCK and PCKg	37
- 2.1.2 PCK versus <i>Fachdidaktik</i>	39
2.2 The background of the concept of pedagogical content knowledge	39
- 2.2.1 Introduction to the concept of pedagogical content knowledge	39
- 2.2.2 The shift from researching teacher behaviour to teacher cognition	40
2.3 The complexity of defining and researching PCK	41
2.4 Shulman's descriptions of PCK	43
- 2.4.1 Defining PCK	43
- 2.4.2 Conceptualisations of PCK building on the work of Shulman	45
- 2.4.3 PCK is more complex than Shulman originally implied	47
- 2.4.4 Alternative perspectives on Shulman's concept of PCK	48
2.5 A constructivist perspective on PCK	49
- 2.5.1 Constructivism and the nature of PCKg	49
- 2.5.2 Constructivism and the content of PCKg	50

- 2.5.3 The development of PCKg viewed from a constructivist perspective	51
- 2.5.4 Reflections on a constructivist perspective on PCKg	53
- 2.5.4.1 <i>The nature of PCKg from a constructivist perspective</i>	53
- 2.5.4.2 <i>The content of PCKg from a constructivist perspective</i>	54
- 2.5.5 Relating a constructivist view of PCKg to this current study	54
2.6 An information processing perspective on PCK	55
- 2.6.1 An information processing perspective and the nature of PK	55
- 2.6.2 Information processing theory and the content of PK	56
- 2.6.3 Reflections on an information processing perspective on PCKg	57
- 2.6.3.1 <i>The nature of PK from an information processing perspective</i>	57
- 2.6.3.2 <i>The content of PK from an information processing theory perspective</i>	58
- 2.6.4 Relating an information processing perspective on PCKg to this current study	58
2.7 An embodied cognition perspective on the specialist preschool music teachers' PCKg	59
2.8 Conclusion	61
Chapter 3 An embodied cognition perspective on the specialist preschool music teacher's PCKg regarding the teaching and learning of rhythm skills	62
3.1 Introduction	62
3.2 Antecedents of an embodied cognition perspective	63
- 3.2.1 The interplay between body, mind and environment in the work of Jean Piaget	63
- 3.2.2 The interplay between body, mind and environment in the work of Lev Vygotsky	65
3.3 An embodied cognition perspective	66
3.4 An embodied cognition perspective in relation to the music teachers' PCKg	69
- 3.4.1 Online embodied teacher cognition reflecting PCKg	69
- 3.4.2 Offline embodied teacher cognition reflecting PCKg	70
3.5 The body in relation to the music teacher's PCKg	71
- 3.5.1 Gestures in teaching and performing music	71

- 3.5.1.1 Gestures	71
- 3.5.1.2 Gestures coexisting with speech in teaching	72
- 3.5.1.3 Gestures in musical performance	73
- 3.5.2 Body positioning and teaching	75
- 3.5.3 Instructional sequence and teaching	75
3.6 Researching PCKg from an embodied cognition perspective	76
3.7 Conclusion	77
Chapter 4 Methodology	79
4.1 Introduction	79
4.2 Goal of the research study and the research question	79
4.3 An interpretive approach to researching the specialist music teachers' PCKg	79
- 4.3.1 An interpretive approach in this current study	79
- 4.3.2 Criticism on case study research from an interpretive perspective	82
4.4 Multiple case studies	83
- 4.4.1 The choice for a multiple case studies approach	83
- 4.4.2 The selection of the cases	83
- 4.4.2.1 Participants	84
- 4.4.2.2 Finding participants for my study	84
- 4.4.2.3 Gaining access to the participants	86
4.5 The methods in the multiple case studies	86
- 4.5.1 The choice of methods	86
- 4.5.2 Trialling the methods and the order of the research methods	87
- 4.5.2.1 Trialling the design and procedures of the methods and the analysis of the data	88
- 4.5.2.2 Trialling the order of the methods	89
- 4.5.3 Stimulated recall interview	91
- 4.5.3.1 Strengths, limitations and choices of the use of the stimulated recall interview	91
- 4.5.3.2 Method design and procedure of the stimulated recall interview	93
- 4.5.3.3 Evaluation of the stimulated recall interview	94
- 4.5.4 The video analysis tasks	96

- 4.5.4.1 <i>Strengths, limitations and choices regarding the use of video analysis tasks</i>	96
- 4.5.4.2 <i>The method design and procedure of the two video analysis tasks</i>	98
- 4.5.4.3 <i>Evaluation of the video analysis tasks</i>	101
- 4.5.5 Digital notebook	102
- 4.5.5.1 <i>Strengths, limitations and choices of the use of a digital notebook</i>	102
- 4.5.5.2 <i>Method design and procedure of the digital notebook</i>	104
- 4.5.5.3 <i>Evaluation of the digital notebook</i>	105
- 4.5.6 Semi-structured interview	105
- 4.5.6.1 <i>Strengths, limitations and choices of the use of a semi-structured interview</i>	105
- 4.5.6.2 <i>Method design and procedure of the semi-structured interview</i>	106
- 4.5.6.3 <i>Evaluation of the semi-structured interview</i>	107
- 4.5.7 Flexibility of the methods	108
4.6 Field notes	108
4.7 Ethical standards	109
- 4.7.1 Informing the participants about the research and asking consent	109
- 4.7.2 Protection from harm and stress	111
- 4.7.3 For whom is the research?	111
4.8 Trustworthiness of the research	112
- 4.8.1 Reflexivity	112
- 4.8.2 Methodological accountability	114
- 4.8.3 Triangulation	114
- 4.8.4 Member checking	115
4.9 Gaps and limitations of the study	116
- 4.9.1 Participants in this study	116
- 4.9.2 Teaching and learning rhythm skills in an open space	117
- 4.9.3 Researching PCKg of experienced teachers versus expert teachers	117
- 4.9.4 Talking about PCKg?	118
- 4.9.5 What is the content of PCKg?	118
- 4.9.6 Distinction between online and offline embodied cognition	119
- 4.9.7 Can language sufficiently reflect PCKg from an embodied cognition perspective?	119

- 4.9.8 Last comments concerning research on PCKg	119
4.10 Conclusion	120
Chapter 5 Analysis of the data	121
5.1 Introduction	121
5.2 Analysis within qualitative research: a thematic analysis approach	121
5.3 The different phases of the data analysis	122
- 5.3.1 Phase one of the analysis: preparation of the data	123
- 5.3.2 Phase two of the analysis: reducing the data	123
- 5.3.3 Phase three of the analysis: inductive coding	127
- 5.3.3.1 <i>Inductive coding of the SRI, notebook and the semi-structured interview</i>	128
- 5.3.3.2 <i>Inductive coding of the first video analysis task: instructional sequence</i>	129
- 5.3.3.3 <i>Inductive coding of the second video analysis task: gestures</i>	129
- 5.3.4 Phase four of the analysis: intercoder agreement	129
- 5.3.5 Phase five of the analysis: deductive coding	132
- 5.3.6 Phase six of the analysis: developing main themes	133
- 5.3.6.1 <i>Sensitising themes</i>	133
- 5.3.6.2 <i>Developing main themes</i>	134
- 5.3.6.3 <i>Main themes in this current study</i>	135
5.4 Conclusion	136
Chapter 6 Findings in relation to the specialist preschool music teachers' PCKg regarding the teaching and learning of rhythm skills	137
6.1 Introduction	137
6.2 Theme one: Pedagogical orientations of the teaching and learning of rhythm skills of preschoolers	138
- 6.2.1 Subtheme: A child-centred approach to teaching and learning rhythm skills	139
- 6.2.2 Subtheme: Teaching and learning rhythm skills through imitation learning	141
- 6.2.3 Subtheme: Teaching and learning rhythm skills through experiential learning	142
6.3 Theme two: Teaching strategies for rhythm skills of preschoolers	143

- 6.3.1 Subtheme: General teaching strategies for teaching rhythm skills to pre-schoolers	143
- 6.3.1.1 <i>Teaching and learning rhythm skills through different ways of moving</i>	143
- 6.3.1.2 <i>Selecting music that induces rhythmic movement</i>	145
- 6.3.1.3 <i>Teaching and learning rhythm skills through repeated and varied exposure</i>	146
- 6.3.1.4 <i>Teaching and learning rhythm skills through physical modelling</i>	146
- 6.3.1.5 <i>Learning rhythm skills through different entry points: language and visual aids</i>	147
- 6.3.2 Subtheme: Instructional sequences of rhythmic activities for pre-schoolers	148
- 6.3.2.1 <i>Physical modelling and scaffolding</i>	148
- 6.3.2.2 <i>Other instructional sequences</i>	149
6.4 Theme three: Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers	150
- 6.4.1 Subtheme: Instructing a rhythmic activity for preschoolers	151
- 6.4.1.1 <i>Instructional gestures</i>	151
- 6.4.1.2 <i>Changing body posture before instructing</i>	151
- 6.4.2 Subtheme: Guiding a rhythmic activity for preschoolers	152
- 6.4.2.1 <i>Cueing the start and end of a rhythmic activity</i>	153
- 6.4.2.2 <i>Cueing the beginning of a new rhythmic movement or rhythm pattern within music</i>	153
- 6.4.2.3 <i>Signalling the character of rhythm</i>	153
- 6.4.2.4 <i>Cueing a rhythmic response</i>	154
- 6.4.2.5 <i>Signalling the focus of the activity</i>	154
- 6.4.3 Subtheme: (Re)presenting rhythm skills to preschoolers	154
- 6.4.3.1 <i>(Re)presenting the pulse and bar</i>	155
- 6.4.3.2 <i>(Re)presenting rhythmic phrasing</i>	155
- 6.4.3.3 <i>(Re)presenting the character of rhythm</i>	156
- 6.4.3.4 <i>(Re)presenting a rhythm pattern</i>	156
6.5 Theme four: Teachers' understanding of preschoolers' learning behaviour with regard to learning rhythm skills	157
- 6.5.1 Subtheme: Understanding the preschoolers' predisposition for learning rhythm skills	158

- 6.5.1.1 <i>How preschoolers are predisposed to learn rhythm skills</i>	158
- 6.5.1.2 <i>Difference between gender in learning rhythm skills</i>	159
- 6.5.2 Subtheme: Understanding the learning behaviour of preschoolers regarding learning rhythm skills	159
- 6.5.2.1 <i>Difficulty in engaging, focusing, concentrating on learning rhythm skills</i>	159
- 6.5.2.2 <i>Difficulty in synchronising rhythmic movements to an external music source</i>	160
- 6.5.2.3 <i>Difficulty translating inner hearing to rhythmic output</i>	160
- 6.5.2.4 <i>Difficulty playing certain rhythms</i>	160
- 6.5.2.5 <i>Emerging understanding of rhythmic phrasing</i>	161
- 6.5.3 Subtheme: Typical preschooler learning behaviour with regard to learning rhythm skills	161
6.6 Theme five: The curriculum in relation to the development of rhythm skills of preschoolers	162
- 6.6.1 Subtheme: Curriculum orientations respecting learning rhythm skills	163
- 6.6.1.1 <i>Developmental curriculum</i>	163
- 6.6.1.2 <i>Content-orientated curriculum</i>	165
- 6.6.2 Subtheme: Curriculum goals respecting rhythm skills	165
- 6.6.3 Subtheme: Choices regarding the content of the curriculum respecting rhythm skills	166
- 6.6.3.1 <i>Integrating rhythm skills with other skills</i>	166
- 6.6.3.2 <i>Rhythm skills that are excluded in the music curriculum for preschoolers</i>	166
6.7 Theme six: Assessment of preschoolers' rhythmic behaviour in relation to learning rhythm skills	168
- 6.7.1 Subtheme: Choosing between summative or formative assessment of the preschoolers' rhythm skills	169
- 6.7.2 Subtheme: Assessing the rhythmic skills of preschoolers in a formative way	170
- 6.7.3 Subtheme: Defining the quality of the performance of rhythm skills of preschoolers	171
6.8 Theme seven: The interaction between an educational context and the learning of rhythm skills of preschoolers	172

- 6.8.1 Subtheme: The musical background of the preschoolers	173
- 6.8.2 Subtheme: Preconditions of the school that impact on the teaching and learning of rhythm skills	174
- 6.8.2.1 <i>Instruments in relation to learning rhythm skills</i>	174
- 6.8.2.2 <i>Taking into account the differences between group 1 and 2</i>	174
- 6.8.2.3 <i>Classroom space in relation to teaching rhythm skills</i>	174
- 6.8.2.4 <i>Duration of a music lesson in relation to learning rhythm skills</i>	175
- 6.8.2.5 <i>Size of the class and learning rhythm skills</i>	175
6.9 Conclusion	176
Chapter 7 Discussion	178
7.1 Introduction	178
7.2 The nature of the specialist preschool music teachers' PCKg regarding rhythm skills viewed from an embodied cognition perspective	179
- 7.2.1 The specialist preschool music teachers' PCKg regarding rhythm skills is multimodal	179
- 7.2.2 The specialist preschool music teachers' PCKg is partly task specific	182
- 7.2.3 The specialist preschool music teachers' PCKg is partly context dependent	183
- 7.2.3.1 <i>Developing and communicating PCKg in the social context of the classroom</i>	183
- 7.2.3.2 <i>Teaching preschoolers</i>	184
- 7.2.3.3 <i>The cultural context shapes the specialist preschool music teacher's PCKg</i>	186
- 7.2.3.4 <i>Developing and communicating PCKg within the context of the school</i>	188
- 7.2.4 Wider contexts that define the nature of the specialist preschool music teachers' PCKg	190
- 7.2.5 Summary: conceptualising the nature of PCKg regarding rhythm skills from an embodied cognition perspective	192
7.3 The content of the specialist preschool music teacher's PCKg regarding rhythm skills viewed from an embodied cognition perspective	193
- 7.3.1 The teacher's body models rhythm skills for preschoolers	194
- 7.3.1.1 <i>Modelling rhythm skills</i>	194

- 7.3.1.2 <i>The teacher's body provides variable models of rhythm skills</i>	195
- 7.3.1.3 <i>Phasing out the teacher's body as a model of rhythm skills</i>	196
- 7.3.2 The teacher's body guides the preschoolers within a world of rhythms	197
- 7.3.3 The teacher's body observes, assesses and provides feedback on the rhythmic development of pre-schoolers	199
- 7.3.3.1 <i>Multisensoric assessment</i>	199
- 7.3.3.2 <i>Non-verbal feedback versus verbal feedback</i>	200
- 7.3.4 The teacher's body provides an adaptive curriculum of rhythm skills	201
- 7.3.5 The integration of different components of PCKg through the teacher's body	201
- 7.3.6 Summary: conceptualising the content of PCKg regarding rhythm skills from an embodied cognition perspective	203
7.4 Conclusion: What the body knows about teaching music	204
Chapter 8 Implications	207
8.1 Introduction	207
8.2 Implications for research	207
- 8.2.1 Researching PCKg from an embodied cognition perspective	207
8.3 Implications for practice in relation to research	208
- 8.3.1 Developing a shared (theoretically based) language for PCKg	208
8.4 Teacher Education	209
- 8.4.1 Teaching in early childhood music education	209
- 8.4.2 Raising awareness of the role of the body in teaching and learning rhythm skills	210
8.5 Implications for practice	211
- 8.5.1 Scaling up	211
- 8.5.2 Tactile modelling	211
- 8.5.3 Extending the PCKg to more child-centred ways of teaching	212
- 8.5.4 Connecting to the musical backgrounds of preschoolers	212
- 8.5.5 Developing ways of systematically assessing the rhythm skills of preschoolers	213
8.6 Policy	214
- 8.6.1 School policy on teaching music including rhythm skills	214

- 8.6.2 School policy on general teachers versus specialist preschool music teachers	215
- 8.6.3 Policy on accountability and transparency of an early childhood music curriculum	216
8.7 Final reflection	217
- 8.7.1 Looking back	217
- 8.7.2 Looking ahead	218
- 8.7.3 Where do I stand now?	219
- 8.7.4 Wrapping up my research	221
Bibliography	222

Tables and figures

Chapter 2

- Figure 2.1 Pedagogical content knowledge [modified from (Mishra & Koehler, 2006)] 44
- Figure 2.2 The content of PCK as defined by Ball and colleagues (2008) 46
- Table 2.3 Overview of the conceptualisations of the content of PCK [modified from Van Driel, Verloop & Vos (1998)] 48
- Table 2.4 Overview of the conceptualisations of the content of PCK and PCKg [modified from Van Driel et al. (1998)] 51
- Table 2.5 Overview of the conceptualisations of the content PCK and PK [modified from Van Driel et al. (1998)] 57

Chapter 4

- Figure 4.1 Overview selection criteria 84
- Table 4.2 Overview of the participants 86
- Figure 4.3 Brief summary of research methods 87
- Figure 4.4 Overview order research methods 90
- Figure 4.5 An example of a change in a forthcoming lesson 108

Chapter 5

- Table 5.1 Overview of the six phases of data analysis 122
- Figure 5.2 Examples of pedagogical knowledge 124
- Figure 5.3 Examples of subject matter knowledge 125
- Figure 5.4 Indicators of online embodied cognition 126
- Figure 5.5 Summary criteria for reducing data 126
- Figure 5.6 An example of the coding manual 127
- Figure 5.7 Examples of codes 128
- Figure 5.8 An example of a code 129
- Figure 5.9 Examples of codes 129
- Table 5.10 Text and video fragments and codes 131

- Figure 5.11 An example of a subtheme	133
- Figure 5.12 Sensitising concepts	134
- Figure 5.13 Subthemes clustered into main themes	135
- Figure 5.14 Themes described in the literature and themes identified in the data	136

Chapter 6

- Table 6.1 Overview theme one	142
- Table 6.2 Overview physical modelling and scaffolding	149
- Table 6.3 Overview theme two	150
- Table 6.4 Overview theme three	157
- Table 6.5 Overview theme four	162
- Table 6.6 Overview theme five	168
- Table 6.7 Overview theme six	172
- Table 6.8 Overview theme seven	176

Appendices

Appendix 1 Procedures of the methods	242
1.1 Procedure stimulated recall interview (Dutch/English)	242
- 1.1.1 Instruction SRI prior to video recording (Dutch/English)	242
- 1.1.2 Instruction SRI (Dutch/English)	243
1.2 Procedure notebook (Dutch/English)	244
1.3 Procedure video analysis tasks (Dutch/English)	245
- 1.3.1 Instruction choice of video clips (Dutch/English)	245
- 1.3.2 Instruction video analysis: task one and task two (Dutch/English)	246
1.4 Procedure semi-structured interview and schedule questionnaire (Dutch/English)	248
Appendix 2 Consent forms	251
2.1 Consent form: specialist preschool music teacher (Dutch/English)	251
2.2 Consent form: parents (Dutch/English)	254
Appendix 3 Examples of coding throughout the different methods	255
3.1 Example stimulated recall interview: teacher Jette	255
- 3.1.1 Dutch version	256
- 3.1.2 English version	259
3.2 Example video task one: teacher Liselot + Melissa	264
- 3.2.1 Dutch version	264
- 3.2.2 English version	265
3.3 Example video task two: teacher Martine + Melissa	266
- 3.3.1 Dutch version	266
- 3.3.2 English version	268
3.4 Example notebook: teacher Jeroen	270
- 3.4.1 Dutch version	270
- 3.4.2 English version	271
3.5 Example semi-structured interview: teacher Floor	273
- 3.5.1 Dutch version	273
- 3.5.2 English version	276
Appendix 4 Final coding manual	279
Appendix 5 Final overview development main themes	284
Appendix 6 Original Dutch citations	287

Appendix 7 Ethical approval certificate and signed consent forms	295
7.1 Ethical approval certificate issued by the University of Exeter	296
7.2 The signed consent forms of the specialist preschool music teachers	303

DVD tracks

- Track 1: Push-button technique
- Track 2: Learning from peers
- Track 3: Pointing to peer
- Track 4: Rhythmic ideas of preschoolers
- Track 5: Modelling new rhythmic pattern clearly
- Track 6: Scaffolding: (1) physical modelling, (2) observing and giving guidance, (3) observing and refraining from giving guidance
- Track 7: Scaffolding: (1) instruction, (2) physical modelling, (3) observing and giving guidance
- Track 8: Instructional gestures
- Track 9: Instructional gestures
- Track 10: Changing body posture
- Track 11: Combining pedagogical and rhythmic gestures
- Track 12: Cueing start of rhythm activity
- Track 13: Cueing end of rhythm activity
- Track 14: Cueing end of rhythm activity
- Track 15: Cueing a change
- Track 16: Signalling a soft rhythmic sound
- Track 17: Signalling a heavy rhythmic sound
- Track 18: Cueing a rhythmic response
- Track 19: Cueing a rhythmic response
- Track 20: Cueing a rhythmic response
- Track 21: Signalling focus rhythm activity
- Track 22: Signalling focus rhythm activity
- Track 23: Signalling focus rhythm activity
- Track 24: Representing the pulse
- Track 25: Representing rhythmic tie
- Track 26: Representing duration note
- Track 27: Representing the beginning of a new rhythmic phrase
- Track 28: Representing a rhythmic antecedent and consequent
- Track 29: Representing pulse and rhythmic phrasing
- Track 30: Representing the ending of a rhythmic phrase
- Track 31: Explaining a gesture

Abbreviations

Ministry of EC&S	Ministry of Education, Culture and Science
PCK	Pedagogical content knowledge
PCKg	Pedagogical content knowing
PK	Practical knowledge
SRI	Stimulated recall interview

Chapter 1 Introducing the study

1.1 Introduction

As a specialist preschool music teacher I had been teaching music to preschoolers (four- to six-year olds) for more than a decade in primary schools in Amsterdam, The Netherlands, when I decided to teach the art and science of teaching (didactics) at the VU University of Amsterdam. I left behind a sonic, experiential world in which the preschoolers reacted in a physical and emotional manner to the musical activities I offered – and entered a verbal and conceptual one in which the adult students had to be invited to give a reaction. The contrast between these educational practices could not have been greater and for some time I felt at a loss, as if I had to learn to teach all over again. At the same time, this experience was food for thought. Why did I feel that one teaching practice differed from the other? What had made teaching music to preschoolers unique in my experience? These questions lingered at the back of my mind for several years. It was only when I started working at the music teacher training college of the Amsterdam School of the Arts that I was given the opportunity to explore these questions and so arrived at this current PhD. I decided to focus my research on teaching and learning rhythm skills after observing my students and thinking back to my own experience teaching preschoolers. I wondered whether the physicality of teaching and learning rhythm skills is inherent to the teaching of music.

1.2 Rationale for this study

1.2.1 Rhythm skills in early childhood music education

It could be argued that rhythm is one of the most fundamental pillars of music – music can exist with little or no pitch variation, but one can hardly find music without temporal organisation (Cross & Morley, 2009; Gordon, 2003; Campbell, 2004; Thaut, 2008; Trainor & Corrigan, 2010). Rhythm divides and organises music “into coherent and comprehensible patterns and forms” (Thaut, 2008, p. 6) that can vary throughout different music cultures (Campbell, 2004). By dividing and organising music in patterns and forms, rhythm on the one hand

guides listeners and performers in making sense of important moments in the unfolding of music through time and on the other hand it creates anticipation and predictability within the music for listeners and performers (Thaut, 2008). As rhythm is such a fundamental feature of music rhythm skills are viewed as a key element in music education, including early childhood music education (Flohr, 2005; Gordon, 2003; Valerio, Reynolds, Bolton, Taggart & Gordon, 1998; Young, 2009).

Preschoolers start developing rhythm skills from birth (Gordon, 2003; Trehub, 2006) or possibly prenatally (Parncutt, 2006) and the task of specialist preschool music teachers is to extend, deepen and broaden the development of rhythm skills of young children (Hargreaves, 1996), giving them a foundational basis for learning music. A broad range of rhythm skills exists and depending on the social, cultural and historical context of music curricula (Hargreaves, 1995) or the choice of specialist preschool music teachers different rhythm skills can be taught and learned in preschool. Examples of rhythm skills are performing the pulse, metre, rhythms and different tempi of music vocally, kinaesthetically or instrumentally at an individual level and at a group level, synchronising movements to rhythm aspects of an external musical source, expressing the character of a rhythm or the rhythmic style of music vocally, kinaesthetically or instrumentally, improvising rhythmically at an individual or group level, performing rhythmic phrases or reading and writing aspects of rhythm notation (Cross & Morley, 2009; Flohr, 2005; Valerio et al., 1998; Young, 2009).

1.2.2 Teaching and learning rhythm skills: theory and practice

Although rhythm skills are seen as a key element in early childhood music education, it still remains a question how these skills can be taught. Different perspectives have emerged on how preschoolers can develop rhythm skills within the context of early childhood music education. For instance, over the past decades models have been created in the field of music psychology that describe the musical development, including rhythmical development from infancy to adulthood (see e.g. Gordon, 2003; Hargreaves, 1995; Swanwick & Tillman in Tillman-Boyce, 1996). These models have been (partly) based on

and inspired by the work of Jean Piaget and, in short, they tend to describe how young children rhythmically progress through qualitatively different stages of musical development (Koopman, 1997). These models are developed with the purpose “to advance thinking about educating and teaching the child in settings of formal schooling” (Taetle & Cutietta, 2002, p. 279). However, in general, teachers do not tend to use these types of educational models when designing and executing their (music) education (Bennett, Wood, & Rogers, 1997; Broekkamp & Van Hout-Wolters, 2007; Bremmer, 2005; De Baets & Nijs, 2013; Heller & O’Connor, 2006). Educational models are often general enough to be applicable to different (music) educational settings (Leinhardt, Young, & Merriman, 1995; Renshaw, 2004) but teachers can feel that these models do not match with their own classroom practice or personal ideas of what “works” for them and their pupils (Bremmer, 2005; De Baets & Nijs, 2013; Heller & O’Connor, 2006; Meijer, 1999). As a result, teachers tend not to use them for their classroom practice.

At a more fine-grained level, research in developmental music psychology has also focused on *particular* rhythm skills of preschoolers such as the ability to keep to the beat or to move to a certain tempo. The goal of this type of research is to indicate the age at which certain rhythm skills emerge (see for overviews Flohr, 2005; Loong & Lineburgh, 2002; Retra, 2010) and ultimately is meant to help teachers decide which rhythm activities are or are *not* developmentally appropriate for preschoolers to learn, the assumption being that development precedes learning. This type of research can lead to the following advice: “[a] developmentally inappropriate practice would be to expect three- and four-year-olds to march or march while clapping because most of them will not be able to do so” (Flohr, 2005, p. 103, emphasis in the original). However, Flohr (2005) also warns that teachers should be cautious with such information since there are many individual differences between children and the social and cultural surroundings impact on the development of rhythm skills of preschoolers and should be taken into account when teaching rhythm skills to preschoolers.

At the other side of theory, practice has brought forth a plethora of music books with hands-on practical rhythm and movement activities that can be applied directly in the preschool classroom but which lack theoretical underpinnings as to why such activities are of importance to the rhythmic development of

children. Traditional music pedagogies such as Kodály, Orff, Dalcroze too have derived principles from practice for developing rhythm skills. These traditional music pedagogies have not been built on systematic research nor are they derived from contemporary theories on teaching and learning. In contrast, based on years of experience these traditional music pedagogies prescribe (sequenced) rhythm activities that can be undertaken by the teacher to develop the rhythm skills of preschoolers. These methods have met with criticism because they tend to be highly prescriptive. In that context, the music education researchers Allsup and Westerlund (2012, p. 127) critically remark that by strict control of musical outcomes, methods like Kodály and Orff “diminish instructional options in order to predict certain and only certain ends and values”. For example, these methods value reading music notation and tend to work towards learning to read music notation including rhythm notation. So, although these methods can provide teachers with practice-based principles for teaching rhythm skills, they can also constrain teachers and pupils from teaching and learning rhythm skills in their own way.

1.2.3 In-between theory and practice: the voice of the specialist preschool music teacher

In-between theory and generic practice-based principles concerning teaching and learning rhythm skills is the voice of the specialist preschool music teacher, a teacher with a Bachelor Degree in Music Education. In general, teachers, including specialist preschool music teachers, tend to develop knowledge in and through their classroom practice that seems to be the opposite of educational and music developmental models, namely (in part) personal, context and content specific (Bennett et al., 1997; Bremmer, 2005; De Baets & Nijs, 2013; Loughran, 2010; Meijer, 1999). The knowledge that these teachers have with regard to teaching and learning rhythm skills can give insight into the complexities of teaching those skills in the social, cultural and physical constraints and possibilities of the preschool. In that sense, the knowledge of specialist preschool music teachers might complement the generative models of musical development that have been developed and can form a bridge between theories on how children learn music and the educational practice (Kwakman & Van den Berg, 2004). However, little is known about the

knowledge these teachers develop in and through practice in early childhood music education (Bremmer, 2005; Cox & Hennessy, 2001; Van Schilt-Mol, 2012) and particularly about teaching and learning rhythm skills with preschoolers.

In itself it is remarkable that little is known of the knowledge that specialist preschool music teachers develop in and through practice because nationally and internationally the “what” and “how” of teaching preschoolers has become the centre of attention due to a shift from a play- and child-centred curriculum to a content-based curriculum in early childhood education (Bodrova, 2008; Grambergen & De Wolff, 2008; Levering, 2006; Melendez Rojas, 2008; Young, 2005). This shift is caused by the assumptions that children are not considered academically ready for school and that children might fall behind in their later academic learning (Bodrova, 2008). In a content-orientated curriculum subject matter knowledge has become a key issue in the preparation of preschool teachers, in how their practice is evaluated, and in the ways that preschoolers’ learning is assessed (Melendez Rojas, 2008; Van Hoorn & Hagenars, 2012). This shift has resulted in a discussion in the field of early childhood education about *what* the content for preschoolers should be and *how* that content should be taught (Bodrova, 2008; Meijer, 2006; Melendez Rojas, 2008; Onderwijsraad, 2008). In addition, in this discussion there is an assumption that preschool teachers approach preschoolers in ways that are markedly different from other age groups; although to date there is little empirical evidence to support this assumption (McCray, 2008; Melendez Rojas, 2008). In this context, the question is *how* specialist music teachers think *rhythm skills* should be taught and learned particularly by *preschoolers*.

1.2.4 The concept of pedagogical content knowledge

Teachers can implicitly and explicitly develop ideas, theories and intuitions through practice (Loughran, 2010; Meijer, 1999) about how rhythm skills can be taught to preschoolers, and in doing so, they not only think about the *what* of teaching – often given in national curricula – but also about the *how* of teaching those skills. The North American educational researcher Lee S. Shulman (1986) recognised that teachers think about both “what” to teach – the content – and

“how” to teach that content. Therefore, in his presidential address to the American Education Research Association in 1986, Shulman suggested that teachers develop a unique kind of knowledge in and through practice that intertwines their content knowledge and pedagogical knowledge, and he called this knowledge “pedagogical content knowledge” (Shulman, 1986, p. 9). What made pedagogical content knowledge (PCK) special was that it is neither about subject matter knowledge per se, nor about general aspects of teaching (Shulman, 1986). PCK was about teachers’ knowledge of how to adapt specific subject matter for the teaching and learning of certain pupils (Park & Oliver, 2008). Shulman (1987) proposed that this type of knowledge should be added to the teachers’ knowledge base as teachers need this kind of knowledge to structure their lesson in a particular way that is suited to the topic being taught: they have to choose teaching and learning activities that suit the topic and they have to anticipate certain learning difficulties of their pupils (Van Driel & Berry, 2010).

The introduction of PCK might have been relatively new to the field of education, yet Shulman and his colleagues had been developing the concept of PCK since the mid eighties during the research for the Stanford Knowledge Growth in Teaching research programme (Ball, Thames, & Phelps, 2008). During this longitudinal research programme a cohort of American novice teachers learning to teach different subjects in secondary education was studied (Shulman, 1986). The examination of these novice teachers offered insight in how preparing and teaching a certain subject asked for specific knowledge on the part of these teachers (Shulman, 1986). Shulman and his colleagues found that effective teachers “represented key ideas using metaphors, diagrams, and explanations that were at once attuned to pupils learning and to the integrity of the subject matter” (Ball et al, 2008, p. 392). At the same time, teachers might use explanations that were correct, but somehow did not open the ideas effectively to learners (Ball et al, 2008). These observations made by Shulman during this research programme thus contributed to the development of the concept of PCK (Ball et al, 2008).

Since Shulman’s introduction of PCK, an assumption has been that exploring PCK might help to define a form of knowledge that is key to the profession of teaching (Shulman, 1987; Vreugdenhil, 2005). From that perspective, exploring

PCK could further the development of the profession of teaching into a more respected and more rewarded occupation (Shulman, 1987). Secondly, an assumption has been that the more teachers know about pupils' learning difficulties concerning a certain topic, and the more varied teaching strategies they have at their disposal, the more effectively they can facilitate learning a topic and hence influence pupil outcomes in a positive way (Drechsler & Van Driel, 2008; Hill, Ball, & Schilling, 2008; Van Hoorn & Hagenaaars, 2012). Thus, researching PCK could provide starting points for the improvement of teaching and learning certain subject topics (Hill et al., 2008). In this context, the music education researcher Burnard (2013a) observed that the understanding of teacher knowledge and teaching in music education are key factors for understanding pupils' learning and achievement. Although Burnard acknowledges the importance of gaining insight into the knowledge of music teachers, the music education researcher Millican (2013, p. 47) notes that "only a few music scholars have begun to investigate and describe just what pedagogical content knowledge looks like in music education". Similarly, there is some research regarding PCK and early childhood education, yet this type of research does not seem to be widespread (Melendez Rojas, 2008) and mainly in the field of maths (e.g. Jang, 2013; McCray, 2008; McCray & Chen 2012). This current study therefore aims to add to the scarce research on PCK in music education in general and focuses particularly on the PCK of specialist preschool music teachers in early childhood education.

1.2.5 Researching pedagogical content knowledge

After its introduction, the concept of PCK sparked a large amount of research into teachers' *cognition* as there was an assumption that the teachers' cognition forms the main source of PCK and guides the teachers' actions in the classroom (Grossman, 1990; Meijer, 1999). The American Psychological Association (n.d.) defines cognition as "processes of knowing, including attending, remembering, and reasoning and also the content of the processes, such as concepts and memories". Similarly, Colman (2003, p. 140) defines cognition in *A Dictionary of Psychology* as "the mental activities involved in acquiring and processing information" and "an item of knowledge or belief". In the case of *teachers'* cognition this relates to planning, decision-making and

reasoning about teaching, and knowledge and beliefs about teaching (Clark & Peterson, 1986; Mathijssen, 2006; Yinger, 1986). Researching teachers' cognition was supposed to give insight into which thoughts determined the behaviour of teachers.

In music education, however, the *body* of the music teacher plays a central role in teaching and learning music, including rhythm skills (Bresler, 2004). Music teachers can communicate aspects of rhythm with their body, simultaneously transmit and instruct rhythm skills in physical ways and react to pupils in physical ways (Westerlund & Juntunen, 2005). Cognition in that case does not only seem to guide the teacher's actions, but cognition can be shaped and changed through physical and social interactions in the classroom, and might actually be part of the physical action (Mathijssen, 2006; Moran, 2011; Vallacher & Wegner, 1987). In other words, the relationship between body, mind and classroom environment of music teachers seems to be more reciprocal and intimate, and the body might be able to communicate a part of the music teacher's PCK.

A recent theoretical perspective that stresses the intimate relationship between body, mind and environment is that of "embodied cognition". In general, the research field of embodied cognition refers to a range of philosophies, theories and research that wish to redress a perceived neglect of the role of the body in cognitive science (Chrisley & Ziemke, 2002). Although there is no one comprehensive view of embodied cognition, the scholars Chrisley and Ziemke (2002) have attempted to define features of this perspective as follows in The Encyclopedia of Cognitive Science:

An understanding of how cognition is realized or instantiated in a physical system, especially a body, may require or be required by an account of a system's embedding in its environment, its dynamical properties, its (especially phylogenetic) history and (especially biological) function, and its nonrepresentational or noncomputational properties. (p. 1102)

In contrast to traditional "disembodied" approaches in cognitive science, an embodied cognition perspective, then, emphasises that the individual's knowing is produced, shaped and enacted through "embodied interactions with

abstracted ideas, physical artefacts, and instantiated bodies” in the social, cultural and physical environment and is manifested in the individual’s body within that environment (Harquail & King, 2010, p. 1621).

As the specialist preschool music teacher’s body seems to play an important role in teaching music in the social setting of a classroom, the PCK will be researched from this particular embodied approach in this current study. The music education historian McCarthy (2007) already observed that the role of the body as a way of knowing has been addressed widely in other disciplines such as sociology, feminism, cognitive science, yet in contrast, the body’s centrality in music education hardly has been studied. Therefore, this current study aims to contribute to research on the role of the teacher’s body in teaching music.

Finally, because from the perspective of embodied cognition, knowledge is not viewed as a static entity, I will refer to pedagogical content *knowing* (PCKg) instead of pedagogical content *knowledge* (PCK) when discussing my research study. The term “pedagogical content knowing” was first introduced by Cochran, DeRuiter and King (1993) in the field of maths and science education and emphasises that the teacher’s knowledge is a *dynamic* form of knowing that emerges in the classroom environment instead of static knowledge brought to the classroom. This notion that PCKg is dynamic and processual in nature will be a major point throughout this study and will be further discussed in relation to the concept of embodied cognition in the findings and discussion chapters of this study.

1.3 Aim and relevance of the study

The goal of this study is to apply the concept of PCKg to early childhood music education and to advance the understanding of PCKg of specialist preschool music teachers from an embodied cognition perspective. Research into the specialist preschool music teachers’ PCKg is first of all relevant because relatively little research has been done on early childhood music education in general (Woodward, 2005; Young, 2009) – yet in countries all over the world, music for young children is a provision in formal schooling. The relative lack of research in early childhood music education could hamper the development of theories on the teaching and learning of music of young children (Young, 2009).

Particularly researching the PCKg of specialist preschool music teachers could contribute to the development of theories on the teaching and learning of music that are closely tied to practice.

Secondly, by researching the PCKg of specialist music teachers from an embodied approach this current study seeks to add a novel perspective to the discussion on how the PCKg of these teachers can be conceptualised and therefore can be explored. Current perspectives on PCK stressing that the teachers' PCK guides their actions have influenced the way PCK has been explored, namely mainly through methods such as questionnaires, interviews, stimulated recalls, concept maps and to a lesser extent through observations (Baxter & Lederman, 1999; Grossman, 1990; Meijer, 1999). An embodied cognition perspective can lead to exploring PCKg with different methods such as, for example, video analysis of gestures and physical actions, possibly uncovering an original and valuable perspective on the nature and content of PCKg of specialist music teachers and one that embraces the teachers' role of the body in teaching music.

It should be noted that current music philosophers (e.g. Elliott, 2005; Bowman, 2004; Bowman & Powell, 2007) and music researchers (e.g. Gruhn, 2012; Phillips-Silver & Trainor, 2007) have already stressed the importance of the body in learning music, including rhythm. Yet these music philosophers and music researchers mainly stress the role of the learner's body in learning rhythm skills, and less emphasis is laid on the teacher's body in teaching and learning rhythm skills. Furthermore, traditional music pedagogies such as Orff, Kodály and Dalcroze have also advocated roles for the learner's body in music learning, but these pedagogies are not derived from contemporary theories on learning and development such as embodied cognition. Or, such as Bowman and Powell (2007, p. 1091) summarise: these traditional music pedagogies "advocate roles in music learning for the body, but they are not derived from nor do they advance a theory of music as embodied – grounded in and emergent from corporeal experience". Therefore, this is an empirical research study that is geared towards the perspective of specialist preschool music teachers from an embodied cognition perspective.

Finally, with regard to practice, exploring PCKg might help to define a form of specialised knowledge that is key to the profession of teaching (Vreugdenhil, 2005) and thus enhance the status of the profession of teaching music (Meijer, 1999). Making the PCKg of specialist preschool music teachers explicit could give these teachers a language to discuss their practice and it could give teachers tools to reflect on their teaching practice (Shulman, 1987). This process could enhance the professionalising of specialist preschool music teachers (Hookey, 2002) and has the possibility of improving the preparation of these teachers.

1.4 The research approach of the study

In this study a multiple case studies approach is taken to researching the specialist music teachers' PCKg. A case study approach is viewed as a form of inquiry that "investigates a contemporary phenomenon in depth and within its real-life context" (Yin, 2009, p. 18) and this approach will provide the opportunity to explore the teachers' PCKg from an embodied cognition perspective in the context of the classroom.

1.5 The context of the study

In this research study the Dutch specialist preschool music teacher teaching pupils at the age of four to six years in preschool education (an integral part of the Dutch primary educational system) is the central focus. To gain an understanding of this system a short overview is given of Dutch preschool (music) education.

1.5.1 A brief history of Dutch preschool education

In The Netherlands preschool education has been regulated by law since 1955 (Commissie Evaluatie Basisonderwijs, 1994). Characteristic for preschool education at the time was that the main focus was on activities, play and working with developmental material as opposed to formal learning in primary education (Commissie Evaluatie Basisonderwijs, 1994). In the Preschool Law (*Kleuteronderwijswet*) the following content of preschool education was

described: play and physical education, work with development material, clay sculpturing, drawing activities, musical activities, storytelling activities and elocution exercises, and the learning of nursery rhymes (Commissie Evaluatie Basisonderwijs, 1994). However, by 1974 the content for preschools was changed by law (Commissie Evaluatie Basisonderwijs, 1994). The focus was moved from activities, play and material to the broad development of young children (Commissie Evaluatie Basisonderwijs, 1994). The developmental and educational areas which preschool teachers had to focus on were now described as physical development, sensory development, language development, musical development, development of other means of expression, social development and cognitive development. Compared to primary school, preschool education was still less outcome oriented. Hence, when referring to preschool education, one spoke of a play-based work plan and of developmental material, not of a curriculum nor learning materials (Commissie Evaluatie Basisonderwijs, 1994).

In 1981, the Primary School Act [translation: *Wet op het Basisonderwijs*] was adopted and in 1985 made law (Levering, 2006). Under this law the preschool was fully integrated into the primary school in order to make an uninterrupted development for pupils possible (Meijer, 2006; Baltussen & Rijkers, 2004). The Dutch primary education programme, the so-called “Basisschool”, now consisted of eight years of education, starting at the age of four until twelve years of age and with compulsory education starting at the age of five (Thijs, Van Leeuwen, & Zandbergen, 2008). Every year has its own group, from Group 1 to Group 8, however, Group 1 and Group 2 (the four- to six-year olds) are usually grouped together. Note that in this research I will use the English term “preschool” to describe Group 1 and Group 2 of Dutch primary education. Moreover, the teacher training college of preschool teachers had to be integrated into the teacher training college for primary education. From now on teachers received a broad education and were certified to teach Group 1 to Group 8. More recently policymakers have voiced their concern over the specific educational needs of young children and have proposed to divide the teacher training college for primary education into a training for the young child and a training for the older child (Onderwijsraad, 2008). Indeed, understanding how a child of four or twelve learns and develops might differ substantially and therefore, separating the teacher training college into a training for the young

child and a training for the older child might allow teachers to develop more in depth knowledge and experience with a certain age group.

1.5.2 The Dutch National Curriculum and preschool music education

In 1993, the Dutch Ministry of Education, Culture and Science (Ministry of EC&S) introduced a National Curriculum into the Dutch primary educational system. In this Dutch National Curriculum “Core Objectives” are defined that should be met by every pupil at the end of their primary education (Greven & Letschert, 2006). Though the Core Objectives are set for all pupils, schools are free in their pedagogical approach and methods to achieve these objectives – the “how” of teaching. Because the preschool programme has become integrated in the primary education, preschool (music) teachers now have to work towards the Core Objectives of the Dutch National Curriculum (Baltussen & Rijkers, 2004; Commissie Evaluatie Basisonderwijs, 1994) and this has caused a shift from a play- and child-orientated curriculum to a content-orientated curriculum (Grambergen & De Wolff, 2008; Levering, 2006).

Since the introduction of the Dutch National Curriculum in 1993, this curriculum has seen two revisions, one in 1998 and one in 2006. In the Dutch National Curriculum of 2006 the five Core Objectives related to music that were stated in the 1998 version of the Dutch National Curriculum have been reduced to three broadly defined Core Objectives that integrally cover the content area of the arts (Greven & Letschert, 2006). These three Core Objectives are (1) the pupils learn to use images, language, music, games and movement to express their feelings and experiences and to communicate with; (2) the pupils learn to reflect upon their own work and the work of others; and (3) the pupils acquire knowledge about and learn to appreciate aspects of cultural heritage (Greven & Letschert, 2006, p. 7). Furthermore, schools are free in their choice to work with generalist or specialist arts teachers in attaining the Core Objectives.

To help schools with achieving the Core Objectives for the arts, the Ministry of EC&S has assigned the National Institute for Curriculum Development to translate the three Core Objectives into two different curricular strands. The first is the “TULE”-strand, and the second is the “Leerplankader Kunstzinnig Oriëntatie” [translation: “Curriculum Framework Arts Education”] (SLO, n.d.).

Moreover, schools are not obliged to follow or choose between these two curricula but both curricular-strands give examples of how the Core Objectives can be attained progressively over the eight years of primary education (Scholtens, 2007). For instance, in relation to rhythm skills the TULE-strand for music education suggests the preschoolers attain the following objective “de maat spelen bij liedjes” [translation: “play to songs with a steady beat”] (Jacobse, Van der Lei, Loenen, Nieuwmeijer, Roozen, & Klein Tank, 2008, p. 27). Alternatively, the “Curriculum Framework Arts Education” for music education suggests the following objectives: “De leerling kan maat en tempo van muziek in beweging weergeven”; “De leerling kan (in groepsverband) eenvoudige ritmische patronen uitvoeren”; and, “De leerling kan zich tijdens het musiceren qua tempo en volume aanpassen aan dat van de groep” [translation: “The pupil can demonstrate the metre and tempo of music through movement”; “The pupil can perform simple rhythmic patterns (in a group)”; “The pupil can adjust his or her volume or pace of playing to that of the group”].

The main difference between these two strands is that the TULE-strand for music education focuses on the *content* of a music curriculum and gives some video examples of musical activities (but not specifically of rhythm activities for preschoolers), whereas the “Curriculum Framework Arts Education” for music education proposes – inspired by the 21st-century skills – a generic approach to teaching music throughout the eight years of primary education with the help of “the creative-process model”. Teachers applying the creative-process model during teaching will have pupils orientate themselves towards themes and goals of an assignment, will have pupils explore different possibilities of an assignment and work on an assignment, and lastly, will have pupils evaluate their learning process. In the “Curriculum Framework Arts Education”, the creative-process model is a pedagogical approach for teaching music and the arts in general – but it is not translated to particular activities that demonstrate how music can be taught according to that model in different age groups. Thus, the *how* of teaching music including rhythm skills to preschoolers remains unclear in both curricular strands and specialist preschool music teachers are still reliant on their own ideas and resources in deciding *how* they are going to teach rhythm skills. However, the concept of PCKg provides entry points for exploring these teachers’ knowledge of teaching strategies, knowledge of the pupils’ learning difficulties, knowledge of curriculum and knowledge of

assessment and therefore this study aims to offer a more detailed account of *how* rhythm skills can be taught.

1.6 Overview of the study

This thesis is divided into eight chapters. Chapter 2 presents a literature review of the historical background of the concept of PCK and the different perspectives on the nature and content of the concept of PCK that have been developed since its introduction. In this chapter I build the argument that an embodied cognition approach can provide a basis for conceptualising the nature of PCKg that suits specialist music teachers who teach rhythm skills in a preschool setting. In Chapter 3 I describe how the specialist preschool teacher's PCKg can be conceptualised from an embodied cognition perspective and I explore how an embodied view of PCKg might be researched.

Chapter 4 presents the methodology of the study, explaining its philosophical underpinnings, the research question, the strengths and limitations of the research methods that were employed in this study and the ethical considerations. It includes a section on the trustworthiness of the study and its gaps and limitations. Chapter 5 explains the analysis process of data collected via the different research methods and the process of intercoder agreement.

Chapter 6 presents the findings of the study: a thematic analysis of what the different research methods revealed about the specialist preschool music teachers' PCKg regarding teaching and learning rhythm skills from an embodied cognition perspective. Chapter 7 discusses the findings in such a manner that it furthers the understanding of the nature and content of the specialist preschool music teachers' PCKg regarding rhythm skills, while Chapter 8 offers implications for future research, teacher education, practice and policy.

1.7 Reading guide

A few last notes have to be made about the use of the terminology in this study. I will use the abbreviation PCK to refer to “pedagogical content *knowledge*” and the abbreviation PCKg to refer to “pedagogical content *knowing*”. I employ these different abbreviations because they refer to different perspectives regarding the nature of teacher knowledge. In addition, to increase the readability of the text I will interchangeably use the term “specialist preschool music teacher” and “teacher”. However, when teachers are discussed other than “specialist preschool music teachers” I will explicitly mention it. Lastly, to give access to embodied aspects of the specialist preschool music teachers’ PCKg, I chose to use video fragments of these teachers wherever possible to illustrate their PCKg. Therefore, included in this research study is a DVD with examples of the specialist preschool music teachers’ PCKg. In the text I will refer to the corresponding video track that can be viewed in addition to reading the text.

Chapter 2 Perspectives on pedagogical content knowledge

2.1 Introduction

In this chapter I will discuss research into the concept of PCK. To show how the concept of PCK has developed since its introduction in 1986 by Shulman, I will first discuss the background of PCK and secondly, its elaborations and refinements by subsequent researchers who mainly have operated in the fields of maths, science and language education. Those fields have conceptualised the nature of PCK from constructivist and information processing theory perspectives and consequently these conceptualisations have been adopted in other fields of education. However, I will argue that the way PCK has been conceptualised in the fields of maths, science and language education does not necessarily fit how specialist preschool music teachers develop and communicate their knowledge about teaching and learning music. In maths, science and language education the content of a lesson is laid down in text and symbol-based curricula, and verbal explanation is used to clarify concepts. In contrast, the content of a music lesson is often laid down in the physical actions of the music teacher and therefore, the teacher's physical actions and gestures would seem to play a prominent role in the teaching and learning of rhythm skills. In the last part of this chapter, I will therefore build the argument that an embodied cognition perspective can provide a basis for conceptualising the nature of PCKg that suits specialist preschool music teachers.

2.1.1 Literature on PCK and PCKg

After its initial introduction in 1986, researching PCK soon developed as a field of study, which led to research spanning different fields of education, spread somewhat unevenly over diverse subject areas (as reviewed in Ball, Thames, & Phelps, 2008). PCK has been extensively researched in science and maths education (e.g. Park & Oliver, 2008), but to a lesser extent in other fields such as language (e.g. Meijer, 1999; Van Olphen, 2008), history (e.g. Gudmundsdottir, 1990) or music (e.g. see research on expert coaches who coach beginning bands from Millican, 2013). Furthermore, PCK has been

researched in the field of primary education (e.g. Jones & Moreland, 2004), secondary education (e.g. Zanting, 2001), higher education (e.g. Crasborn & Hennissen, 2010), and teacher education (e.g. Van Driel, De Jong, & Verloop, 2002). However, research on PCK in early childhood education is scarce and mainly in the field of maths and science education (see. e.g. McCray, 2008; Melendez Rojas, 2008). Ball and her colleagues (2008) also describe which foci research on PCK and PCKg has taken place since its introduction. One line of work has sought to contribute to an understanding of the knowledge teachers need to have about misconceptions and common conceptions that pupils hold prior to learning a subject topic or develop when they learn a subject topic (e.g. Ball et al., 2008). Another strand has been mapping the PCK of novice and expert teachers (e.g. Duling, 1992). Lastly, more recent research focuses on the development of PCK over time and aims to enhance the understanding of teacher learning (Abell, 2008).

Few studies of PCK or PCKg in music education exist and they have different foci, e.g. the development and acquisition of PCK of pre-service teachers or exemplary teachers, or what the need is for PCK in teacher training courses. For example, in the field of music education, the Australians Capaldo, Muscat and Tindall-Ford (2014) examined the pre-service generalist primary teacher's development of PCK for teaching music; Mateiro, Russell and Westvall (2012) examined whether student music teachers in Brazil, Canada and Sweden perceived PCK in a similar way; and the North Americans Haston and Leon-Guerrero (2008) explored what influences pre-service instrumental music teachers' acquisition of PCK. In secondary education, the Australian Ballantyne (2006) researched the perceptions of early-career secondary music teachers regarding the effectiveness of their pre-service preparation and their recommendation to focus on PCK. In primary education, the North American music education researcher Duling (1992) sought to identify the factors that have influenced the development of exemplary middle school general music teachers' PCK. However, during my thorough literature review I found no literature covering the specialist preschool music teachers' PCKg regarding rhythm skills. As there is not a lot of research on PCK or PCKg in the field of music education, in this literature review I will mostly draw on research that has been generated in the field of maths, science and language education, in secondary and teacher education. Although the research on PCK or PCKg in

this literature review does not relate directly to early childhood music education, it is relevant because it discusses the content and nature of PCK and PCKg at a *conceptual* level. As a result, this allows me to consider how PCKg can be conceptualised in such a manner that it might be applicable to early childhood music education.

2.1.2 PCK versus *Fachdidaktik*

Although the concept of PCK was first coined in North America, it connects with a well-established tradition in European literature on teaching and learning (Van Driel & Berry, 2010). The German word *Fachdidaktik* is often used to refer to this tradition (Holgersen & Holst, 2013; Van Driel & Berry, 2010) and can be translated as the pedagogy of subject matter (Holgersen & Holst, 2013; Van Driel & Berry, 2010). In comparison to PCKg, the educational researchers Van Driel and Berry (2010) comment that the European *Fachdidaktik* tradition is first of all more philosophical and practical than empirical, and secondly the *Fachdidaktik* tradition has not provided detailed accounts of how teachers transform subject matter knowledge, nor the ways in which teachers relate those transformations to pupil understanding during classroom interaction. In that respect, these authors (2010, p. 656) note that “PCK adds a new perspective to the *Fachdidaktik* tradition”. By developing a concept of PCKg viewed from an embodied cognition perspective in this study I can provide detailed insights into teaching and learning rhythm skills from a different perspective based on empirical research, and rooted in the existing literature on PCK.

2.2 The background of the concept of pedagogical content knowledge

2.2.1 Introduction to the concept of pedagogical content knowledge

Planning and teaching any subject is often perceived to be a complex activity that draws on many different kinds of teacher knowledge (Georgii-Hemming, 2013; Magnusson, Krajcik, & Borko, 1999). An assumption is that teachers with a differentiated and integrated knowledge base will have greater ability to plan for teaching, to teach and to reflect on the teaching, and thus have a positive

effect on the learning outcomes of pupils (Goldschmidt & Phelps, 2010). Therefore, in the field of teacher education there is an ongoing discussion about which knowledge base can best prepare (pre-service) teachers for the complicated task of teaching (e.g Jansma & Van der Veen, 2009). In this discussion questions are and have been raised concerning what the depth or breadth of a teacher knowledge base should be (Van der Leeuw, Israel, Pauw, & Schaufeli, 2009; Gess-Newsome, 1999a), if the nature of the knowledge base should be mainly theoretical or practical (HBO-Raad, 2012; Fenstermacher, 1994), which knowledge is specific to the profession of teaching (Van der Leeuw et al., 2009) and who should decide on the knowledge base. For example, policymakers, researchers, teacher educators or teachers themselves (Cochran-Smith & Lytle, 1990).

The broad and complex discussion on a professional teacher knowledge base is by no means new. Shulman and his colleagues (1987) proposed a framework for a professional knowledge base for teachers that reflected various types of knowledge. This proposed framework consisted of content knowledge, general pedagogical knowledge, curriculum knowledge, knowledge of learners and their characteristics, and knowledge of educational goals. However, as mentioned in the introduction, according to Shulman and his colleagues (1987), PCK was a type of knowledge that until that time had largely been unidentified and should be added to the framework. PCK was perceived to be unique to the knowledge base of teachers (Sherin, Sherin, & Mandanes, 2000) and this type of knowledge distinguished “expert teachers in a subject area from subject area experts” (Cochran, DeRuiter, & King, 1993, p. 263).

2.2.2 The shift from researching teacher behaviour to teacher cognition

At the time the introduction of the concept of PCK to the discussion of teachers' knowledge base was remarkable. Empirical research on teaching until then mostly had been focusing on process-product studies searching for context-free and scientifically proven indicators that could contribute to effective teaching (Beijaard & Verloop, 1996; Shulman, 1986). This type of research mainly focused on general forms of teaching behaviours – the process of teaching – that correlated with positive pupil outcomes – the product of teaching (Verloop,

1989). The emphasis within this type of research was for instance on how teachers manage their classrooms, allocate time and tasks, and how long they wait before answering questions (Ball et al., 2008). The goal of such research was to be able to generalise results for different educational fields to raise the quality of education (Gess-Newsome, 1999a). Due to the focus on teachers' generic pedagogical behaviour, less attention had been given to the subject matter content in relation to pedagogy (Morine-Dersheimer & Kent, 1999).

Recognising the absence of subject matter *content*, Shulman (1986) called the interaction between subject matter content and pedagogy the missing paradigm in research on teaching. By focusing on the teacher's knowledge of subject matter content in relation to pedagogy, researchers' attention could shift from behaviour towards teacher cognition (Verloop, 1989), the underlying assumption being that the knowledge and beliefs of teachers guides their physical actions and their decisions during teaching (Grossman, 1990; Meijer, 1999). Researching the cognition of teachers was therefore supposed to give insight into which cognitive processes such as decision-making and planning determined the behaviour of teachers, and the goal was to ultimately construct a portrayal of the cognitive psychology of teaching (Clark & Peterson, 1986). In summary, with the introduction of PCK Shulman provided a new framework to explore teacher cognition, and this seemed to revitalise the study of teacher knowledge (Gess-Newsome, 1999a).

2.3 The complexity of defining and researching PCK

Although the notion of PCK has provoked a great amount of research over the last decades (Ball et al., 2008), researching PCK has been shown to be problematic (Hashweh, 2005; Loughran, Berry, & Mulhall, 2006). The concept has been criticised for being poorly defined (Ball et al., 2008; Hashweh, 2005), and the existing definitions of PCK are often formulated in such a broad manner that it captures "nearly any package of teacher knowledge and beliefs" (Ball et al., 2008, p. 394). The nature and content of PCK tends to be interpreted and defined differently and this has engendered a "variety of meanings" (Park & Oliver, 2008, p. 262) and has not led to a universally accepted conceptualisation of PCK (Van Driel & Berry, 2010).

Regarding the *nature* of PCK, different perspectives on teacher learning and development have influenced its conceptualisation. From the field of maths and science education, Cochran, DeRuiter and King (1993, p. 266) renamed “pedagogical content *knowledge*” to “pedagogical content *knowing*” which reflects their constructivist view of PCK, and these scholars stress the dynamic knowledge construction of teachers. Alternatively, from the field of language education, Meijer (1999) explicitly takes an information processing perspective on PCK. From this perspective, the way long-term and short-term memory hold information and the way memory is used in action is stressed (Crasborn & Hennissen, 2010; Meijer, 1999). Both these perspectives will be explained in detail in sections 2.5 and 2.6.

Regarding the *content* of PCK, some researchers have built on Shulman’s description of the content of PCK, slightly altering the original content e.g. Magnusson, Krajcik and Borko (1999) have added “*knowledge and beliefs of assessment in a subject area*” to its content. Other researchers describe the content of PCK differently, *and* change the name of the original term to match the description of the new content, e.g. “*technical pedagogical content knowledge*” (Mishra & Koehler, 2006) or “*generic pedagogical content knowing*” (Fernandez-Balboa & Stiehl, 1995). These factors can contribute to the complexity of defining the content of PCK. Finally, to make matters even more complex, the way the *nature* of PCK is conceptualised can influence the way the *content* of PCK is conceptualised (Cochran et al., 1993). These different views of the nature and content of PCK have resulted in a diversity of research questions and in researching and exploring it in diverse ways, which has complicated the process of building on earlier research or comparing research from different fields (Baxter & Lederman, 1999). One could also argue that PCK’s flexibility as a concept has an advantage as it seems to be applicable to different educational settings, and it can be viewed from different perspectives on learning and development.

Since there is no research on specialist preschool music teacher’s PCKg, in the sections below a closer look will be taken at how researchers in the fields of maths, science and language education have conceptualised the content and nature of PCKg since its introduction in 1986. Taking a detailed look at these conceptualisations will enable me to build an argument as to why a different

perspective on the nature and content of PCKg might be developed for specialist preschool music teachers, yet one that still is rooted in the literature on PCKg.

2.4 Shulman's descriptions of PCK

2.4.1 Defining PCK

In two seminal articles Shulman (1986, 1987) introduced and explained the concept of PCK including what the content of PCK encompassed (Hashweh, 2005; Hill et al., 2008). In Shulman's article of 1986, he refocused attention onto the role of *content* in teaching, and therefore introduced the "domain of content knowledge in teaching" that comprised of "subject matter content knowledge", "pedagogical content knowledge" and "curricular knowledge". Shulman (1986) originally defined PCK as the following:

[t]he most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, and demonstrations – in a word, the most useful ways of representing and formulating the subject that makes it comprehensible to others... Pedagogical content knowledge includes an understanding of what makes the learning of specific topics easy or difficult: the conceptions and preconceptions that pupils of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons. (p. 9)

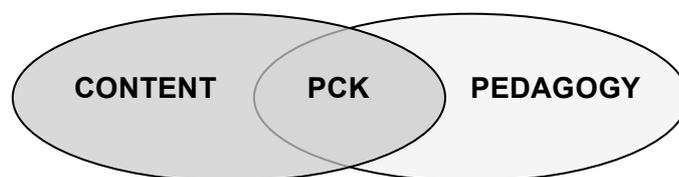
One year later, Shulman and his colleagues had already further developed the concept of PCK and their notion of what the content of this specific knowledge entailed (Gess-Newsome, 1999a). Within the knowledge base of teachers, PCK was now identified as a category in its own right next to six other categories. The total of seven categories of the proposed knowledge base were described as follows:

1. Content knowledge;
2. General pedagogical knowledge, with special reference to those broad principles and strategies of classroom management and organization that appear to transcend subject matter;

3. Curriculum knowledge, with particular grasp of the materials and programs that serve as "tools of the trade" for teachers;
4. Pedagogical content knowledge, that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding;
5. Knowledge of learners and their characteristics;
6. Knowledge of educational contexts, ranging from the workings of the group or classroom, the governance and financing of school districts, to the character of communities and cultures; and
7. Knowledge of educational ends, purposes, and values, and their philosophical and historical grounds. (Shulman, 1987, p. 8)

Similar to the description of PCK in his first article, Shulman (1987, p. 8) presented PCK as “the blending of content and pedagogy into understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction”. PCK was now viewed as (1) being topic specific; (2) encompassing an understanding of how content can be organised, represented, adapted and presented for instruction to the diverse interests and abilities of learners; (3) existing of thoughts and actions of teachers; and (4) being a category within its own right. In the figure below the blending of content and pedagogy into PCK is visualised:

Figure 2.1 Pedagogical content knowledge [modified from Mishra & Koehler, 2006)



Although PCK by now had become one of the seven categories of the teacher knowledge base, Shulman did not explicate the relationship between the seven categories, nor did he discuss an eventual hierarchy between the categories (Hasweh, 2005; Veal & MaKinster, 1999) nor elaborate on the eventual different forms of knowledge within the categories (Hasweh, 2005). The further conceptualisation of the broad and multi-interpretable definition of PCK therefore became the task of other researchers. Indeed, several researchers

(e.g. Ball et al., 2008; Grossman, 1990; Magnusson et al., 1999) have built on the work of Shulman and they have tried to refine this latter concept of PCK (partially) on the basis of empirical findings and (partially) on the basis of theorising.

2.4.2 Conceptualisations of PCK building on the work of Shulman

One of the first researchers to build on the work of Shulman and to start clarifying PCK was the US-based Grossman who had participated in the Stanford Knowledge Growth research project researching novice teachers who teach English (Grossman & Shulman, 1994). Grossman integrated two categories of Shulman's seven original categories as described in section 2.4. in to her own description of PCK, namely *curricular knowledge* and *knowledge of the purpose for teaching subject matter*. She proposed that PCK consisted of four components. The first component of PCK consisted of *knowledge about the purpose for teaching certain subject matters at different age levels*. This first component of PCK surfaces in the teachers' goals for teaching a certain topic. The second component consisted of *knowledge of pupils' understanding, (mis)conceptions and strategies for solving different types of problems*. The third component consisted of *horizontal and vertical curricular knowledge*. The teachers' *horizontal curriculum knowledge* consisted of what pupils have learned and will learn during a longer period (e.g. a year or several years). The teachers' *vertical curriculum knowledge* consisted of the way one's own subject relates to an overall curriculum of pupils. The fourth component consisted of *knowledge of instructional strategies and representations for teaching certain topics*. Lastly, Grossman commented that the four components seem less distinct in practice than in theory.

The North American science educators and researchers Magnusson, Krajcik and Borko (1999) explicitly built on the work of Shulman and Grossman. They gave a relatively elaborate description of five components that could constitute PCK that are partially based on empirical research and partially on theorising. According to their view PCK consisted of the five following components: *knowledge and beliefs of the orientations towards teaching and the purpose for teaching a certain topic in a specific way; knowledge and beliefs of the*

curriculum in relation to teaching a topic; knowledge and beliefs of pupils' understanding of a topic; knowledge and beliefs of assessment in a subject area; and knowledge and beliefs of instructional strategies with regard to a topic. In relation to Shulman's concept of PCK (1987) Magnusson and colleagues (1999) include *knowledge and beliefs of the orientations towards teaching and the purpose for teaching a certain topic in a specific way, knowledge and beliefs of the curriculum in relation to teaching a topic and knowledge of assessment in a subject area* as part of PCK. In addition, they specifically mention that PCK comprises a complex blend of knowledge and beliefs. Magnusson and colleagues (1999) note that teachers' beliefs can serve as filters through which teachers (implicitly) come to develop and use their PCK in the teaching process.

More recently, the US-based Ball, Thames and Phelps (2008) have elaborated on Shulman's concept of PCK (1987) from the perspective of maths education. Partially based on empirical research and partially on theorising Ball and colleagues (2008) sought to clarify the conceptual boundaries between mere subject matter knowledge and the PCK of maths teachers. They theorised where subject matter knowledge might end and PCK might start, and what the differences might be. Further, they integrated "*knowledge of content and curriculum*" in PCK, whereas according to Shulman that type of knowledge is a category in its own right. In the figure below an overview is given of the researchers ideas:

Figure 2.2 The content of PCK as defined by Ball and colleagues (2008)

Domain: Subject matter knowledge		Domain: Pedagogical content knowledge	
Common content knowledge (CCK)	Specialised content knowledge (SCK)	Knowledge of content and pupils (KCS)	Knowledge of content and curriculum
Horizon content knowledge		Knowledge of content and teaching (KCT)	

Within the domain of "*subject matter knowledge*" a differentiation is made between three forms of knowledge: *common content knowledge*, the content teachers need to know but that is not unique to teaching; *specialised content knowledge*, a special form of "decompressed" knowledge of one's subject. Ball and colleagues (2008, p. 401) give the following example: "Accountants have to

calculate and reconcile numbers [...]” but they do not need “to explain why, when you multiply by 10, you add a zero”; and *horizon content knowledge*, the teachers’ overview of all the topics that are taught within a subject, and how these topics conceptually relate to each other.

Within the domain of *pedagogical content knowledge* a differentiation is made between three forms of this knowledge: *knowledge of content and pupils*, e.g. teachers “have to be able to predict what pupils are likely to think, what they might find confusing, interesting and motivating, hard or easy” (Ball et al., 2008, p. 400); *knowledge of content and teaching*, e.g. teachers choose specific examples to explain topics with or to deepen the understanding of pupils; *knowledge of content and curriculum*. Ball and colleagues (2008) provisionally include knowledge of content and curriculum, the third category of Shulman’s initial categories (1987). The researchers are not sure whether this form of knowledge is part of PCK or is a category in its own right.

2.4.3 PCK is more complex than Shulman originally implied

The aforementioned researchers all have further developed Shulman’s concept of the content of PCK (1987), although the core of his conceptualisation, the blend of content and pedagogical knowledge, is concurred. These researchers have integrated one or more of the seven knowledge categories of the teachers’ knowledge base as proposed by Shulman into PCK, or have added a new category to it. Moreover, the aforementioned researchers all agree that PCK is more complex than Shulman originally implied, and they have worked towards a more complex conceptualisation of the content of PCK. This finding is important and relates to this current study: when conceptualising the content of the specialist preschool music teachers’ PCKg the idea that PCKg is more complex than originally defined by Shulman carefully should be taken into account. The way the content has been conceptualised by the researchers that have been discussed in the sections above can be seen in the table below:

Table 2.3 Overview of the conceptualisations of the content of PCK [modified from Van Driel, Verloop & De Vos (1998)]

	1	2	3	4	5
	Knowledge of how to organise, represent, adapt and present a topic for instruction	Knowledge of what makes the learning of specific topics easy or difficult for pupils	Knowledge of a topic and curriculum	Knowledge of purposes, and orientations for teaching certain topics	Knowledge of a topic and assessment
Shulman (1987)	PCK	PCK	0	0	N
Grossman (1990)	PCK	PCK	PCK	PCK	N
Magnusson et al. (1999)	PCK	PCK	PCK	PCK	PCK
Ball et al. (2008)	PCK	PCK	PCK	N	N

Author placed category outside of PCK: 0

Author did not discuss category explicitly: N

2.4.4 Alternative perspectives on Shulman's concept of PCK

Shulman and other researchers who have worked in his line of thought have met criticism that has been directed at how the nature of PCK neither has been conceptualised, nor defined explicitly (Carlsen, 1999; Cochran et al., 1993; Grossman & Shulman, 1994). Grossman and Shulman (1994, p. 7) remarked that the view of knowledge that underlies these aforementioned concepts of PCK has been criticised as being too static, as if teachers “come to their instructional tasks with a fixed 'knowledge base' that undergirds their work”, and as if “the knowledge for teaching exists somehow outside the teacher, derived from research and other authoritative sources and then is applied to the challenge of teaching”. Similarly, Kind (2009, p. 176) comments that Shulman presented teachers' knowledge as “a static body of content” seated in the mind of the teacher and that Shulman seemed to adopt a teacher-centred model of cognition. Grossman and Shulman (1994) maintain that some of the criticism is based on a misconception. They noted that “We did not see ourselves eliciting static knowledge from the mind of teachers, but rather observing the growth and construction of knowledge over time” (Grossman & Shulman, 1994, p. 7). Nevertheless, the North Americans Cochran, DeRuiter and King (1993) who

have a background in maths and science education, proposed to expand the concept of PCK to be more consistent with a constructivist framework as will be described below.

2.5 A constructivist perspective on PCK

2.5.1 Constructivism and the nature of PCKg

A few years after the initial introduction of PCK, Cochran and colleagues (1993) proposed a modification of Shulman's concept of PCK by explicitly taking a constructivist perspective on PCK. They renamed "pedagogical content *knowledge* (PCK)" to "pedagogical content *knowing* (PCKg)" (1993, p. 265) to reflect the dynamic nature of the development of the teacher's personal knowledge. Constructivism is a learning theory that has its roots in philosophy, psychology and education (Von Glasersfeld, 1989; Phillips, 1995; Phillips & Soltis, 2009) and, considered as a whole, constructivism is complex and made up of different – sometimes opposing – viewpoints of learning and development (Phillips, 1995; Phillips & Soltis, 2009). In their description of PCKg, Cochran and colleagues (1993) depart from a radical constructivist view on learning as described by Von Glasersfeld (1989) and Lerman (1989). First of all, they emphasise that the teacher's PCKg is developed actively and continuously during the process of teaching. Secondly, they emphasise that the processes of learning and development serves the organisation of the world as *experienced* by the teacher and not the discovery of an objective and true reality (Cochran et al., 1993; Lerman, 1989; Von Glasersfeld, 1989). Cochran and colleagues (1993) also draw on a social constructivist perspective on learning and development when they note that teachers construct and develop their PCKg in and through a *social* context as a result of interactions with the social environment. According to these authors the teachers' PCKg is therefore situated and context bound, continuously shaped through interaction and reflection on the social, political, cultural and physical classroom environment.

2.5.2 Constructivism and the content of PCKg

The way Cochran and colleagues (1993) conceptualise PCKg from a constructivist perspective influences their view of the *content* of PCKg. According to these authors PCKg consists of four components that are highly integrated and synthesised into a unique and personal form of PCKg. The four components of PCKg are: *pedagogical knowing*; *subject matter content*; *the teacher's understanding of students*; and *the teacher's understanding of the environmental context of learning*. The main difference with Shulman's concept of PCK (1987) is their choice to add *the teacher's understanding of the environmental context of learning*. This component emphasises that teachers must understand which social, political and physical environmental factors influence their teaching and the learning of pupils. Additionally, the component *pedagogical knowing* includes two categories of Shulman's original teachers' knowledge base, namely *knowledge of curriculum* and *knowledge of educational goals*. The component *subject matter content* includes the so-called "non-target content knowledge" of a teacher, the content knowledge that is not directly related to the subject being taught but that also affects teaching. In the table below the differences between Shulman's description of the content of PCK (1987) and the conceptualisation of PCKg by Cochran and colleagues (1993) are visualised:

Table 2.4 Overview of the conceptualisations of the content of PCK and PCKg [modified from Van Driel et al. (1998)]

	1	2	3	4	5	6
	Knowledge of how to organise, represent, adapt and present a topic for instruction	Knowledge of what makes the learning of specific topics easy or difficult for pupils	Knowledge of a topic and the environmental context of learning	Knowledge of subject matter	Knowledge of a topic and curriculum	Knowledge of purposes, and orientations for teaching certain topics
Shulman (1987)	PCK	PCK	0	0	0	0
Cochran et al. (1993)	N	PCKg	PCKg	PCKg	PCKg (so-called "pedagogical knowing")	PCKg (so-called "pedagogical knowing")

Pedagogical content *knowing*: PCKg
 Author placed category outside of PCK: 0
 Author did not discuss category explicitly: N

2.5.3 The development of PCKg viewed from a constructivist perspective

Cochran and colleagues (1993) also turned their attention to the development of PCKg and what could influence that development. They observe that the development of PCKg results from multiple opportunities of pre-service teachers to observe teachers, to teach themselves and to reflect on (their own) teaching. They suggest that "teacher education should promote learning in contexts where goals are focused on teaching *specific* content to *specific* students in *specific* contexts" (1993, p. 266) [italics in the original] and teachers should reflect on these experiences and receive feedback. They also note that PCKg develops through repeated teaching experiences that can promote the simultaneous learning of the different knowledge components of PCKg.

Although Cochran and colleagues (1993, p. 269) provide a theoretical framework for the development of PCKg, they do not support their framework with empirical evidence and note that "some of the ideas are speculative". Since, there has been more research on how the PCKg of (pre-service) teachers develops that seems to support (part of) their constructivist framework. For example, Cochran and colleagues (1993) assert that classroom experience

has an impact on the development of PCKg. Based on a multiple case study of twelve pre-service chemistry teachers, Van Driel, Beijaard and Verloop (2001) suggest that in the perception of the pre-service teachers, classroom experiences had the strongest impact on the development of their PCKg. One reason seemed to be that different teaching activities and classroom events had affected the pre-service teachers' knowledge of specific learning difficulties of pupils. In a multiple case study related to PCKg on the development of practical theories on the teaching of eight secondary school teachers, De Vries (2004) found that their practical theories on teaching developed through classroom experience. The teachers mentioned that through experience they had become more flexible in using different teaching strategies and dealing with mixed classes, and they had come to realise that their developed teaching skills were bound to a certain school type.

In their theoretical framework of PCKg, Cochran and colleagues (1993) also stress that contextual factors influence the development and communication of PCKg. In the field of early childhood education, Bennett, Wood and Rogers (1997) examined the teachers' perceived impact of constraining or mediating factors on the relationship between their personal theories on play and their classroom practice. These teachers indeed felt that the low ratio of adults to children and the large classes worked against a play-based curriculum. From the field of science education, Park and Oliver (2008) found through a multiple case study of three experienced chemistry teachers that *pupils* positively impacted on the development of PCKg of these teachers because they could ask challenging questions which tended to deepen and broaden the teachers' subject matter knowledge. In contrast, based on a single case study the science education researchers Loughran, Berry and Mulhall (2006, p. 5) report that a teacher found it difficult to develop his PCK towards a more constructivist way of teaching because "[t]he sense of comfort and confidence that comes with knowing the routine can quickly dissipate when the expectations for learning shift as a consequence of teachers using approaches to teaching with which students are unfamiliar". The expectations of the pupils thus hindered the development of PCK in a certain direction.

2.5.4 Reflections on a constructivist perspective on PCKg

2.5.4.1 *The nature of PCKg from a constructivist perspective*

Cochran, DeRuiter and King (1993) take a constructivist approach to PCKg and therefore note that it is a personal form of knowing that is content, pupil and context dependent. Reflecting on that stance, it is interesting to consider that the educational researcher Desforges (1995, p. 394) states that not all knowledge is *context* dependent as some knowledge and experience seems to travel with the person from classroom to classroom, but it is still unclear “what travels, what is afforded by the situation and what must be created on the spot?”. Anderson, Reder and Simon (1996) go on to mention that research suggests that knowledge is partly context dependent but also partly context independent.

Furthermore, Cochran and colleagues (1993) do not seem to choose or clearly describe the relation between the two different views of constructivism that underpin their concept of PCKg (Van der Ploeg, 2005). On the one hand, they describe the “radical constructivist” perspective. From this perspective – broadly speaking – teachers create mental constructs of teaching that they have abstracted from their (classroom) experiences through reflection (Cochran et al., 1993; Van der Ploeg, 2005). On the other hand, they describe a “social constructivist” perspective. From this perspective – broadly speaking – the understanding of teaching results from social interaction with the pupils or other teachers (Cochran et al., 1993; Van der Ploeg, 2005). Both views of constructivism could have different implications for the way in which the development of PCKg is conceptualised and how it can be researched. Cochran and colleagues (1993) focus on *knowledge* aspects of PCKg and they do not make an explicit distinction between knowledge and beliefs, such as Magnusson and colleagues (1999) and Meijer (1999), amongst others, do. Finally, although Cochran and colleagues (1993, p. 269) provide a theoretical framework for (the development of) PCKg they do not support their framework with empirical evidence.

2.5.4.2 *The content of PCKg from a constructivist perspective*

In their overview of the components that constitute PCKg Cochran and colleagues (1993) include the knowledge component *subject matter content* to their concept of PCKg. They describe *subject matter content* as a form of content knowledge that is *not* directly related to the subject being taught but that also affects teaching. However, how that knowledge component relates to teaching or impacts on teaching is not described and therefore it remains unclear why it should or could be part of PCKg. Moreover, they do not add the knowledge component *Knowledge of how to organise, represent, adapt and present content for instruction* or what Ball and colleagues (2008) have termed more neutrally *Knowledge of content and teaching*. This seems remarkable as this type of knowledge seems to be a blend of content and pedagogy and is often seen as the core component of PCK (Shulman, 1987; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999; Ball et al. 2008).

2.5.5 Relating a constructivist view of PCKg to this current study

Relating a constructivist view of PCKg to this current study, Cochran and colleagues (1993) make an important point when they stress that the social, political, cultural and physical context in which the teachers operate influences the way their PCKg develops and can be communicated, and that teachers develop knowledge of how that context influences their own teaching and the learning process of their pupils. Subsequent research on PCKg suggests that contextual factors indeed impact on the way PCKg develops and can be communicated – a valuable point to take note of in relation to this study. Less clear, however, is how Cochran and colleagues envisioned research studies investigating PCKg from a constructivist perspective. Alternatively, the Dutch educational researchers Meijer (1999) and more recently Crasborn and Hennissen (2010) have attempted to describe the nature and content of PCKg in such a manner that it also could give direct entry points for research.

2.6 An information processing perspective on PCK

2.6.1 An information processing perspective and the nature of PK

In a qualitative research study that explored the PCK of thirteen secondary language teachers in relation to reading comprehension, Meijer (1999; Meijer, Verloop, & Beijaard, 2002) attempted to seek out how the teachers' PCK could best be explored and how PCK could be made explicit. In her study, Meijer (1999, p. 19) prefers to use the broader term "practical knowledge" (PK) instead of PCK because "studying teacher's pedagogical content knowledge can be seen as studying teacher's practical knowledge from a specific point of view and with respect to a specific content area". Her point of departure in her research was that the teacher's PK *underlies* and *guides* the teacher's actions, although she acknowledges that there is a reciprocal relationship between PK and action.

For her more detailed conceptualisation of the nature of PK, Meijer (1999) draws directly on the work of Baddeley (1990, 2007). Globally, Baddeley (1990, 2007) proposed a theory of memory that divided memory in two different systems that interact with each other in a complex manner, namely the long-term memory and the working memory. According to Baddeley, the long-term memory refers to a memory system that has an unlimited capacity to store a large body of information in an organised and meaningful way on a more or less permanent basis. Incoming information from the environment, e.g. from a classroom event can activate parts of a teacher's long-term memory. Through the activation of the long-term memory, knowledge about teaching is selected and "called up" and is used in the working memory to deal with a (classroom) situation (Meijer, 1999; Meijer et al., 2002). The teacher's PK that is located in the working memory consists of cognitions from long-term memory, called up to deal with specific classroom situations and incoming information of the classroom (Hennissen, Crasborn, Brouwer, Korthagen, & Bergen, 2010; Meijer, 1999). According to Meijer, the teacher mainly draws on the working memory *inside* the classroom and draws on the long-term memory *outside* of the classroom.

In contrast to Cochran and her colleagues, Meijer does acknowledge a difference between knowledge and beliefs but she views the teacher's

knowledge and beliefs to be highly integrated. In her view beliefs roughly refer to personal ideologies, concerns, ideas, values, perspectives and attitudes towards teaching, and knowledge as the teacher's more factual theories on teaching and learning. Based on Baddeley's (1990, 2007) concept of memory, Meijer (1999) asserts that the teacher's PK that is located in the long-term memory consists of an integration of knowledge *and* beliefs. Similar to Cochran and colleagues, Meijer (1999) describes that PK is in part personal and in part content and context related, based on (reflection on) experience and mainly tacit.

In relation to researching PK, Meijer (1999) argues that PK is manifested in the long-term memory and the working memory and *both* memories should be explored to gain an insight into the whole of a teacher's PK. In this process, semi-structured interviews and concept maps are used to explore the teacher's PK in the long-term memory *outside* the classroom. A stimulated recall interview is used to explore the teacher's PK in the working memory *inside* the classroom (Meijer et al., 2002). In this way, Meijer focuses both on PK in and beyond the classroom whereas she observed that in most studies on teacher cognition the focus is usually exclusively on cognition outside the classroom *or* inside the classroom.

2.6.2 Information processing theory and the content of PK

In the analysis phase of her qualitative study, Meijer (1999) starts out by using the seven PCK categories as sensitising concepts that Van Driel and colleagues (1998) located in the literature on the content of PCK. These seven categories were: *knowledge of subject matter; knowledge of general pedagogy; knowledge of student learning and conceptions; knowledge of purposes; knowledge of curriculum and media; knowledge of representations and strategy; and knowledge of context*. From these seven categories, Meijer developed six final categories that covered the PK of her teachers, which she renamed *subject matter knowledge, student knowledge, knowledge of student learning and understanding, knowledge of purposes, curriculum knowledge and knowledge of instructional technique*. As is the case with Grossman (1990), Magnusson and colleagues (1999) and Ball and colleagues (2008), Meijer's

conceptualisation of the content of PK is more complex than Shulman's description (1987). In the table below the difference between Shulman's description of PCK and Meijer's conceptualisation of PK are visualised:

Table 2.5 Overview of the conceptualisations of the content PCK and PK [modified from Van Driel et al. (1998)]

	1	2	3	4	5	6	7
	Knowledge of how to organise, represent, adapt and present a topic for instruction	Knowledge of what makes the learning of specific topics easy or difficult for pupils	Knowledge of subject matter	Knowledge of a topic and curriculum	Knowledge of purposes, and orientations for teaching certain topics	Knowledge of pedagogy	Knowledge of a topic and the environmental context of learning
Shulman (1987)	PCK	PCK	0	0	0	0	0
Meijer (1999)	PK	PK	PK	PK	PK	PK	0

Practical knowledge: PK
 Author placed category outside of PCK: 0

2.6.3 Reflections on an information processing perspective on PCKg

2.6.3.1 The nature of PK from an information processing perspective

Meijer's (1999) point of departure in describing PK is that it underlies and guides the teacher's actions. From the perspective that PK guides the teacher's actions "[o]bservations provide only a limited view of pedagogical content knowledge" and teachers should be asked "to articulate their knowledge" (Baxter & Lederman, 1999, p. 148). Reflecting on that stance, the notion that thinking precedes, leads to, guides and determines physical action has been critically reviewed (Bennett et al., 1997). Research shows that cognition can influence the physical actions of a teacher, but new cognition can develop and can be shaped through physical action, cognition can change through physical action or cognition can be inconsistent with physical actions (Goldin-Meadow &

Beilock, 2010; Moran, 2011; Mathijsen, 2006; Schoenfeld, 1998; Vallacher & Wegner, 1987). In other words, the relationship between physical action and cognition, body and mind, seems to be more complex, intertwined and reciprocal. Baxter and Lederman (1999) comment that research that is only focused on the teacher's cognition, neglecting the teacher's physical actions, gives a limited view of the teacher's PCK. This is underlined by Monteiro, Carrillo and Aguaded (2008) who ascertain that exploring teachers' thinking and physical actions leads to a more complete account of PCK.

2.6.3.2 The content of PK from an information processing theory perspective

Reflecting on the content of PK as proposed by Meijer, it is remarkable that she left out the category *knowledge of educational context*, the one category that Cochran and colleagues have so explicitly added to the conceptualisation of the content of PCK. This is even more remarkable when taking into account that Meijer (1999, p. 19) notes that PK is "contextual, meaning that it is defined in, and adapted to, the classroom situation". She does not, however, offer an explanation for this choice. Possibly, she makes this choice because she views PK from an information processing perspective. This perspective focuses less on how the environment can impact on the teacher and more on how the long-term and short-term memory of the teacher *guides* the actions of the teacher. Similar to Cochran and colleagues, Meijer includes the knowledge components *subject matter content* and *general pedagogy* in PK. However, how *subject matter content* relates to teaching or impacts on teaching, or how *general pedagogy* relates to a topic that is taught is not described and therefore it remains unclear why it should or could be part of PK.

2.6.4 Relating an information processing perspective on PCKg to this current study

Relating Meijer's conceptualisation of PK to this current study, an important point that Meijer observed is that most studies on teacher cognition usually exclusively focus on cognition outside the classroom *or* inside the classroom. She notes that to gain a more comprehensive understanding of teacher

cognition it has to be explored in *and* beyond the classroom because teacher cognition in and outside the classroom is interrelated. Furthermore, an information processing view of PK stresses what happens in the mind of the teacher – as does the constructivist view of Cochran and colleagues – but leaves out the body of the teacher. This is where a complexity arises as the specialist preschool music teacher’s body plays a central role in teaching and learning music. These teachers are able to communicate rhythm, simultaneously transmit and instruct rhythm skills in physical ways and interact with and react to pupils in physical ways (Jorgensen, 2003; Kelly, 1999; Westerlund & Juntunen, 2005; Schippers, 2004). Therefore, the perspective of embodied cognition will be explored as an alternative perspective on PCKg because it stresses the complex interplay between body, mind and environment.

2. 7 An embodied cognition perspective on the specialist preschool music teacher’s PCKg

The conceptualisations of PCKg that have been discussed so far all have been developed in the fields of maths, science and language education. Content matter within maths, science and language education has clearly observable symbols and concepts that can be taught (Melendez Rojas, 2008) and are often laid down in curriculum material. Shulman (1987, p. 13) therefore might assume that “most teaching is initiated by some form of ‘text’: a textbook, a syllabus, or an actual piece of material the teacher or student wishes to have understood”. Another assumption is that to help pupils understand this curriculum material “[an] idea is grasped, probed, and comprehended by a teacher, who then must turn it about in his or her mind, seeing many sides of it” (Shulman 1987, p. 13) and that “To reason one’s way through an act of teaching is to think one’s way from the subject matter as understood by the teacher into the *minds* and motivations of learners” (Shulman, 1987, p. 16) [emphasis added]. This assumption that teachers understand an idea in their own minds and consequently teach pupils to understand that idea in their minds has influenced the way the nature and content of PCKg has been conceptualised to date, e.g. Cochran and colleagues initially depart from a radical constructivist perspective, and Meijer from an information processing perspective.

In general, a radical constructivist and an information processing perspective “conceive of knowing in terms of thoughts and structures in the head” and teaching “then is equivalent to making available the content and structures of the mind to others in an attempt to establish intersubjectivity” (Pozzer-Ardenghi & Roth, 2010, p.31). The way this is done in maths, science and language education is mainly through verbal explanation – written or spoken. However, from the field of music education, Burnard (2013b, p. 113) observes that “not all musical practices are representable through language nor can they necessarily be taught through linguistic means”. In the case of early childhood music education, its curriculum tends to focus on teaching and learning musical *skills*, e.g. singing, playing instruments, moving to music and creating music (Flohr, 2005; Valerio et al., 1998; Young, 2009; Woodward, 2005). These musical skills are not laid down in text-based curriculum material for pupils but mostly laid down in the physical actions of the music teacher. Or, as the music education researcher Jorgensen (2003, p. 113) philosophises: “Music is unlike history and mathematics, in that one must not only be able to know about the subject but one must also possess practical skills and to be able to do it”. Based on personal observations, the music education historian McCarthy (2007, p. 7) describes the role of the body in teaching music as follows: “[...] we cannot ignore body movements and gestures in looking at how teachers and pupils act [...] These movements are an integral part of what it means to be a music teacher or student”. The music education researcher Kelly (1999, p. 3) similarly mentions – based on a literature review of conducting gestures in the classroom – that “conducting gestures, involving body and arm movements, eye contact, facial expression, and overall posture, are tools that teachers use to interact with students”. The performing arts including music might then allow for a way of knowing alternative to the sciences and other academic subjects (Winner, Goldstein, & Vincent-Lancrin, 2013), and these alternative ways of knowing might give way to different approaches to teaching and learning.

So, if the specialist preschool music teacher’s body can be a source of knowing about teaching and learning music, it should be given a more central role in the conceptualisation of the teacher’s PCKg. A more recent perspective on learning and developing that emphasises the intimate relationship between body, mind and the environment is that of embodied cognition (Anderson, 2003; Gallagher, 2005). In short, researchers working from this perspective emphasise that

cognition arises from bodily interactions with the social, cultural and physical world (Rambusch & Ziemke, 2005; Wilson, 2002), and physical actions and gestures are not considered to be a mere *expression* of internal cognitive processes but rather part of cognitive activity (Gallagher, 2005; Lindblom, 2007). Insights from an embodied approach can provide tools to describe PCKg that includes the body, and therefore is suited to the specialist preschool music teacher. Taking an embodied cognition approach in this study, opens up the opportunity to gain empirical evidence of the role of the body in teaching rhythm skills. An embodied cognition perspective on PCKg will be further discussed in the following chapter.

2.8 Conclusion

Drawing on the different strands of research on the concept of PCK and PCKg as discussed in this chapter until now, several points surface that could be of importance for this current study. All of the researchers reviewed in this chapter perceive the content of PCK or PCKg to be more complex than originally described by Shulman. In addition, research suggests that contextual and personal factors influence how PCKg can develop and can be communicated. To gain a more comprehensive understanding of PCKg the teacher's cognition should be explored in *and* beyond the classroom. However, due to a constructivist and information processing approach to PCKg, the body of the teacher as a source of PCKg is neglected in all of the reviewed literature in this chapter – yet the specialist preschool music teacher's body seems central in teaching music, including rhythm skills. Alternatively, an embodied cognition perspective on PCKg regarding rhythm skills emphasises the role of the teacher's body in teaching and learning and could therefore be more suited to describe the nature of the specialist preschool music teacher's PCKg. In the following chapter I will discuss an embodied perspective on PCKg and how PCKg could be researched from this perspective.

Chapter 3 An embodied cognition perspective on the specialist preschool music teacher's PCKg regarding the teaching and learning of rhythm skills

3.1 Introduction

In chapter 2 a constructivist perspective and an information processing perspective on PCKg have been described. These perspectives seem to be too limited for this current study since they overlook how the teacher's PCKg could be developed and communicated with the body, yet in music education the teacher's body seems to play a vital role. In contrast to a constructivist and information processing perspective, an embodied cognition approach emphasises the interplay between the social, cultural and physical environment, the task that is performed *and* the body in continuously shaping cognition and defining how cognition is communicated (Gallagher, 2009; Moran, 2011; Johnson, 1989). To date there seems to be no empirical research exemplifying how the music teacher's PCKg might be conceptualised from this perspective and therefore a goal of this chapter is to further the understanding of how the specialist preschool music teacher's PCKg can be conceptualised from an embodied cognition perspective.

To gain an understanding of embodied cognition in relation to teaching music, this study will not only be informed by theoretical underpinnings of embodied cognition in general but also by fields of research that have sought to support the view of the mind as embodied and shaped by the social, cultural and physical environment. These fields are embodied *music* cognition, gesture studies and cultural musicology. Together, these strands of research might inform this current study in different ways: an embodied music cognition perspective can inform this study about how music content and musical communication can be manifested in and communicated with the body; gesture studies concerned with teaching can inform this study about how pedagogical aspects can be manifested in and communicated with the body; and cultural musicology can inform this current study about how the social, cultural and physical environment can shape teaching practices of music teachers. By drawing on these fields and the theoretical underpinnings of embodied cognition

in general, I will be able to develop a theoretical framework for PCKg viewed from an embodied cognition perspective. Finally, in this chapter I will explore how PCKg might be researched from this perspective.

3.2 Antecedents of an embodied cognition perspective

Over the past years researchers in the fields of philosophy, artificial intelligence, dance, anthropology, cultural musicology, linguistics and neuroscience have been seeking to narrow the Cartesian divide between body, mind and environment through the notion of embodied cognition (Gallagher, 2005). The notion that mind, body and environment are intimately intertwined and cannot be viewed in isolation from each other is not exactly new (Gallagher, 2009), and has been a topic for philosophers going as far back as Aristotle who described *phronesis*, a form of practical knowledge “anchored in activity and groups” (Georgii-Hemming, 2013, p. 21). Although my goal is not to give a comprehensive overview of the philosophical and scientific roots of an embodied cognition framework, due to the educational nature of the current research, I will shortly discuss two well-known figures within the field of education that are commonly seen as antecedents of an embodied cognition approach (Gallagher, 2009; Lindblom & Ziemke, 2007; Pozzer-Ardhenghi & Roth, 2010; Rambusch & Ziemke, 2005; Wilson, 2002): both Piaget and Vygotsky developed influential theories on learning and development that stressed the embodied and situated nature of cognition in their own way. Below these theories will be discussed and related to an embodied cognition perspective.

3.2.1 The interplay between body, mind and environment in the work of Jean Piaget

The Swiss biologist and psychologist Jean Piaget (1896-1980) already observed the importance of the child’s sensorimotor activity in the environment for the emergence of cognitive abilities (Wilson, 2002). He believed that children construct their own understanding of the world through physical experiences, and that with age and experience these understandings are restructured

(Bodrova & Leong, 2007). Based on close observations of children he developed a theory to describe the development of cognitive capabilities that consists of four stages (Piaget, 1964). At the first sensorimotor, pre-verbal stage (approx. 0-2 years) Piaget (1964, p. 177) explained that “practical knowledge [is developed] that constitutes the substructure of later representational knowledge”. In this stage, the child actively explores the world, handling, dismantling and transforming the environment, and starts constructing rudimentary mental concepts about the world based on those physical experiences. Or, as Piaget (1964, p. 178) noted: “Experience of objects, of physical reality, is obviously a basis factor in the development of cognitive structures”. During the second, preoperational stage (approx. 2-7 years) Piaget (1964, p. 177) observed that the child develops “the beginnings of language, the symbolic function, and therefore of thought, or representation”. According to Piaget the child was still not able to conceptualise matters solely in the mind at an abstract level in this stage but still needed to have the concrete physical situation in front of it, e.g. the child counts objects that are laid out in front of it (Phillips & Soltis, 2009). In the third, concrete operational stage (approx. 7-11 years), the child starts conceptualising things and objects, and addition, subtraction and multiplication can be done with numbers instead of with things (Phillips & Soltis, 2009). In the final, fourth formal operational stage (approx. 11-15 years), the adolescent is able to solve problems purely in the abstract (Piaget, 1964). In general Piaget’s work is highly regarded and still influential nowadays but his stage theory of cognitive development has also been heavily criticised (Lindblom & Ziemke, 2007; Phillips & Soltis, 2009). Main criticisms have focused on his use of methodologically flawed experiments (e.g. varying procedures of experiments), the extensive research done on his own children, basing his theory on intellectual Western “ideals” and not paying enough attention to cultural differences in cognitive development (Lindblom & Ziemke, 2007; Phillips & Soltis, 2009).

Relating Piaget’s theory to an embodied cognition perspective, it is interesting to note that the psychologists Thelen, Schöner, Scheier and Smith (2001, p. 2) commented that Piaget “assumed that the goal of development is to rise above the ‘mere sensorimotor’ into symbolic and conceptual modes of functioning”. In contrast, from an embodied cognition perspective there is a continuous interplay between body, mind and environment. It also has been argued that

Piaget – again in contrast to an embodied cognition framework – neglected how social interactions influence the cognitive development of children and adolescents (Lindblom & Ziemke, 2007). Lindblom and Ziemke (2007) mention that Piaget did stress the social dimension because he believed that socio-cultural processes could accelerate or slow down developmental processes. He did not, however, believe that socio-cultural processes alter the direction of the developmental processes. The role of the socio-cultural processes in influencing what and *how* the child learns and develops, on the other hand, has been emphasised by Vygotsky.

3.2.2 The interplay between body, mind and environment in the work of Lev Vygotsky

Like Piaget, the Russian psychologist and educational reformer Lev S. Vygotsky (1896-1934) believed that children construct their own understanding of the world but he placed less emphasis on the child's individual interaction with objects than Piaget did (Bodrova & Leong, 2007). Instead, Vygotsky believed that cognitive development is always socio-culturally mediated: "The path from object to child and from child to object *passes through another person*. This complex human structure is the product of a developmental process deeply rooted in the links between individual and social history" (Vygotsky, 1930-1934/1978, p. 30, emphasis added). Vygotsky (1930-1934/1978) believed that the socio-cultural context mediates what and how the child will learn, and considered the influence of this context at different levels (Bodrova & Leong, 2007): the immediate interactive level (the individual the child is interacting with at that moment), the structural level (social structures that influence the child such as family, school, church) and the general cultural or social level which includes features such as language, gestures, arts, numerical systems and technology.

According to Vygotsky's theory the socio-cultural aspects shape not only *what* the child knows but *how* the child thinks (Bodrova & Leong, 2007; Phillips & Soltis, 2009): the child learns "psychological tools" that human society has invented and that enables individuals to survive in and master the surrounding world (Phillips & Soltis, 2009; Wertsch & Tulviste, 1992). When a child learns to

acquire a psychological tool such as logical thinking or deliberate memorising, it begins by sharing the process of using that tool with others, and Vygotsky named this the “interpersonal” stage (Bodrova & Leong, 2007). When the child has incorporated a psychological tool, the tool becomes “intrapersonal” and then the child can use the tool independently (Bodrova & Leong, 2007). Of the psychological tools language is seen as the most important one because it is used to appropriate other psychological tools (Bodrova & Leong, 2007).

As is the case for the work of Piaget, the work of Vygotsky has been valued and at the same time criticised. The educational researchers Bodrova and Leong (2007, p. 35) note that one of the criticisms is that Vygotsky focused on the role of social factors in learning and development “at the expense of biological factors”. From the field of cognitive science, Rambusch and Ziemke (2005, p. 1804) similarly note that Vygotsky’s view of human cognition is “the result of cultural rather than natural processes”. This is where a difference comes in: not only does a theoretical framework of embodied cognition stress the influence of the social, cultural and physical environment on learning and development but it also places a strong emphasis on the role of the body in the process of learning and development (Rambusch & Ziemke, 2005). A closer look will be taken at this theory below.

3.3 An embodied cognition perspective

From the brief overview above, it is clear that the idea that body, mind and environment are interrelated is by no means new. However, during the 1980s an embodied approach strongly re-emerged in cognitive science when researchers started criticising traditional strands within cognitive science which – broadly speaking – tended to view the human mind as an information processor of inputs and outputs (Anderson, 2003; Leman, 2008; Thompson, 2012). From this perspective, the body only serves as an input and output device, and information from the environment is individually processed in the mind into abstract mental representations (Anderson, 2003; Leman, 2008) and thus mind and body are hierarchically related (Bowman, 2004).

Although there is no unified theory of embodied cognition, in general, researchers taking an embodied approach to cognition theorise about the

interplay between the body and environment in continuously shaping cognition (Gallagher, 2009; Moran, 2011; Johnson, 1989). From this viewpoint, cognition arises from bodily interactions with the social, cultural and physical world, and cognition is grounded in and linked to sensorimotor activity (Bowman, 2004; Rambusch & Ziemke, 2005). Mental images are not viewed as abstract representations but as multimodal representations because they retain spatial, physical, emotional and kinaesthetic aspects of the events and concepts they represent (Hostetter & Alibali, 2008). Embodiment then “does not exclude the brain, but instead includes it with the rest of the body in cognitive processes, hence widening the ‘bodily’ cognitive processes to not only depend on the ‘gray matters between the ears’” (Lindblom, 2007, p. 9). By taking a different perspective on cognition, goal-directed physical action is not considered to be an *expression* of internal cognitive processes but rather part of cognitive activity (Gallagher, 2005; Lindblom, 2007).

The notion within an embodied approach that there is interplay between body and mind, and the *social, cultural environment* might be exemplified by the following study. Based on experimental studies, the developmental psychologists Phillips-Silver and Trainor (2005) found that young infants who are still motorically immature, can be rhythmically bounced to the beat of music by a caregiver. Even though these infants do not produce their own rhythmic movement, they will *physically feel* how they are bounced to music and as a result start *hearing* the beat of music in the way they are moved to the music. In this manner, during the social interaction with a caregiver the infant becomes immersed in particular metrical structures of a music culture (Trainor & Corrigan, 2010). Based on a literature review, Trainor and Corrigan (2010, p. 101) go on to theorise that the child not only is musically shaped through the interaction with the caregiver but the child *elicits* caregiver behaviour such as rocking and bouncing. These authors note that the vestibular system emerges very early on in development and “young infants love vestibular stimulation in the form of rocking, bouncing, and being moved energetically through the air”. They suggest that the infant’s overt reaction to being rocked and bounced elicits even more vestibular input from the caregiver during the time when musical understanding first emerges. In this way, (the bodies of the) infant and caregiver reciprocally shape each other and can reinforce the social, cultural practice of e.g. singing and rocking infants to lullabies (Greenfield, 2002).

With regard to the complex interplay between the body and mind, and the *physical environment*, an embodied approach assumes that the physical environment can pose constraints and possibilities on an individual. These constraints and possibilities can interact to limit or enable particular movement opportunities and thus influence the way cognition is shaped and communicated. At the same time, a body holds constraints and opportunities as to how the environment can be explored (Rosengren & Braswell, 2003; Young, 2003). Young's (2003) study in the field of early childhood music education investigating the spontaneous instrumental music making of three- and four-year olds in preschool settings might exemplify this assumption. Based on grounded theory methodology Young (2003, p. 55) found that "the children's self-initiated music-making, alone and on a xylophone, can be conceptualised as originating from two primary sources: the child's physiology and existing movement vocabulary in interaction with the play potentials of the instrument and its position in space, relative to the child". She (2003, p.52) observed that spatial parameters such as length of the beaters in relation to the length of the child's arms, the size of the playing surface of the xylophone, the space around the child while it was playing the xylophone, all "create sets of relationships from stable spatial measurements which affects calibrations of timing". Thus there is a complex interplay between the – often culturally defined – physical environment and the individual acting on that environment in shaping and communicating (musical) cognition.

Relating the embodied cognition perspective to the specialist preschool music teacher's PCKg, the development and communication of PCKg then is a result of the complex interplay between the social, cultural and physical teaching environment and the teacher's body. This aforementioned description, however, only gives a general idea of how PCKg can be viewed from an embodied cognition perspective. One specific view of embodied cognition can more closely describe where and how teachers develop and communicate their PCKg. This specific view of embodied cognition distinguishes between "online" and "offline" embodied cognition (Robbins & Aydede, 2009; Thompson, 2012; Wilson, 2002) and will be described below in relation to the music teacher's PCKg.

3.4 An embodied cognition perspective in relation to the specialist preschool music teacher's PCKg

3.4.1 Online embodied teacher cognition reflecting PCKg

The term *online embodied cognition* (Robbins & Aydede, 2009; Thompson, 2012; Wilson, 2002) refers to the idea that much of the individual's cognition is shaped through the direct interaction of the individual's body with the surrounding environment. In other words, the specialist music teacher's body, the specific teaching task, the classroom space, the age group that is taught and the curriculum materials that are available all have possibilities and constraints that can influence the way the teacher's PCKg regarding rhythm skills develops and is communicated. So, how can the cognition of specialist preschool music teachers be shaped and communicated in interaction with the surrounding classroom environment? When a teacher is teaching rhythm skills through movement to preschoolers who are excited, these teachers could lower their head to have a better view of them (sensory perception), they could feel their excitement (somatic perception) and could tune in with their own movements to the excited movements of the preschoolers (motor perception). From an embodied approach to cognition, all of these sensory, somatic and motor perceptions are essential for encoding, interpreting and understanding the preschoolers' musical behaviours and responses (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Wilson, 2002). In that sense, the specialist preschool music teacher's PCKg is not "just rational or absolute" (Fink-Jensen, 2007, p. 63) but infused with the sensory-motor experiences of teaching, and bodily affect seems to contribute to – limiting or enabling – the perception and understanding of classroom events (Gallagher, 2014).

In addition, specialist preschool music teachers can react to the rhythmic learning process of preschoolers through continuously *adapting* and *attuning* their conducting gestures during the teaching process (Fink-Jensen, 2007). In turn, the preschoolers can react and adapt to the conducting gestures of the teacher. PCKg then is not simply reproducing past performances of teaching, rather the teacher adapts to and changes the classroom circumstances, subtly modifying his or her physical, musical and verbal responses to fit the needs of the pupils (Sutton & Williamson, 2014). Or, as Johnson (1989, p. 363/364) notes: online embodied cognition stresses the "on-going adjustment of the

organism to the environment” and these adjustments to the environment also effect “changes in that environment”. From an online embodied cognition perspective, PCKg is not only manifested in verbal thoughts or language but can also be manifested in the teacher’s body through for instance gestures (Pozzer-Ardenghi & Roth, 2010). Teachers can chant a rhythm pattern and at the same time they can make the underlying pulse of the rhythm pattern clear through the use of conducting gestures. Thus, information is communicated through gestures (the pulse) that is *not* communicated through the voice (rhythm pattern).

3.4.2 Offline embodied teacher cognition reflecting PCKg

The term *offline embodied cognition* (Thompson, 2012; Niedenthal et al., 2005; Wilson, 2002) refers to the idea that when the cognitive processes are decoupled from the environment where they originally took place, the individual’s sensorimotor systems can run a simulation of some aspects of the social, cultural and physical environment, as a means of representing information of that environment (Hostetter & Alibali, 2008). For example, when teachers think about their pupils, a lesson or a specific teaching activity *beyond* the classroom their sensorimotor systems can run a simulation of (some aspects of) the classroom environment, pupils or the teaching activity as a means of representing information of that classroom environment, the pupils or teaching activity (Niedenthal et al., 2005; Thompson, 2012; Wilson, 2002). Schoenfeld (1998, p. 17) uses the term “lesson image” to describe the teacher’s envisioning of the possibilities and constraints related to a lesson that they have taught or will teach. Through visual imagery but also through auditory and kinaesthetic imagery a teacher can (partially) mentally simulate classroom events (Wilson, 2002) and this can include how teachers think about how pupils “may react to parts of the planned lesson; it includes a sense of what pupils are likely to be confused about, and how the teacher might deal with that confusion” (Schoenfeld, 1998, p. 17).

Lastly, online and offline embodied cognition seem to be reflected in each other, reinforce and influence each other (Goldin-Meadow & Beilock, 2010; Harquail & King, 2010). The music teacher’s online embodied cognition reflecting PCKg

could be infused by elements of the more “abstracted stories, concepts, and assumptions” of the offline embodied cognition during teaching (Harquail & King, 2010, p. 1622; Wilson, 2002). Vice versa, decoupled from the classroom environment, teacher’s offline embodied cognition draws on online aspects of embodied cognition to help represent the original environment and (inter)action (Niedenthal et al., 2005; Wilson, 2002).

3.5 The body in relation to the music teacher’s PCKg

As mentioned above, an embodied approach to cognition provides an overarching theory of the music teacher’s PCKg and an offline and online embodied cognition perspective gives a more specified notion of where and when the music teacher’s PCKg can be developed and communicated. However, it still remains a question how PCKg can be manifested in the body during the act of teaching and what that might possibly look like. Although there seems to be no empirical research to exemplify how content and pedagogy are integrated in and through the body, the fields of embodied *music* cognition, gesture studies and cultural musicology have over the recent years provided empirical research with regard to how the body communicates pedagogical aspects (the pedagogy component of PCKg) and music content (the content component of PCKg) during a musical or teaching activity. These different strands of research have suggested that gestures, body positioning and physical action sequences that reflect instructional sequences might be examples of the role of the body within teaching.

3.5.1 Gestures in teaching and performing music

3.5.1.1 Gestures

Within this current research, gestures could be of particular importance in relation to the specialist music teachers’ PCK since gestures can communicate musical content, and at the same time be used for pedagogical purposes. The word *gesture* has many connotations throughout different fields (Sfard, 2009), and is often interchangeably used with *movement* or *physical action* (Roth, 2001). To make a distinction between a gesture that coexists with speech on

the one hand and a movement or physical action on the other hand, Leman and Godøy (2010, p. 5) describe a gesture as “a movement of part of the body, for example a hand or the head” that is “goal-directed” and that communicates a meaning. They explicate that gestures consist of the body and the actual movement in space, and of the intention and meaning the gestures carry. Narrowing down this general description of gestures, *musical* gestures can be described as a body movement that *goes along with sound* and that communicates an idea or meaning (Jensenius, Wanderley, Godøy & Leman, 2010). By acknowledging that gestures convey meaning, verbal and musical communication and interaction becomes a multimodal process (Lund, 2007).

3.5.1.2 Gestures coexisting with speech in teaching

In the past few years gestures have caught the attention of researchers particularly in the educational field of maths, science and language (e.g. Cook, Mitchell, & Goldin-Meadow, 2008; Kontra, Goldin-Meadow & Beilock, 2012; Pozzer-Ardenghi & Roth, 2010; Roth, 2001), and more recently in the field of music education, particularly in instrumental and vocal teaching (Fatone, Clayton, Leante, & Rahaim, 2011; Kochman, Moelants, & Leman, 2014; Simones, Rodger, & Schroeder, 2014). A growing body of empirical research suggests that gestures fulfil different functions within teaching and learning: the teacher’s gestures seem to hold information that is not necessarily conveyed in speech and pupils could use the teacher’s gestures as substantial information for making sense of their verbal explanations (Goldin-Meadow, 2004; Hostetter, 2011; Pozzer-Ardenghi & Roth, 2010; Roth, 2001); teachers seem to use gestures to clarify and correct eventual misconceptions of pupils (Goldin-Meadow & Beilock, 2010); teacher’s gestures may also contribute to comprehension because gestures can capture and maintain pupils’ attention (Hostetter, 2011).

Based on laboratory and naturalistic settings, the North American McNeill developed a classification of gestures that coexist with speech and that has provided much of the basis of the field of contemporary gesture studies, such as in psycholinguistics, psychology and education (Roth, 2001; Simones et al., 2014). In the fields of maths, science and language education McNeill’s

classification has frequently been used to analyse the teacher's gestures (see e.g. Alibali & Nathan, 2007; Alibali & Nathan, 2011; Pozzer-Ardenghi & Roth, 2010). While McNeill (2005) suggested in earlier work that gestures *reveal* or *express* thought, in his later work he proposed that gestures are shown to be active participants in both speaking and thinking and this latter notion connects to an embodied cognition. McNeill's typology includes beats (the hands move up and down to speech) that serve e.g. to coordinate speaking terms, to stress important words, or to acknowledge understanding; iconic gestures that communicate images of concrete objects and events; metaphoric gestures that communicate images of the abstract; and deictic gestures that are used to point out features in the environment and these gestures serve to establish a link between speech and the surrounding environment (Pozzer-Ardenghi & Roth, 2010; McNeill, 1992).

McNeill's typology has recently also been adopted in music education, e.g. in a case study that intended to examine the role of gestures and body movement of teachers during piano lessons (Simones et al., 2014). Simones and colleagues (2014) observed that teachers adapted their co-verbal gestures according to the pupil's level of performance: e.g. deictic gestures were used by teachers more frequently for grade one pupils for pointing to the piano score, and metaphoric and iconic gestures were used more frequently by teachers in higher grades to focus on musical-conceptual and motor-functional knowledge. In relation to this current study, the specialist preschool music teacher's gestures can coexist with speech, e.g. when an instruction is given verbally but the teachers can also use gestures that coexist with music when performing music. This is why I turn to the field of embodied music cognition to gain an understanding of what gestures that coexist with music might look like.

3.5.1.3 Gestures in musical performance

In general, the field of embodied music cognition has fostered an empirical approach to the role of the body in understanding, listening to, performing and communicating music. More specifically, gestures that coexist with music have been a topic of research within this field. Based on earlier research on gestures that coexist with music (including that of the French musicologist Delalande who

analysed the gestures of Glen Gould), the North European scholars Jensenius, Wanderley, Godøy and Leman (2010) more recently have developed a typology for gestures that coexist with music during the performance of music. Based on empirical research these scholars described that gestures can have different functions during the performance of music. They distinguish between *sound producing gestures* that effectively produce sound, *sound facilitating gestures* that support the sound producing gestures, e.g. through phrasing, *sound accompanying gestures* that are not involved in the sound production itself, but follow the music, and *communicative musical gestures* that are visual and auditive cues given during the performance of music, mainly intended for communication about music between performers, between conductors and performers and between performers and listeners. Although this typology of musical gestures has not been developed in and for the field of music education, the educational researchers Bishop and Burn (2013) have adopted it to analyse musical play of children. They applied ethnographic research methods to explore musical play of seven- to eleven-year olds at two primary schools and observed that different functions of musical gestures can appear simultaneously, e.g. clapping can be a sound-producing gesture as well as communicative when clapping together.

This typology of musical gestures might be used to describe gestures within the context of teaching music – yet at the same time, such a typology might not transfer so directly to teaching as it might seem at first sight. Fatone and colleagues (2011) query what may set gesture in teaching apart from musical gestures in musical performance. They observed that during teaching there often is much repetition, modelling, variation and communication of a musical skill or musical concept in multiple ways. In contrast, in performing, or in listening to a performance of music, “there is one chance to convey meaning in any given musical micro-moment. Teaching is less of a “one-shot” deal” (Fatone et al., 2011, p. 218) and therefore teachers might develop or utilise different kinds or additional gestures than the ones used during musical performance.

In summary, gestures that communicate the specialist preschool music teacher’s PCKg – an integration of pedagogy and content – do not seem to have been described before. So, even though the typologies of gestures that coexist with speech or music that have been described in this chapter can be

used to orient myself towards the analysis of the teacher's PCKg regarding rhythm skills, I will remain open for new types and functions of gestures reflecting PCKg.

3.5.2 Body positioning and teaching

More recently, the way the teacher's body locates itself in space and how that affects teaching has caught the attention of the Canadian-based scholars Pozzer-Ardenghi and Roth (2010). Based on case studies in mathematics and science education and taking a Vygotskian perspective on teaching and learning Pozzer-Ardenghi and Roth (2010, p. 31) suggest that "[...] the body not only is an expressive means but also produces context by placing itself relative to other aspects of the setting" such as the pupils or curriculum materials. For instance, these scholars found that the physical positioning of the teacher can change the possibilities and limitations of social interaction with the pupils (Pozzer-Ardenghi & Roth, 2010). Relating their findings to music education, it suggests that the way music teachers are able to move through space, or are confined by space, affects the way they are able to communicate and develop their PCKg. A music teacher can choose to work in an open space making a mutual tuning in to the movements and sounds possible between teacher and pupils, and pupils amongst each other (Davidson & Malloch, 2009). However, music teachers might not have a choice, and will have to teach in a "borrowed space" (Davidson, 2004, p. 201), namely in the regular classroom. This might affect the way teachers can use their PCKg in a bodily manner and elicit bodily actions of pupils. In conclusion, the manner in which the music teacher uses space might reflect their use and manifestation of PCKg but here too there seems to be no research in relation to the specialist preschool music teacher's PCKg exemplifying this.

3.5.3 Instructional sequence and teaching

Within the field of cultural musicology, based on (participant) observation research the North American scholar Campbell (2001), Dutch scholars Schreuder (2008) and Schippers (2004) found that the goal-directed physical

actions of music teachers communicated their chosen (be it implicit or explicit) *instructional* sequence of a teaching activity. For instance, in certain contexts the teacher can parse a song in small parts, and each of these parts can be demonstrated and taught separately, or the teacher can demonstrate a song and teach it at once as a whole (Schippers, 2004). These different instruction sequences reflected (implicit or explicit) views of how to teach and learn music: the former way reflecting an “analytic view” of teaching music and the latter a “holistic view” of teaching music (Schreuder, 2008, p. 39). These scholars found that these views can differ under influence of the social, cultural context and underlying ideas of how pupils (should) best learn music (Campbell, 2001; Schreuder, 2008). In relation to this current research, the way a rhythm activity is sequenced by the specialist music teacher might reflect different (implicit) views on how to facilitate the learning of rhythm skills, in other words, might reflect different forms of PCKg.

3.6 Researching PCKg from an embodied cognition perspective

If the body communicates aspects of the specialist music teacher’s PCKg, this has consequences for the way in which PCKg can be explored. Pozzer-Ardenghi and Roth (2010) mention that much of the current educational research employs a language-centred approach to teacher cognition, leaving the body as a source of PCKg aside. They observe that there are many studies of pedagogical content knowledge “which are all premised on (individual, internal) knowledge and characteristics that are translated into speech, from where researchers recover (infer) the knowledge lying behind” (Pozzer-Ardenghi & Roth, 2010, p. 149). Indeed, research on PCKg seems to have mainly focused on methods that elicit written or spoken language, such as questionnaires, interviews, stimulated recall interviews, concept-mapping and card sort tasks to explore the teachers’ PCKg (Baxter & Lederman, 1999). Although language is an entry point for exploring the music teachers’ PCKg, from an embodied cognition viewpoint spoken and written language are not the *only* form through which the teachers’ PCKg can be communicated, e.g. from an online embodied cognition perspective PCKg can be manifested in the teacher’s body through for instance gestures (Harquail & King, 2010; Pozzer-Ardenghi & Roth, 2010). Therefore, in this current study, not only exploring the

specialist music teacher's PCKg through written and spoken language is important but also exploring the music teacher's PCKg as manifested in the body is essential to gain a fuller understanding of PCKg from an embodied cognition perspective. This leads to the suggestion that next to methods that explore verbal aspects of the teacher's PCK, for instance observation or video analysis of the teacher's body should be included in the methods to explore the PCKg of the specialist music teachers.

3.7 Conclusion

The goal of this chapter was to develop a theoretical framework for PCKg viewed from an embodied cognition perspective. This perspective views the body as being central to the way our experiences and knowing of the world are being shaped and the way we communicate our experiences and knowing in the world (Harquail & King, 2010; Thompson, 2012; Westerlund & Juntunen, 2005). In this current study a view of embodied cognition will be taken on PCKg that distinguishes between online and offline embodied cognition (Wilson, 2002). From an *online* embodied cognition perspective, the specialist music teacher's PCKg is shaped and communicated through the physical act of teaching in the social, cultural and physical environment of the classroom. Beyond the classroom the specialist music teachers can communicate and develop their offline embodied cognition that reflects PCKg by (partially) drawing on their online embodied cognition, and building on those experiences. Finally, online and offline embodied cognition are reflected in each other and reinforce each other (Thompson, 2012). Furthermore, drawing on the field of embodied *music* cognition, gesture studies and cultural musicology, I will start with the notion that the teachers' PCKg is not only manifested in the verbal domain. It might be manifested in their bodies through gestures that coexist with speech and music. But it also might be manifested in the way their body is positioned in the classroom during the act of teaching or in the physical actions of the teachers that reflect their instructional sequence of a rhythm activity.

With regard to researching PCKg, an online and offline embodied cognition approach suggests the use of multiple methods for exploring the teacher's PCKg in and beyond the classroom. In Chapter 2, Meijer (1999) already noted

that in most studies on teacher cognition the focus is usually exclusively on cognition outside the classroom *or* inside the classroom. However, from an offline and online embodied cognition perspective the teacher's PCKg that is developed and communicated in and beyond the classroom is interrelated. To gain a more complete understanding of the specialist preschool music teachers' PCKg their offline and online embodied cognition in *and* beyond the classroom should be explored. Moreover, the teacher's cognition including PCKg can be communicated verbally *and* with the body. This leads to suggest that next to methods that explore verbal aspects of the teacher's PCKg, for instance observation or video analysis of the teacher's body should be included in the methods to explore the PCKg of the specialist music teachers. In the following chapter the methods for exploring the PCKg of these teachers will be discussed.

Chapter 4 Methodology

4.1 Introduction

In this chapter both the methodological and ethical considerations of this study and how the trustworthiness of the research was ensured will be explained.

4.2 Goal of the research study and the research question

This study first of all aimed to apply the concept of PCKg to early childhood music education since no concept of PCKg has been developed for and through early childhood music education. Secondly, this study aimed to further the understanding of the specialist preschool music teacher's PCKg regarding rhythm skills, particularly from an embodied cognition perspective. Therefore, in this current study the following question was addressed:

What is the PCKg of experienced Dutch specialist music teachers regarding the teaching and learning of the performance of rhythm skills of four- to six-year old pupils in preschool from an embodied cognition perspective?

To my knowledge no research has been done into the specialist preschool music teachers' PCKg regarding the teaching and learning of rhythm skills from an embodied cognition perspective, therefore this study has been exploratory, aiming to provide novel insights into the nature and content of the PCKg of these teachers. In this study, the focus was not on the long-term development of the specialist music teachers' PCKg but on exploring a moment in the specialist music teachers' development of PCKg and how their PCKg was communicated.

4.3 An interpretive approach to researching the specialist music teachers' PCKg

4.3.1 An interpretive approach in this current study

An interpretive approach was taken in researching the PCKg of specialist music teachers. Specific philosophical presuppositions regarding the nature of reality

(ontology), and the nature and acquisition of knowledge (epistemology) underpin an interpretive approach. Within the interpretive approach one presupposition is that reality and meaning-making are socially constructed (Boeije, 2012) and therefore there is no single reality but there are multiple realities (Heaton, 2004). Furthermore, knowledge is not viewed as the objective truth, but is (co)constructed by individuals in a social context (Cain, 2010a; Koopman, 2010).

An interpretive approach is often contrasted with a positivistic approach. From this latter perspective, there is an objective reality that can be known objectively by examining phenomena in a logical and empirical manner (Schwartz-Shea & Yanow, 2012). Provided researchers follow a strict methodological protocol, research results will be free of a subjective bias (Bresler & Stake, 1992). In general, data samples should be large and representative and should be subjected to statistical analysis that can provide an impartial and precise answer (Cain, 2010a), and when a study is replicated other researchers should be able to attain the same results. Within educational research a positivistic approach has led to large-scale surveys, achievement tests and structured observations, e.g. within music education positivist paradigms have underpinned studies that measure how well children perceive musical elements such as rhythm (Cain, 2010a).

With regard to educational research in general, Bulterman-Bos (2004) notes that during the last decades a shift has occurred from positivistic to interpretive research on teaching. She (2004) describes that the research on teaching behaviours in the 1960s and 1970s tended to ignore the special skills and knowledge that teachers developed through practice. Realising that the teachers' perspective was underexposed in research, an increasing number of researchers turned their attention to what teachers actually know. This shift in focus first of all implied an acknowledgement of the value of teachers' practical knowledge (Bulterman-Bos, 2004) but also a realisation that the teachers' interpretative frame should be taken into account to gain "insider knowledge" of teaching (Elbaz-Luwisch, 1997, p. 77). Secondly, researchers had to pay attention to how teaching occurred in natural situations since the context is of influence on teaching (Hutjes & Van Buuren, 1992).

In this current research, the focus was on the practical knowledge of teachers, in particular the PCKg of specialist preschool music teachers. Based on the theoretical framework of embodied cognition there was an assumption that these teachers construct their PCKg partly through and in their physical, social, historical and cultural teaching context. An interpretative paradigm allowed for a case study approach through which the specialist music teachers' PCKg could be explored within that teaching context. Yin (2009, p. 18) notes that a case study approach "investigates a contemporary phenomenon in depth and within its real-life context, especially when boundaries between phenomenon and context are not clearly evident". From an embodied cognition perspective there is an interrelated relationship between the teacher's body, mind and environment and therefore these cannot be viewed in isolation. A case study approach offered the opportunity to explore the specialist preschool music teachers within their teaching context and to gain access to their meaning-making and subjective understandings regarding their PCKg (Sandberg, 2005). My choice for specifically a *multiple* case study approach will be discussed further on in this chapter in section 4.4.

With regard to the choice of methods, researchers exploring the personal lived experiences of, for instance, teachers can find that the subjective understandings of these teachers "are uncovered more by interviews than questionnaires, and observations in 'real life' settings rather than controlled environments" (Cain, 2010a, p. 58). Interviews, observations and other methods that are used in interpretive research have the potential to generate "rich" data of a kind that is hard to obtain by methods like questionnaires, and therefore to provide new insights. In this current explorative study stimulated recall interviews, video analysis, notebooks and semi-structured interviews were used to explore the specialist music teacher's PCKg.

Lastly, with regard to the role of researchers, within an interpretive approach they can be seen as actors and interpreters of a researched event or situation, and an understanding of a situation is co-constructed by researchers and participants (Schwartz-Shea & Yanow, 2012). Within this study I entered the teachers' world seeking to obtain an understanding of their PCKg from the inside rather than from the outside vantage point of the researcher. Instead of viewing the teachers as objects of study, I sought to apply methods that could

give voice – and body – to the music teachers’ perspectives on PCKg and that actively made the teachers informants of the researcher. Elbaz-Luwisch (2010, p. 267) notes that “it is not possible to fully understand teachers’ lives and work unless one engages with them in a shared endeavor; professional growth and learning would be almost a side-benefit of such research”. By actively including the perspective of the teachers this research study also had the opportunity to empower the specialist preschool music teachers.

4.3.2 Criticism on case study research from an interpretive perspective

One of the main concerns about case studies within an interpretive approach is that they provide little basis for scientific generalisation (Yin, 2009): how can researchers generalise findings to a wider population from just a single case or a few cases? However, by doing a case study research within an interpretive approach the aim was not to produce generalisable results, nor did it seek to test specific hypotheses as is custom within positivistic research. This study aimed to provide examples of specialist preschool music teachers’ PCKg regarding the teaching and learning of rhythm skills and aimed to suggest trends within the sample of the six teachers that may be indicative of those amongst the wider community of specialist preschool music teachers (Schwartz-Shea & Yanow, 2012). Given that the nature of this study was explorative, an interpretative approach allowed for generating themes concerning the content and nature of PCKg regarding the teaching and learning of rhythm skills, and examples of how PCKg could be conceptualised from an embodied cognition perspective. The goal of such an interpretive study therefore is to expand and generate theories (Yin, 2009).

A second major concern is the general lack of rigour of case study research (Flyvbjerg, 2006; Yin, 2009): systematic procedures for data collection and analysis can be lacking, the distinction between findings and interpretation can be blurred and a clear presentation of the findings can be missing. However, the way that rigour can be applied in case study research has been discussed extensively (see e.g. Boeije, 2012; Schwartz-Shea & Yanow, 2012; Yin, 2009). Key criteria have been formulated for ensuring the rigour and quality of case study research through for example reflexivity, methodological accountability,

triangulation and member checking. What these criteria entail, and how these criteria have been applied in this current research will be discussed in section 4.8.

4.4 Multiple case studies

4.4.1 The choice for a multiple case studies approach

Depending on the research question a different case study approach can be chosen, e.g. a single case study or a multiple case studies approach (Gerring, 2007). Within this research study I chose to take a multiple case studies approach. First of all, through this approach I was able to take in-depth “pictures” of each of the specialist preschool music teachers’ PCKg, whilst taking the teachers’ teaching context and the perspective of these teachers into account to gain an understanding of their PCKg on teaching and learning rhythm skills. With such an approach PCKg could be explored through multiple methods providing an opportunity to explore the online and offline embodied cognition of the teachers. Also, a multiple case studies approach gave the opportunity to draw “cross-case” commonalities and differences. Whilst individuals construct reality differently, our sense of reality can be shaped by a shared physical, social, cultural or historical context and this could mean that teachers in a particular teaching context might have some understandings and practices in common that can be described and recognised by others.

4.4.2 The selection of the cases

4.4.2.1 Participants

One of the goals of this research was to further the understanding of the concept of PCKg from an embodied cognition perspective. Purposive sampling opposed to random sampling (Silverman, 2010) allowed me to choose a representative group of specialist preschool music teachers for the study who might exemplify embodied elements of PCKg. A form of purposive sampling that Flyvbjerg (2006, p. 230) describes is called “an information-orientated selection of cases”. The goal of an information-orientated selection is “to

maximize the utility of information from small samples” and the cases in this study were selected on “the basis of expectations about their information content” (Flyvbjerg, 2006, p. 230). As I wanted to gain insight into the PCKg of *specialist* preschool music teachers, I selected music teachers with a Bachelor Degree in Music Education, teaching preschoolers (four- to six-year olds) in the Dutch educational system (group 1 and 2). These teachers developed their own curriculum regarding the teaching and learning of rhythm skills, although they could draw on existing teaching materials.

In addition, one assumption was that specialist preschool music teachers who had the opportunity to work in an open space like a gym or playroom would have more choice in the way they could design and execute their music lesson and had more opportunity to involve the body in teaching and learning music. These teachers could be less restricted by contextual constraints, e.g. classroom seating, hence my choice for teachers who taught in an open space. Finally, to increase the comparability of the teachers, I selected specialist music teachers with a minimum of four years experience. Literature suggests that the influence of experience on the development of teaching (including PCKg) seems to stabilise after several years and that teacher practice undergoes the greatest changes in the first one to three years of teaching (De Vries, 2004; Gess-Newsome, 1999b; Veenman, 1984). Therefore, I selected experienced teachers, as an assumption was that their PCKg was more stabilised and therefore better comparable. An overview of the selection criteria is given in the figure below:

Figure 4.1 Overview selection criteria

- music teachers with a Bachelor Degree in Music Education;
- teaching four- to six-year olds in the Dutch educational system (group 1 and 2);
- develop their own curriculum regarding the teaching and learning of rhythm skills;
- teaching in an open space, e.g. a gym or playroom;
- minimum of four years experience in preschool music education.

4.4.2.2 *Finding participants for my study*

Finding participants that met the selection criteria of this study and who were willing to take part in my study was not easy and I had to undertake different strategies for finding specialist preschool music teachers. First of all, I wrote to

all the heads of the Dutch music teaching training colleges at music academies and asked them whether they knew of alumni students who could participate in my study. This led to four specialist preschool music teachers (Martine, Jeroen, Jette and the teacher who trialled the methods) who met the selection criteria and who were willing to participate in the study. Subsequently, I announced my research study at a conference for primary music education of the Gehrels Music Education Foundation (Studiedag Gehrels muziekeducatie) that hosted more than two hundred participants, including specialist preschool music teachers, and I placed an announcement concerning my research on the website of the Gehrels Music Education Foundation too. This resulted in one teacher (Liselot) who met the criteria of this study and who was willing to take part in my study. Also, I contacted the Dutch National Centre of Expertise for Cultural Education and Amateur Arts and inquired whether they knew of teachers that might want to participate in my study. The centre provided me with several names and of those names the specialist preschool music teacher Peter met the criteria of this study and was willing to take part in the study. Lastly, I asked the specialist preschool music teachers who wanted to participate in my study if they knew of any colleagues who also would like to take part in my study and as a result Martine introduced me to Floor. In this research study no pseudonyms were used for the teachers and in section 4.7 on ethics an explanation is given for this choice.

All of the six specialist preschool music teachers who participated in this study (four females and two males) had a Bachelor Degree in Music Education from five different Dutch music teaching training colleges and their years of teaching experience ranged from 4.5 to 26 years. The teachers taught at six different schools (four urban and two rural schools). Four of these six schools had a population of an average or above-average socio-economic background. These schools had very few pupils with a first language other than Dutch. Two schools had a population of an average or under-average socio-economic background and had a mix of pupils from different ethnic minority groups. See the table below for an overview of the participants:

Table 4.2 Overview of the participants

Name	Bachelor Degree in Music Education	Years experience	School
Floor (f)	Conservatorium in Amsterdam	14 years	Rural (average/above-average socio-economic background)
Jeroen (m)	Conservatorium in Utrecht	8 years	Urban (average/above-average socio-economic background)
Jette (f)	Conservatorium in Amsterdam	26 years	Urban (average/above-average socio-economic background)
Liselot (f)	Conservatorium in Enschede	20 years	Rural (average/under-average socio-economic background)
Martine (f)	Conservatorium in Amsterdam/Hilversum	17 years	Urban (average/above-average socio-economic background)
Peter (m)	Conservatorium in Maastricht	4,5 years	Urban (average/under-average socio-economic background)

4.4.2.3 Gaining access to the participants

Initial contact was made with the specialist preschool music teachers by telephone or email. I explained the general aims and the research methods of my study. I then asked whether the teachers were willing to participate in the study and checked whether they met the criteria of my study. I contacted each of the head teachers of the six different schools where these teachers taught by telephone to explain my research study and to ask for their verbal consent. After their consent was given, a detailed written explanation of the study was given to the specialist preschool music teachers and written consent was asked of these teachers. Furthermore, the parents were asked to give their consent to film their child through a letter that was sent by the school. The preschoolers were introduced to the research by their specialist preschool music teacher and were asked verbal consent (see section 4.7 on ethics).

4.5 The methods in the multiple case studies

4.5.1 The choice of methods

Drawing on the theoretical framework set out in Chapter 3, I started with the notion that when and how the specialist music teachers' PCKg regarding teaching and learning rhythm skills can be manifested differs: *during* the act of teaching in the classroom the teachers' PCKg can be manifested in their online

cognition and *beyond the classroom* the teachers' PCKg can be manifested in their offline embodied cognition. I chose to explore these manifestations of PCKg with different methods in the following way:

- *Online embodied cognition*: A stimulated recall interview (SRI) and two video analysis tasks were used to explore the verbal and non-verbal aspects of the specialist preschool music teachers' PCKg regarding the teaching and learning of rhythm skills *during* the act of teaching;
- *Offline embodied cognition*: A digital notebook and semi-structured interview were used to explore the specialist preschool music teachers' PCKg regarding the teaching and learning of rhythm skills *beyond the classroom*.

For the purpose of this research, each method focused on the online *or* offline aspects of embodied cognition of the specialist music teacher. However, as explained in Chapter 3, online and offline embodied cognition are not strictly divided but seem to be reflected in each other (Thompson, 2012): the methods exploring the online embodied cognition might therefore capture traces of offline embodied cognition and vice versa. In the figure below an overview is given of the methods:

Figure 4.3 Brief summary of research methods

Embodied cognition framework	Methods for exploring the online and offline embodied cognition that reflects the teachers' PCKg
Online embodied cognition	Stimulated recall interview and two video analysis tasks (analysis of the instructional sequence and analysis of gestures)
Offline embodied cognition	Digital notebook and semi-structured interview

4.5.2 Trialling the methods and the order of the research methods

To gain insight into the strengths or limitations of the chosen research methods, one specialist preschool music teacher trialled the (order of the) methods. This teacher met the selection criteria that were used for the participants in this research study (see section 4.4.2 on the selection of cases). The outcome of the trial will be discussed below.

4.5.2.1 Trialling the design and procedures of the methods and the analysis of the data

One of the goals of the trial was to gain insight into the strengths or limitations of the first version of the design and procedures of the methods and the analysis of the data. The trial illuminated several limitations of my first version of the design, procedure and order of the methods. Based on the results of the trial I altered the designs and procedures of the semi-structured interview and the video analysis task concerning the analysis of the gestures. In the semi-structured interview that was used during the trial, too many questions (thirty) were designed and the interview format did not seem to encourage the specialist preschool music teacher to explore her own ideas and thoughts concerning PCKg. Therefore, in the semi-structured interview in this current study there were only six generative questions concerning PCKg so as to leave more room for the teachers to communicate their own thoughts and ideas concerning PCKg. The design and procedure of the semi-structured interview that was employed in the main research study will be discussed in section 4.5.6.

Based on the results of the trial an alteration was also made to the video analysis task concerning the gesture analysis. During the trial the specialist preschool music teacher analysed her gestures during the video analysis task with the help of a guiding framework. This guiding framework had been derived from the reviewed literature on gestures and PCKg, yet the teacher was explicitly informed that she could add and develop new categories. A disadvantage of this procedure seemed to be that the teacher tended to *only* look for the categories of the guiding framework, *automatically* describing the observed gestures in terms of the existing PCKg categories. Hence, a new procedure was developed to maximise the possibility for teachers to view their gestures in a less structured and more open manner. The design and procedure of the video analysis task that was employed in the main research study will be discussed in section 4.5.4.

During the analysis phase of the trial I started with deductive coding with the help of a pre-existing thematic framework concerning PCKg that was derived from the literature (Braun & Clarke, 2006). A disadvantage of this procedure seemed to be that I coded PCKg in terms of the existing PCKg categories. To

gain a more open approach to exploring the PCKg of the specialist music teachers I decided to start with inductive coding during the main research study but to apply sensitising concepts as well. The analysis procedure that was used in this main study is described in Chapter 5.

4.5.2.2 Trialling the order of the methods

Another goal of the trial was to gain insight into an optimal order of the methods. During the trial I started with the semi-structured interview, followed by the SRI, notebook and video analysis tasks. However, I found that the semi-structured interview sensitised specialist preschool music teachers too much to a concept of PCKg in an early stage of the research. After the semi-structured interview the teacher took part in the SRI and during this interview the teacher tended to give answers that she thought might relate to PCKg as had been discussed previously in the semi-structured interview. Based on the results of the trial I chose to gradually sensitise the teachers to the concept of PCKg and therefore to start with the most open method, namely SRI and end with the relatively least open method, namely the semi-structured interview. For example, during the SRI the teachers were allowed to recall *any* online embodied cognition and they were not specifically asked to remember cognition that might reflect their PCKg regarding the teaching and learning of rhythm skills. Next, the teachers were introduced to Shulman's (1987) broad description of PCK and they would then be asked to take notes in a notebook that might reflect what they believed and perceived to be their PCKg regarding the teaching and learning of rhythm skills. Subsequently, the teachers were asked to indicate, describe and interpret their instructional sequence and gestures based on Shulman's broad description of PCK in the video analysis tasks. The last research method, the semi-structured interview took the six generative components as a starting point to describe PCKg and in that sense focused the specialist music teachers' attention on a more refined description of what PCKg could entail. In summary, the different research methods progressively focused on the concept of PCKg regarding the teaching and learning of rhythm skills.

Moreover, I decided to choose for the aforementioned order of methods because it started with the actual teaching practice of the teacher (SRI and the video analysis tasks) and ended with the teachers' more abstracted views of the teaching practice (the notebook and semi-structured interview). In other words, there was a shift from online embodied cognition to offline embodied cognition. Thirdly, the SRI and the video analysis tasks could mostly explore the knowledge on rhythm skills and teaching and learning, and the notebook and semi-structured interview could cover a broader spectrum of the teachers' PCKg regarding the teaching and learning of rhythm skills, e.g. knowledge of rhythm skills in relation to the curriculum. Finally, another consideration was that the research process could influence the way specialist music teachers might start teaching. Therefore, the video recording of the SRI at the start of the research process was used for the two video analysis tasks. In the figure below an overview is given of the order of the research methods:

Figure 4.4 Overview order research methods per case

	Order of the research methods per case
Week 1	Videoring two to three lessons Stimulated recall interview Introduction notebook
Week 2	Specialist preschool music teacher writes in notebook
Week 3	Specialist preschool music teacher writes in notebook Video analysis task 1 by specialist preschool music teacher and researcher: instructional sequence Video analysis task 2 by specialist preschool music teacher and researcher: gestures
Week 4	Specialist preschool music teacher writes in notebook Semi-structured interview

In the sections below I will describe the strengths and limitations of the stimulated recall interview, video analysis tasks, the digital notebook and the semi-structured interview in general, then, I will give insight into and evaluate the design and procedure of the methods the way they were employed in this study.

4.5.3 Stimulated recall interview

4.5.3.1 Strengths, limitations and choices of the use of the stimulated recall interview

The specialist music teachers' PCKg regarding the teaching and learning of rhythm skills can be manifested in their online embodied cognition whilst teaching in the classroom. Ideally, researchers would like to explore the online embodied cognition of teachers during teaching. It needs little explanation that asking teachers what they are thinking during (verbal and non-verbal) teaching activities would interfere heavily with the teaching process itself (Bremmer & Schopman, 2011). One frequently used research method that provides an opportunity to maintain the real-life context of teachers (Lyle, 2003) and that can be used for exploring the teachers' online embodied cognition during teaching is called the stimulated recall interview (Bremmer & Schopman, 2011). In general, the stimulated recall interview (SRI) can be described as an introspective research procedure through which teachers' online embodied cognition "can be investigated by inviting subjects to recall when prompted by a video sequence, their concurrent thinking during that event" (Lyle, 2003, p. 861).

Although the SRI is widely used in research on teaching, the use of this method has also been criticised (Sime, 2006). For instance, Yinger (1986, p. 271) notes that the teacher who is undergoing the SRI is subject to the "luxury of meta-analysis and reflection" that was not possible at the time of the original lesson. The result of this reflection is that teachers might interpret the video recording instead of actually recalling their online embodied cognition during the viewed lesson (Yinger, 1986; Verloop, 1989). The question then becomes: are teachers recalling their lesson or reflecting on their lesson (Sime, 2006)? Yinger (1986, p. 270) also notes that the SRI produces a "new event" because there are "more cues available from the video record than was possible to heed in the original situation, the most striking is a view of oneself teaching" and therefore teachers could not be recalling the original situation but are reacting to the new event that is being viewed (Lyle, 2003). Teachers could also supplement incomplete memories or (unconsciously) legitimise and interpret their actions in hindsight (Mathijssen, 2006). Teachers can be anxious to disclose their (unpopular) thoughts and as a result they may give socially desirable answers (Lyle, 2003).

Additionally, Sime (2006) notes that the teacher's embodied cognition during classroom routine behaviours seems to be more difficult to verbalise and Lyle (2003) notes that teachers can also differ in their verbal expressiveness. In the reviewed literature concerns are also voiced about the procedures surrounding the SRI. Verloop (1989) notes that researchers can ask questions during the SRI but these questions can introduce an error because the information asked for might not relate to what the teacher was thinking of in the original situation. The actual videotaping of the teacher's lesson can also influence the teacher's and pupils' behaviour inducing a lesson situation that does not represent the way a lesson usually would have taken place (Bremmer & Schopman, 2011). Or the video recording can have caught irrelevant information or could have missed relevant classroom information (Lyle, 2003) thus presenting the teacher with a somewhat distorted view of that lesson.

In the reviewed literature suggestions were found for ways to increase the quality of the SRI that were applied in this research. To minimise the opportunity for specialist music teachers to *reflect* on their video recording the recording was viewed directly after the recorded event (Lyle, 2003). The teachers were allowed to react to the video recording on their *own* initiative as this might reduce the chance that errors are introduced in the data (Lyle, 2003). More recently, Crasborn and Hennissen (2010) have added a new element to the SRI, namely the so-called push-button technique. The purpose of the push-button technique is to have teachers acknowledge the presence of online embodied cognition *during* the teaching process by pushing a button to indicate the occurrence of such cognition on the spot. By pressing the button a beep is recorded and when the (audio) recording is played back afterwards the beep can be heard. This beep can remind the teacher of their online embodied cognition during the teaching process and help them recall this. In this research the teachers were given a brooch to pin on. The specialist music teachers were asked to unobtrusively touch that brooch during the lesson when they were aware of their online embodied cognition. When the teachers saw themselves touching the brooch in the recording it could be an additional reminder of what they had thought at that moment (see DVD track 1 Push button technique).

4.5.3.2 Method design and procedure of the stimulated recall interview

Instruction SRI prior to video recording

Each specialist music teacher was asked to give a lesson with “rhythm skills” as its central theme. In this PhD the rhythm skills were broadly summarised as “performing pulse, metre, rhythm patterns and tempo”. The teachers were purposely not given a detailed description of rhythm skills so as to leave space for their own interpretation and perception of performing rhythm skills. The teachers were asked to give a lesson in the way they were used to doing and not to develop new teaching or pupil activities especially for this research study (Meijer, 1999). I explained to them that the SRI was not about critically assessing teachers but about exploring their online embodied cognition. Lastly, the push-button technique was explained to the teacher (see appendix 1 Procedures of the methods).

I made a video recording of minimally two lessons of each of the six specialist music teachers for the use of the SRI that captured the teacher and the pupils as much as possible. As most teachers in this research study had either never been video recorded before or had not been video recorded for some time, where possible, I made a prior video recording of the teacher on the same day to let them get used to being video recorded (Bremmer & Schopman, 2011). Also, this provided an understanding of what might possibly be important to film. I aimed to conduct the SRI directly after the specialist music teacher’s lesson. If this was not possible because the specialist music teacher was scheduled for another lesson, I conducted the SRI at another moment, but always on the same day (Meijer, 1999). Prior to the SRI the specialist music teachers were asked whether one of the two lessons that had been recorded was representative of their teaching practice. All the six teachers found the recordings to be sufficiently representative.

Instruction of the SRI

The specialist music teachers were instructed about the purpose and procedure of the SRI in written form (see appendix 1 Procedures of the methods). In this phase of the research the specialist music teachers were not informed about the concept of PCkg but were allowed to recall any thought they had during teaching. The teacher could stop the video as soon as he or she could

remember what he or she was thinking during the teaching activities. It could be possible that during the SRI a teacher indicated that she or he was not thinking anything. In these cases, I probed the teacher only in a general way to reduce the possibility of introducing an error in the recall (Verloop, 1989). If I suspected that a teacher was talking about a “reflection-on-action” (Schön, 1983, p. 55) instead of their online embodied cognition, I asked the teacher “Were you thinking this during your lesson, or is this a reflection on your lesson and therefore a new thought about your lesson?” (Meijer, 1999). Also, the push-button technique could help a teacher to remember the online embodied cognition during their lesson (Crasborn & Hennissen, 2010). During the SRI I kept my prompting at a minimum in order not to introduce an error. I also avoided excessive questioning or asking questions that channelled the teacher’s attention to certain topics (Verloop, 1989). After the SRI the teacher was asked if he or she had explicated all their online embodied cognition (Meijer, 1999). At the end the digital notebook was introduced to the specialist music teacher (see appendix 1 Procedures of the methods) and the specialist music teachers were asked to choose two video clips for the video analysis tasks (see appendix 1 Procedures of the methods).

4.5.3.3 Evaluation of the stimulated recall interview

I encountered several limitations and strengths concerning the use of the SRI in this current research. First of all, a strength seemed to be that the SRI tended to give insight into thoughts and feelings concerning *observing and assessing* the preschoolers that were hardly verbalised during the semi-structured interview. In that sense, the SRI could explore aspects of the teachers’ PCKg that were less well captured through other methods. However, the terminology used in the teacher’s instruction of the SRI might be improved for researching the teachers’ PCKg specifically from an embodied cognition perspective. In the instruction of SRI the emphasis is laid on recalling “thoughts” and not on recalling “physical feelings” and “sensations”. Yet instructing teachers to describe what they are feeling and sensing during teaching could give a broader view of their online embodied cognition during teaching.

Secondly, some teachers mentioned that they refrained from elaborating on certain rhythm activities *in front of the camera* because they knew that preschoolers would get excited. The teachers were afraid that the excited behaviour of the preschoolers might be interpreted as a result of the *teachers* being “out of control”. In that sense, the video recordings did not always fully represent the teachers’ music lessons. In the future, researchers could stress that they know that music teaching could involve dynamic and seemingly chaotic behaviour of pupils but that they will be able to understand that behaviour in the context of teaching music.

Thirdly, with regard to the push-button technique four teachers simply forgot to touch their brooch; they were too much involved in the act of teaching. Of the two teachers that did touch their brooch, Martine mentioned that she found she could remember her thoughts better during the SRI *because* she had pressed the brooch during the three lessons that had been video recorded previously; she had gradually come to realise that she was having similar thoughts throughout the three lessons. Floor mentioned that she especially touched the brooch at moments when the lesson situation lead to a (positive or negative) surprise. Yet both teachers could not always remember what they had been thinking when they saw themselves touching the brooch on video. This possibly could be because the video recording did not always capture the situation that the teachers were thinking about: although I attempted to capture the teachers *and* preschoolers on camera this did not always succeed; in such cases it was mainly the teacher that was captured on film. In summary, the push-button technique could be useful for teachers to remember their thoughts during a SRI, however, it would be advisable to have teachers get used to that technique before actually video recording them for research purposes.

Lastly, Peter mentioned that he could especially recall his thoughts when introducing a rhythm activity to preschoolers that was new to them. In that situation he had to actively think about how to introduce and manage the rhythm activity. In general, Peter’s and Floor’s observation about the SRI in this study raises questions about whether or not a SRI mainly explored *less* routinized thoughts of teachers and tended to overlook *highly* routinized thoughts. Further research could explore that question.

4.5.4 The video analysis tasks

4.5.4.1 *Strengths, limitations and choices regarding the use of video analysis tasks*

In this current study an assumption was that the specialist music teachers' PCKg regarding the teaching and learning of rhythm skills might be manifested in their physical actions that reflected their instructional sequence and gestures during a rhythm activity. As a concern in this study was to have an understanding of PCKg from the "inside" and not only from the outside vantage point of the researcher, I chose *not* to use systematic observation to explore the instructional sequence and gestures of the teachers. Instead, I chose to make use of video analysis tasks to indicate, describe and interpret the instructional sequence of a rhythm activity and gestures during a rhythm activity that could reflect their PCKg of rhythm skills (Tripp & Rich, 2012). These tasks could be executed by the teacher and myself and allowed for a dialogue about the analysis of the instructional sequence and gestures between the teacher and myself.

The teachers executed two video analysis tasks: in the *first* video analysis task the teachers indicated, described and interpreted their physical actions within a rhythm activity that could reflect the instructional sequence of that rhythm activity and in the *second* video analysis task the teachers indicated, described and interpreted their gestures within a rhythm activity. Analysing a video recording could help specialist music teachers see their teaching from a new perspective (Tripp & Rich, 2012): it could enable them to notice aspects of their instructional sequence and gestures that had been "lived rather than understood in an explicit way" (Raingruber, 2003, p. 1156). Video analysis tasks also allowed the teachers time for both observation and commenting on their instructional sequence and gestures; they could rewind the video recording and view physical actions and gestures several times before describing and interpreting what they were seeing (Raingruber, 2003). Furthermore, reviewing the video recording could help teachers to reflect on their non-verbal PCKg that otherwise might not have been noticed or remembered (Raingruber, 2003).

Several choices were made concerning the video analysis tasks of the teachers. With respect to the choice of the length and number of videos that

were analysed, the fact that video analysis can be a time-consuming method played a part (Tripp & Rich, 2012). The video analysis session with the specialist music teacher had been planned to take two hours. In light of the ratio between time and the length of the tasks, the choice was made to let the teachers analyse two teaching activities, each with a maximum length of approximately five minutes. In the two separate teaching activities the focus was put on the development of two different rhythm skills (e.g. pulse, metre, rhythm patterns or tempo) in order to increase the chance that different physical actions and gestures could be visible during these activities.

Another choice concerned what kind of video analysis task the teacher had to carry out, e.g. video editing or completing codes or checklists (Tripp & Rich, 2012). In this study I opted for a rudimentary form of video editing. During the *first* video analysis task the teachers had to indicate and describe the sequence of their physical actions within a teaching activity that could reflect the instructional sequence of that activity. Therefore the teachers had to indicate the time frame of every step of the sequence of their teaching activity and after that they were asked to interpret the whole of the sequence of a teaching activity. In the *second* video analysis task the teacher had to indicate the time frame of every gesture that could reflect their PCKg of rhythm skills and after that the teachers described and interpreted their gestures. Cunningham and Benedetto (2002) do warn that teachers can spend a great deal of time selecting video fragments but they can spend less time on the actual analysis of the performance captured in those fragments. Therefore, the teachers in this study were asked explicitly after the selection of each fragment to give their interpretation of that selection.

Furthermore, I had to choose whether the teachers should use a guiding framework during the video analysis task. A guiding framework can act as an advanced organiser, priming the teacher to notice specific behaviours (Holmlund, 2008). During the *second* video analysis task in this current research the specialist music teacher had to indicate, describe and interpret his or her gestures that might reflect their PCKg regarding the teaching and learning of rhythm skills with the help of a guiding framework. This guiding framework had to be broad enough that it could capture the PCKg regarding the teaching and learning of rhythm skills that could be specific to an early

childhood specialist music teacher and might not have been described before. However, the guiding framework had to be narrow enough not to capture any random gesture, but rather gestures that might reflect a specialist music teacher's PCKg (Damen, 2010). Therefore, the guiding framework was chosen that consisted of Shulman's (1987) general description of PCK, namely that specialist music teachers had to indicate, describe and interpret gestures that in themselves blend content and pedagogy or gestures that are integrated with the sound or speech they accompany that might blend pedagogy and content.

The last choice I had to make was whether teachers should analyse their videos individually, or together with the researcher, or individually and *then* together with the researcher (Tripp & Rich, 2012). Concerning viewing a video together, research has found that it helps teachers to clarify and examine their teaching practice more than viewing a video individually (Tripp & Rich, 2012; Miller, 2009). Tripp and Rich (2012) however, mention that additional research is needed to investigate eventual benefits of using both individual but *also* collaborative reflection as part of the process of video analysis. Although, according to these researchers, a few studies have suggested that asking teachers to analyse their teaching individually and then collectively improved the collaborative discussion of their teaching. In this current study, the two video analysis tasks were first executed by the teacher and by myself individually and then executed together. During the phase of co-analysis the teacher and I could compare and discuss which instructional sequence and gestures we had indicated and described, and how we interpreted them.

4.5.4.2 The method design and procedure of the two video analysis tasks

Instruction prior to the video analysis tasks

The procedure of two video analysis tasks started off with the teacher's choice of two video fragments that would be analysed. At the end of the SRI, the specialist music teacher chose two video clips from the SRI video recording that presented two rounded-off rhythm activities with a focus on the teaching and learning of two different rhythm skills. For example, one teaching activity could focus on the development of a sense of metre, and the other teaching activity could focus on the development of a sense of tempo. Two criteria helped to

choose “a rounded-off teaching activity”. The first criterion was a visible break point between teaching activities through a change in the character of the teaching activity that marked a beginning or end of a teaching activity (Schoenfeld, 1998). For example, a specialist music teacher could end one rhythm chant and introduce dancing freely on rhythmical music. The second criterion was that a reprioritisation of teaching goals was noticeable when such transitions were made between teaching activities (Schoenfeld, 1998). For example, during the one activity the specialist music teacher’s goal could be developing a sense of metre and in the following activity the specialist music teacher could set a new goal, namely focusing on developing a sense of tempo. (see appendix 1 Procedures of the methods).

Instruction video analysis task

At the start of each of the two video analysis tasks, the teachers were given written instructions about the task. In general, the teachers were informed that the two video analysis tasks would take approximately two hours. I emphasised that the video analysis tasks were not about critically assessing the teacher but meant as a method to explore the specialist music teacher’s online embodied PCKg regarding the teaching and learning of rhythm skills. The teachers were informed that both tasks consisted of an individual phase and a collaborative phase of analysis and that this last phase would be recorded, transcribed verbatim and analysed. The teachers were informed that I would remain silent when they viewed and analysed their video fragments but perhaps would ask a brief question for clarification. Lastly, the teachers were informed that they were allowed to rewind the video fragments as much as they wanted (see appendix 1 Procedures of the methods).

Video analysis task one

The goal of the first video task was for the specialist music teachers to indicate, describe and interpret the sequence of their physical actions within a rhythm activity that could reflect the instructional sequence of that rhythm activity. The teachers started with viewing each video fragment in its entirety. Next, the teacher was instructed to view each video fragment again but this time whenever they perceived a rounded-off moment within the teaching activity (a breaking point and a shift of goals within the teaching activity) they were

viewing the teacher could stop the video, indicate, describe and interpret the sequence within the teaching activity. The role of the researcher was to note the beginning and end time of the chosen clips. At the end of this first phase of the task, the teacher viewed all the clips that made up the instructional sequence of their teaching activity again and they could decide then if they still agreed with this sequence. In conclusion, the teacher explained why he or she chose this sequence during their teaching activity. During the co-analysis phase of this video analysis task, the specialist music teacher and researcher viewed the video recording together: they compared whether they observed the same sequence within the two teaching activities and discussed how these sequences can be interpreted.

Video analysis task two

The goal of the second video task was to view the same video clips as in task one and to indicate, describe and interpret the gestures that might communicate their PCKg. First, the teachers were given a description of what in general could be considered a gesture based on the descriptions of gestures of Jensenius and colleagues (2010) and (Roth, 2001): “You can make a gesture with a part of your body, e.g. your arms, hands or head, your face (facial expression) and with your gesture you express a meaning. A gesture also has a quite clear beginning and end”. Then the teachers were instructed that they had to indicate, describe and interpret gestures that in themselves might “blend pedagogy and content” whilst teaching rhythm skills; or indicate and interpret gestures that in combination with singing, chanting, performing, talking, could blend pedagogy and content. This broad guiding framework, namely a “blend of pedagogy and content”, was derived from Shulman’s (1987) description of PCK. To clarify what kind of gestures possibly were meant, the teachers were given the following example: “you can perform rhythm content and simultaneously emphasise certain rhythmical aspects of the music with your gestures and (un)consciously focus the attention of the preschoolers to that aspect”. The teachers also were instructed that once they paused the video, they had to indicate, describe and interpret the gesture that might blend pedagogy and content; or the gestures that in combination with singing, chanting, performing, talking, could blend pedagogy and content, and they had to explain and make brief notes on what the meaning of that gesture could be. During the co-

analysis phase of this video analysis task, the specialist music teacher and researcher viewed the video recording together. They compared whether they observed the same gestures that might blend pedagogy and content, and they compared whether they attributed a similar or different meaning to the observed gestures.

4.5.4.3 Evaluation of the video analysis tasks

I encountered several limitations and strengths concerning the use of the video analysis tasks in this current research. The greatest strength of the video tasks was that they explored the non-verbal PCKg of teachers that they themselves had hardly recognised as PCKg, and as a consequence had hardly verbalised in their notebook or semi-structured interview. The PCKg that could be explored through the video analysis tasks mainly concerned the musical communication and musical interaction that facilitated the learning of rhythm skills of preschoolers.

The first video task seemed more straightforward and recognisable for the teachers – they had little trouble indicating, describing and interpreting the instructional sequence of their rhythm activities. The second video task (gesture analysis) seemed more complex to execute. Some teachers had trouble observing that they were actually *gesturing* and some teachers found it cost a lot of concentration to analyse their gestures. There was also a difference concerning the ease with which teachers could verbally describe and interpret their gestures, e.g. *“Head movement is how I shall call it for the moment... difficult how to give a short description... head movement”* [VA2, Jeroen, 1]. Furthermore, teachers could demonstrate a gesture within a very short time frame and therefore a gesture could easily be overlooked or teachers could demonstrate multiple gestures at the same time, which made it difficult to explore all the demonstrated gestures.

The co-analysis phase during the video task seemed functional since I sometimes overlooked a gesture the teacher had seen and vice versa. My interpretation of the gestures could also sometimes differ from the teacher’s interpretation, e.g. I interpreted a gesture as visualising a pause in the music, however, the teacher meant to visualise the length of a note of a boomwhacker

(an instrument that does not produce long-sounding notes). Moreover, I was at an advantage analysing the gestures of the teachers – I had multiple viewings of the same video fragments and spent more time analysing a teacher's gestures than the teachers themselves. To give teachers a fair amount of practice and time analysing their gestures it would be advisable for future research to have teachers analyse gestures at their own pace in their own environment instead of on the spot in a given time frame. This might have raised the quality of the analysis in this current research and can raise the overall quality of the teachers' analysis of their gestures in future research.

4.5.5. Digital notebook

The specialist music teachers' offline embodied cognition beyond the classroom was explored through digital notebooks and semi-structured interviews as these methods could give in-depth information on a certain aspect of the specialist music teacher's PCKg regarding the teaching and learning of rhythm skills (Hutjes & Van Buuren, 1992). Successively, I will describe the use of the digital notebook and the semi-structured interview the within this research.

4.5.5.1 Strengths, limitations and choices of the use of a digital notebook

In general, notebooks can be used to generate data about teacher cognition (Melief, Tigchelaar, Korthagen, & Koster, 2003; Loughran, Milroy, Berry, Gunstone, & Mulhall, 2001). Notebooks can give insight into the teachers' interpretation of their teaching practice (Melief et al., 2003; Loughran et al., 2001) and can provide realistic pictures of an individual's daily life (Nicholl, 2010). An advantage of notebooks is that notes can be taken in absence of a researcher; this might reduce errors in recall (Bolger, Davis, & Rafaeli, 2003; Nicholl, 2010). Teachers can also take as much time as they want to write down their notes without the interference of a researcher. In the reviewed literature the term "diary" is used in a similar way as the term "notebook" is used in this current research.

The reviewed literature does note several limitations of the use of notebooks (Bolger et al., 2003; Duke, 2012; Nicholl, 2010). Bolger and colleagues (2003) note that using a notebook as a research method requires a high level of

participant commitment and that the completion of a notebook can be an onerous task for participants (Duke, 2012). Therefore, in this current research, participants were informed that they were allowed to describe their PCKg in short text fragments that did not have to have a cohesive relationship and that they did not need to write a “continual story”. Duke (2012) notes that the participant’s motivation to complete a notebook can differ. To heighten the participant’s motivation, she suggests that the instruction of the notebook needs to be clear about the purpose of the notebook in relation to the whole of the research. She also describes that *written* instructions that use appropriate and accessible language are important to support the participant’s motivation to complete the notebook accurately (Duke, 2012). In this current research, a *written* instruction was used that was peer reviewed by a specialist preschool music teacher who did not participate in the research project. I asked this teacher to read the instruction and to comment on the clarity and accessibility of the text. Lastly, in the Netherlands the term “diary” has specific connotations concerning the content and form, namely writing down intimate thoughts and events on a daily basis. The term notebook, however, has a more neutral character and that is why I chose to use this term in the procedure of the notebook.

Additionally, I chose to use the notebook in conjunction with the interview process (Nicholl, 2010). The use of a notebook could give teachers more time to think about their PCKg and to find words that could cover what they perceived to be PCKg before they were interviewed (Duke, 2012). If teachers struggled finding words during the interview they could check what they had written in their notebook. In that sense, the notebook functioned as a mnemonic. Furthermore, the content of the notebook was semi-structured. The subject of the notebook was given, namely the PCKg regarding the teaching and learning of rhythm skills, and the teachers were asked to note their spontaneous thoughts concerning their PCKg regarding the rhythm skills of preschoolers. To limit an induced set of responses and to give the teachers freedom in their descriptions of their PCKg regarding the teaching and learning of rhythm skills (Huberman, 1995) the concept of PCKg was explained on the basis of Shulman’s (1987) broadly defined description of PCK as a blend of content and pedagogy.

Lastly, computer literacy may influence participants' possibility to complete a *digital* notebook (Bolger et al, 2003) or participants might simply not have access to a computer. In this study, all the teachers had access to a computer and had sufficient computer literacy to be able to complete a digital notebook. Furthermore, digital data can be sensitive to tampering when data are saved as a *word-document*. Therefore, the teachers were asked to send a *pdf-document* of their digital notebook to protect against tampering with the data. The strength of a digital notebook is that it makes the analysis easier for the researcher as these types of notebooks are directly ready for analysis.

4.5.5.2 Method design and procedure of the digital notebook

Since the function of the notebook was not to explore the development of PCKg over a longer time frame (Bolger et al., 2003) but to explore the actual PCKg of teachers, the specialist music teachers were asked to write down in a digital notebook as much as possible about what they believed to be their PCKg regarding the rhythm skills of preschoolers over a time period of two to three weeks. The teachers were given examples of PCKg regarding rhythm skills, e.g. "You can think of, for example, whether you adjust rhythm skills to the interests and possibilities of preschoolers". The teachers were explicitly informed that those examples gave an idea of what could be viewed as PCKg, however, that PCKg was not limited to those examples. The teachers were invited to describe what they themselves thought to be PCKg regarding the rhythm skills of preschoolers. The teachers were also asked to write down background information about themselves, e.g. their age, gender, teaching experience and educational background. Furthermore, the teachers were asked whether they gave their music lessons from a personal, and/or music pedagogical and/or a pedagogical orientation. They were informed that the form of the notebook was not set and that their notebooks would not be incorporated as a whole in the study but would be analysed. Names of pupils, other persons or sites (excluding their education) would be anonymised. The teachers were asked to send their digital notebook as a pdf-file to the researcher prior to the semi-structured interview and they were asked to take their notebook to the semi-structured

interview so they could use it as a mnemonic (see appendix 1 Procedures of the methods).

4.5.5.3 Evaluation of the digital notebook

One of the strengths of the use of the digital notebook in this current research was that some teachers used the notebook as a mnemonic during the interview and found it useful to formulate answers during the interview that were based on what they had written down in their notebooks. However, overall, the quality and length of the notebooks varied considerably between the teachers. This could be due to the amount of time they were able – or were motivated – to spend on the notebook. Teachers might also be unaware of their PCKg as it is often tacit, contextualised and associated with particular pupils, events and classrooms (Loughran, Berry, & Mullhall, 2004) and therefore they did not know what to write in their notebook. As a consequence, the gains of the notebooks for this research were somewhat variable. In future research, the overall quality of these types of notebooks might be enhanced through explaining more elaborately what verbal and non-verbal aspects of PCKg could be. Or, possibly to refrain from using a *written* digital notebook, as it might be easier and quicker for teachers to record their thoughts with the use of an audio voice recorder.

4.5.6 Semi-structured interview

4.5.6.1 Strengths, limitations and choices of the use of a semi-structured interview

In this research I used a semi-structured interview to explore the specialist music teachers' PCKg at a more abstracted level (Meijer, 1999) as manifested in their offline embodied cognition. An advantage of a semi-structured interview was that the specialist music teachers taking part in this research could be asked partly the same questions, which could enhance the comparability between the different cases (Meijer, 1999). However, there was room for myself to ask more questions and for the specialist music teacher to bring in their own thoughts on their PCKg (Bulterman-Bos, 2004). In this current research, six interview questions were predefined and derived from the literature and the

topics of these questions focused on the six generative components that could constitute PCKg. The questions in this semi-structured interview could be asked in a random order. Thus the interview could have a more free character and questions could be answered more spontaneously.

The use of interviews to explore the practical knowledge of teachers does not seem unproblematic (Desforges, 1995; Bremmer & Schopman, 2011; Loughran et al., 2001). Loughran and colleagues (2001) note that practical knowledge, including PCKg, is difficult to articulate by teachers for several reasons. Teachers might never have thought about PCKg up until the research and as a consequence teachers might need more time during an interview to reflect before being able to answer a question (Huberman, 1995). Huberman (1995, p. 136) further notes that respondents may be so involved in “the “natural attitudes” of their work and its circumstances, in its taken for grantedness, that there is little reflective distance” for an interviewer to work with. Also, questions about PCKg might be ones teachers would never have come up with themselves, or questions might not be directly related to what happens in their classroom and therefore teachers might not know what to answer (Meijer, 1999). Or, talking about teaching beyond the actual context of teaching, can give distorted or incomplete information (Bremmer & Schopman, 2011).

However, researchers can help teachers elicit their PCKg through examining it in a language that is close to them (Meijer, 1999). In this research, a specialist preschool music teacher who was not participating in this current research assisted in constructing interview questions, which therefore could be more comprehensible to other specialist music teachers (Meijer, 1999). The teachers also were informed that they were allowed to physically demonstrate their possible PCKg before they described what the content of their PCKg was. Teachers could find it easier to describe what they were doing and what their possible PCKg could be by communicating their PCKg in a physical manner.

4.5.6.2 Method design and procedure of the semi-structured interview

The specialist music teachers were first informed that the aim of the interview was to explore their possible PCKg regarding the teaching and learning of rhythm skills of preschoolers and that the interview would last approximately

one and a half hour. The nature of a semi-structured interview was explained to them and they were informed that they could physically demonstrate their possible PCKg before describing it, using their notebook as a mnemonic if necessary. To get the semi-structured interview started, I asked the teachers to imagine one of their lessons in which the teaching and learning of rhythm skills was central. I asked the teachers to describe in detail what they were thinking about when imagining such a lesson. They were also allowed to demonstrate what they might be doing. The teachers were informed that the semi-structured interview would be recorded and transcribed verbatim for analysis. From then on, I introduced the questions of the semi-structured interview (see appendix 1 Procedures of the methods).

4.5.6.3 Evaluation of the semi-structured interview

The use of the semi-structured interview in this current research study provided a powerful tool to gain insight into the PCKg of the music teachers, however, also raised several questions. The goal of the semi-structured interview was to explore the offline embodied cognition of the teachers that reflected their PCKg. Although the verbal explanations reflected the PCKg of teachers it also became apparent during the interviews that the teachers *physically* enacted or imitated parts of their lesson. This raised the question whether these physical expressions could be traces of their online embodied cognition. Possibly this research would have benefitted – and future research could benefit – from video recording the semi-structured interview and analysing these gestures and physical actions of the teachers.

A complexity for the teachers during the semi-structured interview seemed to be that they not only had to try and verbalise their implicit knowledge about teaching and learning rhythm skills but they also had to translate their sonic and physical approach to teaching rhythm skills to verbal explanations about their teaching practice. Some teachers seemed to struggle in the process of talking about their PCKg, and possibly it would have been easier for at least some of the teachers to talk about their PCKg in a focus group that would have facilitated hearing other teachers verbalise their practice. Perhaps that could have given them examples of how to talk about one's practice.

4.5.7 Flexibility of the methods

In this research study the data of the teachers were collected in sequence and the same methods were applied per case. However, due to the interpretive nature of this research study, the methods were to a certain degree adaptive to the experiences in the field (Schwartz-Shea & Yanow, 2012). For example, after the first case study, the findings suggested that facial expression might (partially) reflect a specialist music teacher's PCKg regarding rhythm skills. Therefore, consecutive teachers were explicitly informed during the video analysis tasks that their facial expressions might be part of their PCKg and therefore could be part of their analysis. Also, during the first and second case study, I filmed two or three consecutive lessons of these teachers. What I found was that these teachers tended to make changes to a lesson they had taught to improve their forthcoming lesson. In the figure below an example is given of a teacher who is thinking about a change in her forthcoming lesson:

Figure 4.5 An example of a change in a forthcoming lesson

Martine, stimulated recall interview [2]	"I noticed that, this was the second lesson, I immediately realise a number of things that I did differently in the first lesson and that I also wanted to do differently in the second lesson. So every time I learn on the spot and that really is a shame. Like, o yes, I really should show how the instrument works, how do you hold it. And then I see, I really reflect on the first lesson and then try to change in the following lesson, with the new group".
---	---

I wondered if they were possibly drawing on PCKg regarding rhythm skills during that process and I decided to ask consecutive teachers a question about the changes they made to their lessons directly after the stimulated recall interview. This data was included in the data analysis process.

4.6 Field notes

In this current research I took (field) notes so as to ensure the retention of ideas, impressions and reflections during the phase of data collection and data analysis that may otherwise be lost (Silverman, 2010). In taking (field) notes I took three different foci: first of all, I took observational field notes after I had filmed and interviewed the specialist preschool music teachers and I noted striking events that could possibly be of significance during the analysis of the

data or the interpretation of the data. Secondly, I took field notes that focused on the strengths and possible limitations of the methods that were employed in this current research: how did the teachers react to the methods and could that inform me about the possible strengths and limitations of the used methods? Lastly, I noted possible themes that I found in the data and how they might relate to themes that already had – or had not – been found in the literature.

4.7 Ethical standards

To promote respect for all the participants involved directly (the specialist preschool music teachers and the preschoolers) and indirectly (head teachers and parents) I used the Ethical Guidelines for Educational Research (2011) of the British Educational Research Association and the Ethical Guidelines of the University of Exeter to maintain ethical standards within this research. This research was also in compliance with the Dutch Data Protection Act (Overheid, 2012). Below the measures that were undertaken to maintain the ethical standards are described.

4.7.1 Informing the participants about the research and asking consent

All the participants who were involved directly and indirectly in this current study were informed about the research and consent was asked for the research study. Direct, voluntary and verbal consent was asked from each of the head teachers of the six different schools where the video recording of the specialist music teachers took place. After this consent was given, voluntary, written consent was asked of the six specialist preschool music teachers participating in this research. The consent form clarified the process of the research in which the teachers would be engaged. The teachers would be presented with the findings, including the video clips, for approval before the findings were made public. Furthermore, in this research study no pseudonyms were used for the teachers. First of all, the teachers in this study were not being assessed, but the goal of the study was to explore their PCKg. Based on my experience with earlier research on the practical knowledge of teachers (Bremmer & Schopman, 2011) I found that teachers were proud of their practice and *wanted* to be

mentioned by name. Secondly, the teachers in this research were going to be made visible through the video fragments. Therefore, the specialist music teachers in this research study were asked to give permission to use their first name (all the teachers gave their consent), however, the name of their school and their pupils would be anonymised.

The consent form also explicitly mentioned that in order to influence their PCKg as little as possible by the research process, I would only let them know during the semi-structured interview exactly which aspects of their PCKg concerned the research. Furthermore, the consent form clarified how their data would partly be transcribed verbatim by an independent third person who was not involved in the research or the field of music education and that this person would remove the data from the computer after transcribing it. The specialist music teachers were informed that certain portions of the data would be kept for educational purposes to be used at the Bachelor Degree in Music Education at the Amsterdam Conservatory and for research conferences, but the remainder would be destroyed one year after the conclusion of my PhD. It was explained to them that their complete digital (raw) data would be kept on my personal computer and backups were kept on a personal hard drive. Also, the consent form clarified that their video recordings would not be uploaded to the internet but made available on DVD. Their data would not be made available to third parties unless the specialist music teacher gave prior approval. The specialist music teachers were further asked to send a pdf-file of their notebook to protect against tampering with the data. Lastly, the teachers were informed that they had the right to withdraw from the research for any or no reason, and at any time (see appendix 2 Consent forms).

Substitute, voluntary consent was asked of the parents/caregivers whose children could be captured on video during the recording of the specialist music teacher a week prior to the video recording. The consent form of the parents clarified that the video recordings would be made public at research conferences or in an educational setting, however not placed on the internet. The parents were given my email and telephone number if they had any further questions, or if they did not wish their child to be recorded. The purpose of video recording the music lessons was explained to the preschool pupils

verbally and they were asked to give their consent by verbal reply (see appendix 2 Consent forms).

4.7.2 Protection from harm and stress

Several actions were undertaken to protect the specialist preschool music teachers as much as possible from harm and stress during the research process. In the instructions of the methods that were employed, the specialist preschool music teachers were assured that their teaching practice was not under scrutiny. The teachers were explicitly told that the purpose of the research was to explore their PCKg and not to judge or assess their teaching practice. The research schedule for filming the teachers was designed in such a manner that it fit their existing lessons and the teachers did not need to schedule extra lessons. Moreover, I tried to film the teacher in such a manner that it interfered the least possible with the teaching process.

4.7.3 For whom is the research?

Howe and Moses (1999, p. 56) note that “to be truly ethical, educational researchers must be prepared to defend what their research is for”. The specialist preschool music teachers were informed that this current research aimed to contribute to the theory on learning and teaching music to preschoolers in general but at a practical level the research findings would be used at the Bachelor Degree in Music Education at the Amsterdam Conservatory to help educate and inform future specialist (preschool) music teachers. By actively including the perspective of the specialist preschool music teachers all the participants in the research process could learn from the research process and be empowered. This caused one of the teachers to positively note: *“by talking about it now and by looking at the video recordings, and because of the notebook or the analysis or by reflecting about it yourself, well, it gives you a new perspective on the subject you are teaching”* [SI, Peter, 3].

4.8 Trustworthiness of the research

Several criteria were applied to ensure the trustworthiness and quality of the research. Within a positivistic paradigm the criteria validity (how well a research instrument measures what it is supposed to measure) and reliability (the degree to which research instruments produce stable and consistent results) are applied to ensure and assess the quality of the research. However, validity and reliability do not seem to fit neatly with interpretative research due to different ontological and epistemological viewpoints that underpin interpretative research. Therefore, considerable debate exists on whether or not there are criteria by which interpretative research can be judged, and if so, what the character of these criteria should be (Hammersly, 2007). At the same time there seems to be a general acceptance of the need for clear and transparent approaches for judging the trustworthiness of interpretative research (Boeije, 2012; Schwartz-Shea & Yanow, 2012). The following criteria were used to ensure the trustworthiness of this study and that seemed compatible with interpretative research (Boeije, 2012, p. 173): (a) reflexivity; (b) methodological accountability; (c) triangulation; and (d) member checking.

4.8.1 Reflexivity

One of the ways to ensure the trustworthiness of research is through “reflexivity”. The concept of reflexivity is complex and still a subject of debate (Berger, 2015; Schwartz-Shea & Yanow, 2012). However, commonly it is viewed as the processes of a “critical self-evaluation of researcher’s positionality as well as active acknowledgement and explicit recognition that this position may affect the research process and outcome” (Berger, 2015, p. 220). According to Berger (2015), the practice of reflexivity can enhance the quality of research because it allows researchers to think about the ways in which who they are may *both* assist and obstruct the research process. The goal of reflexivity is not to eliminate the influence of a researcher’s own value system, beliefs and experiences as these can enable identification of issues, themes or situations that are valuable for the research process, but rather to try and understand them (Ahern, 1999). Researchers acknowledging the way their characteristics, beliefs, assumptions and biases impact on research allow for readers to understand and evaluate their positions (Schwartz-Shea & Yanow, 2012; Tufford & Newman, 2010).

In relation to this research study, as a researcher I brought a certain amount of subjectivity to this current research study that will have influenced *how* I elicited and interpreted the PCKg of specialist preschool music teachers. My subjectivity was informed by many years of teaching as a specialist (preschool) music teacher and has enabled me to become familiarised with the actions and the language of the teachers in this study. This connects to what Meijer (1999) suggests: researchers can help teachers elicit their PCKg through examining it in a language that is close to them. Furthermore, coming from the “shared experience position” (Berger, 2015, p. 223) I was in all probability better equipped to know what to ask and how to ask it, as well as to understand the verbal and non-verbal reactions of the specialist preschool music teachers. In addition, my subjectivity was informed by years of teaching as a teacher educator of specialised music teachers at the Conservatorium van Amsterdam (The Netherlands). In this role I am used to observing pre-service specialist music teachers teaching within a preschool setting and I am used to analysing videos of teaching. This experience was useful when I started analysing the video analysis tasks.

On the down side, the specialist preschool music teaching community of which I am part is a small one, and teachers tend to know each other personally or by name. As a consequence, these teachers might want to make “a good impression” within this research as to ensure their own reputation within the music education community. Therefore, it was important to stress that this research was not about critically assessing the teachers but about exploring their PCKg and to actively involve these teachers in my research through, for instance, the co-analysis of the video analysis tasks. Lastly, due to my personal experience I have become, to a certain extent, an insider in the community I am researching. This could mean that I have developed blind spots concerning aspects of teaching and learning rhythm skills, and that I have developed ideas – consciously or unconsciously – about which rhythmic activities can be seen as more successful than others. Or, as Berger (2015, p. 224) remarks: “Bringing the researcher into the researched carries the danger of researcher’s self-involvement to the degree that it blocks hearing other voices”. In this study, it was therefore important to have the perspective of the specialist preschool music teacher to gain a focus on aspects that I might have overlooked or perhaps overvalued or undervalued. For the same reasons, the process of

intercoder agreement with a music teacher was adopted in this study as will be explained in Chapter 5 in section 5.3.4 to secure that the voices of these teachers were heard.

Furthermore, Tufford and Newman (2010, p. 91) remark that reflexivity can also “protect the researcher from the temptation to foreground certain voices while relegating others to a background position, particularly as these voices may confirm or not the researcher’s preconceptions about the phenomenon under study”. In relation to this study, in reporting my findings, I made efforts to use quotations and video fragments of *all* the six teachers that participated in this study, ensuring that the voices *and* bodies of all the participants in this study could be heard and seen – not only those that I might prefer. Lastly, as this research study progressed I came to realise that I am a product of the Western research community I belong to and how values within that community have impacted the research methods I employed during this study. In Chapter 8 in section 8.7 I will elaborate on how my background as a Western researcher has influenced the way this research has been designed.

4.8.2 Methodological accountability

As part of the methodological accountability, I have documented the choice of the research design, the choice and procedures of the methods and the way in which the data analysis was performed in Chapter 4 and 5 of this research study. To account for my findings verbatim quotes and video examples of the participants were used to support the findings in Chapter 6. As my English supervisors did not speak Dutch the original quotes and the translations were viewed by my Dutch mentor Prof. dr. Folkert Haanstra. Moreover, with regard to the data itself, the coding manual will be kept together with the corpus of data (the data of each method has a separate file) and can be made available for scrutiny.

4.8.3 Triangulation

Within a positivistic paradigm triangulation is generally viewed as “a process by which a researcher wants to verify a finding by showing that independent

measures of it agree with or, at least, do not contradict it" (Meijer et al., 2002, p. 146). However, from an interpretive viewpoint there is no one objective truth that can be verified through different methods (Schwartz-Shea & Yanow, 2012). Within an interpretive paradigm triangulation is often applied with sources that have different strengths and foci and so can complement each other to gain a more comprehensive understanding of a complex (educational) phenomenon (Meijer et al., 2002). In this research I assumed that online embodied cognition and offline embodied cognition that reflected the PCKg of the teachers were different manifestations of the same phenomenon. I therefore made use of multi-method triangulation and combined data to give a fuller account of the specialist music teachers' PCKg (Schepens, Aelterman & Van Keer, 2007): each method had its own focus and therefore could shed light on different aspects of PCKg, e.g. verbal and non-verbal aspects (Yin, 2009; Meijer et al., 2002). By combining different methods a richer view could be given of the teachers' PCKg.

4.8.4 Member checking

In this research study member checking was applied (Boeije, 2012). Member checking can be applied when a researcher wants to check whether they have "got it right" from the perspective of a participant "native" to the situation that has been researched (Schwartz-Shea & Yanow, 2012, p. 106) but it also opens up the opportunity for the right to reply for the participants. The notion of member checking is not without problems. Schwartz-Shea and Yanow (2012) note that the word "checking" could imply that if participants object to what the researcher has written, their understanding of the research might weigh heavier than that of the researcher. Alternatively, the perspective that was taken in this study was that member checking can be seen as another source of insight and is used to gain additional understanding instead of confirming a single meaning.

In the process of member checking the participants were sent the findings and asked to check whether they could recognise themselves in the findings, and whether they were quoted in the right context. I asked them to write their possible comments or feedback in the text and to send it back to me after approximately two weeks. I further explained that the findings did not reflect an

assessment of their work, and that they were quoted verbatim in the text because this is common practice within research. Finally, I referred back to their consent form where I had proposed to write individual portraits. I explained that during the research process it became clear that presenting “cross-case” commonalities and differences in the findings chapter would be more informative with regard to illuminating aspects of PCKg from an embodied cognition perspective than individual portraits.

All six specialist preschool music teachers confirmed that they recognised themselves in the findings and had no additional comments: four teachers returned the findings without any additional comments via email, and two other teachers had to be phoned to get a response. These last two teachers might not have responded within the given timeframe due to work pressure, or due to the fact that the findings chapter was written in English, which might have been a complicating factor for teachers to understand what they were reading.

4.9 Gaps and limitations of the study

Although every effort was undertaken to ensure the quality and trustworthiness of this study, in any study concerning PCKg there will be certain gaps and limitations. The gaps and limitations of this study will be discussed below.

4.9.1 Participants in this study

One limitation of this study concerned the selection of participants. I had trouble finding teachers who could or *wanted* to participate in this study. Many teachers commented that they already had little time to prepare their lessons, let alone take part in a research study, or they had never been observed in their classroom by an outsider before, and felt threatened by the idea. Therefore, this research attracted a particular group of specialist preschool music teachers with a desire to talk about their teaching practice, and who were confident enough to have someone come into their classroom. The six teachers in this study taught in rural primary schools (two teachers) and urban primary schools (four teachers), and of these schools four had average/above average socio-economic school populations. Two teachers who taught in one of these average/above average socio-economic schools explained that the parents

valued music education so much that they decided to pay the fees of these teachers. In that sense, the teachers in this study did not reflect a broad diversity of educational contexts and this will have influenced the data that was generated for this study, and consequently the interpretation of that data.

4.9.2 Teaching and learning rhythm skills in an open space

In this current study, I chose to select specialist preschool music teachers that taught in an open space as I assumed they had more choice in the way they could design and execute their music lesson as opposed to teachers being constrained by contextual factors, e.g. classroom seating. However, a question remains as to whether embodiment in teaching rhythm skills is such a crucial part of teaching and learning rhythm skills that it is apparent throughout different educational settings. A study that would have compared teachers in open spaces to teachers in furnished classrooms would have given more insight into this question.

4.9.3 Researching PCKg of experienced teachers versus expert teachers

Since the introduction of PCK, an idea has been that exploring PCKg could provide starting points for the improvement of the teaching and learning of subject topics (Hill et al., 2008). However, De Vries (2004) notes critically that a teacher's PCKg is not necessarily wisdom of practice, and the PCKg of experienced teachers is not necessarily the same as PCKg of expert teachers. Based on a literature review on expert teachers, the educational researcher Tsui (2009) summarises the definitions of expertise made in many expertise studies as a state of highly skilled performance achieved after a number of years of experience and it is characterised by automaticity, fluidity, efficiency and effortlessness. According to Tsui (2009, p. 422) "the notion of 'expertise' is often bound up with years of experience. While experience is a necessary condition for the development of expertise, it is not a sufficient condition". So, although six *experienced* teachers took part in this research study, it does not mean that these teachers were automatically *expert* teachers. In that sense, this current study did not produce conclusions concerning the effectiveness of

different teaching approaches but this was also not an explicit goal of this study. Before research can start explaining the quality and effectiveness of the teacher's PCKg, it first needs to be explored and described.

4.9.4 Talking about PCKg?

One complexity concerning this study was that the concept of PCKg was coined in North America and as such the term PCKg was unknown to the Dutch specialist preschool music teachers. Therefore, I chose to translate the North American term to the European term *Fachdidaktik* (*vakdidactiek* in Dutch), a term the teachers would know. Although the concept of PCKg and the European *Fachdidaktik* are highly similar, it is not exactly the same notion and thus, the teachers might have had thoughts about their teaching practice that relate more to their view of *Fachdidaktik* than to PCKg. Or, alternatively, they might have accentuated different aspects of their teaching *if* they had been familiar with the term PCKg. With the translation of the term PCKg, the precise meaning can be lost, but in the case of the specialist preschool music teachers they also gained from the translation because it gave them a term that they could relate to.

4.9.5 What is the content of PCKg?

Currently, there is no clear consensus on what exactly the content of PCKg is, nor where knowledge of pedagogy ends and where PCKg begins, or where knowledge of subject matter ends and where PCKg begins. This study has not aimed to clarify the content of PCKg at a conceptual level as for example the research of Ball and her colleagues (2008) has tried to (see section 2.4.2). Instead, this research has built on the way the content of PCKg has been described in the literature review but at the same time has shed light on how a different perspective on the nature of PCKg – an embodied cognition perspective – can reveal a new perspective on the content of PCKg.

4.9.6 Distinction between online and offline embodied cognition

In this research study I chose to conceptualise PCKg from an embodied cognition perspective that distinguishes between online and offline embodied cognition. During the research process, this distinction raised the question of when exactly these teachers' embodied cognition is offline. From the field of maths education, Nathan (2008, p. 387) notes that "Obviously, all cognitive processing occurs in some situational context". In relation to this study, I wondered for example whether planning and designing a lesson is an online or offline embodied cognition activity? And if that planning and designing of a lesson is treated as an online embodied cognition activity, should a research method be developed that explores that online embodied cognition? Further theorising and empirical research could perhaps start clarifying this distinction.

4.9.7 Can language sufficiently reflect PCKg from an embodied cognition perspective?

A fundamental question is if language in itself can sufficiently represent the embodied cognition of the specialist preschool music teachers (Bresler, 2006). As explained in Chapter 3, the act of teaching that is solely translated to and presented through language loses "embodied aspects" that might be significant to the teachers' PCKg in this study. Language might only be able to give a partial representation, explore certain aspects of PCKg, or give a particular perspective on PCKg. Therefore, to give access to embodied aspects of PCKg, I chose to combine language-based excerpts with video fragments of the teachers wherever possible to illustrate the findings of this study – however I realise that language and video fragments still might miss embodied aspects that are relevant to an embodied approach to PCKg.

4.9.8 Last comments concerning research on PCKg

The nature of PCKg can present researchers and teachers with somewhat of a paradox (Bremmer, 2005). PCKg is developed in and through practice and is in part personal, context and content bound. When teachers' PCKg is presented as a "theory of practice" it is transformed into a theory *for* teachers that is

decontextualised, disembodied and that tends to generalise (Bremmer, 2005). Not wishing to deny the complexity of this paradox, I do believe that this current research can open up a discussion about the nature and content of the specialist preschool music teachers' PCKg and help to develop a language that takes the embodied, contextualised nature of this form of knowing into account.

4.10 Conclusion

In this chapter my choice for a multiple case study approach within an interpretive paradigm in relation to researching the specialist preschool music teacher's PCKg regarding the teaching and learning of rhythm skills was explained. Furthermore, the strengths and limitations of the research methods, and the study as a whole, was discussed. In the following chapter the way the data of this study was analysed will be explained.

Chapter 5 Analysis of the data

5.1 Introduction

As explained in Chapter 4 the SRI, the video analysis tasks, the semi-structured interview and the notebook were used to explore the specialist preschool music teachers' PCKg regarding the teaching and learning of rhythm skills. In this fifth chapter the data analysis process of these methods will be explained and how the data of these different methods were woven together into themes to describe the specialist preschool music teachers' PCKg. Further, it will discuss the process of intercoder agreement that was employed in this study.

5.2 Analysis within qualitative research: a thematic analysis approach

In this current study, I chose to analyse the data from a thematic analysis approach because thematic analysis can be used to identify and interpret themes across a corpus of data that describe important elements of the researched phenomena in its natural context (Braun & Clarke, 2006). The process of thematic analysis can occur in two primary ways: in an inductive or deductive manner (Braun & Clarke, 2006). In the former manner, the process of coding is mainly aided by a thematic framework, which is derived from the data. In this process of inductive coding a researcher might make use of so-called sensitising concepts that have been derived from a literature review (Bowen, 2006). Sensitising concepts or themes are broad and general descriptions of themes that can function as a lens through which a researcher can view and analyse the data (Boeije, 2012). In the latter manner of deductive coding, the process of coding is mainly aided through a pre-existing thematic framework derived from the literature (Braun & Clarke, 2006). In the process of deductive coding, the researcher still is open to themes that can be identified in the data but that have not been described in the pre-existing framework.

In this current study I chose to start with inductive coding instead of deductive coding in which I might have more readily overlooked contextual aspects of PCKg that were specific for rhythm skills and preschoolers. However, in the process of inductive coding I did use sensitising themes. I first of all derived

these sensitising themes from the components of PCK and PCKg that have been described in Chapter 2 and that consisted of *knowledge of orientations towards teaching and learning a topic*, *knowledge of a topic and teaching*, *knowledge of a topic and learners*, *knowledge of a topic and the curriculum*, *knowledge of a topic and assessment*, and *knowledge of a topic and the educational context*. In section 5.3.6 I will further discuss the use of these sensitising themes. Furthermore, at a more overall level the theoretical framework of embodied cognition provided the lens through which the data were viewed. Finally, an inductive approach offered the opportunity to develop themes that could refute, refine, enrich or further develop the concept of PCKg of specialist preschool music teachers from an embodied cognition perspective (Hsieh & Shannon, 2005), and could provide entry points for developing a concept of PCKg that was closely tied to the practice of early childhood music education (Boeije, 2012; Braun & Clarke, 2006).

5.3 The six phases of the data analysis

In this current study six different phases could be distinguished during the data analysis process. In the sections below each phase will be described in detail and in the following table an overview is given of these different phases:

Table 5.1 Overview of the six phases of data analysis

Phase 1: preparation of the data
Phase 2: familiarising myself with data and reducing the data
Phase 3: inductive coding From data to code, developing a coding scheme
Phase 4: intercoder agreement
Phase 5: deductive coding From developed code scheme to data
Phase 6: developing main themes

5.3.1 Phase one of the analysis: Preparation of the data

The complete data corpus of this current research study consisted of the data sets of the six cases. The data set of an individual case consisted of the data of five methods and these were prepared per case as follows:

- The stimulated recall interview: transcribed verbatim;
- The two video analysis tasks:
 - Firstly, the verbal utterances of the specialist preschool music teacher and the researcher during the two video analysis tasks were transcribed verbatim;
 - Secondly, the time frames of the instructional sequence of the first video analysis task and the gestures of the second video analysis task that were indicated by the teachers and the researcher were coupled to the verbatim transcriptions. In this way, one could find video examples of instructional sequences or gestures that matched with what the teachers and the researcher described.
- The notebook: could be used directly for analysis;
- The semi-structured interview: transcribed verbatim.

As this research was not a language-orientated research that was concerned with conversation analysis and discourse analysis the intonation and alternation were not transcribed or marked specifically within the stimulated recall interview, the video analysis tasks and the semi-structured interview (Boeije, 2012).

5.3.2 Phase two of the analysis: Reducing the data

First, I familiarised myself with each case through repeated reading to gain an overview of the breadth and depth of the data. The five different methods per case generated a considerable amount of data for the analysis process and therefore I chose to reduce the amount of data to be used in the next phase of analysis.

The first criterion to reduce data throughout the different methods was that the data possibly could represent PCKg. Therefore, I had to define the difference between *pedagogical* knowledge and PCKg on the one hand, and *subject matter* knowledge and PCKg on the other hand. Based on the literature review, I decided that the main criterion in distinguishing between *pedagogical* knowledge and PCKg was that pedagogical knowledge had to lack a content aspect, in the case of this study, rhythm skills. Pedagogical knowledge could for example include knowledge of classroom organisation and management, instructional models and strategies in general without specifically referring to subject matter (Morine-Dersheimer & Kent, 1999). However, during the analysis phase it became clear that the boundaries between *pedagogical* knowledge and PCKg were fuzzy. A general pedagogical utterance as “*That is of course how you teach a preschooler. You have to take them into an atmosphere and into a story and into a world of imagination*” might also apply to the learning of rhythm skills. These “unclear” utterances or unclear gestures were temporarily added to the analysis because they could hold information with regard to PCKg. Below in the figure two examples of pedagogical knowledge are given that were *not* selected for the next level of analysis:

Figure 5.2 Examples of pedagogical knowledge

Case Floor [1]	An utterance in the stimulated recall interview as “One group leaves and the other arrives. That is quite a hectic transition, I would say. They do arrive through one door and leave through another. That is a moment, but it is, it’s like getting the kids into the lesson” was excluded from the analysis because it lacked a reference to rhythm skills.
Case Jeroen [2]	A gesture and an explanation of that gesture in video analysis task 2 Melissa: “eyebrows are raised when the child falls on the floor. This causes the specialist music teacher to make contact with the child to see if all is well” was excluded from analysis because it lacked a reference to rhythm skills.

Based on the literature review, I decided that the main criterion in distinguishing between *subject matter* knowledge and PCKg was that subject matter knowledge lacked a pedagogical aspect. Subject matter could for example include knowledge of music in general, rhythm or rhythm skills, but lacked a pedagogical aspect. However, the boundaries between subject matter knowledge and PCKg were also fuzzy. This seemed to be the case especially for the gesture analysis. It was difficult to distinguish between a *natural* response to the music for example nodding one’s head to the pulse of a rhythm

on the one hand, or an *intentional way of representing* the pulse of rhythm to preschoolers on the other hand. It could be questionable whether the act of nodding the pulse once had been an intentional act that had become automatised but still functioned as if it were an intentional act. Or, did the nodding of the pulse *seem* an intentional way of representing rhythm because the teacher's actions were interpreted within an educational setting? Within this research, these "unclear" gestures were temporarily added to the analysis the moment the specialist music teachers or myself identified these gestures as possible PCKg. Below in the figure two examples of subject matter knowledge are given that were *not* selected for the next level of analysis:

Figure 5.3 Examples of subject matter knowledge

Case Jeroen [3]	An utterance in the stimulated recall interview as "For me it is also, I notice, when I am doing it, just drumming away. I don't do it that often, just [drumming] as a musician" was excluded from the analysis because this type of utterance lacks a pedagogical aspect.
Case Jeroen [4]	An utterance in the semi-structured interview as "From a physics viewpoint all matter is built up of vibrations. And I like to imagine that music is a kind of result of that" was excluded from analysis because this type of utterance lacks a pedagogical aspect.

The second criterion that was adopted to reduce data throughout the different methods was that the data represented the teaching and learning of rhythm skills of specifically *preschoolers* and not of another age group. However, when the teachers compared teaching preschoolers to another age group the data was included to the analysis as this kind of comparison could make the *particularities* of teaching preschoolers clearer.

Lastly, one extra criterion was adopted to reduce data within the stimulated recall interview: the data had to represent the online embodied cognition during the music lesson. This meant that a selection had to be made within the SRI between utterances that involved the online embodied cognition on the one hand, and utterances that could be considered as offline embodied cognition. Below in the figure examples of the indicators are presented that were used to identify the online embodied cognition of the specialist music teachers (Meijer, 1999):

Figure 5.4 Indicators of online embodied cognition

<ul style="list-style-type: none"> - I thought/I was thinking/I am thinking - I felt/I was feeling/I am feeling - I realised/I was realising/I am realising - I notice/I was noticing/I am noticing - I also remember that - What I asked myself - This is also one of those estimates - I chose to - “Conscious” is in the sentence

During the process of selecting data of the stimulated recall interviews it became clear that the specialist music teachers could spontaneously start reflecting *on* their action instead of recalling their online embodied cognition during teaching. Because these reflections possibly contained information with regard to this current study, I decided to add these reflections to the analysis process but to separate these reflections from the online embodied cognition of the SRI. I wanted to keep the online embodied cognition separate to explore the content of this type of cognition. Before the reflections and explanations about the teaching process were added to the analysis process, I first selected the data, namely reflections and explanations that hypothetically represented PCKg. Solely “pedagogical” reflections or “subject matter” reflections were excluded from the analysis. Secondly, the data had to reflect PCKg regarding the teaching and learning of *rhythm skills* of *preschoolers*. Below in the figure a summary of the criteria for reducing data is given:

Figure 5.5 Summary criteria for reducing data

Two criteria for the five different methods per case
<ol style="list-style-type: none"> 1. Data reflects PCKg concerning rhythm skills and not solely pedagogical knowledge or solely subject matter knowledge 2. Data reflects PCKg regarding the teaching and learning of rhythm skills of specifically <i>preschoolers</i>
Extra criteria stimulated recall interview
<ol style="list-style-type: none"> 1. Data reflects online embodied cognition

5.3.3 Phase three of the analysis: inductive coding

During the third phase of the analysis process I began with the inductive coding of the five different methods that were employed per case and I started with the development of a coding scheme from the data (Boeije, 2012; Braun & Clarke, 2006). During this analysis process text and video fragments were constantly compared to other similar fragments in and between cases (Saldña, 2009). Comparing text and video fragments that had been coded the same way, could improve the possibility that the same type of fragments were labelled with the same code (see appendix 3 Examples of coding throughout the different methods). Further, to improve the consistency of coding, I developed a coding manual that consisted of the name of the code, a description of the content of the code and of examples (Zhang & Wildemuth, 2009). Below in the figure an example of the coding manual is given:

Figure 5.6 An example of the coding manual

Name code	Content code	Examples from data
Cueing a rhythmic response	Teacher cues <u>during a rhythm activity</u> that preschooler/s should give a rhythmic response	<ul style="list-style-type: none"> - nodding or pointing to a preschooler to cue that it is their turn to respond rhythmically - teacher points to him/herself and consequently to the group of preschoolers to indicate that it is the group's turn to respond rhythmically

This coding manual (see appendix 4 Final coding manual) was developed in the software programme HyperRESEARCH that also was used to code my data and to record my analysis process. In general, an advantage of software programmes can be that they facilitate filing and retrieving data at a high speed (Silverman, 2010). Hypothetically, this code-and-retrieve function can make the analysis of data more complete: fragments of data can be less likely lost or overlooked as *all* the data coded in a particular way are retrieved (Lu & Shulman, 2008). Because *all* the data are retrieved concerning a certain code or theme, the code-and-retrieve function could enable researchers to examine their own coding more critically (Lu & Shulman, 2008; Silverman, 2010). Furthermore, the progress of the coding and analysis process can be recorded as it develops, and in that way, the analysis processes can be made more explicit for other researchers (Lu & Shulman, 2008).

The software programme HyperRESEARCH is designed in such a manner that it enables researchers to start with the case as the unit of analysis and within a research study as many cases may be opened as deemed necessary. Also, each individual case can be linked to an unlimited amount of different sources (Staller, 2002), e.g. in this current study the transcriptions of the SRI, the two video analysis tasks, the notebook and the semi-structured interview. Moreover, the same code can be applied to different sources (Staller, 2002). In this current study the same code was applied to different sources, e.g. the code “Differentiating rhythm skills for group 1 and group 2” was developed for a stimulated recall interview and reapplied in a semi-structured interview. However, a disadvantage of analysis software might be that because a machine can “manipulate isolated and manageable pieces of text, these parts can take on a life of their own and may do so at the expense of the greater context from which they are drawn” (Staller, 2002, p. 474). An advantage of HyperRESEARCH is that a code can always be viewed in the original context. Below a description will be given of the process of inductive coding per method.

5.3.3.1 Inductive coding of the SRI, notebook and the semi-structured interview

I started with close reading the data. I then broke the data of the SRI, notebook and the semi-structured interview down into fragments that could reflect the specialist music teachers’ PCKg regarding rhythm skills for preschoolers and I labelled that fragment with one or more codes that best reflected the content of that fragment (Saldāna, 2009). Below in the figure an example of code is given:

Figure 5.7 Examples of codes

Code	Interview Liselot [5]
Learning rhythm skills through visual aids	“With young children I often link something visual to sound [e.g. rhythm]”
	Stimulated recall interview Jeroen [6]
Learning through repetition, variation or contrast	“But every time also, what I felt in the beginning of this [rhythm] activity, a lot of [rhythm] skills they show with this kind of activities, they just have to seep in. It doesn’t make sense to stop [the activity] and say: it has to be done this way. But, do it again, again, again and then at a certain moment the penny drops with most of them”.

5.3.3.2 Inductive coding of the first video analysis task: instructional sequence

I started with viewing the video fragments and close reading the specialist music teachers' and researcher's description of the sequence of their teaching activities regarding rhythm skills for preschoolers. I then broke the data down into fragments that reflected a *part* of the sequence of the teaching activity. Below in the figure an example of a code is given:

Figure 5.8 An example of a code

Code	First video analysis task Martine [7], time 16.07
Sequence 1	"Well, first I just tell, of course, what we will do. Just an overview: "We will sing the song with, with... and with playing on instruments, with 'rasps' in this case, on the beat".

5.3.3.3 Inductive coding of the second video analysis task: gestures

I started with viewing the video of the gestures and close reading the specialist music teachers' and researcher's description of the gestures that could reflect PCKg regarding rhythm skills for preschoolers. Below in the figure an example of the codes is given:

Figure 5.9 Examples of codes

Code	Second video analysis task Jeroen [8] Time 17.06
(Re)presenting the pulse/bar	Jeroen: "...on the beat... that is a physical stressing of the pulse in this case, if I say it correctly... or maybe also the rhythm... supporting of the, yes, letting children feel what we are doing. Rhythmic pulse, I think, in this case"
	Second video analysis task Floor [9] Time 11.42
Cueing start or end of rhythm activity	Melissa: "holding the rhythm sticks in a freeze in the air in combination with firmly closed lips"

5.3.4 Phase four of the analysis: intercoder agreement

Within qualitative research there is a debate whether the process of intercoder reliability, well recognised within quantitative research, should or should not be applied in qualitative research studies (Armstrong, Gosling, Weinman & Marteau, 1997; Schwartz-Shea & Yanow, 2012). Within that debate, qualitative researchers can argue that assessing intercoder reliability is an important

method for ensuring rigour (Armstrong et al., 1997). However, qualitative researchers can also argue that differences in coding says nothing about a greater or lesser “accuracy” or “truth” within a qualitative research study due to the ontological and epistemological viewpoints that underpin this type of studies (Schwartz-Shea & Yanow, 2012, p. 81). In this current interpretive study, I chose to include a specific form of intercoder reliability, which focuses on an intersubjective agreement between coders, and I therefore used the term “intercoder agreement” instead of “intercoder reliability”. The goal of the intercoder agreement process within this current study was to shed light on my blind spots, to allow for the possibility of adapting my codes, to tighten definitions of codes in the coding manual before I moved on to deductive coding (from codes to data), and to ensure that the voices of the specialist preschool music teachers were heard.

The following choices were made for the procedure of the intercoder agreement process. First of all, I chose to execute the intercoder agreement process after the coding of the third case. At that point of the analysis process, I started to move from inductive coding (from data to codes) to deductive coding (from codes to data). By executing the intercoder agreement process at that specific moment in the analysis process, the overall trustworthiness of the coding could be enhanced *during* the coding process itself. Secondly, I chose for a researcher in (preschool) music education who also teaches music to preschoolers to participate in the intercoder agreement process. Her familiarity with the field of preschool music education could be of added value for the goal of the intercoder agreement process. The intercoder agreement process itself consisted of three steps. During the first step, text fragments and video fragments of every method were chosen at random throughout the three cases that reflected the codes that each of the methods had generated thus far. It should be noted that *several* text fragments and video fragments could be chosen for one and the same code because different methods could have generated the same code. For example, the code “Differentiating rhythm skills for group 1 and group 2” was generated in the semi-structured interview and the stimulated recall interview of case 1 (Jeroen) and in the semi-structured interview and notebook of case 2 (Liselot). Further, *several* codes could be applied to one text fragment and video fragment. Below in the table an overview is given of how many text and video fragments were used in the intercoder

agreement process and how many codes were generated per method after the analysis of three cases:

Table 5.10 Text and video fragments and codes

Methods	Text/video fragments	Amount codes
SRI	13 text fragments	14
Video analysis task 1 (physical action sequence)	9 text + video fragments	5
Video analysis task 2 (gestures)	10 text + video fragments	14 (2 doublings of the codes)
Notebook	17 text fragments	17
Semi-structured interview	53 text fragments	60 (2 doublings of the codes)

During the second step, the extra coder recoded the text fragments and video fragments with the existing codebook and coding manual. The extra coder did not receive an explanation of the codes in advance so it could be determined retrospectively whether the descriptions in the coding manual were clear. During the third step, we compared whether the extra coder had applied the same code to the content of a text fragment and video fragment as I had done, or had applied a different code than I had done, or felt she could not apply an existing code to a text fragment or video fragment. This process resulted in the following changes:

- Two text fragments were recoded and five extra codes were added to text and video fragments in addition to the existing codes;
- Four sets of codes were merged together because the content of these codes were too similar and showed too little distinction, e.g. the codes “Learning from peers” and “Exchanging rhythm content at same developmental level” was merged into “Learning rhythm skills from peers”;
- One new code was developed, namely “Assessing the development of rhythm skills over time”;
- The extra coder mentioned that the code “Limitations of preschoolers bodies” had negative connotations and therefore I renamed this code to: “Possibilities of preschoolers bodies” (this code was later merged into “Synchronising rhythmic movements to external source of music);

- The extra coder noted that there is a relation between the codes “learning rhythm skills through variation” and “learning rhythm skills through repetition”. Variation and repetition are ways of learning that might go together, e.g. the teacher might repeat an activity with a slight variation.

Finally, the extra coder remarked that there was a difference in the degree of difficulty with regard to the recoding of the different methods. The extra coder found coding the notebook the easiest and coding the SRI the most difficult. A possible explanation is that the specialist music teachers were given several weeks to write in their notebook and this could result in a (relative) coherent text. However, during the SRI the specialist music teachers were trying to figure out what they were thinking *during* teaching on the spot, and this might be a cause for less coherent and clear utterances of the teachers. Moreover, the extra coder noted that some cases were easier to code than others. A possible explanation could be that some teachers are more used to or have more experience with explaining and talking about their classroom practice.

5.3.5 Phase five of the analysis: deductive coding

During the inductive coding of the third case, the need to develop new codes diminished: the data could largely be covered with one of the existing codes in the coding scheme and by and large the coding scheme had been developed that could now be used for deductive coding. Therefore, during the fourth case I started moving from inductive coding to deductive coding (Boeije, 2012). The goal of this coding was first of all to determine whether the codes developed thus far covered the new data, whether new codes should be added or earlier codes should be dropped, should be split or should be merged with codes with a similar meaning.

The second goal in this phase was to start developing subthemes. I first of all chose to weave the data of the different methods together in preliminary subthemes since from an embodied perspective online embodied cognition and offline cognition seem to be reflected in each other, reinforce and influence each other (Harquail & King, 2010). I did not want to create a fragmented view of PCKg that distinguishes between the data of the methods that explore online

or offline cognition but to *combine* the data of the methods and thus contribute to a fuller understanding of the PCKg of specialist preschool music teachers as a whole (Bulterman-Bos, 2008). However, I did remain open to the possibility that certain methods could explore aspects of PCKg regarding the teaching and learning of rhythm skills of preschoolers that other methods were not able to explore.

In the process of developing subthemes, I grouped the codes of the different methods together. After the codes of the five methods were grouped together I started searching for codes that could be clustered together on the basis of shared characteristics, e.g. a shared characteristic could be that different codes reflected *a teaching strategy* for rhythm skills. By clustering the codes in groups with similar characteristics, I started forming preliminary subthemes. The development of these subthemes was an iterative process, namely going to and fro between the codes and the developing subthemes. Below in the figure an example is given of how codes were clustered in a subtheme:

Figure 5.11 An example of a subtheme

Subtheme: general teaching strategies for rhythm skills
Learning pulse metre phrasing through movement
Learning rhythm skills through fantasy figures or themes
Learning through touch
Music that induces rhythmic movement
Learning rhythm skills through repetition, variation or contrast
Learning rhythm skills through language
Learning rhythm skills through visual aids

5.3.6 Phase six of the analysis: developing main themes

5.3.6.1 Sensitising themes

During the last phase, the analysis was focused at the broader level of main themes (Braun & Clarke, 2006). As mentioned at the beginning of this chapter, throughout the entire analysis process sensitising themes that had been derived from the literature review regarding possible components of PCKg in Chapter 2 were at the back of my mind. However, in this last phase I actively used them to identify different themes. The sensitising themes I identified in the literature review regarding the possible components of PCKg in Chapter 2 were based on

the theoretical and empirical findings in secondary and tertiary education, mainly found in the subject areas of science and maths education (e.g. Ball et al., 2008; Cochran et al., 1993; Magnusson et al., 1999), and to a lesser extent in other fields such as language and history (e.g. Shulman, 1987; Grossman, 1990; Meijer, 1999). As these six themes did not seem to have been explored in early childhood *music* education I remained open to finding new main themes. Below in the figure an overview is given of the sensitising themes used during the analysis process in this study:

Figure 5.12 Sensitising themes

Sensitising themes
<p>1. Orientations towards teaching and learning a topic Researchers referring to this theme: Cochran et al., 1993; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999</p>
<p>2. A topic and teaching Researchers referring to this theme: Ball et al., 2008; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987</p>
<p>3. A topic and learners Researchers referring to this theme: Ball et al., 2008; Cochran et al., 1993; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987</p>
<p>4. A topic and the curriculum Researchers referring to this theme: Ball et al., 2008; Cochran et al., 1993; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999</p>
<p>5. A topic and assessment Researchers referring to this theme: Magnusson et al., 1999</p>
<p>6. A topic and the educational context Researchers referring to this theme: Cochran et al., 1993</p>

5.3.6.2 Developing main themes

In the process of identifying main themes I started reviewing the subthemes and grouping subthemes together on the basis of shared characteristics, e.g. the subthemes “general teaching strategies for rhythm skills” and “instructional sequences of rhythmic activities for preschoolers” were clustered together in the main theme “Teaching strategies for rhythm skills of preschoolers”. The development of main themes was an iterative process: I went back and forth between the subthemes and the developing of main themes. For an overview of the subthemes and main themes see appendix 5 Final overview development

main themes. Below in the figure an example is given of how subthemes were clustered together in a main theme.

Figure 5.13 Subthemes clustered into main themes

Theme two: teaching strategies for rhythm skills of preschoolers
Subtheme: general teaching strategies for rhythm skills
Learning pulse metre phrasing through movement Learning rhythm skills through fantasy figures or themes Learning through touch Music that induces rhythmic movement Learning rhythm skills through repetition, variation or contrast Learning rhythm skills through language Learning rhythm skills through visual aids
Subtheme: Instructional sequences of rhythmic activities for preschoolers
Instructional sequence 1 in relation to learning rhythm skills Instructional sequence 2 in relation to learning rhythm skills Instructional sequence 3 in relation to learning rhythm skills

5.3.6.3 Main themes in this current study

In this current study I identified seven themes in total that might describe the PCKg regarding the teaching and learning of rhythm skills of specialist preschool music teachers. One new theme was identified with respect to the six sensitising themes that had been used in this study, namely, *“Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers”* and this theme is further described in Chapter 6. In relation to these themes, I note that describing these teachers’ PCKg as neatly parsed themes that reflect the knowledge components of PCKg has on the one hand the benefit of making PCKg more accessible to empirical analysis (Park & Chen, 2012). On the other hand, the science educators and researchers Van Driel and Berry (2010, p. 657) argue that one of the problems in breaking the teachers’ PCKg down into segmented and static components is that it can result “in a simplistic and therefore misleading view of PCKg”. In that sense, the distinction between the seven themes that reflect different knowledge components of PCKg is somewhat artificial and the components of PCKg are in all probability more integrated or interdependent of each other in practice. The educational researchers Gess-Newsome (1999a), Abell (2008) and Park and

Oliver (2008) have all theorised along similar lines about how different components of PCKg reciprocally influence each other and develop in an integrated manner over the years. Therefore, the way the themes that reflect knowledge components of PCKg might be interdependent of each other will be further discussed in Chapter 7 in section 7.3.5. For now, in the figure below an overview is given of the themes that were described in the literature and the themes that have been identified in the data of this study:

Figure 5.14 Themes described in the literature and themes identified in the data

Themes in literature	Themes identified in the data
Orientations towards teaching and learning a topic	Pedagogical orientations regarding the teaching and learning of rhythm skills of preschoolers
A topic and teaching	Teaching strategies for rhythm skills of preschoolers
-	Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers
A topic and learners	Preschoolers' dispositions and learning difficulties with regard to learning rhythm skills
A topic and the curriculum	The curriculum in relation to rhythm skills of preschoolers
A topic and assessment	Assessment of preschoolers' rhythmic behaviour in relation to learning rhythm skills
A topic and the educational context	The interaction between an educational context and the learning of rhythm skills of preschoolers

5.4 Conclusion

In this chapter the different phases of the analysis process were described: preparation of the data, reduction of the data, inductive coding, intercoder agreement, deductive coding and the development of the main themes. In total, I developed seven themes that reflected different knowledge components of PCKg with specific relevance to the teaching and learning of rhythm skills in preschool education. One of the themes was new and had not been identified in the literature reviewed in this current research, namely *“Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers”*. In the following chapter the seven themes that reflect the different knowledge components of PCKg and that have been identified in the data are presented.

Chapter 6 Findings in relation to the specialist preschool music teacher's PCKg regarding the teaching and learning of rhythm skills

6.1 Introduction

In the former chapter the analysis process of this current research that involved identifying (sub)themes in the data was described. In this sixth chapter the seven main themes that were identified in the data and that reflect components of the specialist preschool music teachers' PCKg concerning rhythm skills will be presented. On the one hand, these seven themes illustrate the *content* of the specialist preschool music teachers' PCKg and on the other hand the *nature* of their PCKg. Moreover, in this study, the focus was not on the long-term development of these teachers' PCKg and therefore it is important to recognise that the findings represented a snapshot in time rather than an absolute and complete picture of their PCKg.

Furthermore, as mentioned in Chapter 1 in which the study was introduced, each theme will be illustrated with language-based excerpts and – where possible – video fragments will illustrate these teachers' PCKg and I will indicate in the text which video track can be viewed. With respect to the quotations of these teachers: only the excerpts from the data cited in this current study have been translated from the original Dutch. During the translations of the excerpts I encountered difficulties concerning slight differences in the use of music terminology but also in retaining the everyday speech style of these teachers. I therefore chose to add the original Dutch excerpts that were chosen for this study so Dutch native speakers are able to access these original excerpts (see appendix 6 Original Dutch citations). Behind the quotation of a teacher a number is added that refers to the original Dutch quote in appendix 6.

In addition, following all the quotations the reference to the research method and the name of the teacher was added. With regard to the research methods [SRI] refers to the stimulated recall interview, [SI] refers to the semi-structured interview, [NB] refers to the notebook, [VA] refers to the video analysis task, and

[EI] refers to the extra information. By adding the reference to a method it can become more apparent which themes draw more heavily on which methods.

Lastly, at the end of each presentation an overview of the theme will be given in a table. The goal of the table is to give an overview of the subthemes within a main theme and to make clear which case(s) provided evidence for a (sub)theme. These tables might be misleading in the sense that they seem to stress how many teachers showed evidence of a (sub)theme, and that the number of teachers naturally provides evidence that a (sub)theme is more or less important within this study. However, I agree with Braun and Clarke (2006, p. 5) who note that “the ‘keyness’ of a theme is not necessarily dependent on quantifiable measures – but in terms of whether it captures something important in relation to the overall research question”. Below the seven main themes including the tables will be described.

6.2 Theme one: Pedagogical orientations of the teaching and learning of rhythm skills of preschoolers

One theme that was identified in the data as being a part of the specialist music teachers’ PCKg was “the pedagogical orientations regarding the teaching and learning of rhythm skills of preschoolers”. A teacher’s orientation regarding teaching, learning and the topic or skill plays a role in how teachers facilitate the learning of a certain topic or skill (Magnusson et al., 1999) and thus pedagogical knowledge and content knowledge are blended into PCKg. The teachers in this study remarked that as pre-service teachers they had been taught in general how to teach music but had not been taught how to specifically teach preschoolers. It was only after their graduation that they learned to teach rhythm skills to preschoolers in and through practice and to develop pedagogical orientations towards teaching rhythm skills. As a result, their pedagogical orientations seem to be reciprocally co-determined by themselves, the characteristics and learning behaviours of the preschoolers, the rhythm skills being taught and the space in which they were being taught. Instead of *applying* pedagogical orientations, the teachers in this study seemed to have developed pedagogical orientations in the context of their classroom. This connects to an embodied cognition perspective that the classroom practice

itself shapes the teacher's pedagogical orientations too (Gallagher, 2009). From the data, I discriminated three pedagogical orientations regarding the teaching and learning of rhythm skills of preschoolers: a child-centred approach; experiential learning; and imitation learning.

6.2.1 Subtheme: A child-centred approach to teaching and learning rhythm skills

All of the teachers explained that they developed a child-centred approach to teaching and learning rhythm skills to a more or lesser extent. Central to their view of a child-centred approach is first of all that they would like to work out "where the children are" rhythmically and to help them move forward in their rhythmic development. They noted that they try to build on their rhythmic interests and ideas: *"In the ideal situation you follow what they can do [rhythmically]. Or you look at what they can do and continually offer something that connects to that"* [SI, Jeroen, 1]. Most of the teachers explained that *specifically* preschoolers should be allowed to develop rhythm skills at their own pace and at their own level without receiving too much explicit (verbal) instruction from the teacher: *"in group 1 and 2 [...] you assume that children have to be able to develop themselves. And you should not impose things, they do it at their own pace"* [SI, Peter, 2]. As a consequence, they choose rhythmic activities that *all* preschoolers can join in with, regardless of their level of performance or age. Often, they will explicitly *not* mention what is right or wrong and leave room for the preschooler's personal interpretation of the rhythmic activity: *"a little child could not do the movement [to the beat], for me it is fine if she does it in a different way. [...] I want children to be free to adjust the movement"* [SRI, Martine, 3].

Secondly, central to the child-centred approach of the teachers is the idea that preschoolers benefit from learning rhythm skills from peers. The teachers described how they usually choose a preschooler that can set the right rhythmic example, have the other preschoolers observe or join in with that preschooler (see DVD track 2 Learning from peers) or they will explicitly *point* to a preschooler who is performing a rhythm skill correctly (see DVD track 3 Pointing to pre-schooler). The teachers explained that preschoolers might find it easier to

understand a rhythm skill that is performed by a peer and are more motivated to join in with a peer: *“if they immediately exchange things with each other at their own level, it works better. That they maybe also recognise more in what the other does. That it connects more to what they might be able to do”* [SI, Jeroen, 4]. Further, they explained that it heightens the attention of preschoolers when they are watching peers instead of the specialist music teacher: *“If they look at each other then you see that they are more concentrated. They can get tired if I always do everything first”* [SI, Jette, 5].

Thirdly, central to their child-centred approach is that all of the teachers explained that they encourage the preschoolers to contribute their rhythmic ideas *within* a rhythmic group activity that is set up by the teacher (see DVD track 4 Rhythmic ideas of preschoolers). The teachers can pick up on rhythmic ideas that the preschoolers (spontaneously) show within a rhythmic group activity. Often, a teacher will take the preschooler’s idea, clarify or slightly alter that idea and incorporate it into the rhythmic group activity so the rhythmic idea can be performed by all the preschoolers: *“[...] I do not first show [all the rhythms] but I let the children also make up [rhythms]. And that [idea of a child] is perhaps not always that rhythmical, but you can make something rhythmical out of it”* [SI, Floor, 6]. Floor mentioned she might pick up a rhythm pattern of a child and clearly mirror that back to the child. She explained that this helps her to check whether she has understood the rhythmic idea and at the same time she then has the opportunity to model the idea clearly to the whole group. From an embodied perspective, the teacher and preschoolers form an interactive environment and attune their musical behaviour to each other and influence and shape each other’s musical behaviour (Cross & Morley, 2009).

The teachers gave several reasons of why they value the rhythmic ideas of the preschoolers. Contributing their own rhythmic ideas strengthens the involvement of the preschoolers in the rhythmic activity, it tends to add a “fun element” and more variety to the rhythm activity: *“You try to involve the children by having them make up [rhythmic] movements themselves”* [NB, Martine, 7]. Although there is room for the preschoolers to contribute their rhythmic ideas the teachers do mention that they have to take the lead in the process of learning rhythm skills: *“in the end I ensure that I take the lead by doing it in a different tempo”* [SI, Liselot, 8]. Liselot noted that rhythmic ideas of preschoolers

can also lead to chaos and that one constantly has to make an “on the spot” decision whether or not to incorporate their rhythmic ideas into a group’s activity: “so every time it is a challenge how much space I should give them to do what they feel like at that moment and to what degree I am the teacher who says ‘no’” [SI, 9].

Lastly, Liselot [SI, 10] mentioned that she would like to expand her child-centred approach regarding the teaching and learning of skills: “[Working independently] is a too narrow part in my current practice I think”. She [SI, 11] draws on her experience as a preschool general teacher when she notes that preschoolers are able to work independently or in small groups: “It is not that easy with young children in a music lesson, but it is possible because they can do it in their normal class as well”. At the same time Liselot [SI, 12] noted that having preschoolers work independently seems to be more complex in a music lesson because of the dynamic nature of that lesson: “But I have not quite succeeded to do it, like, in the dynamic whole of such a lesson”.

6.2.2 Subtheme: Teaching and learning through imitational learning

All the teachers mentioned that the preschoolers learn rhythm skills through imitating the performance of rhythm skills of the teacher or peers. These teachers noted that preschoolers observe the rhythmic skills of the teachers or peers and then (unconsciously) start imitating the rhythm skills of the teachers or peers without verbal instruction: “You see that when they sit around you, they also copy [the rhythmic skills]” [EI, Martine, 13] or “they observe [the rhythmic skills], so the way the older children do it [...] And they then copy that behaviour, they absorb it like a sponge and they slowly do that as well” [SI, Jette, 14]. The teachers explained that preschoolers tended to pick up the sequence of a rhythmic movement and the *intention* of a rhythmic activity more easily by seeing and hearing an example perform a rhythm pattern or rhythmic movement instead of receiving verbal instruction about a rhythm pattern or rhythmic movement: “Here it was especially important to show the order and the intent [of the rhythmic movement]. That generally works well because in that case you do not have to speak much” [EI, Liselot]. This pedagogical orientation seems to result in – or results from – a non-verbal way of teaching and the

choice of physical modelling as a teaching strategy to teach rhythm skills (see theme two on teaching strategies).

6.2.3 Subtheme: Teaching and learning rhythm skills through experiential learning

All of the teachers explained that preschoolers learn rhythm skills through experiential learning in the sense that rhythm skills are learned through moving to rhythm aspects of music and feeling the rhythm: *“For me moving is the most essential part for preschoolers [...] because in my mind children learn while moving”* [SI, Peter, 16] or *“when working on rhythmic skills of preschoolers I will always use movement”* [SI, Jeroen, 17]. These teachers explain that preschoolers develop a sense of rhythm *because the rhythm is experienced and felt through the whole of the body: “That they feel the beat with their body, I think that is very important with preschoolers. So nothing with music notation or reading music. It is purely feeling by clapping, through instruments, but especially through their whole body”* [SI, Martine, 18]. This pedagogical orientation seems to result in – or results from – teaching strategies that incorporate different ways of moving (see theme two on teaching strategies). In the table below an overview is given of the theme “Pedagogical orientations towards the teaching and learning of rhythm skills of preschoolers”.

Table 6.1 Overview theme one

Theme one: Pedagogical orientations towards the teaching and learning of rhythm skills of preschoolers						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: A child-centred approach to teaching and learning rhythm skills						
Child-centred approach	x	x	x	x	x	x
Subtheme: Teaching and learning rhythm skills through experiential learning						
Imitation learning approach	x	x	x	x	x	x
Subtheme: Teaching and learning rhythm skills through imitation learning						
Experiential learning approach	x	x	x	x	x	x

6.3 Theme two: Teaching strategies for rhythm skills of pre-schoolers

The second theme I identified in the data was “Teaching strategies for *the rhythm skills of preschoolers*” and this type of knowledge seems to form the heart of PCKg (Ball et al., 2008; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987). Whereas the first theme relates to general orientations regarding teaching and learning rhythm skills to preschoolers, this theme covers the actual strategies employed by these teachers. Knowledge about teaching strategies is developed through classroom practice and is about specific teaching strategies that suit the nature of the topic or skill and the learners who are being taught (Loughran, 2010; Magnusson et al., 1999); thus pedagogical knowledge and content knowledge are blended. In the case of the specialist music teachers they can develop teaching strategies for specifically *rhythm skills* that are meant to facilitate the learning of rhythm skills of *preschoolers*. Within this second main theme I distinguished two subthemes, namely: “*General teaching strategies for teaching rhythm skills to preschoolers*” and “*Instructional sequences for rhythmic activities*”. Concerning the first, when it comes to learning rhythm skills, these teachers seem to know how to draw the preschoolers into a multimodal learning environment that combines sound, sight, moving and feeling. Concerning the latter subtheme, through the video analysis tasks it became apparent that teachers sequence a rhythm activity in a specific way, mostly through “physical modelling and imitating” that can be extended to “scaffolding”. Below the findings of the subthemes will be described.

6.3.1 Subtheme: General teaching strategies for teaching rhythm skills to preschoolers

6.3.1.1 *Teaching and learning rhythm skills through different ways of moving*

All the teachers noted that different ways of employing whole-body movement can be used to develop the performance of rhythm skills. First of all, the teachers frequently let preschoolers walk, stamp or move with their whole body to the pulse of music, to different metres or to rhythm patterns within music. Two teachers explained that through *walking* to the music the preschoolers experience a recurring pulse but they also experience that music travels

through time: *“So they stamp on the beat, but at the same time they also move forward on the beat”* [SI, Martine, 19].

Secondly, three teachers mentioned that they can structure movements to make a dance form, e.g. changing the rhythmic movement per bar or rhythmic phrase: *“With the ‘slagwerkboogie’ there is a different movement every bar. E.g. on the first 4 beats move 4 steps forward, afterwards take 4 steps back, then turn around for 4 beats etc.”* [NB, Martine, 20]. One teacher mentioned that she always pre-structures the movements of the preschoolers so as not to create chaos: *“It is never really free. It is always organised. I never let them free, so they don’t go ballistic”* [SI, Martine, 21]. In contrast, Jeroen mentioned that he prefers to let preschoolers dance spontaneously to music because it gives them the opportunity to synchronise their movements to the music on their own terms: *“I think that especially young preschoolers are not quite ready for [structured dancing]”* [SI, Jeroen, 22].

Thirdly, all of the teachers could employ a thematic approach to rhythm activities or make use of metaphors when they want to elicit certain rhythmic movements in the preschoolers. They would verbally introduce a theme, e.g. fairy-tale figures, farm animals, wild-life animals or going on a holiday and ask the preschoolers to take on a role that elicits certain rhythmic movements within that theme: *“The children in that lesson then go to the beach. There [at the beach] you walk in different ways. So the sand is hot, therefore you walk quickly”* [SI, Floor, 23]. In other words, the use of language-based metaphors seems to elicit the performance of specific rhythm skills without having to use formal rhythm terminology. Peter explained that he refrains from saying certain music is reggae (formal terminology) and reggae is always played slightly “laid back” in style but he tells the preschoolers *“that one is ill, and if you are ill you don’t feel well. You work slower. The rhythm keeps going [...] but you just hang in there [that rhythm] a little”* [SI, Peter, 24]. By taking on the role of a “sick person”, the preschoolers have bodily sensations and feelings that influence the way they will perform rhythm skills.

Martine speculates whether preschoolers might learn rhythm skills easier when their imagination is activated: *“If you offer [rhythm skills] really dryly, then they will not learn it. I think. So really with imagination and then they learn everything very quickly I think”* [SI, Martine, 25]. This remark coincides with Davidson, Pitts

and Correia (2001, p. 57) who paraphrase Correia's and John Paynter's ideas as follows: "teachers should actively use body imagery, metaphor, and physical movement to help the child experience and so understand the music they are learning". Lastly, Floor explained that it is easier to *combine* rhythm aspects through a thematic approach, e.g. having the preschoolers march around the classroom on the beat of the music whilst simultaneously pretending to play the trombone on every second beat of that bar.

6.3.1.2 *Selecting music that induces rhythmic movement*

All of the teachers remarked that music induces a physical rhythmic response in the preschoolers. In other words, the music *presents* rhythm aspects and simultaneously becomes a "pedagogical tool" to elicit rhythmic movement in the preschoolers without the teachers having to explain verbally what the preschoolers have to do: "[...] *I start such a particular rhythm lesson with moving to music, whereby the music is clearly an instigator to move in a certain way: quickly, slowly*" [SI, Liselot, 2]. The teachers could give different examples of what kind of musical sources induced rhythmic movement in preschoolers. Certain instruments induce rhythmic movements: "[*The children*] *start moving immediately when they hear the sound [of the djembe]. If I do that with a flute, it is something quite different*" [SI, Jeroen, 28]. Or, a specific tempo sets preschoolers in motion: "*There was a strong, yes, a good, a kind of marching beat and yes, I think that it is contagious.*" [VA, Floor, 29]. One teacher mentioned that music with more complex rhythm patterns invites preschoolers to move to music and she therefore prefers using more complex rhythmic music with preschoolers. Further, the teachers explained that they selected music that can induce rhythmic movements in the preschoolers *without* an intervention from the teacher. In general, empirical research shows that music can set people in motion and can especially induce *rhythmic* movements (Burger, Thompson, Luck, Saarikallio & Toviainen, 2012). Music content that is learned then at the same time can be the tool with which it is learned and in that sense the rhythmical musical environment shapes the musical cognition of the preschooler.

6.3.1.3 *Teaching and learning rhythm skills through repeated and varied exposure*

All of the teachers noted that preschoolers learn rhythm skills through repetition. They explained that preschoolers need to be repeatedly exposed to the same rhythm activity over time and they need enough repetition within an activity to be able to develop a rhythm skill. Or, as Jeroen [SI, 26] summarises: *“Repetition is very important with preschoolers. Repetition within an activity, but also repetition of an activity”*. To keep preschoolers motivated, concentrated and challenged during the repetition of a rhythmic activity teachers will add small variations to the activity, e.g. change the rhythmic movement per musical phrase. Four of the teachers also noted that they employ “contrast” to facilitate the learning of rhythm skills: contrasting tempi (slow-fast), different metres (duple-triple meter) or the expressive character of rhythm (legato-staccato) within a rhythmic activity helps preschoolers learn the difference between the two contrasting rhythm aspects.

6.3.1.4 *Teaching and learning rhythm skills through physical modelling*

All of the teachers used “physical modelling” as a teaching strategy for teaching and learning rhythm skills. In her qualitative research into movement as a musical response among preschoolers (age two to four) Metz (1989, p. 52) distinguishes between two methods of modelling that can be employed by a teacher, namely “imitational modelling” and “tactile modelling”. Imitational modelling refers to imitating the body movements, gestures and sounds of another person (Metz, 1989); this type of modelling was predominantly used by the teachers. The teachers explained that they will mainly present themselves as a rhythmic model but they will also use peers as a rhythmic model. These teachers will model a rhythm skill during the whole rhythmic activity or for parts of a rhythmic activity, e.g. *“I will walk in front and the children walk in a line behind me and copy my movements and the way I walk”* [SI, Floor, 22] or *“You teach more ‘physically’. You move along, help them by sitting in front of them and ‘joining in’”* [NB, Martine, 23]. Some teachers mentioned that they will emphasise their rhythmic movements more strongly when they want the preschoolers to imitate new rhythmic movements; in other words, they signal

non-verbally that a certain movement should be imitated: *“The first time that you do [a new movement] choose a clear movement. [...] I think that it helps the children to promote the copying of the rhythm”* [Peter, 24; see DVD track 5 Modelling a new rhythmic pattern clearly]. Less frequently used by the teachers in this study was the method of “tactile modelling” (Metz, 1989, p.52). In this type of modelling, a body part of the preschoolers can be moved in a rhythmic manner by the teacher. Martine explained that this type of modelling might give the preschoolers an idea of what to do and also how a movement *feels*: *“taking the hands [of the] child and letting them feel the rhythm”* [NB, 25]. In other words, body movements can lead to physical sensations that might add to learning rhythm skills.

6.3.1.5 Learning rhythm skills through different entry points: language and visual aids

Some teachers sought different entry points to make rhythm and rhythm skills more tangible for preschoolers. Three teachers used language to learn rhythm skills. Jette sometimes uses the Kodály rhythm syllables (Ta-ti-to) to learn rhythms. Floor uses words to learn rhythms and she notes that using language has two functions: the word itself can reflect a rhythm pattern (e.g. skipping) but at the same time can instruct the preschoolers what to do (e.g. skipping): *“with the word skipping [they] think: hey, that’s that movement!”*. *And they can access the rhythm much better than if they just hear some [rhythms]. [...] I think they can envisage it [rhythms] better if I use texts”* [SI, 30]. Less common in this study was the use of visual aids. Jette and Liselot mention that they will sometimes visually represent the rhythm that will be played. Liselot [SI, 31] explains she works with visual material to prevent the preschoolers *“getting lost... and I keep control over what they are doing, like. If you don’t use that, then it is much more difficult to, also for the children, keep track of whether they still understand what I am doing”*.

6.3.2 Subtheme: Instructional sequences of rhythmic activities for preschoolers

6.3.2.1 Physical modelling and scaffolding

All of the rhythmic activities that the teachers introduced to the preschoolers during this current research were focused on whole group activities. One instructional sequence that was employed by all teachers was “physical modelling and imitating” that could be extended by some to “scaffolding”. Bodrova and Leong (2007) describe scaffolding as a process in which the task itself is not changed but what the pupils do is made easier with the assistance of a more expert person. Then, “Gradually, the level of assistance decreases as the learner takes more responsibility for performance of the task” (Bodrova & Leong, 2007, p. 47). These teachers often first gave an instruction of the rhythmic activity, and secondly started modelling rhythm patterns on instruments or modelling rhythmic movements, mostly synchronised to music or a song. The preschoolers would then start imitating the teacher. Two teachers used music itself as a “model” and the preschoolers “imitated” the rhythm aspects of the music that were being played: *“I’m sitting at the side and they run around and dance in the middle [...] I [am] not the central figure but the music [is] the central figure”* [VA, Jeroen, 36]. Jeroen places himself purposefully to the side of the classroom so the preschoolers can focus on the music. At a certain point during the rhythm activity teachers could stop modelling and start observing the preschoolers and where necessary, still guided the preschoolers verbally or non-verbally with gestures, or these teachers observed the preschoolers but refrained from *actively* guiding the preschoolers: *“[...] I [pull] myself back, as it were. I listen whether they can also do it themselves and that they should also be able to do it without me. So now I hand them some responsibility”* [VA, Martine, 37].

Physical modelling and imitating are clearly observable actions for the preschoolers and scaffolding implies a purpose of the teacher that might not always be visible to the preschoolers. However, Jette noted that when she is in the process of scaffolding she will stand back from the rhythm activity, e.g. outside the circle of preschoolers and will not physically participate in the rhythmic activity. She [EI, 38] explained that this provides a visual model of her intentions to the preschoolers: *“That is why I stand apart from them. And they know this. So they know: [...] OK, now she will check us and we will do our best*

more". Liselot [VA] also places herself outside of the activity by sitting at the side of a bench while the preschoolers are playing instruments sitting down on the floor and thus she provides a visual model of her intentions to scaffold. Pozzer-Ardenghi and Roth (2010, p. 32) describe that the positioning of the teacher "structures the lesson conceptually; and it structures the lesson temporally, when the lecturer moves from location to location, thereby making available that a change is in progress". In the table below an overview is given of the instructional sequence that can be used with modelling and scaffolding (see DVD tracks 5 Scaffolding; and DVD track 6 Scaffolding):

Table 6.2 Overview physical modelling and scaffolding

Instructional sequence: physical modelling and scaffolding
<ol style="list-style-type: none"> 1. Instruction rhythmic activity; 2. Teacher models rhythm skill OR music "models" rhythm; 3. Preschoolers imitate teacher OR "imitate" rhythm aspects in the music; <ul style="list-style-type: none"> • Variation: Preschoolers rhythmic ideas are picked up and modelled by teacher 4. Teacher stops modelling, observes preschoolers, but will guide the activity verbally or non-verbally through gestures; 5. Teacher stops modelling, observes and refrains from guiding the preschoolers.

6.3.2.2 Other instructional sequences

Jeroen and Martine used two other sequences to instruct rhythm skills that may lead to the suggestion that there might be more instructional sequences than observed in this study. One teacher employed the following cycle as instructional sequence: the teacher modelled rhythm patterns on an instrument, the preschoolers imitated those on instruments, the teacher verbally reflected on the quality of playing, the preschoolers played rhythm patterns on instruments, teacher verbally reflected on the quality of playing etc. Finally, one teacher sequenced his activity from simple to complex at three different levels: (1) he started with a call-and-response of easy rhythm patterns and made the rhythm patterns more complex; (2) first the group as a whole was expected to respond and then individual preschoolers were expected to respond; and lastly (3) the preschoolers were first asked to *imitate* the call of the teacher and then asked to *improvise* a response to the call of the teacher. In the table below an overview is given of the theme "Teaching strategies for rhythm skills of preschoolers":

Table 6.3 Overview theme two

Theme two: teaching strategies for rhythm skills of preschoolers						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: general teaching strategies						
Strategy: Different ways of moving	x	x	x	x	x	x
Strategy: Music that induces rhythmic movement	x	x	x	x	x	x
Strategy: Repeated and varied exposure						
a. Repetition and variation	x	x	x	x	x	x
b. Contrast	x	x	x	-	-	x
Strategy: Modelling						
a. Imitational modelling	x	x	x	x	x	x
b. Tactile modelling	x	-	-	-	x	-
Strategy: Different entry points						
a. Language	x	-	-	x	x	-
b. Visual aids	-	-	x	x	-	-
Subtheme: Instructional sequences of rhythmic activity for preschoolers						
Sequence:						
a. Modelling and imitating	x	x	x	x	x	x
b. Modelling, imitating and scaffolding	x	-	x	x	x	-
Sequence: Playing – reflecting verbally – playing etc.	-	-	-	-	x	-
Sequence: Easy to complex	-	x	-	-	-	-

6.4 Theme three: musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers

The one new theme that was identified in the data as being a possible part of the specialist music teachers' PCKg and that not had been identified in the literature that was reviewed for this current study was "Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers". Whereas the second theme relates to actual teaching strategies employed by the teachers, this theme covers the musical communication and musical interaction *within* the chosen teaching strategies. During the video analysis tasks it became apparent that the teachers developed knowledge of how to employ their gestures, body and sounds to communicate and interact

predominantly non-verbally about the rhythm and rhythm skills they were performing during a rhythm activity. The gestures and the way the teachers used their bodies seemed to be intended to communicate rhythmic aspects or to elicit a rhythmic response in the preschoolers that facilitates their learning of rhythm skills. In this current research, the teachers' repertoire of gestures seemed to consist of three different types of gestures that have a different function in the learning process of rhythm skills, namely: instructional gestures, guiding gestures and (re)presentational gestures. These different types of gestures will be discussed as different subthemes below.

6.4.1 Subtheme: Instructing a rhythmic activity for preschoolers

6.4.1.1 *Instructional gestures*

All of the rhythmic activities that the teachers taught in this current research were whole group activities. In advance of the rhythmic activity, the teachers would often verbally explain and simultaneously act out the intention of a rhythmic activity with the use of gestures, or the actual movements of the activity (see DVD track 8 Instructional gestures; see DVD track 9 Instructional gestures). Some of the teachers explained their use of instructional gestures and movements during the instruction of a rhythmic activity as follows: *"I always [...] show them one time what it is. That they [...] have an overview of 'what does she want'"* [SI, Martine, 39]. Jeroen [VA, 40] noted that when he is instructing a rhythmic activity preschoolers will find difficult to understand he will *"get into action much more. Then I also use more gestures [...]"*.

6.4.1.2 *Changing body posture before instructing*

Two teachers in this study explained that they first change their body posture to communicate that they will start a rhythmic activity. By changing their body posture they cue the preschoolers to take on a posture that will help them to get ready for the rhythm activity: *"I straighten up. Like: we're getting ready to begin. [...] First, I was sitting bent forwards, and I was still talking. Then I already say [non-verbally]: Hey! Get ready. And how do you get ready for a music lesson?"* [VA, Martine, 41; see DVD track 10 Changing body posture]. These teachers

communicated that the body has to be “made ready” for performing and learning music.

6.4.2 Subtheme: Guiding a rhythmic activity for preschoolers

Most rhythmic activities that the teachers introduced to the preschoolers during this current research were focused on performing the pulse, metre, rhythm patterns or tempo with the whole group. The teachers seemed to develop knowledge of how to help the preschoolers to synchronise their rhythmic movements or playing to rhythm aspects of a song or a piece of music as a group and to help them orient themselves within the music. The teachers used verbal instructions, e.g. counting to guide the preschoolers, but predominantly seemed to use gestures including facial expressions and glances to guide the learning of rhythm skills of preschoolers and to interact with them. These teachers would sing a song, chant rhythm patterns, listen to music or play a rhythm pattern on an instrument and *simultaneously* cue preschoolers when and how to respond rhythmically or how to synchronise their moving, playing or chanting to the (recorded) music. This could result in complex combinations of gestures that blend pedagogy and rhythmic content. For example, one of the teachers pointed his finger at a preschooler to take turns (pedagogy), whilst shaking the pulse with his hand (rhythm content) and simultaneously looking stern to show the expressive intention of the rhythm (expressiveness) (see DVD track 11 Combining pedagogical and rhythmic gestures). One teacher did note that the preschoolers have to become immersed in the meaning of certain gestures. She will verbally explain what certain gestures mean and she noted that it can take time for preschoolers to learn – and remember – the meaning of certain gestures: *“a kind of ‘stop’ sign works really well. You realise that you have made agreements with them and because they have repeated it so often [...] and when you come back to it they just perform it”* [EI, Martine, 42]. The (combination of) gestures that could be identified in the data that guide the learning process of rhythm skills of preschoolers are described below.

6.4.2.1 Cueing the start and end of a rhythmic activity

Cueing the *start* of a rhythmic activity takes place through, for instance, taking a sharp breath in combination with demonstrating clear rhythmic movements (see DVD track 12 Cueing start of rhythm activity). Cueing the *end* of a rhythmic activity can take place through, for example, holding the rhythm sticks in a freeze in the air in combination with firmly closed lips (see DVD track 13 Cueing end of rhythm activity) or making a stop gesture with one hand and simultaneously placing a finger on the mouth (see DVD track 14 Cueing end of rhythm activity).

6.4.2.2 Cueing the beginning of a new rhythmic movement or rhythm pattern within music

The teachers tended to cue the beginning of a new rhythmic movement or a new rhythm pattern that had to be played within a piece of music – these changes often followed the rhythmic phrasing of a piece of music – just slightly before the new movement or rhythm pattern actually starts: *“With preschoolers you always have to show everything really clearly. Very clearly. Beforehand.”* [VA, Jette, 43], e.g. lifting the boomwhacker in the air and pointing to cue a change (see DVD track 15 Cueing a change).

6.4.2.3 Signalling the character of rhythm

The teachers used e.g. large gestures to elicit a louder sound or smaller gestures to elicit a soft sound such as sitting low to the ground and making small movements with rhythm sticks (see DVD track 16 Signalling a soft rhythmic sound) or e.g. putting on a stern face to make sure the preschoolers stamp a rhythm in a heavy manner (see DVD track 17 Signalling a heavy rhythmic sound).

6.4.2.4 Cueing a rhythmic response

The teachers could cue a rhythmic response at an individual level, e.g. a teacher can bend forward to invite the next preschooler in line to respond, point to the preschooler and signal an upbeat with the hand (see DVD track 18 Cueing a rhythmic response). At a group level the teachers could use cues for a rhythmic response, e.g. the teacher looks at his hands that are clapping a rhythm pattern and when he looks up and opens his hands to the side it is the turn of the preschoolers to imitate the rhythm pattern (see DVD track 19 Cueing a rhythmic response), or the teacher points to himself and points to the preschoolers when it is their turn to respond (see DVD track 20 Cueing a rhythmic response).

6.4.2.5 Signalling the focus of the activity

The teachers could signal the focus of the rhythm activity through the direction of the gaze, e.g. staring at their rhythm sticks to inform the preschoolers how to play these sticks (see DVD track 20 Signalling focus activity), or staring at the legs that model a rhythm pattern (see DVD track 21 Signalling focus activity), or pointing to the way an instrument has to be played (see DVD track 22 Signalling focus activity).

6.4.3 Subtheme: (Re)presenting rhythm skills to preschoolers

The teachers also developed knowledge about how to (re)present rhythm aspects as the beat, rhythm patterns and rhythmic phrasing, and rhythm skills through their body: the subject matter is *in* and *of* the teachers. Whilst singing, chanting or listening to music, a teacher can represent, communicate and clarify rhythm aspects of that music, e.g. “the beat” of the music with his or her body. At the same time this representation of the beat presents and communicates the rhythm skill, e.g. “keeping the beat”, yet the teachers could *simultaneously* represent, communicate and clarify different rhythmic aspects through their bodies, e.g. rhythmic phrasing or the expressive quality of the rhythm, and therefore can give a visual model of how “the beat” fits in with a larger musical context. Finally, one teacher mentioned that presenting the pulse also supports

the teacher in keeping a steady beat within the rhythmic activity and therefore this type of gestures are helpful for preschoolers *and* teachers: *“And that is [keeping a steady beat], I think, for the children as well as myself. [...] I have to be completely into it in order to let it proceed well and they also have, like, a musical and visual anchor through me”* [VA, Jeroen, 44]. The (re)presentational gestures that were identified in the data are the following:

6.4.3.1 (Re)presenting the pulse and bar

The pulse could be (re)presented by walking, nodding, swaying, tapping the foot or moving the whole body to the pulse or to the first beat of a bar. In this way a visual model of the pulse is given to the preschoolers: *“with my body and especially with my head I see that especially, really also the pulse is in there”* (Jeroen, 45; see DVD track 24 Representing the pulse). Some teachers (re)presented the bars of music through their body, e.g. choosing a movement that lasts a bar, e.g. turning around during a bar.

6.4.3.2 (Re)presenting rhythmic phrasing

The beginning of a rhythmic phrase could be (re)presented through e.g. lifting rhythm sticks higher in the air to give a visual model of the start of a new rhythmic phrase within a piece of music (see DVD track 27 Representing the beginning of a new rhythmic phrase). The length of a rhythmic phrase could be (re)presented through gestures, e.g. changing gestures on the rhythmic antecedent and the rhythmic consequent (see DVD track 28 Representing a rhythmic antecedent and the rhythmic consequent). The teachers could nod the beat with their head vertically and at the same time move the head horizontally to give a visual model of a rhythmic phrase and the pulse (see DVD track 29 Representing pulse and rhythmic phrasing). Finally, the teachers could also (re)present the ending of a rhythmic phrase by e.g. shortly freezing their rhythmic movement at the end of a rhythmic phrase (see DVD track 30 Representing the ending of a rhythmic phrase).

6.4.3.3 (Re)presenting the character of rhythm

The character of rhythm can be (re)presented, e.g. walking in a staccato manner: *“Then you stamp on the floor in a very staccato way, so that it is both the beat as a way to express the character of the rhythm”* [VA, Jette, 46].

In the table below an overview is given of the theme “Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers”.

6.4.3.4 (Re)presenting a rhythm pattern

A rhythm pattern or the duration of a note could be (re)presented in various ways, e.g. a raised eyebrow can represent a “rhythmic tie” (see DVD track 25 Representing rhythmic tie). One teacher explained that she demonstrates the length of a note in the air with specifically a boomwhacker because these instruments do not sound very long and she wants to inform the preschoolers of the duration of a note (see DVD track 26 Representing duration note).

Table 6.4 Overview theme three

Theme three: musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: Instructing a rhythmic activity to preschoolers						
Instructional gestures	x	x	x	x	x	x
Changing body posture before instructing	x	-	-	-	x	-
Subtheme: Guiding a rhythmic activity of preschoolers						
Guiding: start and end of a rhythmic activity	x	x	x	x	x	x
Guiding: new rhythmic movement or rhythm	x	x	x	x	x	x
Guiding: character of rhythm	x	x	x	x	x	x
Guiding: rhythmic response	-	x	-	x	-	x
Guiding: focus of the rhythm activity	x	-	x	-	-	x
Subtheme: (Re)presenting rhythm skills to preschoolers						
(Re)presenting:						
a. pulse	x	x	x	x	x	x
b. bar	x	x	x	-	x	-
(Re)presenting: rhythmic phrasing	x	x	x	x	x	-
(Re)presenting: character of rhythm	x	x	x	-	x	x
(Re)presenting: rhythm patterns	-	x	x	x	-	-

6.5 Theme four: Teachers' understanding of preschooler's learning behaviour with regard to learning rhythm skills

The fourth theme that I identified in the data as being a part of the specialist music teachers' PCKg was the theme: "Teachers' understanding of preschooler's learning difficulties with regard to learning rhythm skills". This theme covers the teachers' PCKg in relation to the preschoolers perspective in learning rhythm skills. Through working, observing and reacting to the preschoolers the teachers seem to start developing notions of the preschoolers pre-disposition for learning rhythm skills and the preschooler's learning

difficulties of learning rhythm skills (Van Driel, 2008). This type of knowledge is about what teachers understand to be the preschooler's predisposition for learning rhythm skills, what preschoolers might find difficult about the process of learning rhythm skills and what "typical" preschooler behaviour could be with regard to learning rhythm skills. This type of knowledge informs the specialist preschool music teacher about which strategies to use. Below the two subthemes (1) the preschooler's disposition for learning rhythm skills and (2) the learning difficulties of preschoolers regarding learning rhythm skills are described that comprise this fourth main theme.

6.5.1 Subtheme: Understanding the preschoolers' predisposition for learning rhythm skills

6.5.1.1 How preschoolers are predisposed to learn rhythm skills

Five teachers in this study talked about the predisposition for learning rhythm skills. They noted that they believe that in principle all preschoolers are predisposed to learn music, although the extent to which rhythm skills can be learned can vary depending on the aptitude of the preschooler: *"I definitely think that everybody is musical. [...] And that there are big differences, that is true of course"* [SI, Jette, 47]. Yet, these teachers tended to interpret predisposition in different ways. Liselot and Floor explained that "moving" to rhythm aspects of music is a natural predisposition of preschoolers: *"Young children naturally already often move to the pulse and beat"* [NB, Liselot, 48]. Liselot explains she builds on that natural disposition: *"So starting from that natural disposition to move, you keep adding to that"* [SI, Liselot, 49]. Jeroen [SI, 50] takes a more cognitive approach to learning rhythm skills and mentions that he hopes that through recurring exposure to music *"their brain is capable of detecting rhythmic patterns in sound"* and therefore it is important, in his view, to expose the preschoolers regularly to music.

6.5.1.2 *Difference between gender in learning rhythm skills*

Three teachers remarked that they observed a difference in gender and learning rhythm skills. Liselot noted that in general her female preschoolers seemed to develop their fine motor skills sooner and therefore have less trouble playing instruments as a xylophone than male preschoolers. Additionally, Peter observed that in general his male preschoolers seemed to pick up rhythm patterns easier opposed to his female preschoolers who seem to pick up melodies easier. Jette [SI, 51] noted that she observed that music induces different types of rhythmic movements in male preschoolers and female preschoolers: *“you see that a lot of girls like to twirl. Boys not so much. There really is a difference. Boys move very differently to music than girls”*.

6.5.2 Subtheme: Understanding the learning behaviour of preschoolers regarding the learning of rhythm skills

6.5.2.1 *Difficulty in engaging, focusing, concentrating on learning rhythm skills*

All of the teachers mentioned that some preschoolers have trouble staying motivated and engaged during a rhythm activity. The teachers found that they actively needed to keep these preschoolers motivated and engaged. Five teachers mentioned that some preschoolers have difficulty with focusing and concentrating on the rhythm skills that are being taught: *“In general what they find difficult is the concentration that is required for some things”* [SI, Jeroen, 52]. These teachers gave different reasons why they believe it is difficult to focus on learning rhythm skills. Four teachers explained that the concentration span of some preschoolers is still short. Further, three teachers observed that some preschoolers have difficulty combining singing and moving to rhythm aspects of the music; they will tend to focus on singing *or* moving. These teachers also noted that an instrument tended to distract preschoolers because they focus on exploring the material, form and sound of the instrument instead of playing a rhythm on the instrument. Jette also noted that some preschoolers can get over-focused on playing a rhythm pattern and repeat playing a certain rhythm pattern on and on even though the rest of the group has moved on playing a different rhythm pattern.

6.5.2.2 Difficulty in synchronising rhythmic movements to an external music source

Four teachers explained that some preschoolers have trouble with their motor coordination and therefore find it hard to synchronise their movements to an external music source in a rhythmic manner. The teachers mentioned that certain movements are more difficult to synchronise to rhythm aspects of music, e.g. clapping and skipping. Then again, some movements seemed less problematic to synchronise to rhythm aspects in music, e.g. walking to music. Yet in the latter case the teachers did mention that the music has to be the right tempo, especially not too slow: *“If I want to have a child walk in time with the beat I have to make sure that I have music that fits. With those short legs, you know”* [SI, Liselot, 53].

6.5.2.3 Difficulty translating inner hearing to rhythmic output

Four teachers remarked that some preschoolers can have difficulty translating their inner hearing to “rhythmic output”, be it a sounding rhythmic result on an instrument or rhythmic movements. However, Liselot [EI, 54] noted that movement and inner hearing might influence each other reciprocally and develop mutually: *“so the physical is linked to how you hear it, but also how it comes out”*.

6.5.2.4 Difficulty playing certain rhythms

Four teachers explained that in general preschoolers have difficulty playing certain rhythms. Floor mentioned that her preschoolers had trouble playing dotted rhythms, Jette noted that her preschoolers have trouble playing on an upbeat, Peter explained that his preschoolers have no trouble just keeping to the beat but do struggle with keeping the right tempo when they have to play triplets. Lastly, Martine observed that she generally finds that her preschoolers have trouble playing rhythm patterns and they find it easier to keep the beat. She hypothesises that this is the case because keeping the beat seems to be more natural, more connected to physiological processes like breathing and the

beating of the heart: *“Beat is in your body, of course, I think. Your breath, your heartbeat. I don’t know. I think it is closer”* [SI, Martine, 55].

6.5.2.5 Emerging understanding of rhythmic phrasing

One teacher noted that he could identify the preschoolers’ emerging understanding of rhythmic phrasing. During a game where the preschoolers have to stop moving when the drumming stops, this teacher noted that some preschoolers would anticipate when the teacher would stop playing a rhythmic phrase and they would stop moving just shortly *before* a rhythmic phrase would end, or would already start moving before the teacher started playing another rhythmic phrase: *“because I usually drum in regular structures, you can observe it just before: You can see the children stop just before I play the last note [of a phrase]”* [SI, Jeroen, 56].

6.5.3 Subtheme: Typical preschooler learning behaviour with regard to learning rhythm skills

Four teachers noted that in general preschoolers exhibit a different kind of behaviour whilst learning rhythm skills than the older pupils they teach. Floor and Martine noted that specifically preschoolers copy each other’s rhythmic behaviour: even though preschoolers are allowed to improvise their *own* rhythm pattern, the rhythm pattern that is played by the first preschooler will be copied exactly the same by the following preschoolers. Jette explained that she notices that the preschoolers “become” the music when learning rhythm skills in contrast to twelve-year olds (group 8 of the Dutch primary education system) who refrain from becoming fully engaged with the music and place themselves outside of the music and comment on the music. She [SI, 57] notes that preschoolers *“are that music [...] but children in group 8 place themselves outside of the music. They also have an opinion about it. Like: hmm, do I like this song? Is it cool or not cool?”*. Finally, Liselot and Floor noted that preschoolers are highly explorative and will start exploring rhythm instruments immediately and as teachers they value that impulse and build on that impulse: *“When I put instruments down and they want to go to them, then that is what*

you want. It is not handy [...] but the first impulse is exactly what you want: the need to touch something” [SI, Liselot, 58]. In the table below an overview is given of the theme “Preschoolers’ dispositions and learning difficulties with regard to learning rhythm skills”:

Table 6.5 Overview theme four

Theme four: Preschoolers’ dispositions and learning difficulties with regard to learning rhythm skills						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: Understanding the preschoolers’ predisposition for learning rhythm skills						
Predisposed: how preschoolers are pre-disposed to learn rhythm skills	x	x	x	x	-	x
Predisposed: gender	-	-	x	x	x	-
Subtheme: Understanding the learning behaviour of preschoolers regarding learning rhythm skills						
Difficulty: engagement and focusing on the rhythm skill	x	x	x	x	x	x
Difficulty: synchronising movements to rhythm aspects in music	x	x	x	x	x	-
Difficulty: inner hearing and rhythmic output	x	x	-	x	x	-
Difficulty: playing certain rhythms	x	-	x	-	x	x
Emerging understanding: rhythmic phrasing	-	x	-	-	-	-
Subtheme: Typical preschooler learning behaviour with regard to learning rhythm skills						
Typical preschool behaviour with regard to learning rhythm skills	x	-	x	x	x	-

6.6 Theme five: The curriculum in relation to the development of rhythm skills of pre-schoolers

The fifth theme that I identified in the data as being a part of the specialist music teachers’ PCKg was “The curriculum in relation to the development of rhythm skills of preschoolers”. Whereas the above-mentioned themes reflect the

teachers' PCKg that is closely tied to the actual act of teaching, this theme covers the teachers' long-term approach to teaching rhythm skills. Teachers can thoughtfully think about how much time should and can be spent on certain topics in relation to the pupils' characteristics and a certain pedagogical approach, and thus blend pedagogical and content knowledge. In this current study none of these teachers had a detailed curriculum written out on paper that covered the preschool years, nor did they – at any point – refer to the core objectives of the Dutch national curriculum or the curricular strands developed by the SLO (see section 1.5.2). Although their curriculum was not written down explicitly, these teachers all had global ideas about the content and goals of their curriculum and therefore, the main theme could be divided into three subthemes: “curriculum orientations with regard to learning rhythm skills”; “curriculum goals with regard to rhythm skills”; and “choices with respect to the content of the curriculum regarding rhythm skills” and will be described below.

6.6.1 Subtheme: Curriculum orientations respecting learning rhythm skills

6.6.1.1 *Developmental curriculum*

Four explained that they have a global idea about how the development of rhythmic skills of preschoolers unfolds and they will offer a range of activities and adapt activities in such a manner that the activities can facilitate that rhythmic development of preschoolers. This approach results in a developmental curriculum in which “the teacher is seen primarily as an adapter of curricula, one who learns to modify predetermined content to fit the developmental needs and capabilities of the learner” (Glatthorn, 2005, p. 82). Yet, the way rhythmic development was viewed by the teachers did differ.

Peter explained that he stresses the *physical feeling* that music can evoke in the preschoolers. He explains that this *feeling* can lead to certain movements and in turn, these movements can lead to the expression of a certain pulse: “*I think that you should start with that [feeling] and from that feeling a certain movement comes up, a certain pulse*” [SI, 59]. As soon as the preschoolers develop a sense of pulse, he will start adding rhythm patterns to activities. As the preschoolers start developing their rhythm skills he will no longer focus the

attention on the “feeling” or “pulse” of the music but will start offering melodic rhythm patterns directly.

Similarly, Liselot explained that although the young children have a predisposition to react to music rhythmically, they primarily react to the character of music: *“I think that they then react to the character of the music, so not so much feel a pulse, feel a beat or feel a rhythm”* [SI, 60]. By offering rhythmic activities that focus attention on the rhythmic aspects of music preschoolers start developing rhythm skills. Liselot further noted that the motoric development plays an important role in the rhythmic development. In the process of recognising the rhythmic aspects of music she will design *specific* rhythm activities that engage the preschoolers in gross motor activities that involve the whole body. After the preschoolers have mastered rhythm patterns with the whole body, she might then translate these rhythm patterns to new activities that involve fine motoric skills such as playing the rhythm patterns on instruments.

Jeroen explained that he conceptualises the rhythmic development of preschoolers in different phases. First of all, preschoolers absorb music and move freely and spontaneously to music. In the long term the preschoolers are able to start coordinating their movements to the pulse of the music: *“In first instance it is more of a free reaction [...] that evolves more and more into walking on the beat or moving on the beat”* [SI, 61]. As soon as the preschoolers are able to perform a steady pulse, they move on to being able to perform (complex) rhythm patterns on a steady beat. The last phase is that preschoolers are able to rhythmically improvise on a steady beat.

Jette noted that preschoolers in their first year first absorb and observe the way older preschoolers rhythmically move to music and slowly start imitating that behaviour: *“And then at a certain moment they observe that, how those older children do it [...] And then they copy that behaviour”* [SI, 62]. Jette further explained that in their second year preschoolers start performing rhythm skills more independently and are able to model these skills for the younger preschoolers.

6.6.1.2 Content-orientated curriculum

Less common in this current study, was a more content-orientated approach to the curriculum. Martine and Floor explained that their starting point for their curriculum was laying a broad musical foundation (including rhythm skills) for the later years: *“with the preschoolers, then I lay the base, the primer as it were”* [SI, Floor, 63]. Both these teachers started with simple rhythmic activities and gradually moved on to more complex rhythmic activities. However, these teachers noted that the content of their curriculum was not described in detail and the rhythm activities were still open to the ideas of the preschoolers.

6.6.2 Subtheme: Curriculum goals respecting rhythm skills

All of the teachers remarked that they have broad preschool curriculum goals in mind with regard to learning rhythm skills. These curriculum goals of the teachers are, as mentioned earlier, not written down in a curriculum. Martine did question the fact that she has not written out any goals and she wondered whether it would influence the level of performance of rhythm skills if she would formulate clear goals: *“I think that if you set your goals... if you define them, that you achieve more. That you achieve a higher level”* [SI, 64].

With regard to curriculum goals, all of the teachers noted that preschoolers should be able to *move* to rhythm aspects of music, e.g. to the pulse of duple or triple metre, to rhythm patterns, to different tempi and to different styles, e.g. reggae or samba. Furthermore, all the teachers agreed that the preschoolers should be able to *perform* (e.g. clap or play) a steady beat, different metres including up and down beats. Three teachers noted that preschoolers should be able to sing a song with a steady beat, and another three teachers noted that preschoolers should be able to hear the differences between the beat and rhythm patterns, between different tempi and different metres. Another three teachers mentioned that a goal of the curriculum was that they wanted to see a shift in the preschool years from preschoolers imitating the teacher or peers to being able to perform rhythm skills independently. Some additional goals were mentioned less frequently. Two teachers mentioned that preschoolers should be able to improvise rhythmically on a steady beat and the same teachers mentioned that preschoolers should be able to express the rhythmic character

of music. A goal that was mentioned once in this current study was that preschoolers develop a sense of rhythmic phrasing.

6.6.3 Subtheme: Choices with respect to the content of the curriculum regarding rhythm skills

6.6.3.1 *Integrating rhythm skills with other skills*

All of the teachers mentioned that they chose to offer rhythm skills to preschoolers integrated with other musical skills. These teachers explained that preschoolers should learn the function of rhythm within the whole of music, not as an isolated phenomenon: “[...] *I do not believe as such that you can isolate the rhythm from the song [...] It is a whole and that rhythm services the melody*” [SI, Jette, 65]. As a result, these teachers tended to focus on different rhythmic aspects such as metre and rhythm patterns within e.g. a song. Liselot explained that preschoolers naturally reacted to music in a more holistic way and were less focused on separate musical elements like rhythm patterns or melody and therefore, she teaches rhythm skills integrally with other musical skills: “*For young children beat and rhythm are a logical part of participating in music. It is part of the whole and they do not feel it is a separate element*” [NB, 66]. The teachers also mentioned that they integrate the learning of rhythm skills with social and self-regulatory skills because they feel that these skills are highly related to rhythm skills: “*Showing what you are capable of regarding the beat, pulse and rhythm forces you to draw on your social behaviour in the group, your confidence, being able to listen and controlling your body*” [NB, Liselot, 67].

6.6.3.2 *Rhythm skills that are excluded in the music curriculum for preschoolers*

In this current study, some teachers explicitly noted that they excluded specific rhythm skills from the preschool music curriculum. Floor and Martine mentioned that they excluded learning to read rhythm notation from the curriculum. They would start learning to read rhythm notation when the pupils start learning to read in the higher classes. Liselot noted that she did not include learning to read rhythm notation in her preschool curriculum but did at times work with

graphic notation. Jette explained that she teaches in different schools and at times she will offer some basic form of learning to read rhythm notation.

Martine and Jeroen remarked that they refrained from having preschoolers play complementary rhythms: “*clapping complementary rhythms, they should find that difficult [...] that is, I think, outside the scope of what they are be able to do*” [SI, Jeroen, 68]. Liselot too, noted that preschoolers find this difficult: “*I notice that they find it difficult, for example to play a crotchet and a quaver at the same time*” [SI, 69]. Yet at times, she will offer playing complementary rhythms just to stretch the preschoolers. Then again, Jette mentioned that preschoolers are able to play complementary rhythms but this is only because they are overly focused on their own part and do not listen to other parts. In the table below an overview is given of the theme “The curriculum in relation to the development of rhythm skills of preschoolers”:

Table 6.6 Overview theme five

Theme five: The curriculum in relation to the development of rhythm skills of preschoolers						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: curriculum orientations						
Developmental curriculum	-	x	x	x	-	x
Content-orientated curriculum	x	-	-	-	x	-
Subtheme: Goals for curriculum with regard to rhythm skills						
Goals for curriculum:						
a. Moving to rhythm aspects of music	x	x	x	x	x	x
b. Clapping or playing with and to a steady beat	x	x	x	x	x	x
c. Singing with a steady beat	-	x	x	-	-	x
d. Hearing differences between rhythm aspects	x	-	x	x	-	-
e. From imitating to performing rhythm skills independently	x	-	x	-	x	-
f. Improvising rhythmically on a steady beat	-	x	-	-	x	-
g. Expressing the rhythmic character of music	-	x	-	-	x	-
h. Rhythmic phrasing	-	-	-	x	-	-
Subtheme: Choices regarding the content of the curriculum						
Integrating rhythm skills with other skills	x	x	x	x	x	x
Rhythm skills that are excluded in the music curriculum for preschoolers						
Reading rhythmic notation is excluded	x	-	-	x	x	-
Playing different parts together is excluded	-	x	-	-	x	-

6.7 Theme six: Assessment of preschoolers' rhythmic behaviour in relation to learning rhythm skills

The sixth theme I identified in the data of this current study was "Assessment of the preschoolers' rhythmic behaviour in relation to learning rhythm skills". This theme covers how teachers assess the rhythmic learning process of the preschoolers and what their views on assessing are. In general, teachers can

seek to gain an understanding of the learning process of pupils with regard to certain topics and find adequate ways of assessing that specific learning process; thus pedagogical knowledge and content knowledge are blended. With regard to the assessment of the preschoolers' rhythm skills, the teachers tended to assess the (development of the) preschoolers' rhythm skills through listening, seeing, touching *and* physically sensing the preschoolers. Observing and assessing the (development of) rhythm skills of preschoolers therefore seems to be a multimodal activity and - as conceptualised from an embodied cognition perspective - all senses seem to affect the teacher's understanding of the performance of rhythm skills of preschoolers (Johnson, 1989). This main theme is divided in three subthemes that will be described below: "Choosing between summative or formative assessment of the preschoolers' rhythm skills", "Assessing the rhythmic skills of preschoolers through observation, feeling and haptic feedback" and "Defining the quality of the performance of rhythm skills of preschoolers".

6.7.1 Subtheme: Choosing between summative or formative assessment of the preschoolers' rhythm skills

All of the teachers explained that they did not use any form of summative assessment (assessment of learning) to assess and grade the rhythmic skills of preschoolers but instead preferred using formative assessment (assessment for learning) to further the preschoolers' rhythmic development. These teachers explained that they closely observed the development of preschoolers to see whether or not the preschoolers understand what they are doing but without pressurising the preschoolers: *"Then you also test, unbeknownst, which children, like, have understood where you wanted to go [...] without putting pressure on the children"* [SI, Liselot, 70]. These teachers give different reasons of why they refrained from using that summative assessment for rhythm skills. Firstly, they noted that preschoolers are already being pressured to perform at school and summative assessment could take away the pleasure preschoolers experience during the music lessons: *"Well, I think that [testing] is not required. No, because I think that you also take away a lot of pleasure. And also... yes, those children already have to do so much, you know"* [SI, Jette, 71]. Secondly, Jeroen noted that assessing the preschoolers would come at the expense of

the little time he has every week to teach music. Thirdly, the teachers explained that the preschoolers need time to develop their rhythmic skills and should not be pressurised into developing rhythmic skills they might not be ready for, e.g. the motoric development of some preschoolers lags behind and that might interfere with their rhythmic development. Finally, although Liselot did not use summative assessment for rhythm skills she did note that she would be able to see an advantage of summative assessment: *“if you have a goal, something you want to achieve, then really the only way to see if you have realised that goal, is to test that”* [SI, 72].

6.7.2 Subtheme: Assessing the rhythmic skills of preschoolers in a formative way

All of the teachers explained that they actively *observed* the preschoolers as a group during a rhythm activity to assess whether the group is picking up on a rhythm skill during the lesson or over time. Floor noted: *“I keep my eyes open when they are all ticking with those sticks and one of those rhymes, then I look around, like, who is doing it well?”* [SI, 73]. Based on these observations and assessments Jeroen explained that he decides whether or not he will repeat a rhythm activity to help the preschoolers with their learning process. The teachers also noted that through observing and assessing a group they are able to judge whether the (elaboration of the) rhythmic activity is suitable for a group: *“I then sense whether there is enough concentration to do this [extending a rhythmic activity]”* [SRI, Jeroen, 74]. During an observation the teachers might also relate the *physical feeling* the rhythm activity evokes in their *own* body (e.g. a sense of weight or tempo) to what the preschoolers are actually doing during that rhythm activity. This “physical feeling” or “sensation” in their own bodies in relation to what the preschoolers are doing can provide teachers additional information about the preschoolers’ performance of rhythm skills: *“But you just feel when you are busy that children want to speed up”*. Consequently, the teacher can also give feedback through the body: *“Then you automatically hold back. Just play laid back, as it were. Then they copy that”* [SRI, Peter, 75].

The teachers mentioned that they observe and assess the performance of rhythm skills not only of the group as a whole but also at an individual level to

get a global idea of a preschoolers' rhythmic development: *"She does that very witchlike, with different jumps. Not all on the beat, but that is all right. [...]. You also see that a boy who shows the beat on the pulse very well"* [E1, Jette, 76]. In this way, the teachers could gain an overview of the development of the performance of rhythmic skills at an individual level during a lesson but also over the course of several lessons. Some teachers noted that they would use tactile modelling as a way of feedback to help the preschoolers with their rhythmic development, e.g. taking the hands of a preschooler and swinging them back and forth to the beat of the music. Through the activity of tactile modelling these teachers also received haptic information about the rhythmic development of a preschooler because the teachers would be able to *feel* the way the preschoolers were able to join in with the swaying of the beat. This haptic information informed the teachers and enabled them to adapt the process of tactile modelling to the needs of the preschooler.

6.7.3 Subtheme: Defining the quality of the performance of rhythm skills of preschoolers

As described above the teachers used formative assessment to gain an understanding of how the preschoolers as a group or at an individual level were able to perform a rhythm skill. Furthermore, four teachers had specific ideas about the quality of the performance of rhythm skills and they noted that although preschoolers are young, you could still demand a certain quality: *"you [can] certainly demand something from a preschooler. Not everything is always immediately good"* [S1, Floor, 77]. These teachers mentioned different aspects when they were looking for quality with regard to the performance of rhythm skills of preschoolers. They mentioned that starting a rhythm activity together was important as this influences the course of a rhythm activity positively. Then during a rhythm activity the teachers noted that they observed whether the preschoolers were playing the beat of music or the first beat of a bar together as a group. Floor noted that to help the preschoolers play a beat together on time she will ask them to listen or look at each other: *"You can make children aware of it. And listen to it. Or make a child watch it, like: do you see all those feet move at the same time?"* [S1, 78]. Moreover, these teachers remarked that they observed whether the preschoolers would end a rhythm activity together.

Jette also explained that she observes the quality of the rhythmic movement of preschoolers and the expressive character of the rhythmic movement: *“I am observing them and something must change. They have to be more expressive, not so timid”* [EI, 79]. Even though these teachers used formative assessment to further the development of the performance of rhythm skills, they also noted that rhythm skills ripen over time and preschoolers can perform a rhythm skill better over time. In the table below an overview is given of the theme “Assessment of the preschoolers’ rhythmic behaviour in relation to learning rhythm skills”:

Table 6.7 Overview theme six

Theme six: Assessment of the preschoolers’ rhythmic behaviour in relation to learning rhythm skills						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: Choosing between summative or formative assessment of the preschoolers’ rhythm skills						
Formative assessment instead of summative assessment	x	x	x	x	x	x
Subtheme: Assessing the rhythmic skills of preschoolers in a formative way						
Assessing the performance of rhythm skills of preschoolers in a formative way	x	x	x	x	x	x
Subtheme: Defining the quality of the performance of rhythm skills of preschoolers						
Quality of the performance of preschoolers	x	-	x	x	x	-

6.8 Theme seven: The interaction between an educational context and the learning of rhythm skills of preschoolers

The seventh theme that I identified in this study was *“The interaction between an educational context and the learning of rhythm skills of preschoolers”*. This theme covers how teachers understand how contextual factors influence and shape the teaching of rhythm skills of preschoolers. In general, teachers will know how to deal with the contextual constraints and possibilities there are and how these will affect the choice of topics in combination with teaching and

learning activities (Magnusson et al., 1999; Cochran et al., 1993). From an embodied perspective “behaviour is guided and supported by the context in which it unfolds” (Griffiths & Scarantino, 2009, p. 442) but Rosengren and Braswell (2003) note that the environment can also limit behaviour and the educational context therefore can play an important role in how the teachers are able to teach rhythm skills. The theme “The interaction between an educational context and the learning of rhythm skills of preschoolers” is divided into two subthemes: “the musical backgrounds of the preschoolers” and “preconditions of the school that impact on the teaching and learning of rhythm skills”. Below the subthemes will be described.

6.8.1 Subtheme: The musical background of the preschoolers

Five teachers noted that the musical background of the preschoolers influences the learning process of rhythm skills. These teachers explained that the more the preschoolers have been exposed to a certain style e.g. at home the easier they find performing rhythm skills in that style. Peter [SI, 80] noticed that he teaches at a school with pupils with Arabic backgrounds and these pupils are more at ease with unusual metres: *“These children mainly hear Turkish and Moroccan music, so they feel that metre very well. But all right, the moment I chose for something samba-ish it becomes difficult for them”*. Jeroen [SI, 81] observed that preschoolers nowadays are exposed to different kinds of music and that influences the learning of rhythm skills: *“That children of this age, for example, can already do more complex rhythms than 30 years ago. Just because there is more in that regard coming from world music, or pop music and jazz”*. Then again, Jette noted that her preschoolers have trouble with certain rhythms because they have *not* been exposed to pop music as much yet at that age.

6.8.2 Subtheme: Preconditions of the school that impact on the teaching and learning of rhythm skills

6.8.2.1 *Instruments in relation to learning rhythm skills*

All of the teachers noted that they have access to instruments and could use instruments in the development of rhythm skills of the preschoolers. The teachers did mention two elements in their choice for rhythm instruments for preschoolers. First of all, an instrument had to be able to produce a clear rhythmic sound. Jeroen remarked that certain instruments lend themselves more for rhythm skills namely instruments with a clear attack. Secondly, the preschoolers have to be able to handle an instrument motorically. Floor [SI, 82] explained that it is *“fun to do it once in a while with instruments, but I think that [learning rhythm skills] out of movement goes, well, much quicker for preschoolers than with more difficult motoric acts [on an instrument]”*.

6.8.2.2 *Taking into account the differences between group 1 and 2*

In the Dutch preschool group 1 (four-year olds) and group 2 (five- to six-year olds) are combined in one class. To meet the needs of the different age groups in a preschool class, five of the teachers actively chose to differentiate the rhythm skills they teach: *“the clapping [is] motorically quite difficult, but, all right, it doesn’t stop me from doing it for the eldest preschoolers”* [SI, Floor, 83]. Through differentiating these teachers explained that they can develop the rhythm skills of both the age groups but also accommodate the differences *within* the groups.

6.8.2.3 *Classroom space in relation to teaching rhythm skills*

Five teachers noted that because they believed preschoolers learn rhythm skills through movement, there needs to be enough space to move. Jeroen [SI, 84] explained that it might even be detrimental for the rhythmic development if there is *not* enough space to move. He remarked that the preschooler who starts running to djembe music is showing a fitting reaction to the music: *“maybe for such a preschooler it’s the most fitting reaction to what he hears at that*

moment. If you can't run at that moment, you miss that step". Peter, however, noted that there should not be too much space because this elicits chaos, e.g. preschoolers running around.

6.8.2.4 Duration of a music lesson in relation to learning rhythm skills

Four teachers mentioned how the duration of the music class influences the teaching and learning of rhythm skills. These teachers said that in general thirty minutes is enough time to spend on the development of rhythm skills although it should not be shorter as some skills need enough "time-on-task" to seep in. Some teachers noted that forty minutes would be better because this would allow teachers to elaborate on rhythmic activities or make rhythmic activities more complex and it would allow for more time for teachers to experiment with rhythmic activities: *"That you can also experiment a bit. You can make it difficult"* [SI, Jette, 85].

6.8.2.5 Size of the class and learning rhythm skills

Four teachers mentioned the size of the class in relation to learning rhythm skills, although they differed in opinion about the optimal size for teaching and learning rhythm skills. Liselot and Jette observed that in principle the size of the class does not matter in relation to learning rhythm skills but the attitude of the preschoolers does: *"If children are used to focusing on someone who does something [...] then you can achieve a lot. Then you can build rhythms with 100 children"* [SI, Liselot, 86]. Liselot mentioned that because rhythms are learned through imitational learning it was possible to teach large groups providing there is enough space. Floor noted that she would prefer smaller groups: the larger the group, the more difficult it becomes to teach rhythm skills through movement because of the lack of space. Jeroen [SI, 87] mentioned that the size of the class influences the way he teaches rhythm skills; he only had time to observe how preschoolers were learning rhythm skills in general and had less time to focus on individual pupils: *"So the size of the group has as a consequence that I have to keep it more general. That I have to work with average skills"*. Ideally he would like to work in small groups so he can focus on

the development of rhythm skills of individual preschoolers. In the table below an overview is given of the theme “The interaction between an educational context and the learning of rhythm skills of preschoolers”:

Table 6.8 Overview theme seven

Theme seven: The interaction between an educational context and the learning of rhythm skills of preschoolers						
	Floor	Jeroen	Jette	Liselot	Martine	Peter
Subtheme: Musical backgrounds						
Musical backgrounds	x	x	x	-	x	x
Subtheme: Preconditions of the school that impact on the learning of rhythm skills						
Precondition: instruments	x	x	x	x	x	x
Precondition: differences between group 1 and 2 class	x	x	x	x	-	x
Precondition: classroom space	-	x	x	x	x	x
Precondition: duration music lesson	x	x	x	-	x	-
Precondition: size of class	x	x	x	x	-	-

6.9 Conclusion

In this chapter seven themes were presented that reflected these specialist preschool music teachers’ PCKg with regard to teaching and learning rhythm skills viewed from an embodied cognition perspective, namely: “pedagogical orientations regarding the teaching and learning of rhythm skills of preschoolers”, “teaching strategies for rhythm skills of preschoolers”, “musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers”, “preschoolers’ dispositions and learning difficulties with regard to learning rhythm skills”, “the curriculum in relation to rhythm skills of preschoolers”, “assessment of preschoolers’ rhythmic behaviour in relation to learning rhythm skills”, and “the interaction between an educational context and the learning of rhythm skills of preschoolers”. These themes illustrated the content and nature of the specialist preschool music teachers’ PCKg with

regard to teaching and learning rhythm skills. In the following chapter interpretations will be given of these findings.

Chapter 7 Discussion

7.1 Introduction

The purpose of this study was to apply the concept of PCKg to early childhood music education and to further the understanding of the specialist preschool music teacher's PCKg regarding rhythm skills from an embodied cognition perspective. Therefore, in this study one major question was addressed, namely "What is the PCKg of experienced Dutch specialist music teachers regarding the teaching and learning of the performance of rhythm skills of four- to six-year old pupils in the preschool from an embodied cognition perspective?". The findings of this study that were drawn from a sample of six specialist preschool music teachers provide a complex and rich picture of the nature and content of these teachers' PCKg. In discussing the findings of these teachers, I will draw out those that might be applicable to a wider population of specialist preschool music teachers who develop their own curriculum regarding rhythm skills and who teach groups of preschoolers in an open space and some findings concerning the nature of PCKg might possibly be applicable to a wider community of teachers in general.

The overall aim of this chapter is to consider and expand the discussion on how the nature and content of the specialist preschool music teachers' PCKg can be conceptualised and how an embodied cognition approach to PCKg relates to earlier conceptualisation of PCK and PCKg. Firstly, I will discuss that an embodied cognition approach to PCKg casts a new light on the *nature* of the PCKg of these teachers. Drawing on the findings, I interpret the teachers' PCKg to be a multimodal and dynamic way of knowing that emerges from the interrelated role between the social, cultural and physical classroom environment, the teaching task that is performed and the teacher's body. Beyond the classroom, I propose that reflection on and the planning of teaching can be facilitated through the teacher's body. Secondly, in former studies on PCK or PCKg that have been discussed in Chapter 2, the *content* of PCK has reflected a linguistic, aural and visual approach to teaching and learning. In contrast, I will discuss in section 7.3 that an embodied cognition approach to PCKg casts a new light on a non-verbal way of teaching and a physical

approach to teaching and learning rhythm skills. At the end of this chapter I will arrive at several conclusions that represent my contribution to theory with respect to the nature and content of PCKg of specialist preschool music teachers.

Lastly, although I will discuss the findings of the nature and content of these teachers' PCKg in different sections, to some degree the two cannot be separated. I therefore recognise that the distinction between the nature and content of these teachers' PCKg is a slightly artificial one: sometimes the bodily nature of the specialist preschool music teachers' PCKg coincided with the content of their PCKg as was the case with their gestures that reflect PCKg. I will interpret the findings in more detail below and in doing so, I will draw on research from a range of relevant theoretical domains and their application in educational research.

7.2 The nature of the specialist preschool music teachers' PCKg regarding rhythm skills viewed from an embodied cognition perspective

In this section I will discuss how the specialist preschool music teachers' online cognition that reflects their PCKg can be interpreted as multimodal in nature, partly task specific, in part socially and culturally defined and dependent on the school context. I will also discuss the idea that beyond the classroom the teachers' offline embodied cognition that reflects their PCKg draws on the physical experience of teaching. Wider experiences in different contexts beyond teaching can shape the teachers' PCKg and also will be discussed. Lastly, I will give an overall interpretation of the nature of PCKg viewed from an embodied cognition perspective.

7.2.1 The specialist preschool music teachers' PCKg with respect to rhythm skills is multimodal

As explained in detail in Chapter 2, due to the theoretical frameworks as a constructivist and information processing approach that have underpinned the concept of PCKg the role of the teacher's body has been neglected in the research on PCK and PCKg. Yet during the act of teaching rhythm skills I found

that the entire body of the specialist preschool music teacher was used to integrate rhythm content and pedagogy into PCKg and to communicate PCKg. During teaching, these teachers' PCKg regarding rhythm skills was distributed over language, sound, gestures, facial expression, body positioning, physical action, physical feelings, and blended into what Pozzer-Ardenghi and Roth (2010, p. 2) call a "communicative unit" that forms a meaningful whole for the preschoolers.

The distribution of information over the entire body with regard to rhythm content and pedagogy was possible because these teachers could communicate similar information in different modalities. Teachers could use language (talking about rhythm), gestures (representing aspects of rhythm visually), voice (chanting rhythm with words, syllables or open sounds with pitch or without pitch) or play rhythm patterns on an instrument. With regard to pedagogical aspects such as signalling silence teachers could use the word "stop" or use a gesture that signalled that the preschoolers had to stop playing rhythms, or the teacher could simply stop playing rhythms on an instrument to signal silence. Based on these findings, I suggest that because similar information can be communicated in different modalities and because teachers can combine different modalities, they have an endless variety at their disposal to develop and communicate their PCKg in a multimodal manner.

This ability to distribute knowledge over the body has an important implication as it enhances the teachers' possibility to blend content and pedagogy real-time during a rhythm activity. Moreover, the modality of physical feelings has been given no emphasis in the literature on PCK or PCKg that was reviewed for this current study but, as this study found, is part of the nature of the PCKg of specialist preschool music teachers viewed from an embodied cognition perspective.

Furthermore, this research found that *how* the PCKg was distributed over the entire body shifted according to the teaching and learning situation. When introducing a rhythm activity, the teachers in this study relied more on verbal and gestural communication: they would briefly explain what was expected of the pre-schoolers and employed instructional gestures (Nathan, 2008). Yet when they started teaching the rhythm activity their use of language diminished and these teachers then relied more on gestural and musical communication.

An interpretation is that when teachers are performing music they are able to keep the temporal unfolding of music going *because* they can employ their body to instruct and guide the preschoolers through the rhythm activity – the use of language would only interfere with the flow of music. Thus, the preschoolers can experience the time-based character of music without language interfering but still gain guidance and instruction from teachers with regard to learning rhythm skills. The teachers' use of guiding and (re)presentational gestures during a rhythm activity possibly has an advantage over language because teachers can express different layers of music simultaneously: they can express the pulse, metre, rhythmical phrasing and the expressive character of a rhythm all at the same time with their body and thereby give a visual model of what the different layers of music look like while the music sounds. Language cannot capture these different layers of music *simultaneously* to such an extent that gestures and movements can and might be less functional to use during a rhythm activity.

Beyond the classroom, at first glance the teachers in this study mainly seemed to use verbal channels to communicate their PCKg regarding rhythm skills. However, when these teachers talked about their classroom practice they not only verbally described their lesson images and memories of teaching but they made certain movements or gestures, chanted and strummed rhythms and *demonstrated* what they did during teaching. These findings imply that the way teachers “act out” what they had done during teaching might help to elicit and shape their PCKg: they can re-enact parts of their lesson at a slower pace, repeat certain actions and have time to figure out what they did during teaching, integrate new rhythm patterns and rhythm movements in their repertoire or change ones they already know. In this way they can gain insight into their PCKg and shape it. Thus, reflecting on teaching might not only take place in the mind – but might be done and facilitated by re-enacting the lesson with the entire body. In the following chapter concerning the implications of this study I will return to this point and discuss how it can be applied within a music teacher training college.

In summary, during the act of teaching I interpret the nature of PCKg regarding rhythm skills of the specialist music teachers to be multimodal and to be distributed over language, sound, gestures, facial expression, body positioning

physical action, and physical feelings. Beyond the classroom, the teachers' bodies can form a source for recalling, re-enacting and eliciting classroom experiences for developing and communicating their PCKg.

7.2.2 The specialist preschool music teachers PCKg is partly task specific

In the reviewed literature in Chapter 2, PCK and PCKg has been described as being topic specific (e.g. Ball et al., 2008; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987). However, in this current study, the teachers developed and communicated PCKg concerning a certain *skill* and I suggest that PCKg can develop differently with regard to teaching a topic or a skill. Teaching and learning a topic might elicit more verbal explanation whilst the findings in this current study showed that teaching a skill elicits more physical modelling, the use of gestures and non-verbal teaching strategies. From an embodied cognition perspective the possibilities and constraints of a teaching task in part define how cognition including PCKg can be developed and communicated. For instance, when the teachers in this study taught rhythm skills, they often performed the music that was used during the rhythm activity. In doing so, they had to find ways to keep the stream of music going whilst simultaneously *teaching* rhythm aspects of that performed music and they did that predominantly in a non-verbal manner. So, I suggest that *because* teachers perform a rhythm skill, it “forces” them to teach in a non-verbal way and this elicits a non-verbal form of PCKg.

Still, it remains a question whether the PCKg regarding teaching and learning rhythm skills of specialist music teachers is entirely skill specific. The findings indicate that some of the teachers' PCKg regarding rhythm skills such as the use of variation and repetition as a teaching strategy, or modelling and scaffolding, or taking a child-centred approach to teaching are applicable to teaching different musical skills as well. These findings are similar to the research findings of Fernandez-Balboa and Stiehl (1995, p. 295) who found – based on small-scale qualitative research on university teachers – a difference between “specific PCK” and “generic PCK”. These researchers described “specific PCK” as a form of PCK that is particular to teaching a specific subject or content area, and “generic PCK” as a form of PCK that is common to

teaching across all subjects or content areas. The findings of this study indeed point in the direction of the findings of Fernandez-Balboa and Stiehl (1995). Therefore, I interpret the nature of the specialist music teachers' PCKg with respect to rhythm skills to be partially task specific.

7.2.3 The specialist preschool music teachers' PCKg is partly context dependent

An embodied cognition perspective emphasises that the social, cultural and physical context shapes PCKg and defines how PCKg can be communicated. Empirical research regarding PCK and PCKg that has been described in Chapter 2 (section 2.5.3) indicates that the classroom practice, the school context, including the structures and goals of the school system, and the larger societal influences on a school all affect the way the teachers' PCKg can be developed and communicated. In part these factors were found to influence the PCKg of the specialist preschool music teachers in this study as well and will be discussed below.

7.2.3.1 Developing and communicating PCKg in the social context of the classroom

Drawing on the findings, one key interpretation arising from this study is that the social context of the classroom plays an important role in the development and communication of the specialist preschool music teachers' PCKg regarding rhythm skills. In this study, it became apparent that these teachers were active participants in most of the rhythm activities and were an integral part of the musical action. Therefore, these teachers and preschoolers could form a close-knit social system that directly reacted and interacted with each other. The ethnomusicologist Brinner (1995, p. 183) developed the term "interactive system" to describe the way in which music performers – or in the case of this study the teacher and preschoolers – communicate, coordinate and orient themselves during the performance of music. According to Brinner (1995, p. 5) an interactive system includes "[...] cues, responses, prompts, signals and markers [...]" through which performers communicate and musically interact with each other. Similarly, the music educator and researcher Fink-Jensen (2007, p. 63) developed the metaphor of "bodily dialogue" to describe this bodily

and social communication and interaction between teacher and pupil, between the taught content, the teachers' and pupils' bodies and between the pupils themselves.

Furthermore, I propose that teaching and learning to perform rhythm skills in such a social context as an interactive system might be functional for several reasons. For instance, an interactive system allows for teachers and preschoolers to co-define the pulse or tempo of a rhythmic activity. The bodies of preschoolers are smaller and teachers will have to adapt their tempo to fit with the body movements of preschoolers and vice versa. In addition, through an interactive system preschoolers can learn to perform rhythm skills with the *continual* assistance of their peers and the teacher. In this system, teachers can give the preschoolers multiple opportunities to practice their rhythm skills while the music lasts: preschoolers can alternate between observing how the teacher and their peers perform rhythm skills, then consequently participate in the interactive system, revert to observing again and go back to participating in the interactive system all during the temporal unfolding of the music. Viewed from that perspective, the social context is an important aspect for teaching and learning rhythm skills and for developing and communicating a teacher's PCKg.

7.2.3.2 *Teaching preschoolers*

In the introduction to this study, I mentioned that there is an assumption that early childhood teachers approach preschoolers markedly different from other age groups, although there is little empirical evidence to support this assumption (McCray, 2008; Melendez Rojas, 2008). I found in this study that – in the perception of the specialist preschool music teachers – the preschoolers provided a particular social context and these teachers modified their teaching behaviour to fit with them. First of all, these teachers could refine their repertoire of rhythmic movements and gestures to fit the preschoolers. The way they used an “exaggerated” gaze and pointing to focus preschoolers on important aspects of a rhythm activity reminded me of how parents and caregivers of young children point at an important object to bring that “shared external referent into the interpersonal exchange” (Brooks & Meltzoff, 2013, p. 168). Possibly, preschoolers might still be extra sensitive to such gazes and pointing gestures

and therefore they might be functional for teachers to use in a preschool setting.

Secondly, these teachers remarked that preschoolers imitated the teacher and other preschoolers easily, they were explorative and enthusiastic and these teachers suggested that the preschoolers “become the music”. It is conceivable that preschoolers feel less need for social conformity and belonging to a group identity at that age and therefore are more able to “move along” with teachers and other preschoolers. Alternatively, preschoolers gradually learn to conform to the parameters of behaviour expected in schools and teachers might have a higher tolerance for preschoolers’ explorative and enthusiastic behaviours because they assume that preschoolers are still in the process of learning to conform to those parameters. Also, the imitational, experiential and whole-group approach of teachers might in part reinforce imitative and enthusiastic behaviours of preschoolers and in that sense, the way preschoolers are approached and taught might evoke some of the “typical preschool behaviours”.

Finally, these teachers mentioned that they used language-based metaphors or images to elicit the performance of rhythm skills of preschoolers, e.g. asking preschoolers to walk like a giant stimulated them to take big steps and experience a slow tempo. These teachers’ repertoire of metaphors and imagery formed a part of their PCKg and it reflected what these teachers deemed “developmentally appropriate” for preschoolers in particular, e.g. moving like fairy tale-figures (witches, gnomes, giants), animals (hare, snail, pony) or wild-life animals (elephants, flamingo). I suggest that these images and metaphors can pull preschoolers into a safe and fun world of imagination and can elicit rhythm skills such as walking or clapping to the beat. However, the four- to six-year olds actually might watch and co-perform with video clips, Disney movies or video games at home, with friends or in shopping malls that present less innocent images and more complex rhythms. In that context, the researchers in early childhood education Bertram and Pascal (2002) observed that early childhood education is still influenced by Rousseau’s “Romantic” view of early childhood: the child is viewed as an innocent to be protected from negative influences from the outside world. For instance, when preschoolers are asked to rhythmically gallop like a horse during a music lesson one can imagine that preschoolers are not meant to draw on their experience with the world hit “Gangnam style” from the South Korean musician Psy and to reproduce the

sexually suggestive and provocative rhythmic horse trot-dance movements of the singer. Probably, preschoolers *know* without being told that they are not meant to move like the musician Psy – although it could be very much part of their musical everyday life and musical experiences. So, on the one hand teachers can employ language-based metaphors and images that they find developmentally appropriate for preschoolers and that are supposed to enhance the rhythm skills of these pupils but on the other hand these metaphors and images can constrain preschoolers from experiencing and performing (at times more complex) rhythm skills on their own terms, based on their own musical and multimedia experiences beyond the classroom.

7.2.3.3 The cultural context shapes the specialist preschool music teacher's PCKg

“Culture” is a broad and complex concept (Schippers, 2004) and – in short – can be viewed at a macro level (e.g. the culture of large groups or school culture) and at a micro level (e.g. cultural backgrounds of teachers or pupils). In this research study, I did not focus on the macro level of culture by researching and describing e.g. the culture of a school where these teachers taught and how that impacted on the development of their PCKg. However, what I did find in the data was that these teachers’ personal educational background at Dutch music conservatories could impact on the way their PCKg was communicated in the classroom. European conservatories hold cultural values concerning teaching and learning music – and these values can be passed on to future teachers (Schippers, 2004). In that context, it is interesting to note that based on a multiple case study of history teachers, the Norwegian-based Gudmundsdottir (1990) found that teacher training courses enculturate (pre-)service teachers in a particular way in a discipline. She explained that knowledge, concepts, principles and ideas within a discipline can be structured differently depending on the values and perspective a teacher training course takes, and these specific values and perspectives influence the development of the (pre-service) teacher’s PCKg. Yet Gudmundsdottir (1990) does not describe how an educational context might particularly shape *non-verbal* PCKg aspects of (pre-service) teachers. It is therefore notable that one teacher in this study mentioned that he had learned his musical and pedagogical gestures that

reflected his PCKg at his teacher training college: “*decrescendo, small [gestures] becoming bigger, that is a general musical gesture. [...] Those are pedagogical gestures that we were given at teacher training college and that I, for one reason or another, consciously or unconsciously, just still use*” [E1, Peter, 1].

It is conceivable that specialist (preschool) music teachers can consciously or unconsciously start developing culturally defined repertoires of pedagogical and musical gestures during teacher training college that become part of their PCKg. Teachers start learning pedagogical and musical gestures according to certain cultural constraints that are part of a teacher training college course. Lemán (2008, p. 55) describes cultural constraints as “rules or conditions that impose limits on what is acceptable, appreciated, and considered to be true or valid in a culture”. In all probability, teachers will learn musical and pedagogical gestures that fit a predominantly Western (school) music repertoire and that are meant to guide and clarify Western (school) music during whole classroom teaching and learning and therefore might be less well suited to teaching other music as world music, jazz or pop music that might develop – at least to some extent – a different repertoire of gestures and rhythmic movements. For instance, although teachers can chant a samba rhythm, their musical and pedagogical *gestures* might not fit that rhythm, thus communicating to focus on rhythm aspects that are not necessarily of importance to samba. In that sense, there could at times be a mismatch between the content and pedagogy of these teachers – and content and pedagogy therefore might not always blend smoothly.

In addition, one teacher in this study explained that the preschoolers needed to be encultured in the meaning of some of the teacher’s musical or pedagogical gestures to be able to react to the gestures in “appropriate” ways. Some of the teachers in this study chose to verbally explain the cultural meaning of a gesture (see DVD track 31 Explaining a gesture) and actually practised understanding the meaning of a gesture: “*the gestures that I have explained, during the years I of course practise them*” [E1, Martine, 2]. Lemán (2008) remarks that the interpretation, understanding and reaction to culturally defined musical gestures depends in part on the familiarity with the meaning of those gestures, and musical gestures in part “rely on an intersubjective basis of

shared understanding” (Leman, 2008, p. 20). The findings of this study suggest that the specialist preschool music teachers’ bodies are encultured in certain musical and pedagogical gestures of their teaching trainer course and subsequently a teacher encultures the preschoolers in those musical and pedagogical gestures so that they can participate in the interactive system on the basis of a shared understanding of these gestures.

7.2.3.4 Developing and communicating PCKg within the context of the school

The teachers in this study mentioned that the physical context of the school influenced the way they were able to develop and communicate their PCKg. All the teachers commented that they needed space to move since they felt that rhythm skills were developed primarily through movement and therefore an open space was experienced to be an important condition for teaching and learning these skills. Normally, a school has to facilitate such an open space but one teacher described that it is not always easy to gain access to an open classroom space: *“Some schools have a play room, in that case I have to enforce that I can use it”* [SI, Liselot, 3]. So why would schools possibly refrain from giving access to an open space to these teachers besides the fact that a school might not have such an open space or that it simply takes too much time for a class to access an open space? The bodies of the teacher and of the preschoolers that move to the rhythm of music, play rhythms and express rhythm might mean noise, enthusiasm, running, touching, falling, dancing, chaos, excitement, and this can go against the disciplinary nature of the school that stresses calmness, studiousness and discipline (Hennessy, 2009). Or, as Bresler (1998, p. 29) noted: *“School etiquette inhibits freedom of movement (in contrast to out of school music where movement often accompanies music integrally)”*. *Not* providing access to an open space to specialist preschool music teachers might reflect the school’s disciplinary culture and it might be difficult for specialist preschool music teachers to literally and figuratively negotiate their own space and to develop their PCKg in a direction that they wish for. In Chapter 8 on the implications of this study I will return to this point.

The school’s choice to provide or not provide access to an open space is a more obvious factor affecting the teachers’ PCKg. However, the school can also

impose other “physical constraints” on specialist preschool music teachers such as lesson durations of thirty minutes, a lack of instruments and large groups of preschoolers. These “physical constraints” of a school can lead teachers to take a whole-group approach to teaching rhythm skills in which imitation learning is a dominant approach to teaching. Although learning rhythm skills through imitation in an interactive system can have benefits and is far more interactive in nature than one might presume – it is a one-sided way of teaching rhythm skills in which the personal, creative and musical voices and bodies of the preschoolers are made less audible and visible. In a way, the interaction between the “physical constraints” imposed by a school and the solutions of teachers to those constraints can *maintain* a whole group and imitational approach to teaching rhythm skills. Thus, developing and communicating PCKg is not something that happens in isolation but in interaction with the “physical constraints” of a school and these constraints might covertly reflect a school’s view of what the nature of teaching music should be in the school curriculum: a social, whole-group – but disciplined – activity. Interestingly, such a view on teaching partly goes against “the creative process-model” that is currently suggested in the Dutch national “Curriculum Framework Arts Education” (see Chapter 1, section 1.5.2.) and against the national and international tendency within education to focus on creativity in the light of the 21st-century skills in general (Craft, 2008).

In summary, I suggest that the PCKg of the specialist preschool music teachers emerges in and is shaped by the physical, social, cultural context of the teacher. However, this study has made a contribution to theory by illuminating the role of the teachers’ and preschoolers’ *bodies* in this social, cultural embedded view of PCKg. First of all, teaching and learning rhythm skills can take part in an interactive system in which teachers and preschoolers can interact with each other through sound, *gestures* and *movements* and the PCKg of teachers can be shaped through this non-verbal way of interaction. Secondly, as previously stated, teachers can be influenced by a European culture of early childhood education that is still partly rooted in Rousseau’s ideas of the child. As a result, teachers can use metaphors and images that evoke “suitable” rhythmic movements in the preschoolers – protecting them from “non-suitable” rhythmic movements associated with video clips and multimedia experiences from the outside world. Furthermore, teachers bring *bodies* to the classroom

that have been encultured in a particular music culture and consequently they can enculture preschoolers in that music culture through their bodies. Lastly, the physical constraints of a school that in part reflect the school's view on how music education should take place can shape the PCKg of teachers. Thus, the PCKg of specialist preschool music teachers does not develop in an isolated manner but it can be developed and communicated through the constraints and possibilities of the physical, social, cultural contexts in which teachers operate.

7.2.4 Wider contexts that define the nature of the specialist preschool music teachers' PCKg

In this research study an approach of embodied cognition that distinguished between online embodied cognition and offline embodied cognition underpinned the concept of PCKg. The term online embodied cognition referred to the idea that much of a teacher's cognition is shaped and communicated in direct interaction with the social, cultural and physical classroom environment (Wilson, 2002). The term offline embodied cognition referred to the idea that beyond the classroom, teachers can simulate some aspects of the act of teaching by drawing on all the senses as a means of representing teaching music that took place earlier or will take place in the future (Wilson, 2002). However, during this research study I experienced the boundaries of such an approach: these teachers' PCKg was shaped in wider contexts than the classroom context alone. This raises the question of how other "embodied experiences" in different contexts can shape and define the way PCKg can be communicated. Although this current study did not explicitly explore the wider "embodied experiences" that might shape the PCKg of the specialist preschool music teacher, I will name two experiences that I found to stand out in the findings.

First of all, music teachers' professional identity can be framed as musician and music teacher (Hargreaves, Purves, Welch, & Marshall, 2007). In this study, I found that the "musician professional identity" could influence the development and communication of the PCKg belonging to the "music teacher professional identity". For instance, Jeroen [S1, 4] explained that "*sometimes [it is] difficult to isolate rhythmic development. Also from my background in world music I often find it instinctively 'strange' to make a strict division [between musical*

elements]”. Or, one teacher explained that for many years she used to play in an orchestra and when she was teaching rhythm skills she imagined her preschoolers to be an orchestra. In doing so, she also employed the musical values and musical communication that accompany the music culture of an orchestra: *“In this case I think [about] an orchestra. That you start together, make music in time, stop at the same time. So that is what I think of. So I give feedback on those aspects very often”* [EI, Martine, 5]. This could imply that the “musician identity” not only includes a repertoire of music but also a repertoire of musical movements, musical gestures, musical communication and musical values that can impact the “music teacher identity” and influence the way PCKg develops and is communicated. Differences in teaching styles then might also be visible in the musical and pedagogical gestures of teachers that in part are developed through the “musician identity”.

Secondly, the (ongoing) education of specialist preschool music teachers in their own field or in a different field shaped their PCKg. For instance, one teacher remarked that after his music teacher training college he attended a Bachelor of Musical Theatre course in Tilburg (The Netherlands) and this shaped his PCKg regarding rhythm skills: *“there [Bachelor Musical Theatre] you learn a lot to work with drama. And my experience was suddenly that because of what I did in Tilburg I applied that to the children here”* [Peter, SI, 6]. At the same time these teachers did not always know where they had learned what: *“I find it very difficult to state that this comes from here and this come from there”* [SI, Jeroen, 7]. These teachers integrated their personal experiences into and beyond the classroom into a (partially) personalised form of PCKg: *“You just also saw that I have difficulty remembering all those names, it’s really a sign that I have learned everything, but have internalised it and made it my own that it is now just becoming my thing”* [SI, Jeroen, 8]. So, although the teachers in this study noted that they did not teach according to an existing music pedagogy such as, for example, Kodály, nor had learned to teach according to one, possibly teachers in general will learn some theories and pedagogy on teaching and learning music at their teacher training college and transform and internalise this information to such a degree that it *feels* highly personal.

In summary, I suggest that the “musician identity” not only feeds into the musical repertoire that music teachers develop and bring to the classroom but it

also feeds into the musical values, musical movements and gestures of specialist preschool music teachers. Furthermore, a wide range of contexts that are not necessarily directly related to the teacher's teaching training education, the classroom practice or the teacher's "music teacher identity" can shape the PCKg regarding rhythm skills in a personal way through for example educational courses taken in a different field to music.

7.2.5 Summary: conceptualising the nature of PCKg regarding rhythm skills from an embodied cognition perspective

Interpreting all the strands of the findings together, similar to the constructivist view on PCKg as described by Cochran and colleagues (1993) and the information processing view as described by Meijer (1999) in Chapter 2, from an embodied cognition perspective PCKg is viewed as in part personally, socially and culturally defined and in part dependent of the school context. In line with the earlier conceptualisations of PCK and PCKg, the teachers' PCKg regarding rhythm skills consists of different kinds of experiences that are acquired in and beyond the context of the classroom and that are integrated in a personal form of PCKg. However, an embodied cognition perspective on PCKg does differ from the aforementioned views on PCK and PCKg in several ways.

I first of all propose that from an embodied cognition perspective PCKg is not only viewed as a verbal form of knowing but is viewed as a multimodal form of knowing that is distributed over the entire body: teachers can draw on verbal, sonic and non-verbal resources to blend content and pedagogy whilst they are teaching. This multimodal conceptualisation of PCKg contributes to theory as it implies a broader concept of PCKg than has currently been described in literature. This conceptualisation includes non-verbal ways of knowing and might lead – as is the case in this research study where I found "musical communication and musical interaction" as a non-verbal form of PCKg – to developing new components of PCKg within and beyond music education. Secondly, I suggest that PCKg should not only be viewed to be topic or skill specific but should be viewed to be task specific – the same topic or skill can be taught in different ways, which can define the way PCKg develops and is

communicated. So, it is not merely the topic or the skill in itself but in combination with the teaching task that defines the teachers' PCKg. Lastly, from an embodied cognition perspective, PCKg is not something that is taken to the classroom and applied to the classroom. In contrast, it implies that the teacher's PCKg emerges from the interaction between the social, cultural and physical classroom environment, the task that is performed and the *teacher's body* (Gallagher, 2009; Johnson, 1989). This is why the term pedagogical content knowing (PCKg) fits an embodied cognition perspective opposed to the term pedagogical content knowledge (PCK) that suggests a far more static view of knowledge. From a broader viewpoint, this dynamic and embodied view of pedagogical content knowing forms a contribution to theory that can go beyond the specific context of specialist preschool music teachers extending to other fields of education.

7.3 The content of the specialist preschool music teachers' PCKg regarding rhythm skills viewed from an embodied cognition perspective

The literature that was reviewed in Chapter 2, showed that research on PCKg in the fields of language, maths and science education has focused on teaching strategies that facilitate the learning of certain topics and concepts, and how the understanding of those topics and concepts can be deepened in the mind of the pupils through verbal and visual means (Shulman, 1986, 1987; Grossman, 1990; Magnusson et al., 1999). Alternatively, the content of the different components of the teachers' PCKg regarding teaching and learning rhythm skills emphasises a non-verbal way of teaching and a physical way of learning. Already in Chapter 2 anecdotal evidence from the field of music education pointed in the direction of the centrality of the teacher's body in teaching music. Drawing on the findings, a key interpretation is that specialist preschool music teachers' bodies can take on different roles during teaching such as a model, guide, assessor, to facilitate the learning of rhythm skills, and their bodies can provide an adaptive curriculum of rhythm skills for preschoolers as will be further discussed below. In the following chapter on the implications of this study I will return to these points and their possible application in research, the music teacher training college and in practice.

7.3.1 The teacher's body models rhythm skills for preschoolers

7.3.1.1 *Modelling rhythm skills*

Drawing on the findings, I suggest that one of the roles of the teacher's body within the teaching process of rhythm skills is that it models rhythm skills for preschoolers. The teachers in this study found that moving to rhythm aspects of music and performing (e.g. clap or play) a steady beat within different metres were main goals of a preschool music curriculum, and they all remarked that they predominantly used "imitational modelling" to help preschoolers attain these goals. This meant that preschoolers imitated the body movements, gestures and sounds of these teachers (Metz, 1989).

Although modelling might seem an easy teaching strategy, these teachers did not simply model a rhythm skill with their body. They emphasised their rhythmic movements more strongly when they wanted the preschoolers to imitate new rhythmic movements or rhythm patterns, and they signalled to the preschoolers when they started modelling a new movement. These teachers also gazed at important body parts that were moving to the rhythm or gazed at the rhythm sticks with which they were demonstrating a rhythm pattern. The anthropologist Downey (2008, p. 205) also noted, based on case study research looking at how the Brazilian dance form capoeira is taught and learned through imitation, that learners often "do not imitate indifferent models" and the teacher who models a skill not simply enacts "a practice but also provides other sorts of stimulation and direction tailored to the novice's needs". Similar to what the specialist preschool music teachers were doing, Downey (2008, p. 206) found that the Capoeira teacher "often assists in practical ways, such as altering or exaggerating the movement to be emulated [...] or redirecting the novice's attention". Imitation modelling then is viewed as "interactive rather than unidirectional" (Downey, 2008, p. 205). Relating this to the findings of this study, I suggest that although preschoolers can imitate the rhythm skills of teachers, they will also actively react to the teacher, and evoke a physical reaction in the teacher that can alter the way the teacher models. Possibly, the use of their bodies allows preschoolers a stronger role in the interaction with the specialist preschool music teachers: preschoolers do not need to search for language explaining how and what they understand of the learning process of rhythm skills but they can continuously *show* their learning process through their

gestures and movements and thus affect the way the teacher models during the rhythm activity itself. This then results in an interactive teaching and learning process and might explain *why* teachers can experience a whole-group activity to be child-centred, namely because their teaching in part is defined by the preschoolers they are teaching.

7.3.1.2 The teacher's body provides variable models of rhythm skills

All of the specialist preschool music teachers in this study remarked that the preschoolers needed frequent exposure to a (model of a) rhythm skill and needed to repeat a rhythm skill so that it can seep in. However, the educationalists Hattie and Yates (2014, p. 73) note that exposure to a model is important but in itself is not enough: "Exposure to successful performances may not, within itself, constitute a viable modelling stimulus for learning. If it did, we would become musicians through attending a concert". The specialist preschool music teachers played a crucial role in *how* the repetition of a skill took place, actively modelling and at times correcting the preschoolers' performance of rhythm skills during each repetition, and keeping the preschoolers engaged during the repetition of a rhythm activity. One of the ways that these teachers kept the preschoolers *engaged* when repeating a rhythm activity was through modelling variations of a rhythm skill. However, variation could have a more profound function. The Swedish educational psychologist Marton developed the *Variation Theory of Learning*, and in short, this theory conceptualises learning as the pupil's ability to distinguish different features or aspects of what is being learned (Marton & Pang, 2006). According to this theory, the task of the teacher is to deliberately seek ways to vary certain aspects of e.g. a new skill but to keep certain aspects constant and thus help pupils to distinguish core aspects of a skill (Marton & Pang, 2006). In relation to this study, this could imply that if the specialist preschool music teacher varies a rhythm skill in certain ways, the preschoolers can start to discern the basic concept or structure behind the rhythm skill. Variation within the process of repeating a rhythm skill might therefore have a function that goes beyond *engaging* preschoolers in the learning process but might be an important aspect for the understanding and performing of rhythm skills.

7.3.1.3 Phasing out the teacher's body as a model of rhythm skills

Although all the specialist preschool music teachers in this study provided a model of rhythm skills with their body, some teachers would employ scaffolding: they stopped physically modelling the rhythm skill at a certain point and reverted to observing the way the preschoolers performed the rhythm skill and watching whether they could perform that skill independently. Niedenthal and Alibali (2009) suggest how this process of scaffolding can be interpreted from an embodied cognition perspective. These authors explained: "We suggest that the adult who provides social scaffolding in learning interactions serves as an environmental support for thinking by the child" (Niedenthal & Alibali, 2009, p. 1269). Early in acquiring new skills, the social environment, e.g. the specialist preschool music teacher, provides part of the knowledge the child, e.g. preschooler, needs to perform a task with such as, for instance, the performance of rhythm skills. With time and experience (exposure), the preschooler "internalizes that knowledge, so that the social scaffolding is no longer necessary" (Niedenthal & Alibali, 2009, p. 1269).

Furthermore, in this study the way these teachers' bodies occupied space changed during the process of physically modelling and scaffolding and impacted on the learning process of the preschoolers. This connects to Pozzer-Ardhenghi and Roth (2010) who have already called attention to the role of the teacher's body in space in relation to the teaching-learning process as described in Chapter 3 (section 3.5.2). In that context, I suggest that when teachers set up an interactive system and participate in that system they are the focal point of attention, and teachers can invite preschoolers to synchronise to their rhythmic movements or rhythm patterns. However, when teachers exit this interactive system a more symmetric relationship between the preschoolers can develop. As a consequence, the preschoolers can co-construct a process of entrainment among themselves on their own terms or with the music that is being played. Thus, a shift in attunement occurs: from being rhythmically attuned to the teacher on the one hand, to being rhythmically attuned to peers or the music that is sounding on the other hand. Therefore, the way the teachers' bodies occupy space can induce a shift in teaching and learning roles. Furthermore, teachers can place themselves explicitly at the side of the classroom because they want to indicate that preschoolers have to focus on the

music – in a way the music itself becomes a “virtual” teacher inducing rhythmic movements in preschoolers. So, the use of proximity (the way the body occupies space and in relation to others) then can become a pedagogical tool for flexibly defining the roles of the teacher, the preschoolers and the music in the teaching and learning process of rhythm skills in a non-verbal way.

Pulling the different threads on modelling together, I interpret the role of the specialist preschool music teacher’s body to be able to model a rhythm skill in an interactive and variable manner. In that process, the teachers can modify and adapt the rhythm skill to the preschoolers in front of them and the preschoolers can elicit physical reactions in teachers, thus making imitational modelling an interactive process. Additionally, the way the teacher’s body occupies space can reflect the teaching role of the teacher and the learning role of the preschoolers during a rhythm activity.

7.3.2 The teacher’s body guides the preschoolers within a world of rhythms

Another interpretation arising from the study is that the teacher’s body can take on the role of guide during a rhythm activity. This idea is illustrated by the new form of non-verbal content of PCKg regarding rhythm skills that I identified in the data: the teachers in this study used *gestures* that coexisted with speech and music to guide preschoolers during the learning process of rhythm skills. First of all, the specialist preschool teachers used *instructional* gestures that coexisted with speech to communicate their instructions of a rhythm activity. By linking their words to gestures that reflected real-world actions, these teachers clarified the intention of a rhythm activity *and* the sequence of the rhythm activity (Alibali & Nathan, 2007). This offered the preschoolers an overview of the (motions of a) rhythm activity and the preschoolers then knew what was expected of them. The maths educator and researcher Nathan (2008, p. 390) hypothesised that the use of gesture and other body-based behaviours can “invoke similar sensations in the listener/observer. This allows interlocutors to provisionally enter into a shared social space”. Possibly, because teachers employ language *and* instructional gestures, the preschoolers do not need to fully rely on language to be able to understand the intention of the shared activity and in that way, the participation of all the preschoolers in the interactive

system is better ensured.

Secondly, guiding gestures of teachers that coexisted with music were able to enhance the synchronisation of the preschoolers' rhythmic movements (including playing rhythm patterns on an instrument) to the teacher and their peers with whom they interact musically. The teachers in this study cued well in advance that a rhythmic movement or rhythmic pattern was about to change and provided the preschoolers sufficient opportunity to respond to those changes. Possibly, being able to anticipate and communicate a change in rhythmic movements or rhythm patterns *in time* during the unfolding of music becomes an important teacher skill of being able to guide preschoolers in the learning process of rhythm skills. Furthermore, this study can imply that the teachers' bodies are an entry point for the preschoolers to co-experience the rhythmic movements or rhythm patterns of the teachers that coincide with the rhythmic structure of the music. By enhancing synchronisation through their guiding gestures the teachers can help preschoolers to "latch on" to their body and to become immersed in rhythm aspects of a given music culture. In this way, teachers can mediate the learning process of rhythm skills through the body.

Thirdly, when these teachers taught rhythm skills they often became the content matter of the rhythm activity, and their gestures communicated *about* rhythm aspects of the music that was being performed. Through (re)presentational gestures these teachers were able to give visual signposts of important rhythm aspects in the music and these signposts could help pupils to "ground their understanding of abstract ideas in the physical world" (Hostetter, Bieda, Alibali, Nathan, & Knuth, 2006, p. 1523). Drawing on these findings, I propose that abstract rhythmic notions such as for example the pulse become embodied and concrete when preschoolers can hear, see and feel the pulse. Moreover, it is through these (re)presentational gestures that it might become – unconsciously – clear to the preschoolers that the learning should focus on *rhythm* skills, and not on any other musical skill.

Taken all together, I suggest that specialist preschool music teachers employ their gestures to instruct preschoolers but also use them to guide preschoolers through the sonic, invisible world of rhythms and to focus them on rhythm skills. Teachers can transform their bodies into a musical landscape: they can

simultaneously represent different rhythm aspects such as the beat, the rhythmic phrasing and the expressive character of a rhythm through their body and make the intangibility of music more tangible for preschoolers in this manner.

7.3.3 The teacher's body observes, assesses and provides feedback on the rhythmic development of preschoolers

7.3.3.1 *Multisensoric assessment*

Originally, the component of PCKg reflecting *knowledge of assessment and subject matter* was not viewed as part of the concept of PCK by Shulman (1987) and remarkably, Magnusson and colleagues (1999) were the only authors reviewed in Chapter 2 who integrated *knowledge of assessment and subject matter* into their concept of PCK. The teachers in this study mentioned that formative assessment of the preschoolers' development of rhythm skills was an important part of their teaching practice. An interpretation of this study is that specialist preschool music teachers' bodies can take on the role of assessor during the formative assessment of rhythm activities. Teachers can develop what I would like to call a multisensoric way of assessing preschoolers: they "read" the preschoolers' bodies by listening and looking at how the preschoolers are performing rhythm skills, and through tactile modelling they can physically feel the rhythmic development of preschoolers. In addition, because teachers can participate with the preschoolers in rhythm activities, and relate the physical feeling the rhythm activity evokes in their own body (e.g. a sense of weight or tempo) to what the preschoolers are actually doing during that rhythm activity. In that way, teachers can draw on *different* senses to gain information about the rhythmic development of preschoolers.

Furthermore, during a rhythm activity in an open space, teachers can automatically receive *direct* feedback of practically *all* the preschoolers through their continuous physical rhythmic responses. In other words, the rhythmic learning process of the preschoolers as a group is partially made audible and visible – perhaps unlike other subjects such as language and maths where the teacher asks for a verbal or written response of individual pupils to gain insight into their learning process. These collective and continuous overt rhythmic

responses of preschoolers might allow teachers to assess what Vygotsky (1930-1934/1978, p. 86) termed “the zone of proximal development”. In short, the notion of the zone of proximal development refers to the distance between what children know and can do by themselves, and what they can achieve under adult guidance or in collaboration with more capable peers. From the field of language education, Smit, Van Eerde and Bakker (2013) have suggested that the idea of ZPD can be extended to a whole class teaching ZPD and that teachers can assess the level of a group as a whole. This idea might be applicable to specialist preschool music teachers: receiving direct feedback from the *group* of preschoolers allows teachers to assess the level of a group of preschoolers in *direct* musical interaction with them. As a consequence, teachers can make rhythm patterns easier or more complex, change the pacing of the rhythm activity, extend or shorten a rhythm activity on the spot to suit the learning process of the preschoolers as a group.

7.3.3.2 *Non-verbal feedback versus verbal feedback*

In relation to providing feedback to help develop the rhythm skills of the preschoolers, the teachers in this study mentioned that they mostly refrained from giving verbal feedback and predominantly gave non-verbal feedback, e.g. modelling a good example of a rhythm movement or rhythm pattern, using guiding gestures or through tactile modelling. In general, in education the focus is on how teachers provide *verbal* feedback during the learning process of pupils (see e.g. Hattie & Timperly, 2007), however, in the field of sports education there has been more of a focus on the impact of non-verbal feedback. Based on a literature review, Masters, Law and Maxwell (2002) suggest that verbal feedback does not necessarily optimise the learning of motor skills. Verbal feedback can focus the attention on a movement and can de-automatise the movement while the purpose of learning motor skills is to automate a movement. When motor skills are learned in an implicit way the learner cannot de-automatise the movement “because he or she will have no verbal knowledge of the parameters of the movement, with which to interfere with the sequencing and consciously hierarchical organisation of the motor commands as the skill is executed” (Masters et al., 2002, p. 129).

The observations of Masters, Law and Maxwell (2002) could well connect to what one of the teachers in this study mentioned: *“It makes no sense to stop and say: ‘you have to do it this way’. But, repeat, repeat, repeat and at a certain moment the penny drops with most of them”* [SI, Jeroen, 9]. In relation to the findings of this study, it might simply take longer to verbally correct preschoolers – this is not to say language should or could not have any place within teaching rhythm skills. Interestingly, language as a pedagogical tool was not prominent in this study, perhaps because these teachers preferred an “experiential learning” approach to teaching and learning rhythm skills. However, language might be useful to discuss and assess the quality of the performance of rhythm skills and to provide preschoolers with a vocabulary to talk about rhythm aspects.

7.3.4 The teacher’s body provides an adaptive curriculum of rhythm skills

Drawing on the findings of this study, I also suggest that the specialist preschool music teachers’ bodies can take on the role of an adaptive curriculum. In contrast to written or visual curriculum materials that are static and less easy to change on the spot, during the moments that the specialist preschool music teachers in this study performed the content of a rhythm activity, they became “living curriculum material” that was adaptable to the level of learning of the preschoolers. Remarkably, during a rhythmic movement activity or playing rhythmic patterns on instruments, these teachers could sense and adapt to the musical level of preschoolers *and* simultaneously to the emotional state of preschoolers. For instance, through performing rhythm activities faster or slower these teachers adapted the level of *difficulty* of the activity but at the same time they could regulate excited, impulsive or inattentive *behaviour* of preschoolers through that same activity. This finding might imply that teachers can work from a general template but can flexibly adapt their music lesson content to the specifics of the context. Thus, teachers can provide an adaptive curriculum that is attuned to the musical level of preschoolers and that takes their emotional needs into account.

From the field of music psychology, Swaine (2014) suggests that through co-regulation, e.g. between teacher and preschooler, emotional responses of preschoolers can be regulated in ways that it enhances rather than diminishes

the attentional capacity of preschoolers. It is conceivable that by keeping attuned to the emotional state of preschoolers, teachers can “stay in control” and keep the preschoolers regulated in such a manner that they stay concentrated on the rhythm skills. However, in this study Floor did note that she had learned to react and adapt to the preschoolers more strongly over the years as she had become more confident that her PCKg could and would be defined by the preschoolers whom she taught. Possibly, teachers need to be confident that they can be responsive and interactive in relation to their pupils without losing “control” over the classroom situation and perhaps, over the years, teachers start redefining what a sense of control means within early childhood music education.

Lastly, to accommodate an adaptive approach to learning rhythm skills, none of the teachers in this study had written down the goals or content of their curriculum in a detailed plan. However, these teachers seemed to enter their lessons “well prepared” instead of “well planned” (Loveless, 2008, p. 68). Loveless (2008, p. 68) explains that being well prepared is “an aspect of teacher professional knowledge that is ‘draft’ in character, engaged in design of opportunities and possibilities for pupils”. Yet, being well planned has gained importance and the content and goals of a curriculum have become a key issue in how their classroom practice is evaluated and in the ways that preschoolers’ learning is assessed (Van Hoorn & Hagenaars, 2012). In this regard, there is a tension between being well planned and the trend for accountability and transparency of early childhood education, and the well prepared, embodied, non-verbal and adaptive approach of these specialist preschool music teachers.

7.3.5 The integration of different components of PCKg through the teacher’s body

The educational researcher Grossman theorised that the different “components” of PCK are less distinct in practice and the science educator and researcher Abell (2008) also suggested that PCK is more than the sum of different components and that teachers employ the components of PCKg in an integrated fashion when they plan and teach. At the same time, Abell (2008) remarked that there is little empirical evidence on how different components of

PCK could be integrated. However, drawing on the findings of this study, an interpretation is that the bodies of teachers play an important role in facilitating the integration of different components of PCKg. For example, whilst modelling a rhythm skill (teaching strategy) the teachers' bodies can simultaneously see, physically feel and hear whether preschoolers are speeding up (assessing); their bodies thus take on a double role as model and assessor of rhythm skills, in that way integrating different components of PCKg. Or, teachers can model a rhythm skill (teaching strategy) and simultaneously use pedagogical and musical gestures (musical communication and musical interaction) to guide the learning of rhythm skills; again, their bodies take on a double role as model and guide, thereby integrating different aspects of PCKg. The teachers' bodies might flexibly change from the role of model, guide, assessor and adaptive curriculum, and at times integrate these different roles. This suggests that these teachers have the opportunity to draw on different components of their PCKg through their body in an effective way and are able to model, assess and correct during the activity itself *whilst* keeping the flow of the rhythm activity going.

7.3.6 Summary: conceptualising the content of PCKg regarding rhythm skills from an embodied cognition perspective

In conceptualising the content of the PCKg of the specialist preschool music teacher from an embodied cognition perspective, a key finding of this study is that the centrality of the teachers' bodies cannot be ignored. An embodied view of the content of PCKg broadens earlier conceptualisations of its content to include physical and non-verbal ways of teaching next to linguistic, aural and visual ways of teaching. An embodied approach to the content of PCKg therefore has more possibilities to describe the content of PCKg that specialist preschool music teachers develop and communicate, e.g. during the teaching and learning process of rhythm skills, the teachers' bodies can take on different roles – that of model, guide, assessor and adaptive curriculum. Furthermore, teachers might develop what resonates with what the Finnish dance researcher Parviainen (2002, p. 148) terms “embodied sensitivity”. This term refers to teachers making use of their own embodied experiences with music and of kinaesthetic empathy (the feeling that one is sharing the movement and the

intention that is reflected in that movement of the person whom one is observing) to understand the rhythmic learning experience of preschoolers, to guide and assess the preschoolers in their rhythmic learning process.

7.4 Conclusion: What the body knows about teaching music

This study has contributed to developing a novel perspective on PCKg that departs from earlier perspectives on PCK as described by Shulman (1986) and other researchers following his line of thought that PCK is viewed as more static knowledge brought to the classroom and applied to teaching. An embodied perspective on PCKg builds on the constructivist perspective on PCKg of Cochran and her colleagues (1993) in the sense that PCKg from an embodied cognition perspective is viewed as a dynamic way of knowing emerging from the social, physical and cultural classroom practice. Nevertheless, an important difference is that this novel perspective on PCKg includes the teachers' and pupils' bodies as crucial factors for developing and communicating PCKg in and beyond the classroom.

From an embodied cognition perspective, I propose that PCKg should not be viewed as merely verbal in nature but multimodal because specialist preschool music teachers can flexibly draw on verbal, sonic and non-verbal resources to develop and communicate their PCKg about rhythm skills. As teachers often perform music during the act of teaching, their use of language can diminish, and their bodies can (interchangeably and simultaneously) take on sophisticated roles in the teaching process of rhythm skills: their bodies model rhythm skills, guide rhythm skills through gestures, assess rhythm skills and co-regulate emotions that a rhythm activity elicits. The teachers' bodies can become a strong mediating factor for preschoolers for experiencing and learning rhythmical structures of a given music as their bodies transform the invisible and intangible world of rhythms to a visible and tangible one – bridging an abstract and sonic realm to a concrete and physical world for the preschoolers. The teachers' bodies thus can create a multimodal learning environment that gives preschoolers access to a shared meaning of music and allows them to participate in an interactive system set up by teachers.

Moreover, I suggest that teachers do not develop their PCKg in isolation but that their PCKg is shaped by and emerges in their social, cultural and physical context. Because teachers have portable bodies – they are not curriculum texts that can be left behind in the classroom – they are always exposed to social, cultural and physical experiences that in some way or another shape their PCKg. Within the classroom, the PCKg of teachers can be socially defined as it emerges from co-constructive verbal, sonic and non-verbal processes between themselves and the preschoolers. In whole-group teaching, the teaching and learning of rhythm skills can take place in a social interactive system and in that system, teachers and preschoolers can subtly adapt rhythmic movements, sounds, gestures and rhythm patterns to each other during a rhythm activity. In this manner, the teachers' PCKg regarding rhythm skills can structure the learning process of preschoolers but at the same time can be structured through the social interaction with preschoolers making PCKg processual in nature.

Furthermore, teachers' bodies do not come to the classroom as blank slates but can communicate movements and gestures that have been learned in different social, cultural contexts. Teachers' bodies can be moulded into a "music teacher identity" through the pedagogical and musical gestures that they have learned at their teacher trainer college. These gestures reflect cultural ideas of teaching and learning music, fit a Western (school) music repertoire and enable preschoolers to learn such a music repertoire. In addition, the teachers' bodies can also be moulded by a "musician identity": they learn a music repertoire, musical interaction, musical and pedagogical gestures that belong to the world of music in which they can perform as musicians. In the classroom, teachers can draw on these different music, gestural and movement repertoires and develop and communicate a personal form of PCKg that in part is reflected in those gestures and movements.

Lastly, physical space can impact on the way teachers develop and communicate their PCKg regarding rhythm skills. The way the teachers' bodies occupy an open space in relation to the preschoolers can communicate what the roles of the teacher and learners are in the process of teaching and learning rhythm skills. The relationship between space and the teachers' bodies thus becomes a tool for teachers to visualise what the roles of the learners and

teacher are or will be during a rhythm activity. Moreover, the school context, too, is a space that can impact on the PCKg of teachers. The physical constraints of a school not only define in part how the teachers' PCKg can develop and is communicated but also can reflect how a school perceives the place of music education for preschoolers. By providing short lessons of thirty minutes and large groups of preschoolers teachers can be encouraged to take a whole-group teaching approach and in turn, this approach reinforces the view of a school that music is a social, whole-group activity.

Taking a wider perspective, an embodied cognition perspective on PCKg suggests an innovative way for looking at teaching taking into consideration the way the body knows how to teach by blending pedagogical and content knowing in dynamic interaction with its social, cultural and physical context. Although the role of the body of the teacher is more obvious in the performing arts, physical education and other skill-based subjects, it does not mean that the body of the teacher in other subjects is absent. I propose that the PCKg of teachers in general should not be viewed as merely verbal in nature but can be viewed as multimodal too: teachers in different fields of education such as maths, history and language education can draw on verbal *and* non-verbal and possibly visual resources to make their subject insightful. These teachers will in all probability develop a repertoire of gestures that fits the content as well as the age group they are teaching. They will employ the whole of the body as a "communicative unit" (Pozzer-Ardenghi & Roth, 2010, p. 2) to teach about their subject and thus provide a multimodal teaching and learning environment for their pupils, reacting to and interacting with their pupils in verbal and non-verbal ways. Through the way the teachers' bodies occupy space they can communicate the shifting roles the teachers and learners can take on during the process of learning. Finally, although during subjects as maths, science and language education pupils might be sitting down more behind desks, these teachers can – consciously or unconsciously – read the gestures and movements their pupils employ when talking about the subject that is being taught and that reflect their understanding of that subject. The teacher's body then is an important tool to draw pupils into the subject being taught, to enhance their understanding of the subject and to guide the learning process of that subject.

Chapter 8 Implications

8.1 Introduction

The findings of this study could have important implications for research, practice, teacher education and policy. What the specialist preschool music teachers have communicated about the nature and content of their PCKg regarding the teaching and learning of rhythm skills points towards areas which require further research or further development of teachers. Below the implications of this current study will be described.

8.2 Implications for research

8.2.1 Researching PCKg from an embodied cognition perspective

By taking an embodied cognition perspective on the PCKg of teachers in general and of music teachers in particular, a new line of inquiry can open up. From this perspective the teachers' PCKg is multimodal, however, research on PCKg seems to have mainly focused on methods that elicit written or spoken language (Baxter & Lederman, 1999; Pozzer-Ardenghi & Roth, 2010). Yet researching PCKg from an embodied cognition perspective might entail introducing methods such as the video analysis of gestures and physical actions, observations through physically participating, and stimulated recall interviews that not only elicit the verbal thoughts of teachers on their PCKg but also the physical feelings teachers have while they are teaching music. Such research integrates the field of gesture studies within a PCKg framework instead of viewing gestures as an isolated phenomenon in teaching and learning. Furthermore, when different methods are used to capture embodied aspects of the teacher's PCKg the question then also becomes how the data that represent the PCKg of the teachers can be presented in a multimodal manner. In this study video fragments were added to give a more complete view of the specialist preschool music teachers' PCKg, however, (re)presenting what these teachers are physically feeling (e.g. the haptic feedback they give and receive) has proven difficult and a constructive way to do this has yet to be

found.

8.3 Implications for practice in relation to research

8.3.1 Developing a shared (theoretically-based) language for PCKg

The teachers in this study all developed PCKg in and through their classroom practice but their PCKg would have remained implicit and undocumented if they had not participated in this current study. The general lack of specialist preschool music teachers in making their PCKg explicit, however, can make their practice vulnerable: for instance viewed from the outside it might seem that using the body in the teaching and learning process of rhythm skills is a coincidental choice and not a fundamental choice that needs to be facilitated. As a result teachers might need to teach in a furnished classroom and infuse their music lesson with literacy and numeracy activities, subtly shifting a music lesson from the physical and sonic realm to the verbal and symbolic realm with which a school feels more comfortable. I suggest that specialist preschool music teachers make their PCKg explicit to be able to defend the choices they make with respect to their early childhood music curriculum and practice. They need to explain why and how their PCKg differs from text-based teaching, and why they prefer to teach in an open space, why they predominantly take a developmental curriculum approach and come to their job “well-prepared” instead of “well-planned” (Loveless, 2008, p. 68).

In the process of making their PCKg explicit, the music educator and researcher Cain (2010b) suggests that

it might be helpful for academics to help music teachers to find ways to understand and appreciate the knowledge they generate, not by adopting the norms and practices of the educational research community, but by finding norms and practices that are more in tune with the varied types of knowledge that are understood, used and valued by musicians and teachers. (p. 173)

A shared language could be co-developed with specialist preschool music teachers and researchers that is closely tied to early childhood music education

and that suits and explains the nature of teaching *music* instead of explaining a music practice with generic educational models that have been developed for more text and symbol-orientated education. At the same time, I recognise that it is an ongoing challenge to develop a language for early childhood music education that can capture *embodied* aspects of that practice. Perhaps using audio video examples to illustrate theories and principles of early childhood music education can be a first starting point for capturing these embodied aspects.

8.4 Teacher Education

8.4.1 Teaching in early childhood music education

All of the specialist preschool music teachers in this study explained that it was only after their graduation that they learned to teach music, including rhythm skills, to preschoolers. These teachers explained that they had not been educated to teach preschoolers during their teacher education. As one teacher noted in her notebook: *“Did not have any classes at school about giving music lessons to preschoolers, also not about rhythm. Did not make any observations of preschoolers (also no visual information) and did not need to do an internship with preschoolers. Poverty”* [NB, Martine, 1]. Because of the lack of schooling at their teacher education, these teachers remarked that they felt inadequate during the first year(s) of teaching preschoolers: *“My first year, in that field, I felt I performed badly”* [SI, Peter, 2] or *“I sometimes was deeply ashamed”* [SI, Floor, 3]. It was mainly through a process of trial and error that these teachers learned to teach music, including rhythm skills, to preschoolers.

I find it to be problematic when student teachers are not educated to teach preschoolers during their teacher education – neither practically nor theoretically – but are certified to do so anyway. From an embodied cognition perspective, practice plays an important part in shaping the teacher’s PCKg and student teachers should be exposed to that practice. In my view, teacher education should also give student teachers the opportunity to understand principles and theories that can underpin early childhood music education. These principles and theories can be used by student teachers to reflect on their developing PCKg and they can develop a deeper understanding of their

practice through connecting their classroom experience to theoretical underpinnings. Teacher education could develop a course or a specialisation for early childhood music education that integrates practice and theory on early childhood music education.

8.4.2 Raising awareness of the role of the body in teaching and learning rhythm skills

During teacher education teacher educators should raise the awareness of the prominent role of the body in teaching and learning rhythm skills, and how the body can take on different roles during the act of teaching. In that context, the educational researcher De Vries (2004) notes that (student) teachers do not automatically learn from certain experiences, but that (student) teachers need some form of reflection to learn from these experiences. For instance, the use of the body might not be a focus point of reflection because (student) teachers are not aware of the function of the body within teaching and learning music. In this study research methods were developed that can be used by student teachers to explore, analyse and reflect on their developing (non-verbal) PCKg. Through video analysis tasks student teachers can analyse how they use their body in the process of teaching and how that relates to the learning of rhythm skills of preschoolers. Through the SRI they can explore their thoughts and physical feelings during teaching and how they inform them about teaching and learning rhythm skills. These methods can help student teachers to gain a deeper understanding of teaching and learning of rhythm skills and they can give insight into how teaching and learning rhythm skills can be viewed as a multimodal practice. However, it should be mentioned that the use of these methods might be more challenging for student teachers compared to more experienced teachers. Student teachers might struggle finding the right words that can explain what they are doing, thinking and physically feeling during teaching.

8.5 Implications for practice

8.5.1 Scaling up

The body of the teacher and the preschoolers played a large role in the teaching and learning of rhythm skills in this research. From an embodied cognition perspective, the pupil's body plays a role at the highest levels of meaning-making of music (Bowman, 2004) and therefore, it is important to actively include the body in the music lesson through all the senses and movement. However, this actively including the body in teaching music is often generally still “conceived for the training of young children, a fact that suggests, however unintentionally, that the bodily basis of music is something eventually outgrown – a means that eventually becomes dispensable or irrelevant” (Bowman & Powell, 2007, p. 1091). A recent Dutch large-scale survey seems to exemplify this: this survey demonstrated that movement activities tend to disappear from the music lesson in the higher classes of the Dutch primary education (Hoogeveen, Beekhoven, Kieft, Donker, & Van der Grinten, 2014). Yet it might be fruitful to include elements of the preschool music practice as the use of movement, and a responsive, interactive and experiential way of teaching rhythm skills in a whole group in higher classes of primary music education and “to appeal to senses other than the auditory” (Jordon, 2001, p. 100).

8.5.2 Tactile modelling

In this current study, tactile modelling as a teaching strategy was less frequently used – or mentioned – than imitational modelling by the teachers. In general, touch in education has become somewhat awkward and McHugh-Grifa (2011, p. 17) mentions that music teachers might be reluctant to use touch within a classroom setting “due to the pervading ‘moral panic’ that leads many observers to question the appropriateness of touch in educational settings”. Yet touch in music education might facilitate learning music, including rhythm skills, e.g. Metz (1989) notes that tactile modelling can guide pupils to move their bodies in particular ways and can also elicit musical responses in pupils. Tactile modelling and touch applied in an appropriate manner could therefore be a worthwhile teaching strategy in teaching rhythm skills to preschoolers.

8.5.3 Extending the PCKg to more child-centred ways of teaching

In this study the teachers had developed PCKg regarding the teaching and learning of rhythm skills mainly for whole-group activities: individualised learning of rhythm skills or learning rhythm skills in small groups was nearly absent. One could argue that preschoolers already have acquired particular musical skills and do not always need a whole-group instructional sequence such as physical modelling, imitation and scaffolding – in that case different instructional sequences could also be used that stress more individualised learning or learning in small groups from peers and creative activities. The teachers could weave individual or small-group activities in their music lessons and thus create a space for the personal expression of rhythms skills, improvisation and rhythmic movements that acknowledges the musical identity and abilities of preschoolers. In all probability, specialist preschool music teachers will need to develop an additional PCKg regarding the teaching and learning of rhythm skills for small groups and individualised learning, rethinking the purpose of such activities, the use of space and materials in such activities and to rethink the role of the teacher during such activities. However, to develop this additional PCKg the teachers might need smaller classes and more time or more assistance per class.

8.5.4 Connecting to the musical backgrounds of preschoolers

From an embodied cognition perspective the broader social, cultural and physical background of the preschoolers shapes the cognition of preschoolers too (not only the school) and therefore the preschoolers do not come to school as blank slates – or, for that matter, as blank bodies. Interestingly, although the teachers did offer a range of different kinds of music to the preschoolers during their rhythm activities, I found that the teachers did not mention that they would actively connect to or draw on the musical or movement backgrounds of the preschoolers. A reason why these teachers did not actively connect to the musical or movement backgrounds of the preschoolers is possibly because “A current and fairly prevalent view in music education research and practice tends to focus on two-sided oppositions that are usually framed as informal–formal, or alternatively as in-school and out-of-school, or everyday and curricular music

practices” (Young, 2012, p. 122). This dichotomy results in teachers looking outwards at the musical backgrounds of preschoolers – something that happens in the home environment, the playground or at music and dance classes – but not as something that is embodied in the preschoolers, present in the classroom and something to connect to and to draw on.

Besides, the emphasis on whole-group rhythm activities might leave less space for the individualised voices and bodies of preschoolers, leaving less opportunity to gain insight into the personal, musical worlds of preschoolers. However, preschoolers show different rhythmic capabilities in different social, cultural settings (Barrett, 2005) and, interpreted from an embodied cognition perspective, different social, cultural and physical environments elicit different – less or more complex – rhythmic behaviours. What preschoolers show during a music lesson can be different to what they show in another musical context and the music lesson is only a part of their musical environment. From the field of music education Pitts (2000, p. 41) summarises: “The function of music in the curriculum is a facilitative one, where lessons are a source of learning and experience that form only part of the child’s musical world and identity”. The music class could then be a place where different worlds of rhythms could be brought together, experienced and extended.

8.5.5 Developing ways of systematically assessing the rhythm skills of preschoolers

The researcher in music education Murphy (2007) notes that in general young children are usually encouraged to have fun with music and therefore assessment is seen as unimportant. In contrast, the teachers in this current study did not find all kinds of assessment unimportant – they valued and applied a multisensoric form of formative assessment – nonetheless, it was not always clear when, what and how the rhythmic development of preschoolers was assessed because the formative assessment of these teachers was not documented systematically. As accountability and transparency are becoming key words in education, also in preschool education, teachers need to develop ways of assessing the preschoolers that specifically fits teaching and learning rhythm skills and more generally, that fits teaching music. At the same time, one

also has to be realistic: little contact time with large numbers of preschoolers can make meaningful assessment of rhythm skills complex.

Assessment will need careful rethinking and discussing with a school about how and which time can be spent on assessing and documenting the learning process of rhythm skills (or other musical skills for that matter) of preschoolers in a meaningful way. For instance, the music educator and researcher Bond (2012, p. 244) suggests, based on a Reggio Emilia approach to teaching, that “Video and audio documentation, in addition to sharing children’s dialogue about their music making, can demonstrate children’s growing musicianship skills”. Less time-consuming can be the use of rubrics or the possibility for teachers to latch on to the pupil monitoring system (a digital system that is used to track and monitor the performance of pupils over the course of eight years of primary education), a way of assessing that is more common in the Netherlands. Bond (2012) also remarks that documenting the musical learning processes of preschoolers can be an advocacy tool. She suggests that the support of the music teacher’s practice might increase when the broader community – school and parents – come to understand the nature of pupil’s musical learning.

Lastly, through documenting the learning *process* of rhythm skills, teachers can start gaining more detailed insight into which difficulties preschoolers can encounter when learning rhythm skills. How preschoolers come to understand – or do not understand – the performance of rhythm skills lies at the heart of PCKg and when specialist preschool music teachers start documenting this process it becomes open for discussion in a wider community of teachers. Thus, within a community of specialist preschool music teachers, ideas could be developed about the learning process of rhythm skills in a more explicit manner.

8.6 Policy

8.6.1 School policy with regard to teaching music including rhythm skills

The preconditions of a school for teaching music impact on the way the specialist preschool music teacher’s PCKg can or cannot be developed and communicated: the school can give or deny access to an open space for

teaching music, give or deny access to instruments, give or deny access to small or larger time slots etc. One of the questions that arose in this study is whether the role of the teacher's body is marginalised in early childhood music education because of the preconditions that are granted – or denied – by the school. If a school acknowledges the importance of the role of the body in the teaching and learning of rhythm skills, then it should first and foremost provide access to an open space. Gaining access to the right kind of space for the teaching and learning of rhythm skills is, however, not as accepted or easy as it seems: I had great trouble finding specialist preschool music teachers for this study who teach in an open space since most of the teachers I approached taught in a general (seated) classroom which constrains movements to a certain degree. I find it therefore interesting that nobody would argue the right of a physical education teacher to teach in an open space.

A less obvious precondition would be the school's tolerance and understanding for chaos, noise, physicality and excitement that facilitates learning music. Remarkably, some teachers in this research mentioned that they refrained from elaborating on certain rhythm activities in front of the camera because they knew that preschoolers would get excited. The teachers were afraid that the physical and excited behaviour of the preschoolers might be interpreted as a result of the teacher being "out of control" – exactly the opposite of what is expected of a teacher, namely being "in control". A school acknowledging that different subjects might elicit different perspectives on teaching and learning could give specialist preschool music teachers literally and figuratively speaking more space for teaching music.

8.6.2 School policy with regard to general teachers versus specialist preschool music teachers

In the Netherlands, schools are free in their choice to work with generalist or specialist arts teachers, including a specialist music teacher, in attaining the Core Objectives for Arts Education. However, based on a literature review the researcher in music education De Vries (2013) sums up that there is a frequent reluctance for general teachers to teach music because teachers identify themselves as being "unmusical", they lack adequate music education in

teacher education, they have low general confidence to teach music and they lack access to relevant professional development in music education. This current study sheds some more light on why it might be difficult for generalist teachers to (learn to) teach music: they not only have to become proficient in a different subject area but – as the specialist preschool music teachers have shown in this study – also in a different, more non-verbal pedagogy. If a school decides on having a generalist teacher teach music the school should rethink how the generalist can be professionalised in teaching music; not only should a school provide the opportunity to learn music content but it should also focus on pedagogy and thus help generalist teachers develop PCKg that suits music.

8.6.3 Policy concerning accountability and transparency of an early childhood music curriculum

Currently, processes of accountability and transparency are permeating early childhood education in general and “The ‘enactment’ perspective (teachers and learners together create their own curriculum realities) is increasingly replacing the ‘fidelity’ perspective on implementation (teachers faithfully following curricular prescriptions from external sources)” (Van den Akker, 2006, p. 25). Not wishing to deny that some form of accountability and transparency mechanisms can be helpful for both policy and practice, it remains questionable how accountable and transparent early childhood music education – or music education in general – can be made seeing its embodied nature. Or, as the researchers Vasquez Heilig, Cole, and Aguilar (2010, p. 142) from the field of arts education policy critically remark: “because it is so hard to measure what is really important, the consequences of pinning down the wrong thing can be severe”. Policymakers, researchers and music teachers should therefore debate which aspects of music education can and should be accounted for – without losing an essential part of music education that is embodied, non-verbal, processual, intangible and hard to pin down – instead of striving for a form of accountability that might be borrowed from other subjects that can be made accountable for more readily.

8.7 Final reflection

8.7.1 Looking back

This research study has looked at the specialist preschool music teachers' PCKg from an embodied cognition perspective. Looking back, would I have embarked on this research journey differently when starting anew? In some respects, I would. First of all, through this study it has become clear to me that the way a researcher is usually involved in research is through *looking* and *listening* but from an embodied cognition perspective other senses such as the physical feelings that the researcher experiences can also be a way to observe and interpret a situation. In that context, the Canadian anthropologist Howes (2003) talks about a hierarchy of senses and notes that sight in the West is often viewed as the most important of senses because it seems to be the most informative, followed by hearing, and at the bottom of the hierarchy stands touch, which is associated with "mere" physical sensation. The focus of Western researchers is therefore often on the audible and visible. With regard to my study, although I chose *not* to employ systematic observation, it could have been insightful to have systematically listened, looked *and* physically felt what was going on in the classroom, observing these teachers and the preschoolers with multiple senses. For instance, I too felt that the preschoolers sped up during a rhythm activity and this helped me to understand how teachers can use their body as an assessment tool. Furthermore, my research methods have focused on eliciting what these teachers say and do but have had less focus on eliciting what they physically feel. In other words, this research has opened my eyes to the different senses and their place in research, and has opened the way for developing research methods that take the different senses into account.

In retrospect, I also found that exploring solely the specialist preschool music teachers' perspective on PCKg has its own limitations. Schoenfeld (1998, pp. 4-5) mentions that while the perspective of the teacher "represents a significant aspect of classroom reality, it is by no means all of it: there is the reality from the students' point of view". From an embodied cognition perspective, I now understand the process of teaching and learning music to be closely linked. Therefore, if I would explore the PCKg of these teachers again, I might include a video analysis of how pupils learn music, or I might interview the pupils about

their perception of how the teacher teaches music. Gaining insight into teaching *and* learning music can give a more comprehensive view of a music teacher's PCKg from an embodied cognition perspective.

Finally, looking back, it is unclear what the most optimal situation is to gain access to these teachers' offline embodied cognition that reflects their PCKg; is a "formal" interview at a set time the most effective way to explore their offline embodied cognition? I found for instance, that these teachers reflect on their lessons in-between lessons – and this could be a moment that they actively draw on their offline embodied cognition that reflects their PCKg. But there could be more of such moments – a teacher travelling to school musing about his or her lesson could be such a moment. A next time, I might consider different situations or moments in the lives of these teachers for gaining access to their offline embodied cognition that reflects their PCKg. In addition, this research has informed me about the multimodal nature not only of their online embodied cognition but of their offline embodied cognition too. If I would interview these teachers again, I might video the interviews and analyse these teachers' gestures, sounds and movements as part of their offline embodied cognition that reflects their PCKg. Approaching an interview as a "multimodal research method" might reveal novel information about these teachers' PCKg.

8.7.2 Looking ahead

This research study has raised new questions that could be explored in the future. Firstly, an embodied cognition perspective on PCKg has widened the conceptualisation of its content. As a result, a line of enquiry can open up emphasising newly described non-verbal aspects of the content of PCKg. For instance, how do music teachers give non-verbal feedback? Or, do music teachers develop and communicate different repertoires of gestures reflecting their PCKg with regard to musical skills other than rhythm skills? Do these teachers adapt their non-verbal PCKg to different age groups? How do these teachers employ space as a pedagogical tool? As such, the teachers' bodies still are a missing link in research on PCKg.

A strand of research could also focus on classroom practices in which specialist preschool music teachers have developed a more child-centred approach to teaching and learning music through for instance small-group learning activities, or in the ways they incorporate the musical backgrounds of the preschoolers. Such research could consider how PCKg of music teachers taking a child-centred approach differs from the PCKg of music teachers that take a whole-group approach and, eventually, inform pre-service teachers about the advantages and disadvantages of different approaches to teaching music.

Furthermore, the science educator and researcher Abell (2008, p. 1410) has already pondered the question: “How is PCK different for teachers of different subjects?” An embodied cognition perspective on PCKg can be applied in subjects other than music and might reveal possible differences – or similarities – in the ways that embodiment emerges in teaching and learning. These differences and similarities might also explain what makes teaching and learning in a certain subject unique.

Lastly, another strand of research could take place at a more conceptual level. An embodied cognition framework is related to Vygotsky’s theory, however, “the body” does not have a clear place in that Vygotskian approach to teaching and learning. Future research could possibly integrate these two related perspectives, stressing the body perspective in a Vygotskian approach to teaching and learning or stressing Vygotskian theories on teaching and learning within an embodied cognition framework. Thus, understanding the role of the teachers’ and pupils’ bodies in teaching and learning could be furthered.

8.7.3 Where do I stand now?

Undertaking this research project has directly impacted my current practice as a teacher educator for music education in primary education. For instance, at a practical level we have decided as a team of teacher educators to negotiate an open space for teaching music in primary education for our student teachers. Formerly, our student teachers taught in seated classrooms, their bodies safely tucked away behind guitars. An open space elicits different teaching strategies and invites the student teachers to incorporate movement as a way of learning music. In addition, to feel confident enough to employ and present their bodies

as a pedagogical tool we now also provide the first-year student teachers with the module “Voice & Physique” in which they learn to support their non-verbal teaching and teaching strategies that include movement by creating a good physical awareness.

Furthermore, during the internship of the student teachers in primary education the teacher educators would sit at the back of the classroom, filling in an observation sheet regarding the actions of these teachers. However, during this research I have come to realise how close-knit the teaching-learning process is and that the student teachers are shaped by their pupils. Therefore, I want to revise our observation sheet the coming academic year by including the perspective of the pupils and to start observing the *interaction* between student teachers and pupils more consciously. Also, I want to reposition myself more to the front of the classroom so I will be able to observe the student teacher and pupil interaction more clearly. I hope that these changes will sensitise our student teachers to the way they are shaped and shape the pupils they are teaching. Furthermore, reflecting on a taught lesson with the student teacher was usually done by sitting down and talking about the lesson. However, I want to experiment with a more dynamic way of reflecting in which the student teachers are allowed to physically enact part of their lessons to understand what they had been doing during the lesson.

The video fragments of the teachers participating in this study are of tremendous value for my student teachers too. First of all, the video fragments give insight into the practice of the specialist *preschool* music teacher. It can illuminate what kind of rhythm activities can be employed in a preschool setting and *how* these teachers involve preschoolers in such activities. The Dutch national curricular strands offer insight into the “what” but not in the “how” of preschool music education and in that sense the video fragments offer a range of activities demonstrating how rhythm skills can be taught. Secondly, I use these fragments to exemplify how teachers can use their *body* as a model, guide and assessment tool in the process of teaching rhythm skills to preschoolers. This sensitises the student teachers to the function of their body within teaching and learning rhythm skills. In the future, the text-based findings of my research can complement the video fragments making insightful *why* these teachers wish to teach the way they do. This then opens up the possibility

of discussing how these teachers teach – exploring advantages and disadvantages of a teaching practice, or analysing such teaching practices through different theoretical lenses. Thus, the PCKg of these specialist preschool music teachers can form a bridge between theories on the one hand, and practice on the other.

8.7.4 Wrapping up my research

In conclusion I turn to the eminent educationalist Eisner (2006, p. 45) who addresses the heart of my research study: "Artistry in teaching depends on embodied knowledge. The body plays a central role; it tunes you in to what's going on. You come to feel a process that often exceeds the capacity of language to describe". The specialist preschool music teachers' bodies fulfil an important role in the process of teaching and learning music but still are a missing link in research on PCKg in music education. However, these teachers' bodies deserve to be investigated and made visible, and the principles of embodied cognition offer a valuable guide to do so.

Bibliography

- Abell, S. K. (2008). Twenty years later: Does pedagogical content knowledge remain a useful idea? *International Journal of Science Education*, 30(10), 1405-1416. doi.org/10.1080/09500690802187041
- Ahern, K. J. (1999). Ten tips for reflexive bracketing. *Qualitative Health Research*, 9(3), 407-411. doi.org/10.1177/104973239900900309
- Alibali, M. W., & Nathan, M. J. (2007). Teachers' gestures as a means of scaffolding students' understanding: Evidence from an early algebra lesson. In R. Goldman, R. Pea, B. J. Barron, & S. Derry (Eds.), *Video research in the learning sciences* (pp. 349-365). Mah Wah, NJ: Lawrence Erlbaum Associates.
- Alibali, M., & Nathan, M. J. (2011). Embodiment in mathematics teaching and learning: Evidence from learners' and teachers' gestures. *Journal of the Learning Sciences*, 21(2), 247-286. doi.org/10.1080/10508406.2011.611446
- Allsup, R. E., & Westerlund, H. (2012). Methods and situational ethics in music education. *Action, Criticism, and Theory for Music Education*, 11(1), 124-148.
- American Psychological Association. (n.d.). *Glossary of psychological terms*. Retrieved 2014, January 23, from <http://www.apa.org/research/action/glossary.aspx?tab=3>.
- Anderson, J. R., Reder, L. M., & Simon, H. A. (1996). Situated learning and education. *Educational Researcher*, 25(4), 5-11. doi.org/10.3102/0013189X025004005
- Anderson, M. (2003). Embodied cognition: A field guide. *Artificial Intelligence*, 149(1), 91-130. doi.org/10.1016/S0004-3702(03)00054-7
- Armstrong, D., Gosling, A., Weinman, J., & Marteau, T. (1997). The place of interrater reliability in qualitative research: An empirical study. *Sociology*, 31(3), 597-607. doi.org/10.1177/0038038597031003015
- Baddeley, A. (1990). *Human memory. Theory and practice*. Hillsdale, NJ: Lawrence Erlbaum.
- Baddeley, A. (2007). *Working memory, thought and action*. Oxford, UK: Oxford University Press. doi.org/10.1093/acprof:oso/9780198528012.001.0001
- Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching. What makes it special? *Journal of Teacher Education*, 59(5), 389-407. doi.org/10.1177/0022487108324554
- Ballantyne, J. (2006). Reconceptualising preservice teacher education courses for music teachers: The importance of pedagogical content knowledge and skills and professional knowledge and skills. *Research Studies in Music Education*, 26(1), 37-50. doi.org/10.1177/1321103X060260010101
- Baltussen, M., & Rijkers, J. (2004). Doorgaan met de doorgaande lijn [Continuing with the curricular strand]. *De wereld van het jonge kind*, 31(10), 336-339.

- Barrett, M. (2005). A systems view of musical creativity. In D. Elliot (Ed.), *Praxial music education. Reflections and dialogues* (pp. 177-195). New York, NY: Oxford University Press.
- Baxter, J. A., & Lederman, N. G. (1999). Assessment and measurement of pedagogical content knowledge. In J. Gess-Newsome, & N.G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science teaching* (pp. 147-161). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Beijaard, D., & Verloop, N. (1996). Assessing teachers' practical knowledge. *Studies in Educational Evaluation*, 22(3), 275-286. doi.org/10.1016/0191-491X(96)00016-8
- Bennett, N., Wood, L., & Rogers, S. (1997). *Teaching through play. Teachers' thinking and classroom practice*. Buckingham, UK: Open University Press.
- Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*, 15(2), 219-234. doi.org/10.1177/1468794112468475
- Bertram, T., & Pascal, C. (2002). *Early years education: An international perspective*. London, UK: Qualifications and Curriculum Authority.
- Bishop, J. C., & Burn, A. B. (2013). Reasons for rhythm: Multimodal perspectives on musical play. In R. Willett, C. Richards, J. Marsh, J. Bishop, & A. Burn (Eds.), *Children, media and playground cultures: Ethnographic studies of school playtimes* (pp. 89-199). Basingstoke, UK: Plaggrave Macmillan. doi.org/10.1057/9781137318077.0009
- Bodrova, E., & Leong, D. (2007). *Tools of the mind. The Vygotskian approach to early childhood education* (2nd ed.). Upper Saddle River, NY: Pearson Education.
- Bodrova, E. (2008). Make-believe play versus academic skills: a Vygotskian approach to today's dilemma of early childhood education. *European Early Childhood Education Research Journal*, 16(3), 357-369. doi.org/10.1080/13502930802291777
- Boeije, H. R. (2012). *Analysis in qualitative research*. London, UK: Sage Publications.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54(1), 579-616. doi.org/10.1146/annurev.psych.54.101601.145030
- Bond, V. L. (2012). *Sounds to share: The state of music education in three Reggio-inspired American preschools* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses (AAT 3516146).
- Bowen, G. A. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods*, 5(3), 1-9.
- Bowman, W. (2004). Cognition and the body: Perspectives from music education. In L. Bresler (Ed.), *Knowing bodies, moving minds. Towards embodied teaching and learning* (pp. 29-50). Dordrecht, The Netherlands: Kluwer Academic Publishers. doi.org/10.1007/978-1-4020-2023-0_3
- Bowman, W., & Powell, K. (2007). The body in a state of music. In L. Bresler (Ed.), *International handbook of research in arts education* (pp. 1087-1108).

- Dordrecht, The Netherlands: Springer. doi.org/10.1007/978-1-4020-3052-9_74
- Boyce-Tillman, J. (1996). A framework for intercultural dialogue in music. In M. Floyd (Ed.), *Worldmusics in education* (pp. 43-94). Hants, UK: Scolar Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi.org/10.1191/1478088706qp063oa
- Bremmer, M. (2005). *Nootzaak! De praktijkkennis van vakleerkrachten in het basisonderwijs betreffende het ontwerpen en het uitvoeren van een curriculum voor 'noten leren lezen' en hoe deze praktijkkennis zich verhoudt tot theoretische inzichten rondom het leren lezen van noten* [Necessity! The practical knowledge of specialist teachers in primary education regarding the design and execution of a curriculum for 'learning to read music notation' and how this practical knowledge relates to theoretical insights concerning learning to read music notation]. Amsterdam, The Netherlands: Lectoraat Kunst- en cultuureducatie.
- Bremmer, M., & Schopman, E. (2011). De improvisatieles: Praktijkkennis van docenten muziek vergeleken met theoretische inzichten [The improvisation lesson: Practical knowledge of music teachers in secondary education compared to theoretical insights]. In M. Bremmer, E. van Hoek, E. Schopman, & A. Vervoorn, *Onderzoek naar muziek in het voortgezet onderwijs* [Researching music in secondary education] (pp. 45-127). Amsterdam, The Netherlands: Lectoraat Kunst- en cultuureducatie.
- Bresler, L., & Stake, R. (1992). Qualitative research methodology in music education. In R. Colwell (Ed.), *The handbook on music teaching and learning* (pp. 75-90). New York, NY: Shirmer Books.
- Bresler, L. (1998). The genre of school music and its shaping by meso, micro and macro contexts. *Research Studies in Music Education*, 11(1), 2-35. doi.org/10.1177/1321103X9801100102
- Bresler, L. (2004). Prelude. In L. Bresler (Ed.), *Knowing bodies, moving minds. Towards embodied teaching and learning* (pp. 7-11). Dordrecht, The Netherlands: Kluwer Academic Publishers. doi.org/10.1007/978-1-4020-2023-0_1
- Bresler, L. (2006). Embodied narrative inquiry: A methodology of connection. *Research Studies in Music Education*, 27(21), 21-43. doi.org/10.1177/1321103X060270010201
- Brinner, B. (1995). *Knowing music, making music. Javanese gamelan and the theory of musical competence and interaction*. Chicago, IL: The University of Chicago Press.
- British Educational Research Association. (2011). *Ethical Guidelines for Educational Research*. London, UK: British Educational Research Association.
- Broekkamp, H., & Hout-Wolters, B. van (2007). The gap between educational research and practice: A literature review, symposium, and questionnaire. *Educational Research and Evaluation*, 13(3), 203-220. doi.org/10.1080/13803610701626127

- Brooks, R., & Meltzoff, A. N. (2013). Gaze following: A mechanism for building social connections between infants and adults. In M. Mikulincer, & P. R. Shaver (Eds.), *Nature and development of social connections: From brain to group* (pp. 167-183). Washington, DC: American Psychological Association.
- Bulterman-Bos, J. (2004). *Teaching diverse learners: A practice-based perspective* (Doctoral dissertation). Retrieved from <http://www.che.nl/~media/Academie%20Educatie/Lectoraat/Praktijkperspectief%20op%20omgaan%20met%20verschillen.pdf>
- Bulterman-Bos, J. (2008). Will a clinical approach make education research more relevant for practice? *Educational Researcher*, 37(7), 412-420. doi.org/10.3102/0013189X08325555
- Burger, B., Thompson, M. R., Luck, G., Saarikallio, S., & Toiviainen, P. (2012). Music moves us: Beat-related musical features influence regularity of music-induced movement. In E. Cambouropoulos, C. Tsougras, P. Mavromatis, & K. Pasiadis (Eds.), *Proceedings of the 12th International Conference on Music Perception and Cognition and the 8th Triennial Conference of the European Society for the Cognitive Sciences of Music* (pp. 183–187). Thessaloniki, Greece: School of Music Studies, Aristotle University of Thessaloniki.
- Burnard, P. (2013a). Introduction. In E. Georgii-Hemming, P. Burnard, & S. Holgersen (Eds.), *Professional knowledge in music teacher education* (pp. 1-18). Farnham, UK: Ashgate.
- Burnard, P. (2013b). Problematizing what counts as knowledge and the production of knowledge in music. In E. Georgii-Hemming, P. Burnard, & S. Holgersen (Eds.), *Professional knowledge in music teacher education* (pp. 97-110). Farnham, UK: Ashgate.
- Cain, T. (2010a). Music teachers' action research. In M. van Hoorn (Ed.), *Alle registers open* [All registers open], (pp. 54-77). (Cultuur+Educatie; 28). Utrecht, The Netherlands: Cultuurnetwerk Nederland.
- Cain, T. (2010b). Music teachers' action research and the development of big k knowledge. *International Journal of Music Education*, 28(2), 159-175. doi.org/10.1177/0255761410362942
- Campbell, P. S. (2001). Unsafe suppositions? Cutting across cultures on questions of music's transmission. *Music Education Research*, 3(2), 215-227. doi.org/10.1080/14613800120089269
- Campbell, P. S. (2004). *Teaching music globally. Experiencing music, expressing culture*. New York, NY: Oxford University Press.
- Capaldo, S., Muscat, B., & Tindall-Ford, S. (2014). Examining pre-service generalist primary teachers' pedagogical content knowledge for teaching music in the K-6 classroom. *The International Journal of Early Childhood Learning*, 21(1), 19-32.
- Carlsen, W. S. (1999). Domains of teacher knowledge. In J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science education* (pp. 133-144). Dordrecht, The Netherlands: Kluwer Academic Publishers.

- Chrisley, R., & Ziemke, T. (2002). Embodiment. In L. Nadel (Ed.), *Encyclopedia of cognitive science* (pp. 1102-1108). London, UK: Nature Macmillan Publishers.
- Clark, C. M. & Peterson, P. L. (1986). Teachers' thought processes. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 3-36). New York, NY: Macmillan.
- Cochran-Smith, M., & Lytle, S. (1990). Research on teaching and teacher research: The issues that divide. *Educational Researcher*, 19(2), 2-11. doi.org/10.3102/0013189X019002002
- Cochran, K. F., DeRuiter, J. A., & King, R. A. (1993). Pedagogical content knowledge: An integrative model for teacher preparation. *Journal of Teacher Education*, 44(4), 263-272. doi.org/10.1177/0022487193044004004
- Colman, A. (2003). *A dictionary of psychology*. Oxford, UK: Oxford University Press.
- Commissie Evaluatie Basisonderwijs. (1994). *Onderwijs aan jonge kinderen. Evaluatie van het basisonderwijs. Deelrapport 3* [Educating young children. Evaluation of primary education. Subreport 3]. Utrecht, The Netherlands: Inspectie van het Onderwijs.
- Cook, S. W., Mitchell, Z., & Goldin-Meadow, S. (2008). Gesture makes learning last. *Cognition*, 106(2), 1047-1058. doi.org/10.1016/j.cognition.2007.04.010
- Cox, G. & Hennessy, S. (2001). Music in schools. In BERA Music Education Review Group. (Ed.), *Mapping music education research in the UK* (pp. 32-39). Southwell, Notts: British Educational Research Association.
- Craft, A. (2008). Tensions in creativity and education: Enter wisdom and trusteeship? In A. Craft, H. Gardner, & G. Claxton (Eds.), *Creativity, wisdom, and trusteeship. Exploring the role of education*. (pp. 16-34). Thousand Oaks, CA: Corwin Press.
- Crasborn, F. J. A. J., & Hennissen, P. P. M. (2010). *The skilled mentor. Mentor teachers' acquisition of supervisory skills* (Doctoral dissertation). Retrieved from <http://alexandria.tue.nl/extra2/675808.pdf>
- Cross, I., & Morley, I. (2009). The evolution of music: Theories, definitions and the nature of the evidence. In S. Malloch, & C. Trevarthen (Eds.), *Communicative musicality* (pp. 61-82). New York, NY: Oxford University Press.
- Cunningham, A., & Benedetto, S. (2002). Using digital video tools to promote reflective practice. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2002* (pp. 551-553). Chesapeake, VA: AACE.
- Damen, M.-L. (2010). *Cultuurdeelname en CKV. Studies naar effecten van kunsteducatie op de cultuurdeelname van leerlingen tijdens en na het voortgezet onderwijs* [Culture participation and CKV. Studies on effects of arts education on culture participation of pupils during and after secondary education] (Doctoral dissertation). Retrieved from <http://www.kernvakckv.nl/ckv-en-cultuurparticipatie.pdf>

- Davidson, J. W., Pitts, S. E., & Correia, J. S. (2001). Reconciling technical and expressive elements in young children's musical instrument learning. *Journal of Aesthetic Education*, 35(3), 51-62. doi.org/10.2307/3333609
- Davidson, J. W., & Malloch, S. (2009). Musical communication: The body movements of performance. In S. Malloch, & C. Trevarthen (Eds.), *Communicative musicality. Exploring the basis of human companionship* (pp. 565-584). Oxford, UK: Oxford University Press.
- Davidson, J. (2004). Embodied knowledge: Possibilities and constraints in the arts education and curriculum. In L. Bresler (Ed.), *Knowing bodies, moving minds. Towards embodied teaching and learning* (pp. 197-212). Dordrecht, The Netherlands: Kluwer Academic Publishers. doi.org/10.1007/978-1-4020-2023-0_13
- De Baets, T., & Nijs, L. (2013). De muzikleraar als onderzoeker [The music teacher as researcher]. In T. De Baets, & L. Nijs (Eds.), *Muziekpedagogiek in beweging. Onderzoek als motor voor onderwijsinnovatie* [Research as engine for education innovation] (pp. 69-84). Heverlee, Belgium: Euprint.
- De Vries, Y. (2004). *Onderwijsconcepten en professionele ontwikkeling van leraren vanuit praktijktheoretisch perspectief* [Educational concepts and professional development of teachers from a practical theoretical perspective] (Doctoral dissertation). Retrieved from: <http://elib-a.ucl.ac.uk/full.php?id=879203>
- De Vries, P. (2013). Generalist teachers' self-efficacy in primary school music teaching. *Music Education Research*, 15(4), 375-391. doi.org/10.1080/14613808.2013.829427
- Desforges, C. (1995). How does experience affect theoretical knowledge for teaching? *Learning and Instruction*, 5(4), 385-400. doi.org/10.1016/0959-4752(95)00024-0
- Downey, G. (2008). Scaffolding imitation in capoeira: Physical education and enculturation in an Afro-Brazilian art. *American Anthropologist*, 110(2), 204-213. doi.org/10.1111/j.1548-1433.2008.00026.x
- Drechsler, M., & Driel, J. van (2008). Experienced teachers' pedagogical content knowledge of teaching acid-base chemistry. *Research in Science Education*, 38(5), 611-631. doi.org/10.1007/s11165-007-9066-5
- Duke, J. (2012). Joining the dots: Piloting the work diary as a data collection tool. *Issues in Educational Research*, 22(2), 111-126.
- Duling, E. (1992). *The development of pedagogical-content knowledge: Two case studies of exemplary general music teachers* (Doctoral dissertation). Retrieved from https://etd.ohiolink.edu/rws_etd/document/get/osu1244060359/inline
- Eisner, E. (2006). The satisfactions of teaching. *Educational Leadership*, 63(6), 44-46.
- Elbaz-Luwisch, F. (1997). Narrative research: Political issues and implications. *Teaching and Teacher Education*, 13(1), 75-83. doi.org/10.1016/S0742-051X(96)00042-X

- Elbaz-Luwisch, F. (2010). Narrative inquiry: Wakeful engagement with educational experience. *Curriculum Inquiry*, 40(2), 265-281. doi.org/10.1111/j.1467-873X.2010.00481.x
- Elliott, D. J. (2005). Introduction. In D. J. Elliott (Ed.), *Praxial music education. Reflections and dialogue* (pp. 3-18). New York, NY: Oxford University Press.
- Fatone, G., Clayton, M., Leante, L., & Rahaim, M. (2011). Imagery, melody and gesture in cross-cultural perspective. In A. Gritten, & E. King (Eds.), *New perspectives on music and gesture* (pp. 203-220). Farnham, UK: Ashgate.
- Fenstermacher, G. D. (1994). The knower and the known: The nature of knowledge in research on teaching. In L. Darling-Hammond (Ed.), *Review of Research in Education*, 20 (pp. 3-56). Washington, DC: American Educational Research Association. doi.org/10.2307/1167381
- Fernandez-Balboa, J. M., & Stiehl, J. (1995). The generic nature of pedagogical content knowledge among college professors. *Teaching and Teacher Education*, 11(3), 293-306. doi.org/10.1016/0742-051X(94)00030-A
- Fink-Jensen, K. (2007). Attunement and bodily dialogues in music education. *Philosophy of Music Education Review*, 15(1), 53-68. doi.org/10.2979/PME.2007.15.1.53
- Flohr, J. W. (2005). *Musical lives of young children*. Upper Saddle River, NJ: Prentice-Hall.
- Flyvbjerg, B. (2006). Five misunderstandings about case study research. *Qualitative Inquiry*, 12(2), 219-245. doi.org/10.1177/1077800405284363
- Gallagher, S. (2005). *How the body shapes the mind*. New York, NY: Oxford University Press. doi.org/10.1093/0199271941.001.0001
- Gallagher, S. (2009). Philosophical antecedents to situated cognition. In P. Robbins, & M. Aydede (Eds.), *The Cambridge handbook of situated cognition* (pp. 35-51). New York, NY: Cambridge University Press. doi.org/10.1017/CBO9780511816826.003
- Gallagher, S. (2014). Phenomenology and embodied cognition. In L. Shapiro (Ed.), *Routledge handbook of embodied cognition* (pp. 9-18). London, UK: Routledge.
- Georgii-Hemming, E. (2013). *Music as knowledge in an educational context*. In E. Georgii-Hemming, P. Burnard, & S. Holgersen (Eds.), *Professional knowledge in music teacher education* (pp. 19-37). Farnham, UK: Ashgate.
- Gerring, J. (2007). *Case study research. Principles and practices*. Cambridge, UK: Cambridge University Press.
- Gess-Newsome, J. (1999a). Pedagogical content knowledge: An introduction and orientation. In J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science teaching* (pp. 3-17). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Gess-Newsome, J. (1999b). Knowledge and beliefs about subject matter. In J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science teaching* (pp. 51-94). Dordrecht, The Netherlands: Kluwer Academic Publishers.

- Glatthorn, A. A. (2005). Curriculum theory. In A. A. Glatthorn, F. Boschee, B. M. Whitehead, & B. F. Boschee (Eds.), *Curriculum leadership. Strategies for development and implementation* (pp. 73-104). London, UK: Sage.
- Goldin-Meadow, S. (2004). Gesture's role in the learning process. *Theory into Practice*, 43(4), 314-321. doi.org/10.1207/s15430421tip4304_10
- Goldin-Meadow, S., & Beilock, S. L. (2010). Action's influence on thought: The case of gesture. *Perspectives in Psychological Science*, 5(6), 664-674. doi.org/10.1177/1745691610388764
- Goldschmidt, P., & Phelps, G. (2010). Does teacher professional development affect content and pedagogical knowledge: How much and for how long? *Economics of Education Review*, 29(3), 432-439. doi.org/10.1016/j.econedurev.2009.10.002
- Gordon, E. E. (2003). *A music learning theory for newborn and young children*. Chigaco, IL: GIA Publications.
- Gramberg, P., & Wolff, A. de (2008). Een rijk programma voor ieder kind [A rich programme for every child]. *De wereld van het jonge kind*, 36(1), 7-9.
- Greenfield, P. M. (2002). The mutual definition of culture and biology in development. In H. Keller, Y. H. Poortinga, & A. Schölmerich (Eds.), *Between culture and biology. Perspectives on ontogenetic development* (pp. 57-76). Cambridge, UK: Cambridge University Press. doi.org/10.1017/CBO9780511489853.004
- Greven, J., & Letschert, J. (2006). *Kerndoelen primair onderwijs* [Core Objectives primary education]. Den Haag: Ministerie van Onderwijs, Cultuur en Wetenschap.
- Griffiths, P. E., & Scarantino, A. (2009). Emotions in the wild: The situated perspective on emotion. In P. Robbins, & M. Aydede (Eds.), *Cambridge handbook of situated cognition* (pp. 437-453). Cambridge, UK: Cambridge University Press. doi.org/10.1017/CBO9780511816826.001
- Grossman, P. L. (1990). *The making of a teacher*. New York, NY: Teachers College Press.
- Grossman, P. L., & Shulman, L. S. (1994). Knowing, believing, and the teaching of English. In T. Shanahan (Ed.), *Teachers thinking, teachers knowing: Reflections on literacy and language education* (pp. 3-22). Urbana, IL: National Council of Teachers of English.
- Gruhn, W. (2012). Representations of music: Neural foundations and metaphorical descriptions. *Visions of Research in Music Education*, 20. . Retrieved from <http://www-usr.rider.edu/vrme~/>
- Gudmundsdottir, S. (1990). Values in pedagogical content knowledge. *Journal of Teacher Education*, 41(3), 44-52. doi.org/10.1177/002248719004100306
- Hammersley, M. (2007). The issue of quality in qualitative research. *International Journal of Research and Method in Education*, 30(3), 287-306. doi.org/10.1080/17437270701614782
- Hargreaves, D. J. (1995). De muzikale ontwikkeling van kinderen [The musical development of children]. In F. Evers, M. Jansma, P. Mak, & P. de Vries (Eds.), *Muziekpsychologie. Muzikale ontwikkeling, schepping, beleving*,

- waarneming* [Music psychology. Musical development, creation, experience, perception] (pp. 3-26). Assen, The Netherlands: Van Gorcum.
- Hargreaves, D. J. (1996). *The developmental psychology of music*. Cambridge, UK: Cambridge University Press.
- Hargreaves, D., Purves, R., Welch, G., & Marshall, N. (2007). Developing identities and attitudes in musicians and classroom music teachers. *British Journal of Educational Psychology*, 77(3), 665-682. doi.org/10.1348/000709906X154676
- Harquail, C. V., & Wilcox King, A. (2010). Construing organizational Identity: The role of embodied cognition. *Organization Studies*, 31(12), 1619-1648. doi.org/10.1177/0170840610376143
- Hashweh, M. Z. (2005). Teacher pedagogical constructions: a reconfiguration of pedagogical content knowledge. *Teacher and Teaching: theory and practice*, 11(3), 273-292. doi.org/10.1080/13450600500105502
- Haston, W., & Leon-Guerrero, A. (2008). Sources of pedagogical content knowledge: Reports by preservice instrumental music teachers. *Journal of Music Teacher Education*, 17(2), 48-59. doi.org/10.1177/1057083708317644
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112. doi.org/10.3102/003465430298487
- Hattie, J., & Yates, G. (2014). *Visible learning and the science of how we learn*. New York, NY: Routledge.
- HBO-Raad. (2012). *Kennisbasis docent muziek* [Knowledge base music teacher]. Den Haag, The Netherlands: HBO-Raad/Vereniging van Hogescholen.
- Heaton, J. (2004). *Reworking qualitative data*. London, UK: Sage Publications.
- Heller, J. J., & O'Connor, E. J. P. (2006). Maintaining quality in research and reporting. In R. Colwell (Ed.), *MENC handbook of research methodologies* (pp. 38-72). New York, NY: Oxford University Press.
- Hennessy, S. (2009). Creativity in the music curriculum. In A. Wilson (Ed.), *Creativity in Primary Education* (pp. 134-147). Exeter, UK: Learning Matters.
- Hennissen, P., Crasborn, F., Brouwer, N., Korthagen, F., & Bergen, T. (2008). Mapping mentor teachers' roles in mentoring dialogues. *Educational Research Review*, 3(2), 169-186. doi.org/10.1016/j.edurev.2008.01.001
- Hennissen, P., Crasborn, F., Brouwer, N., Korthagen, F., & Bergen, T. (2010). Uncovering contents of mentor teachers' interactive cognitions during mentoring dialogues. *Teaching and Teacher Education*, 26(2), 207-214. doi.org/10.1016/j.tate.2009.02.022
- Hill, H., Ball, D. L., & Schilling, S. (2008). Unpacking "pedagogical content knowledge": Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education*, 39(4), 372-400.
- Holgerson, S. E., & Holst, F. (2013). Knowledge and professionalism in music teacher education. In E. Georgii-Hemming, P. Burnard, & S. Holgerson (Eds.), *Professional knowledge in music teacher education* (pp. 51-72). Farnham, UK: Ashgate.

- Holmlund, N. T. (2008). Making the hidden explicit: Learning about equity in K-8 preservice science education. *Journal of Science Teacher Education*, 19(3), 235-254. doi.org/10.1007/s10972-008-9091-x
- Hoogeveen, K., Beekhoven, S., Kieft, M., Donker, A., & Grinten, M. van der (2014). Monitor *cultuuronderwijs in het primair onderwijs & programma Cultuureducatie met kwaliteit (2013-2014)* [Monitor cultural education in primary education & programme Cultural education with quality (2013-2014)]. Utrecht, The Netherlands: Sardes/Oberon.
- Hookey, M. R. (2002). Professional development. In R. Colwell, & C. P. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 887-902). New York, NY: Oxford.
- Hostetter, A. B. (2011). When do gestures communicate? A meta-analysis. *Psychological Bulletin*, 137(2), 297-315. doi.org/10.1037/a0022128
- Hostetter, A. B., Bieda, K., Alibali, A. W., Nathan, M. J., & Knuth, E. J. (2006). Don't just tell them, show them! Teachers can intentionally alter their instructional gestures. In R. Sun, & N. Miyake (Eds.), *Proceedings of The 28th Annual Conference of the Cognitive Science Society* (pp. 1523-1528). Mah Wah, NJ: Lawrence Erlbaum Associates.
- Hostetter, A. B., & Alibali, M. A. (2008). Visible embodiment: Gestures as simulated action. *Psychonomic Bulletin and Review*, 15(3), 495-514. doi.org/10.3758/PBR.15.3.495
- Howe, K. R., & Moses, M. S. (1999). Ethics in educational research. *Review of Research in Education*, 24(1), 21-59. doi.org/10.3102/0091732X024001021
- Howes, D. (2003). *Sensual relations: Engaging the senses in culture and social theory*. Ann Arbor, MI: University of Michigan Press.
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288. doi.org/10.1177/1049732305276687
- Huberman, M. (1995). Working with life history narratives. In H. McEwan, & K. Egan (Eds.), *Narrative in teaching, learning, and research* (pp. 127-165). New York, NY: Teachers College Press.
- Hutjes, J. M., & Buuren, J. A. van (1992). *De gevalsstudie strategie van kwalitatief onderzoek* [Case study strategy in qualitative research]. Amsterdam, The Netherlands: Uitgeverij Boom.
- Jacobse, A., Lei, R. van der, Loenen, S., Nieuwmeijer, C., Roozen, I., & Klein Tank, M. (2008). *TULE - Kunstzinnige oriëntatie. Inhoud en activiteiten bij de kerndoelen* [Artistic orientation. Contents and activities of the Core Objectives]. Enschede, The Netherlands: SLO.
- Jang, Y. J. (2013). *Perspectives on mathematics education for young children* (Doctoral dissertation). Retrieved from https://www.ideals.illinois.edu/bitstream/handle/2142/45405/Youn%20Joo_Jang.pdf?sequence=1
- Jansma, F., & Veen, D. van der (2009). *De kennisbasis. Het fundament voor professioneel (leren) handelen*. Utrecht, The Netherlands: ADEF.
- Jenselius, A. R., Wanderley, M. M., Godøy, R. I., & Leman, M. (2010). Musical gesture: Concepts and methods in research. In R. I. Godøy, & M. Leman

- (Eds.), *Musical gestures: Sound, movement and meaning* (pp. 12-35). New York, NY: Routledge.
- Johnson, M. (1989). Embodied knowledge. *Curriculum Inquiry*, 19(4), 361-377. doi.org/10.2307/1179358
- Jones, A., & Moreland, J. (2004). Enhancing practicing primary school teachers' pedagogical content knowledge in technology. *International Journal of Technology and Design Education*, 14(2), 121-140. doi.org/10.1023/B:ITDE.0000026513.48316.39
- Jordon, S. (2001). Embodied pedagogy: The body and teaching theology. *Teaching Theology and Religion*, 4(2), 98-101. doi.org/10.1111/1467-9647.00100
- Jorgensen, E. R. (2003). *Transforming music education*. Bloomington, IA: Indiana University Press.
- Kelly, S. N. (1999). Using conducting gestures to teach music concepts. A review of research. *Applications of Research in Music Education*, 18(3), 3-6.
- Kind, V. (2009). Pedagogical content knowledge in science education: Potential and perspectives for progress. *Studies in science education*, 45(2), 169-204. doi.org/10.1080/03057260903142285
- Kochman, K., Moelants, D., & Leman, M. (2014). Gesture as communicative tool in vocal pedagogy. *Journal of Interdisciplinary music studies*, 6(2), 233-250.
- Kontra, C., Goldin-Meadow, S., & Beilock, S. L. (2012). Embodied learning across the life span. *Topics in Cognitive Science*, 4(4), 731-739. doi.org/10.1111/j.1756-8765.2012.01221.x
- Koopman, C. (1997). *Keynotes in music education: A philosophical analysis* (Doctoral dissertation). Nijmegen, The Netherlands: Katholieke Universiteit Nijmegen.
- Koopman, C. (2010). Redactioneel. In M. van Hoorn (Ed.), *Alle registers open* (pp. 4-13). (Cultuur+Educatie; 28). Utrecht, The Netherlands: Cultuurnetwerk Nederland.
- Kwakman, K., & Berg, E. Van den (2004). Professionele ontwikkeling als kennisontwikkeling door leraren: Naar een betere interactie tussen praktijk en theorie [Professional development as knowledge development by teachers: Towards a better interaction between practice and theory]. *Velon, Tijdschrift voor Lerarenopleiders*, 25(3), 6-12.
- Leinhardt, G., McCarthy Young, K., & Merriman, J. (1995). Integrating professional knowledge: The theory of practice and the practice of theory. *Learning and Instruction*, 5(4), 401-408. doi.org/10.1016/0959-4752(95)00025-9
- Leman, M. (2008). *Embodied music cognition and mediation technology*. Cambridge, MA: Massachusetts Institute of Technology.
- Leman, M., & Godøy, R. I. (2010). Why study musical gestures? In R. I. Godøy, & M. Leman (Eds.), *Musical gestures. Sound, movement and meaning* (pp. 3-11). New York, NY: Routledge.

- Lerman, S. (1989). Constructivism, mathematics and mathematics education. *Educational Studies in Mathematics*, 20(2), 211-223.
doi.org/10.1007/BF00579463
- Levering, B. (2006). Hoe de kleuterschool verdwijnen kon. Over even goed de beste moeten zijn [How the kindergarten could disappear. About being the best nonetheless] (pp. 11-29). In S. Goorhuis-Brouwer, & B. Levering (Eds.), *Dolgedraaid. Mogen peuters nog peuteren en kleuters nog kleuteren?* [Out of control. Can toddlers still toddle and pre-schoolers still pre-school?]. Amsterdam, The Netherlands: SWP.
- Lindblom, J. (2007). *Minding the body: Interacting socially through embodied action* (Doctoral dissertation). Retrieved from <http://www.divaportal.org/smash/get/diva2:23965/FULLTEXT01.pdf>
- Lindblom, J., & Ziemke, T. (2007). Embodiment and social interaction: A cognitive science perspective. In T. Ziemke, J. Zlatev, & R. M. Frank (Eds.), *Embodiment* (pp. 129-162). (Body, Language and Mind; 1). Berlin, Germany: Mouton de Gruyter.
- Loong, C. Y., & Lineburgh, N. E. (2002). Research in early childhood music: 1929-1999. *Bulletin of the International Kodály Society*, 27(2), 24-29.
- Loughran, J. J., Milroy, P., Berry, A., Gunstone, R., & Mulhall, P. (2001). Documenting science teachers' pedagogical content knowledge through PaP-eRs. *Research in Science Education*, 31(2), 289-307.
doi.org/10.1023/A:1013124409567
- Loughran, J. J., Berry, A., & Mulhall, P. (2004). In search of pedagogical content knowledge in science: Developing ways of articulating and documenting professional practice. *Journal of Research in Science Teaching*, 41(4), 370-391.
- Loughran, J. J., Berry, A., & Mulhall, P. (2006). *Understanding and developing science teachers' pedagogical content knowledge*. Rotterdam, The Netherlands: Sense Publishers.
- Loughran, J. J. (2010). *What expert teachers do: Teachers' professional knowledge of classroom practice*. London, UK: Routledge.
- Loveless, A. (2008). Creative learning and new technology? A provocation paper. In J. Sefton-Green (Ed.), *Creative learning* (pp. 61-73). London, UK: Arts Council England.
- Lu, C. J., & Shulman, S. W. (2008). Rigor and flexibility in computer-based qualitative research: Introducing the coding analysis toolkit. *International Journal of Multiple Research Approaches*, 2(1), 105-117.
doi.org/10.5172/mra.455.2.1.105
- Lund, K. (2007). The importance of gaze and gesture in interactive multimodal explanation. *Language Resources and Evaluation*, 41(3/4), 289-303.
doi.org/10.1007/s10579-007-9058-0
- Lyle, J. (2003). Stimulated recall: A report on its use in naturalistic research. *British Educational Research Journal*, 29(6), 861-878.
doi.org/10.1080/0141192032000137349
- Magnusson, S., Krajcik, J., & Borko, H. (1999). Nature, sources and development of pedagogical content knowledge for science teaching. In J.

- Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science teaching* (pp. 95-132). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Marton, F., & Pang, M. F. (2006). On some necessary conditions of learning. *Journal of the Learning Sciences*, 15(2), 193-220.
doi.org/10.1207/s15327809jls1502_2
- Masters, R. S. W., Law, J., & Maxwell, J. (2002). Implicit and explicit learning in interceptive actions. In K. Davids, G. Savelsbergh, & J. Van Der Kamp (Eds.), *Interceptive actions in sport: Information and movement* (pp. 126-143). London, UK: Routledge.
- Mateiro, T., Russell, J., & Westvall, M. (2012). Student music teachers' perceptions of pedagogical content knowledge-in-action: an inquiry across three countries. *Finnish Journal of Music Education*, 15(2), 53-64.
- Mathijssen, I. C. H. (2006). *Denken en handelen van docenten* [Thinking and action of teachers] (Doctoral dissertation). Retrieved from <http://dspace.library.uu.nl/handle/1874/8884>
- McCarthy, M. (2007). Narrative inquiry as a way of knowing in music education. *Research Studies in Music Education*, 29(1), 3-12.
doi.org/10.1177/1321103X07087564
- McCray, J. S. (2008). *Pedagogical content knowledge for preschool mathematics: Relationships to teaching practices and child outcomes* (Doctoral dissertation). Retrieved from <http://gradworks.umi.com/33/13/3313155.html>.
- McCray, J. S., & Chen, J. Q. (2012). Pedagogical content knowledge for preschool mathematics: Construct validity of a new teacher interview. *Journal of Research in Childhood Education*, 26(3), 291-307.
doi.org/10.1080/02568543.2012.685123
- McHugh-Grifa, A. (2011). The use of physical touch to facilitate learning in music education. *Visions of Research in Music Education*, 18. Retrieved from <http://www-usr.rider.edu/vrme~/>
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago, IL: University Of Chicago Press.
- McNeill, D. (2005). *Gesture and thought*. Chicago, IL: University of Chicago Press. doi.org/10.7208/chicago/9780226514642.001.0001
- Meijer, P. (1999). *Teachers' Practical Knowledge. Teaching reading comprehension in secondary education* (Unpublished doctoral dissertation). University of Leiden, Leiden, The Netherlands.
- Meijer, P. C., Verloop, N., & Beijaard, D. (2002). Multi-method triangulation in a qualitative study on teachers' practical knowledge: An attempt to increase internal validity. *Quality & Quantity*, 36(2), 145-167.
doi.org/10.1023/A:1014984232147
- Melendez Rojas, R. L. (2008). *Pedagogical content knowledge in early childhood: A study of teachers' knowledge* (Doctoral dissertation). Retrieved from <http://gradworks.umi.com/33/13/3313157.html>.

- Melief, K., Tigchelaar, A., Korthagen, F., & Koster, B. (2003). *Leren van lesgeven* [Learning from teaching]. Soest, The Netherlands: Uitgeverij H. Nelissen
- Metz, E. (1989). Movement as a musical response among preschool children. *Journal of Research in Music Education*, 37(1), 48-60. doi.org/10.2307/3344952
- Miller, M. J. (2009). Talking about our troubles: Using video-based dialogue to build preservice teachers' professional knowledge. *The Teacher Educator*, 44(3), 143-163. doi.org/10.1080/08878730902954167
- Millican, J. Si (2013). Describing instrumental music teachers' thinking: Implications for understanding pedagogical content knowledge. *Applications of Research in Music Education*, 31(2), 45-53. doi.org/10.1177/8755123312473761
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A new framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054. doi.org/10.1111/j.1467-9620.2006.00684.x
- Monteiro, R., Carrillo, J., & Aguaded, S. (2008). Emergent theorisations in modelling the teaching of two science teachers. *Research in Science Education*, 38(3), 301-319. doi.org/10.1007/s11165-007-9051-z
- Moran, N. (2011). Music, bodies and relationships: An ethnographic contribution to embodied cognition studies, *Psychology of Music*, 41(1), 1-13. doi.org/10.1177/0305735611400174
- Morine-Dershimer, G., & Kent, T. (1999). The complex nature and sources of teachers' pedagogical knowledge. In J. Gess-Newsome, & N. G. Lederman (Eds.), *Examining pedagogical content knowledge: The construct and its implications for science teaching* (pp. 21-50). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Murphy, R. (2007). Harmonising assessment and music in the classroom. In L. Bresler (Ed.), *International handbook of research in arts education* (pp. 361-380). Dordrecht, The Netherlands: Springer. doi.org/10.1007/978-1-4020-3052-9_22
- Nathan, M. J. (2008). An embodied cognition perspective on symbols, grounding, and instructional gesture. In M. DeVega, A. M. Glenberg, & A. C. Graesser (Eds.), *Symbols, embodiment and meaning: A debate* (pp. 375-396). Oxford, UK: Oxford University Press. doi.org/10.1093/acprof:oso/9780199217274.003.0018
- Nicholl, H. (2010). Diaries as a method of data collection in research. *Paediatric Nursing*, 22(7), 16-20. doi.org/10.7748/paed2010.09.22.7.16.c7948
- Niedenthal, P. M., Barsalou, L. W., Winkielman, P., Krauth-Gruber, S., & Ric, F. (2005). Embodiment in attitudes, social perception, and emotion. *Personality and Social Psychology Bulletin*, 9(3), 184-211. doi.org/10.1207/s15327957pspr0903_1
- Niedenthal, P., & Alibali, M. W. (2009). Conceptualizing scaffolding and goals for a full account of embodied cognition. (Commentary on L. E. Williams, J. Y. Huang, & J. A. Bargh, The scaffolded mind: Higher mental processes are

- grounded in early experience of the physical world.). *European Journal of Social Psychology*, 39(7), 1268–1271. doi.org/10.1002/ejsp.693
- Onderwijsraad. (2008). *Ambities voor het jonge kind en voor de basisschool* [Ambitions for the young child and for primary education]. Den Haag, The Netherlands: Onderwijsraad.
- Overheid. (2012). *Wet bescherming persoonsgegevens* [Law protection of personal details]. Retrieved from http://wetten.overheid.nl/BWBR0011468/geldigheidsdatum_09-05-2012#Aanhef
- Park, S., & Oliver, J. S. (2008). Revisiting the conceptualisation of pedagogical content knowledge (PCK): PCK as a conceptual tool to understand teachers as professionals. *Research in Science Education*, 38(3), 261-284. doi.org/10.1007/s11165-007-9049-6
- Park, S., & Chen, Y. C. (2012). Mapping out the integration of the components of pedagogical content knowledge (PCK): Examples from high school biology classrooms. *Journal of Research in Science Teaching*, 49(7), 922–941. doi.org/10.1002/tea.21022
- Parncutt, R. (2006). Prenatal development. In G. E. McPherson (Ed.), *The child as musician. A handbook of musical development* (pp. 1-32). Oxford, UK: Oxford University Press. doi.org/10.3102/0013189X024007005
doi.org/10.1093/acprof:oso/9780198530329.003.0001
- Parviainen, J. (2002). Kinaesthesia and empathy as a knowing act. In A. M. Fiskvik, & E. Bakka (Eds.), *Dance knowledge – Dansekunnskap. Proceedings of the sixthth NOFOD conference* (pp. 147-154). Trondheim, Norway: Norges Teknisk-Naturvidenskabelige Universitet.
- Phillips, D. C. (1995). The good, the bad, and the ugly: The many faces of constructivism. *Educational Researcher*, 24(7), 5-12.
- Phillips, D. C., & Soltis, J. F. (2009). *Perspectives on learning*. New York, NY: Teachers College Press.
- Phillips-Silver, J., & Trainor, L. J. (2005). Feeling the beat: movement influences infants' rhythm perception. *Science*, 308(5727), 1430. doi.org/10.1126/science.1110922
- Phillips-Silver, J., & Trainor, L. J. (2007). Hearing what the body feels: Auditory encoding of rhythmic movement. *Cognition*, 105, 533–546. doi.org/10.1016/j.cognition.2006.11.006
- Piaget, J. (1964). Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching*, 2(3), 176-186. doi.org/10.1002/tea.3660020306
- Pitts, S. E. (2000). Reasons to teach music: Establishing a place in the contemporary curriculum. *British Journal of Music Education*, 17(1), 31-42. doi.org/10.1017/S0265051700000127
- Pozzer-Ardenghi, L., & Roth, W.- M. (2010). *Staging and performing scientific concepts: Lecturing is thinking with hands, eyes, body, and signs*. Rotterdam, The Netherlands: Sense Publishers.

- Raingruber, B. (2003). Video-cued narrative reflection: A research approach for articulating tacit, relational, and embodied understandings. *Qualitative Health Research*, 13(8), 1156-1169. doi.org/10.1177/1049732303253664
- Rambusch, J., & Ziemke, T. (2005). The role of embodiment in situated learning. In B. G. Bara, L. Barsalou, & M. Bucciarelli (Eds.), *Proceedings of the 27th Annual Conference of the Cognitive Science Society* (pp. 1803-1808). Mah Wah, NJ: Lawrence Erlbaum Associates.
- Renshaw, P. (2004). Connecting conversations: The changing voice of the artist. In M. Miles (Ed.), *New practices: new pedagogies* (pp. 99-116). London, UK: Routledge.
- Retra, J. (2010). *Music is movement. A study in to aspects of movement representation of musical activities among preschool children in a Dutch music education setting* (Doctoral dissertation). Retrieved from <https://ore.exeter.ac.uk/repository/handle/10036/3189>
- Robbins, P., & Aydede, M. (2009). A short primer on situated cognition. In P. Robbins, & M. Aydede (Eds.), *The Cambridge handbook of situated cognition* (pp. 3-10). Cambridge, UK: Cambridge University Press. doi.org/10.1017/CBO9780511816826.001
- Rosengren, K. S., & Braswell, G. S. (2003). Learning to draw and to write: Issues of variability and constraints. In G. J. P. Savelsbergh, K. Davids, J. van der Kamp, & S. Bennett (Eds.), *Development of movement coordination in children: Applications in the fields of ergonomics, health sciences, and sport* (pp. 56-74). New York, NY: Routledge.
- Roth, W. M. (2001). Gestures: Their role in teaching and learning. *Review of Educational Research*, 71(3), 365-392. doi.org/10.3102/00346543071003365
- Saldaña, J. (2009). *The coding manual for qualitative researchers*. London, UK: Sage.
- Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches? *Organizational Research Methods*, 8(1), 41-68. doi.org/10.1177/1094428104272000
- Schepens, A., Aelterman, A., & Keer, H. van (2007). Studying learning processes of student teachers with stimulated recall interviews through changes in interactive cognitions. *Teaching and Teacher Education*, 23(4), 457-472. doi.org/10.1016/j.tate.2006.12.014
- Schippers, H. (2004). *Harde noten. Muziekeducatie in wereldperspectief* [Loud notes. Music education in world perspective]. (Cultuur+Educatie; 9). Utrecht, The Netherlands: Cultuurnetwerk Nederland.
- Schoenfeld, A. H. (1998). Toward a theory of teaching-in-context. *Issues in Education*, 4(1), 1-94. doi.org/10.1016/S1080-9724(99)80076-7
- Scholtens, S. (2007). *Doorlopende leerlijnen* [Curricular strands]. Groningen, The Netherlands: Rijksuniversiteit Groningen.
- Schön, Donald A. (1983). *The reflective practitioner: how professionals think in action*. New York, NY: Basic Books.
- Schreuder, A. (2008). *Multiculturele variaties in muziekeducatie* [Multi cultural variations in music education]. Amsterdam, The Netherlands: Lectoraat Kunst- en cultuureducatie.

- Schwartz-Shea, P., & Yanow, D. (2012). *Interpretive research design: Concepts and processes*. London, UK: Routledge.
- Sfard, A. (2009). What's all the fuss about gestures? A commentary. *Educational Studies in Mathematics*, 70(2), 191-200. doi.org/10.1007/s10649-008-9161-1
- Sherin, M. G., Sherin, B., & Mandanes, R. (2000). Exploring diverse accounts of teacher knowledge. *Journal of Mathematical Behavior*, 18(3), 357-375. doi.org/10.1016/S0732-3123(99)00033-4
- Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(4), 4-14. doi.org/10.3102/0013189X015002004
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.
- Silverman, D. (2010). *Doing qualitative research* (3rd ed.). London, UK: Sage.
- Sime, D. (2006). What do learners make of teachers' gestures in the language classroom? *International Review of Applied Linguistics in Language Teaching*, 44(2), 211-230. doi.org/10.1515/IRAL.2006.009
- Simones, L. L., Rodger, M., & Schroeder, F. (2014). Communicating musical knowledge through gesture: Piano teachers' gestural behaviours across different levels of student proficiency. *Psychology of Music*, 30, 1-13. doi.org/10.1177/0305735614535830
- SLO. (n.d.). *Leerplankader kunstzinnige oriëntatie*. Retrieved from <http://kunstzinnigeorientatie.slo.nl/>
- Smit, J., Eerde, H. van, , & Bakker, A. (2013). A conceptualisation of whole-class scaffolding. *British Educational Research Journal*, 39(5), 817-834. doi.org/10.1002/berj.3007
- Staller, K. M. (2002). Musings of a Skeptical Software Junkie and the HyperRESEARCH™ Fix. *Qualitative Social Work*, 1(4), 473-487. doi.org/10.1177/14733250260620874
- Sutton, J., & Williamson, K. (2014). Embodied remembering. In L. Shapiro (Ed.), *The Routledge handbook of embodied cognition* (pp. 315-325). London, UK: Routledge.
- Swaine, J. S. (2014). Musical communication, emotion regulation and the capacity for attention control: A theoretical model. *Psychology of Music*, 42(6), 856-863. doi.org/10.1177/0305735614545197
- Taetle, L., & Cutietta, R. (2002). Learning theories as roots of current practice and research. In R. Colwell, & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 279-298). New York, NY: Oxford University Press.
- Thaut, M. H. (2008). *Rhythm, music, and the brain: Scientific foundations and clinical applications*. New York, NY: Routledge.
- Thelen, E., Schöner, G., Scheier, C., & Smith, L. B. (2001). The dynamics of embodiment: A field theory of infant perseverative reaching. *Behavioral and Brain Sciences*, 24(1), 1-86. doi.org/10.1017/S0140525X01003910
- Thijs, A., Leeuwen, T. van, & Zandbergen, M. (2008). *The development of education. National report of the Netherlands*. Den Haag, The Netherlands: Ministry of Education, Culture and Science.

- Thompson, M. (2012). *The application of motion capture to embodied music cognition research* (Doctoral dissertation). Retrieved from <https://jyx.jyu.fi/dspace/bitstream/handle/123456789/37648/9789513946906.pdf?sequence=1>
- Tillman-Boyce, J. (1996). A framework for intercultural dialogue in music. In M. Floyd (Ed.), *Concepts of worldmusics in education* (pp. 43-95). Hants, UK: Scholar Press.
- Trainor, L. J., & Corrigan, K. A. (2010). Music acquisition and effects of musical experience. In M. Riess-Jones, & R. R. Fay (Eds.), *Springer handbook of auditory research: Music perception* (pp. 89-128). Heidelberg, Germany: Springer. doi.org/10.1007/978-1-4419-6114-3_4
- Trehub, S. E. (2006). Infant as musical connoisseurs. In G. E. McPherson (Ed.), *The child as musician. A handbook of musical development* (pp. 33-50). Oxford, UK: Oxford University Press. doi.org/10.1093/acprof:oso/9780198530329.003.0002
- Tripp, T., & Rich, P. (2012). Using video to analyze one's own teaching. *British Journal of Educational Technology*, 43(4), 678-704. doi.org/10.1111/j.1467-8535.2011.01234.x
- Tsui, A. (2009). Distinctive qualities of expert teachers. *Teachers and Teaching*, 15(4), 421-439. doi.org/10.1080/13540600903057179
- Tufford, L., & Newman, P. (2010). Bracketing in qualitative research. *Qualitative Social Work*, 11(1), 80-96.
- Valerio, W. H., Reynolds, A. M., Bolton, B. M., Taggart, C. C., & Gordon, E. E. (1998). *The early childhood music curriculum: Music play*. Chicago, IL: GIA Publications. doi.org/10.1177/1473325010368316
- Vallacher, R., & Wegner, D. (1987). What do people think they're doing? Action identification and human behaviour. *Psychological Review*, 94(1), 3-15. doi.org/10.1037/0033-295X.94.1.3
- Van den Akker, J. (2006). Curriculum development re-invented: Evolving challenges for SLO. In J. Letschert (Ed.), *Curriculum development re-invented. Proceedings of the Invitational Conference on the Occasion of 30 Years SLO 1975-2005* (pp. 16-31). Enschede, The Netherlands: SLO.
- Van der Leeuw, B., Israel, T., Pauw, I., & A. Schaufeli (2009). *Kennisbasis Nederlandse taal voor de pabo* [Knowledge base Dutch language for the teacher education of primary teachers]. Den Haag, The Netherlands: HBO-Raad.
- Van der Ploeg, P. (2005). Pabo's varen blind op constructivisme [Teacher education of primary education sails blindly on constructivism]. *Velon, Tijdschrift voor lerarenopleiders*, 26(2), 13-19.
- Van Driel, J. H., Verloop, N., & Vos, W. de (1998). Developing science teachers' pedagogical content knowledge. *Journal of Research in Science Teaching*, 35(6), 673-695. doi.org/10.1002/(SICI)1098-2736(199808)35:6<673::AID-TEA5>3.0.CO;2-J
- Van Driel, J. H., Beijaard, D., & Verloop, N. (2001). Professional development and reform in science education: The role of teachers' practical knowledge.

- Journal of Research in Science Teaching*, 38(2), 137-158.
doi.org/10.1002/1098-2736(200102)38:2<137::AID-TEA1001>3.0.CO;2-U
- Van Driel, J. H., Jong, O. de, & Verloop, N. (2002). The development of preservice chemistry teachers' PCK. *Science Education*, 86(4), 572-590.
doi.org/10.1002/sce.10010
- Van Driel, J. H. (2008). *Van een lerende vakdocent leer je het meest* [You learn most from a specialist teacher who is learning]. Leiden, The Netherlands: Universiteit Leiden.
- Van Driel, J. H., & Berry, A. (2010). The teacher education knowledge base: Pedagogical content knowledge. In B. McGraw, P. L. Peterson, & E. Baker (Eds.), *International Encyclopedia of Education* (pp. 656-661). Oxford, UK: Elsevier. doi.org/10.1016/B978-0-08-044894-7.00642-4
- Van Hoorn, M., & Hagedaars, P. (2012). Kunstzinnige oriëntatie: de kwaliteit van de leerkracht [Artistic orientation: the quality of the teacher]. In M. van Hoorn (Ed.), *Cultuureducatie: een kwestie van onderwijskwaliteit* [Cultural education: a question of education quality] (pp. 48-73) (Cultuur+Educatie; 32). Utrecht, The Netherlands: Cultuurnetwerk.
- Van Olphen, M. (2008). TPCK: An integrated framework for educating world language teachers. In AACTE Committee on Technology and Innovation. (Eds.), *The handbook of technological pedagogical content knowledge for teaching and teacher educators* (pp. 107-128). New York, NY: Routledge for the American Association of Colleges for Teacher Education.
- Van Schilt-Mol, T. (2012). Muziekles op de basisschool: Meer en beter? [Music lessons at primary school: More and better?]. In T. IJdens, M. van Hoorn, A. van den Broek, & C. van Rensen (Eds.), *Jaarboek Actieve Cultuurparticipatie 2012. Doelen, middelen en effecten* [Yearbook Active Cultural Participation 2012. Targets, means and effects] (pp. 37-52). Utrecht, The Netherlands: Fonds voor Cultuurparticipatie.
- Vasquez Heilig, J., Cole, H., & Aguilar, A. (2010). From Dewey to No Child Left Behind: The evolution and devolution of public arts education. *Arts Education Policy Review*, 111(4), 136-145. doi.org/10.1080/10632913.2010.490776
- Veal, W. R., & MaKinster, J. G. (1999). Pedagogical content knowledge taxonomies. *Electronic Journal of Science Education*, 3(4). Retrieved from <http://unr.edu/homepage/crowther/ejse/ejsev3n4.html>
- Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research*, 54(2), 143-178. doi.org/10.3102/00346543054002143
- Verloop, N. (1989). *Interactive cognitions of student-teachers. An intervention study* (Unpublished doctoral dissertation). University of Leiden, Leiden, The Netherlands.
- Von Glasersfeld, E. (1989). Constructivism in education. In T. Husen, & T. N. Postlethwaite (Eds.), *The International Encyclopedia of Education*, 1 (pp. 162-163). Oxford, UK: Pergamon Press.
- Vreugdenhil, K. (2005). Leraren opleiden en nascholen door samenwerking tussen docenten en schoolbegeleiders [Educating and training teachers by secondary teachers together with teacher educators]. *Velon, Tijdschrift voor lerarenopleiders*, 26(2), 23-30.

- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.) (A. R. Luria, M. Lopez-Morillas & M. Cole [with J. V. Wertsch], Trans.) Cambridge, MA: Harvard University Press. (Original manuscripts [ca. 1930-1934])
- Wertsch, J., & Tulviste, P. (1992). L. S. Vygotsky and contemporary developmental psychology. *Developmental Psychology*, 28(4), 548-557. doi.org/10.1037/0012-1649.28.4.548
- Westerlund, H., & Juntunen, M. L. (2005). Music and knowledge in bodily experience. In D. J. Elliott (Ed.), *Praxial music education. Reflections and dialogue* (pp. 112-122). New York, NY: Oxford University Press.
- Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, 9(4), 625-636. doi.org/10.3758/BF03196322
- Winner, E., Goldstein, T. R., & Vincent-Lancrin, S. (2013). *Art for Art's Sake? The Impact of Arts Education*. Paris: Educational Research and Innovation/OECD Publishing. doi.org/10.1787/9789264180789-en
- Woodward, S. C. (2005). Critical matters in early childhood music education. In D. J. Elliott (Ed.), *Praxial music education: Reflections and dialogues* (pp. 249-266). New York, NY: Oxford University Press.
- Yin, R. K. (2009). *Case study research. Design and methods* (4th ed). Thousand Oaks, CA: Sage Publications.
- Yinger, R. J. (1986). Examining thought in action: A theoretical and methodological critique of research on interactive teaching. *Teaching and Teacher Education*, 2(3), 263-282. doi.org/10.1016/S0742-051X(86)80007-5
- Young, S. (2003). Time-space structuring in spontaneous play on educational percussion instruments among three- and four-year-olds. *British Journal of Music Education*, 20(1), 45-59. doi.org/10.1017/S0265051702005284
- Young, S. (2005). Changing tune: Reconceptualizing music with under three year olds. *International Journal of Early Years Education*, 13(3), 289-303.
- Young, S. (2009). *Music 3-5*. Oxon, UK: Routledge. doi.org/10.1080/09669760500295987
- Young, S. (2012). Theorizing musical childhoods with illustrations from a study of girls' karaoke use at home. *Research Studies in Music Education*, 34(2), 113-127. doi.org/10.1177/1321103X12466137
- Zanting, A. (2001). *Mining the mentor's mind* (Unpublished doctoral dissertation). University of Leiden, Leiden, The Netherlands.
- Zhang, Y., & Wildemuth, B. M. (2009). Qualitative Analysis of Content. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (pp. 308-319). Westport, CT: Libraries Unlimited.

Appendix 1 Procedures of the methods

1.1 Procedure stimulated recall interview (Dutch/English)

- 1.1.1 Instruction SRI prior to video recording (Dutch/English)
- 1.1.2 Instruction SRI (Dutch/English)

1.2 Procedure notebook (Dutch/English)

1.3 Procedure video analysis tasks (Dutch/English)

- 1.3.1 Instruction choice of video clips (Dutch/English)
- 1.3.2 Instruction video analysis: task one and task two (Dutch/English)

1.4 Procedure semi-structured interview and schedule questionnaire (Dutch/English)

1.1 Procedure stimulated recall interview (Dutch/English)

1.1.1 Instruction SRI prior to video recording (Dutch/English)

<p>Beste [naam],</p> <p>Op [datum + school] zal ik een video opname maken van uw muziekles in de <u>speel- of gymzaal</u> bij de <u>kleuters</u> (groep 1 en 2). Het video materiaal gaat u <i>daarna</i> bekijken om te achterhalen wat u tijdens het lesgeven dacht. Het gaat echter <u>niet</u> om een beoordelingssituatie. Het doel van deze methode is om uw gedachten die u tijdens het lesgeven heeft in kaart te brengen.</p> <p>Ik zou u willen vragen om een les te geven waarin '<u>ritmische vaardigheden</u>' centraal staat. Onder ritmische vaardigheden kunnen bijvoorbeeld 'puls en maat kunnen houden, het kunnen uitvoeren van melodische ritmes en tempo kunnen houden' verstaan worden. Het is de bedoeling dat u lesgeeft zoals u altijd lesgeeft. Ik vraag u dan ook nadrukkelijk om geen nieuwe docenten of leerling-activiteiten te ontwikkelen <u>speciaal</u> voor dit onderzoek.</p> <p>Vooraf aan het filmen van uw muziekles krijgt u een button opgespeld. Mocht u zich bewust zijn van gedachten tijdens het lesgeven, dan raakt u (onopvallend) die button aan. Wanneer u de video van uw muziekles terugkijkt, dan kan de aanraking van de button een geheugensteun zijn voor wat u tijdens uw les dacht.</p> <p>Met vriendelijke groet,</p> <p>Melissa Bremmer</p>
<p>Dear [name],</p> <p>On [date + school] I will make a video recording of your <u>preschool music</u> lesson in the <u>playroom or gym</u>. Afterwards you will view the recording to ascertain what you were thinking during teaching. However, this will not concern an assessment of your teaching. The goal of this method is to explore the thoughts you have during teaching.</p> <p>I kindly request you to teach a lesson that has '<u>rhythm skills</u>' as a central theme. Rhythm skills are understood to be, for example: performing the pulse, metre, rhythm patterns and tempo. You are supposed to teach in the way you usually teach. I strongly request you to not <u>especially</u> develop any new teaching or learning activities for this study.</p> <p>Furthermore, before the recording starts you will be given a brooch. Should you be aware of any thoughts during teaching you can unobtrusively touch the brooch. When you view the recording of your preschool music lesson the touching of the brooch can be a mnemonic for you of what you thought during the lesson.</p> <p>Kind regards,</p> <p>Melissa Bremmer</p>

1.1.2 Instruction SRI (Dutch/English)

Instructie stimulated recall interview

Wij gaan zo meteen een video bekijken van de les die u vandaag gegeven heeft. Het doel van het bekijken van deze video is om u te helpen herinneren wat u aan het denken was tijdens het lesgeven. Het is onmogelijk om alles te onthouden wat u denkt tijdens het lesgeven, vandaar dat ik deze video gebruik om zoveel mogelijk gedachten terug te halen. Hopelijk kunt u door het bekijken van de video zoveel mogelijk van uw gedachten tijdens het lesgeven terug halen. Probeer dan ook de les te herleven.

Zet de video op stop als u zich herinnert wat u aan het denken was tijdens het lesgeven. Probeer werkelijk alles te zeggen wat u tijdens het lesgeven aan het denken was, zonder u af te vragen of het belangrijk of vreemd is of niet. U kunt van alles denken, bijvoorbeeld over individuele leerlingen, de klas, uzelf, de lesstof, hoe u lesgeeft, ga zo maar door. Overigens, gedurende de les heeft u uw button aangeraakt zodra u zich bewust was van een gedachte tijdens het lesgeven. Als u dit terug ziet op de video, helpt het u misschien extra om te herinneren wat u op dat moment dacht.

Kortom: ik wil graag dat u vertelt wat u denkt tijdens het lesgeven. Het is wel belangrijk dat u onderscheid maakt tussen dit soort gedachten, dus wat u echt tijdens het lesgeven denkt, en nieuwe gedachten die u krijgt omdat u uzelf opeens op video ziet lesgeven. In dit onderzoek gaat het niet om deze laatste genoemde nieuwe gedachten. Soms is het natuurlijk moeilijk onderscheid te maken tussen deze twee verschillende gedachten. Als ik twijfel over welke soort gedachte het is, vraag ik u: 'dacht u dat tijdens het lesgeven, of is dit een reflectie op uw les en daarom een nieuwe gedachte naar aanleiding van het bekijken van de video?'

Soms kan het zijn dat u helemaal opgaat in het bekijken van de video en dat u vergeet te vertellen wat u tijdens de les aan het denken bent. Als u langer dan ongeveer 45 seconden niets zegt, dan zet ik de video stil en dan vraag ik u: wat bent u hier tijdens het lesgeven aan het denken? Of: waar richt u uw aandacht momenteel op? Als u het niet meer weet wat u tijdens het lesgeven dacht, start u de video weer.

Over het algemeen zal ik tijdens het bekijken van de video niets zeggen. U zult de enige zijn die aan het woord is. Ik luister en misschien vraag ik u iets korts ter verduidelijking. Alles wat u zegt wordt wel opgenomen en later woord voor woord uitgeschreven en geanalyseerd.

Ik ben hier niet om uw les te beoordelen. Het gaat er echt om te achterhalen wat vakleerkrachten denken tijdens het lesgeven. Het gaat mij om een natuurgetrouw beeld, hoe u normaal gesproken lesgeeft en wat u denkt tijdens het lesgeven.

Heeft u nog vragen?

Gebaseerd op protocol Meijer (1999, p. 67)

Instruction stimulated recall interview

In a moment we are going to watch the video recording of your lesson. The purpose of watching this video is to help you remember what you were thinking during this lesson. It is impossible to remember everything you were thinking during your lesson. However, I hope that this video recording will stimulate you to recall your thoughts during your lesson. Therefore, try to relive your lesson.

Stop the video recording every time you can recall what you were thinking during your lesson. Really try to say everything you can recall without asking yourself whether your thoughts were important or 'strange' or not. You could be thinking about anything, for example you could have thoughts about individual pupils, the class, yourself, the content of your lesson, how you are teaching etc. Moreover, during the lesson you might have touched the brooch the moment you were aware of a thought during teaching. If you see this in the recording, it might be an additional reminder of what you thought at that moment.

So, I would like you to tell about your thoughts while you were teaching. However, it is important that you clearly distinguish between the actual thoughts you had during teaching, and new thoughts you are suddenly having now as you are watching yourself on video. In this research, the focus is not on these newly formed thoughts. Of course, sometimes it is difficult to clearly distinguish between these two different kinds of thoughts. In case I have doubts about whether a thought you report concerns one you had during your teaching, or whether it is a new thought you are having now, I will ask: "Were you thinking this during your lesson, or is this a reflection on your lesson and therefore a new thought about your lesson as a result of watching the video?"

At times, you could become fully absorbed in watching the video recording and you could forget to report what you were thinking during your lesson. In case this happens and you let the video run for approximately more than 45 seconds without reporting what you were thinking, I will stop the video recording and ask: "what were you thinking during this moment?" or "what captured your attention?" If you cannot recall what you were thinking during your lesson, you can just start the video recording again.

In general, I will not interfere during viewing the video. You will be the only one talking. I will listen and maybe ask you a short question for clarification. Everything you say will be recorded, transcribed verbatim and analysed.

I am not here to judge or assess your lesson. The purpose of this interview is to explore what specialist preschool music teachers are thinking during teaching. For me it is important to get a faithful representation of how you normally teach and what you think while teaching.

Do you have any questions?

Based on the protocol of Meijer (1999, p. 67)

1.2 Procedure notebook (Dutch/English)

Beste [naam],

In de volgende fase van dit onderzoek verzoek ik u om de komende twee tot drie weken een digitaal notitieboek bij te houden met als doel om uw kennis over het didactiseren van ritmische vaardigheden voor kleuters in het basisonderwijs in kaart te brengen. Onderstaand wordt eerst de inhoud van het notitieboek toegelicht en daarna de vorm.

1. Inhoud: Kennis over het didactiseren van ritmische vaardigheden voor kleuters

In dit onderzoek wordt toegespitst op een bepaald aspect van uw muziek-didactische kennis, namelijk hoe u de vakinhoud 'ritmische vaardigheden' didactiseert voor kleuters in het basisonderwijs. U kunt daarbij bijvoorbeeld denken aan of u in uw muziekcurriculum ritmische vaardigheden aanpast op de interesses en mogelijkheden van *specifiek* kleuters; of u ritmische vaardigheden op een bepaalde manier presenteert rekening houdend met de interesses en mogelijkheden van *specifiek* kleuters; en of u kleuters op een bepaalde wijze instrueert bij het leren van ritmische vaardigheden**.

Bovenstaande voorbeelden kunnen u een idee geven over wat er binnen dit onderzoek onder andere wordt verstaan onder het 'didactiseren van ritmische vaardigheden'. Bovenstaande voorbeelden zijn echter niet uitputtend. Graag nodig ik u uit om uw eigen ideeën, mening en kennis over het didactiseren van ritmische vaardigheden voor kleuters in een muziekcurriculum in het basisonderwijs in uw digitaal notitieboek te beschrijven.

2. Inhoud: Achtergrond informatie over uzelf

Zoudt u zo vriendelijk willen zijn om de volgende vragen te beantwoorden in uw digitaal notitieboek:

- Wat is uw leeftijd?
- Wat is uw geslacht?
- Hoeveel jaar geeft u muziekles aan kleuters?
- Heeft u naast uw opleiding tot vakleerkracht muziek aan een conservatorium (Schoolmuziek of Opleiding Docent Muziek), nog een andere opleiding afgerond? Zo ja, welke?
- Hoe heeft het door u gevolgde onderwijs aan het conservatorium (Schoolmuziek of Opleiding Docent Muziek) uw ontwerpen en uitvoeren van een curriculum voor 'ritmische vaardigheden' beïnvloed?
- Geeft u muziekles vanuit een persoonlijke, en/of muziekpedagogische, en/of een didactische opvatting? Zo ja, welke?
- Korte beschrijving van uw huidige werkzaamheden

3. Vorm: uw eigen notitieboek

U mag uw notitieboek vormgeven zoals u zelf wilt. U hoeft bijvoorbeeld geen lopend verhaal op te schrijven maar u kunt bijvoorbeeld (korte) tekstfragmenten noteren. De tekst van uw notitieboek wordt in dit onderzoek geanalyseerd en zal niet als geheel terug te vinden zijn in dit onderzoek. Namen en plekken (op uw opleiding na) worden geanonimiseerd.

Tot slot vraag ik u om uw digitaal notitieboek een dag *voor* het interview naar mij te mailen in de vorm van een pdf-bestand. Ook vraag ik u om uw digitaal notitieboek uitgeprint mee te nemen naar het interview zodat het kan dienen als een geheugensteun.

Heeft u verder nog vragen omtrent de vorm of inhoud van uw digitaal notitieboek?

*onder ritmische vaardigheden wordt bijvoorbeeld verstaan: puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden

** Gebaseerd op Shulman (1987, p.8)

Dear [name],

In the next phase of this study I request you to take notes in a digital notebook for the next two to three weeks in order to map your pedagogical content knowledge regarding the teaching and learning of rhythm skills to preschoolers in primary education. Below the content of the notebook will first be explained and afterwards the form.

4. Content: Your pedagogical content knowledge regarding the rhythm skills of preschoolers

In this study the focus will be on a certain aspect of your pedagogical content knowledge, namely the teaching and learning of 'rhythm skills' of preschoolers in primary education. With regard to this type of knowledge, you can think of, for example, whether you adjust rhythm skills to the interests and possibilities of *specifically* preschoolers; or if you present rhythm skills in a certain way, taking into account the interests and possibilities of *specifically* preschoolers; and if you instruct preschoolers in a *specific* way when teaching rhythm skills **.

The examples above can give you an idea of what is meant by the pedagogical content knowledge regarding rhythm skills of preschoolers in this study, however, it need not be limited to these examples. I kindly invite you to describe your own ideas and pedagogical content knowledge regarding the teaching and learning of rhythm skills of preschoolers in your digital notebook.

5. Content: Background information on yourself

Would you be so kind as to answer the following questions in your digital notebook:

- How old are you?
- What is your gender?
- How long have you been teaching music lessons to four- to six-year olds?
- Have you completed any other training besides your Bachelor Music Education? If so, which?
- How has your Bachelor Music Education influenced the design and execution of a curriculum for 'rhythm skills'?
- Do you give your music lessons from a personal, and/or music pedagogical and/or a pedagogical orientation? If so, which?
- Brief description of your current activities.

6. Form: your own notebook

You may write your notebook any way you like. You do not, for example, have to write a narrative but you can note (short) fragments. The text of your notebook will be analysed in this research and will not be presented as a whole in this study. Name and places (with exception of your education) will be anonymised.

Finally, I ask you to email me the digital notebook in pdf form one day before the interview. I also request you to bring a printed version of your digital notebook to the interview so it can function as a mnemonic.

Do you have any questions regarding the form or content of your digital notebook?

* for example: performing pulse, metre, rhythm patterns and tempo

** Based on Shulman (1987, p.8)

1.3 Procedure video analysis tasks

1.3.1 Instruction choice of video clips (Dutch/English)

Instructie keuze video fragment

We hebben net een stimulated recall interview gedaan waarbij u op video naar uw les heeft gekeken en u uw gedachten heeft verteld tijdens het lesgeven. Ik vraag u nu om uit de twee lessen die ik heb gefilmd twee, verschillende 'afgeronde lesactiviteiten' te kiezen waarin u ritmische vaardigheden voor kleuters didactiseert van maximaal 5 minuten. Hieronder licht ik toe wat ik daarmee bedoel.

- Met een 'afgeronde les activiteit' bedoel ik dat het gaat om een les activiteit binnen uw les die een duidelijk begin en eindpunt heeft, en u heeft een specifiek doel met die activiteit;
- Met verschillend bedoel ik dat u bij beide lesactiviteiten bezig bent om een andere ritmische vaardigheid te didactiseren voor de kleuters;
- U kiest twee videofragmenten uit waarop u op een adequate wijze de ritmische vaardigheden voor kleuters

didactiseert, met andere woorden u kiest uw 'best practice'.

Een veronderstelling in dit onderzoek is dat aspecten van uw kennis over het didactiseren van ritmische vaardigheden voor kleuters ook in uw handelingen en gebaren zit tijdens het lesgeven. Daarom zullen wij zowel op individuele basis als samen uw les fragmenten bekijken en analyseren in een later stadium van dit onderzoek.

Heeft u nog vragen?

Instruction choice of video clips

We have just finished a stimulated recall interview in which you viewed the video of your music lesson and recalled what you were thinking whilst teaching. I now request you to choose two different 'completed teaching activities' from the two lessons that I videoed that focus on the teaching and learning of rhythm skills with a maximum of 5 minutes in length. Below I will explain what I mean by this:

- A 'completed teaching activity' is understood to be a teaching activity during your lesson that has a clear beginning and an end, and you have a specific goal with this activity;
- 'Different' is understood to mean that in each of the two teaching activities you focus on the teaching and learning of a different rhythm skill of preschoolers;
- You will choose two video clips that capture how you develop the rhythm skills of preschoolers in an adequate manner; in other words, you choose your 'best practice'.

An assumption in this research is that aspects of your pedagogical content knowledge regarding the teaching and learning of rhythm skills might be present in your actions and gestures during teaching. Therefore, we will view and analyse these fragments first individually and secondly together at a later stage in this study.

Do you have any questions?

1.3.2 Instruction Video analysis: task one and task two (Dutch/English)

Beste [...]

Een veronderstelling in dit onderzoek is dat aspecten van uw kennis over het didactiseren van ritmische vaardigheden voor kleuters ook in uw handelingen en gebaren zit tijdens het lesgeven. Het doel vandaag is dan ook om deze vorm van kennis te herkennen, te beschrijven en te analyseren. Overigens gaat het ook hier niet over een beoordelingssituatie van uw lesgeven maar gaat het erom uw muziek-didactische kennis in kaart te brengen.

We gaan daarom zo meteen de twee video fragmenten bekijken die u gekozen heeft tijdens het stimulated recall interview. Naar aanleiding van deze twee videofragmenten gaat u beschrijven en analyseren wat u doet tijdens het lesgeven. U krijgt hiervoor twee verschillende opdrachten. In totaal zult u ongeveer twee uur bezig zijn met deze opdrachten.

Opdracht 1

Het doel van deze opdracht is om te beschrijven en om uit te leggen wat de opbouw is van uw 'ritme' lesactiviteit voor kleuters.

Per gekozen video fragment gaat u eerst de lesactiviteit in z'n geheel bekijken. Daarna bekijkt u de lesactiviteit nog een keer. Nu zet u de video stop zodra u vindt dat er binnen de lesactiviteit een stap afgerond is en de volgende stap met een nieuw doel gaat beginnen. U noteert eerst de begin- en eindtijd van deze stap. Daarna beschrijft u uitvoerig wat u zojuist heeft gedaan tijdens deze stap zoals wat u zegt, welke muziek u gebruikt of zelf zingt of speelt, hoe u speelt en zingt, wat u met de klas doet enzovoort. Beschrijf ook wat het doel was van deze stap. Zet daarna de video weer aan en zet de video weer stop als u denkt dat de volgende stap afgerond is binnen de lesactiviteit. U herhaalt dit proces totdat de lesactiviteit klaar is.

Aan het einde van deze opdracht kunt u nogmaals op de video bekijken welke stappen u onderscheiden heeft binnen de lesactiviteit en of u het daar nog steeds mee eens bent. Tot slot legt u uit waarom u kiest voor de volgorde van deze stappen binnen uw lesactiviteit.

Over het algemeen zal ik tijdens het bekijken van de video niets zeggen. Bij dit onderdeel zult u de enige zijn die aan het woord is. Ik luister en misschien vraag ik u iets korts ter verduidelijking. Wel noteer ik de tijdseenheden van de stappen (wanneer zo'n stap begint en wanneer zo'n stap eindigt binnen de lesactiviteit) mee zodat we hier nog op terug

kunnen komen.

Zodra u klaar bent met het bekijken van de video fragmenten dan bekijken we de fragmenten nog eens samen. Ik heb namelijk ook een analyse gemaakt van de opbouw van uw lesactiviteiten. Op deze manier kunnen we onze bevindingen met elkaar vergelijken, bediscussiëren en eventueel aanvullen. Dit wordt opgenomen en later woord voor woord uitgeschreven en geanalyseerd.

Heeft u nog vragen?

Opdracht 2

Het doel van deze tweede opdracht is om uw muziek-didactische gebaren te herkennen en te analyseren. Het gaat om gebaren die u (onbewust) gebruikt tijdens het leerproces van ritmische vaardigheden van kleuters. Bijvoorbeeld: “u accentueert met uw gebaren bepaalde ritmische aspecten in de muziek die u uitvoert met het doel om (onbewust) de aandacht van de kleuters te vestigen op die aspecten”. Een gebaar kunt u maken met een gedeelte van uw lichaam bijvoorbeeld uw armen, hand en hoofd, gezicht en met uw gebaar drukt u een betekenis uit*. Ook heeft een gebaar vaak een vrij duidelijk begin en einde**. Uw gebaren kunnen een ritmische of een didactische betekenis hebben, of allebei tegelijkertijd. U kunt uw gebaren gebruiken in combinatie met bijvoorbeeld zingen, het uitvoeren van ritmische vaardigheden, het bespelen van een instrument of tijdens het praten.

U heeft tijdens **opdracht 1** twee ‘ritme’ lesactiviteiten opgedeeld in verschillende stappen. U bekijkt nu nog eens iedere stap apart van elke ritme activiteit. U zet de video stop zodra u een gebaar herkent dat u (onbewust) gebruikt met een didactisch of muziekinhoudelijke betekenis (of beiden) in relatie tot het leren van ritmische vaardigheden door kleuters. Vervolgens:

- beschrijft u dat gebaar en noteert u het tijdstip van het gebaar; en
- licht u toe wat u denkt dat de functie van dat gebaar kan zijn. In een latere fase komen we terug op uw toelichting van uw gebaar. In dat verband is het handig om wat aantekeningen te nemen van uw toelichting.

U kunt rustig de video een paar keer terugspoelen zodat u opnieuw uw gebaar kunt bekijken. Over het algemeen zal ik tijdens het bekijken van de video niets zeggen. Bij dit onderdeel zult u de enige zijn die aan het woord is. Ik luister en misschien vraag ik u iets kortst ter verduidelijking.

Zodra u klaar bent met het bekijken van de video fragmenten dan bekijken we de fragmenten nog eens samen. Ik heb namelijk ook een analyse gemaakt van uw gebaren. Op deze manier kunnen we onze bevindingen met elkaar vergelijken, bediscussiëren en eventueel aanvullen. Dit wordt opgenomen, woord voor woord uitgeschreven en geanalyseerd.

Heeft u nog vragen?

*(Jensenius, Wanderley, Godøy & Leman, 2010)

** (Roth, 2001)

Dear [...]

An assumption during this study is that aspects of your pedagogical content knowledge regarding rhythm skills of preschoolers are also present in your physical actions and gestures during teaching. The goal today is to define, describe and analyse this form of pedagogical content knowledge. Incidentally, this is not an assessment of your teaching, but rather the focus is on exploring your pedagogical content knowledge.

We are therefore going to view the two video clips that you have chosen during the stimulated recall interview. Based on these two video clips you will describe and analyse what you are doing during teaching. You will be given two different video analysis tasks. In total, these tasks will take approximately two hours.

Task 1

The goal of this task is to indicate, describe and interpret the sequence of your teaching activity regarding the teaching and learning of rhythm skills of preschoolers.

With each chosen video fragment you will first view the teaching activity in its entirety. Next, you will view the teaching activity again. Now, however, you will stop the video the moment you perceive a completed step *within* the teaching activity followed by the start of a new step and a new goal. You will note the start and end time of this step. Describe in detail what you have just done during this step, such as what you are saying, which music you use or sing or play, how you play and sing, what you are doing with the class, etc. Also interpret what the goal is of this step. Afterwards resume the video and stop it again when you perceive the next completed step within the teaching activity. You will repeat this process until the teaching activity has been completed.

At the end of the task you can watch the video fragment and review which steps you have identified during the teaching activity and if you still agree with that. In conclusion you will explain why you have chosen for this sequence within the teaching activity.

In general I will not say anything during the viewing of the video. During this task you will be the only one speaking. I will listen and perhaps ask a question for clarification. I will record the time units of the steps (when a step begins and when a step ends *within* the teaching activity) so we can come back to them.

When you are finished watching the video fragments, we will watch the fragments again together. I have also made an analysis of the sequence of your teaching activities. This way we can compare our findings, discuss them and possibly add to them. This will be recorded and later transcribed verbatim and analysed.

Do you have any questions?

Task 2

The goal of this task is to recognise and analyse your gestures that communicate your pedagogical content knowledge. It concerns the gestures you (unconsciously) use during the teaching of rhythm skills to preschoolers. For example: "you can perform rhythm content and simultaneously emphasise certain rhythmical aspects of that music with your gestures and (un)consciously focus the attention of the preschoolers to that aspect". You can make a gesture with a part of your body, for example your arms, hand and head, face, and with your gesture you communicate a meaning*. A gesture also often has a clear beginning and end**. Your gestures might communicate a rhythmic or pedagogical meaning or might "blend pedagogy and content". You can use your gestures in combination with, for example, singing, performing rhythm skills, playing an instrument or during speaking.

During Task 1 you have divided two rhythm activities in various steps. You will now view every step separately of each rhythm activity and stop the video the moment you define a gesture that communicates rhythm or pedagogical aspects (or blend both) in relation to the teaching and learning of rhythm skills of preschoolers. Afterwards:

- You describe that gesture and record the time of that gesture, and
- You explain what you think the function of that gesture may be. In a later phase we will return to your explanation of your gesture. In that regard it is useful to make notes of your explanation.

If you wish, you can rewind the video a couple of times in order to see your gesture. In general, I will not speak during the viewing of the video. During this task you will be the only one speaking. I will listen and perhaps ask brief questions for clarification.

Once you have finished viewing the video fragment we will watch the fragment together as I have also analysed your gestures in an earlier stage. This way we can compare our findings, discuss them and possibly complement them. This will be recorded, transcribed verbatim and analysed.

Do you have any questions?

* (Jensenius, Wanderley, Godøy & Leman, 2010)

** (Roth, 2001)

1.4 Procedure semi-structured interview and schedule questionnaire (Dutch/English)

Instructie semi-gestructureerde interview

Ik neem vandaag een interview bij u af met het doel om uw muziek-didactische kennis in kaart te brengen. Het gaat daarbij over uw kennis over het didactiseren van ritmische vaardigheden voor kleuters in het basisonderwijs

In dit interview gaat het er vooral om dat u uw eigen ideeën en kennis over het didactiseren van ritmische vaardigheden voor kleuters in het basisonderwijs inbrengt. Ik heb wel een aantal vragen dat ik u wil stellen maar ik zal voornamelijk vragen stellen ter verduidelijking van wat u vertelt.

Het kan tijdens het interview voorkomen dat u het lastig vindt om uit te leggen wat u bedoelt. U kunt op zo'n moment uw notitieboek raadplegen. Maar u kunt ook eerst *voordoen* wat u bedoelt en vervolgens proberen te *verwoorden* wat u bedoelt.

Zoals aan het begin aan het onderzoek vermeld is, wordt dit interview opgenomen en later woord voor woord uitgeschreven zodat ik het kan analyseren voor mijn onderzoek. Het interview zal rond anderhalf uur duren.

Heeft u nog vragen?	
<p>Openingsvraag: Stelt u in uw verbeelding voor dat u een muziekles geeft aan kleuters waarin het ontwikkelen van ritmische vaardigheden centraal staat. Kunt u de muziekles beschrijven die u voor zich ziet? Zowel vanuit uw eigen perspectief als vanuit het perspectief van de kleuters? U mag ook uitbeelden en tegelijkertijd uitleggen wat u voor zich ziet.*</p> <p>* Based on the concept 'lesson image' (Schoenfeld, 1998), and on the concept of 'offline and online' embodied knowledge (see Chapter 2)</p>	
Categorie: ritmische vaardigheden en doceren	Vraag: Wat kunt u mij vertellen over hoe u ritmische vaardigheden doceert aan uw kleuters op uw basisschool?
Categorie: ritmische vaardigheden en leren	Vraag: Hoe leren volgens u <i>kleuters</i> ritmische vaardigheden op uw basisschool?
Categorie: ritmische vaardigheden en het curriculum	Vraag: Wat kunt u mij vertellen over de opbouw van een curriculum voor 'ritmische vaardigheden' voor uw kleuters op uw basisschool?
Categorie: ritmische vaardigheden en toetsen	Vraag: Wat kunt u mij vertellen over het toetsen van ritmische vaardigheden van uw kleuters op uw basisschool? U mag het woord 'toetsen' breed opvatten.
Categorie: ritmische vaardigheden en de educatieve context	Vraag: Wat kunt u mij vertellen over de relatie tussen de educatieve context (zoals het klaslokaal waarin u lesgeeft, de groepen kleuters waaraan u lesgeeft en de school waarin u lesgeeft) en het leren en doceren van ritmische vaardigheden van uw kleuters op uw basisschool?
Categorie: ritmische vaardigheden en de didactische/muziekpedagogische opvatting	<p>Vragen:</p> <p>We hebben het in het interview gehad over allerlei aspecten van het didactiseren van ritmische vaardigheden. Zoudt u tot slot kunnen samenvatten:</p> <ul style="list-style-type: none"> • Wat 'ritme' is volgens u? • Wat 'ritmische vaardigheden' zijn volgens u? • Ligt er een didactische en/of muziekpedagogische opvatting ten grondslag aan hoe u de ritmische vaardigheden van kleuters ontwikkelt? Zo ja, kunt u die toelichten? • U heeft net uw didactische en/of muziekpedagogische opvatting toegelicht. Om welke redenen werkt u vanuit deze opvatting bij het ontwikkelen van ritmische vaardigheden tijdens de muziekles?
<p>Instruction semi-structured interview</p> <p>Today I am interviewing you in order to map the pedagogical content knowledge that you have developed. It specifically concerns your PCK regarding the teaching and learning of rhythm skills of preschoolers in primary education.</p> <p>The main aim of this interview is that you put forward your own ideas and pedagogical content knowledge regarding the teaching and learning of rhythm skills for preschoolers in primary education. I do have some questions I would like to put to you, but I will chiefly ask questions to clarify what you are explaining.</p> <p>It is possible that during the interview you will find it difficult to communicate what you mean. You can check your notebook at such times. You can also demonstrate what you mean and try to communicate it in words afterwards.</p> <p>As mentioned at the beginning of this study, the interview will be recorded and transcribed verbatim in order for me to analyse it for my research. The interview will last around one and a half hours.</p> <p>Do you have any questions?</p> <p>Opening question: Imagine that you are giving a music lesson to preschoolers that focuses on the teaching and learning of rhythm skills. Can you describe that music lesson? Both from your own perspective and from the perspective of the preschoolers? You may also act out and simultaneously explain what you imagine.*</p>	

* Based on the concept 'lesson image' (Schoenfeld, 1998), and on the concept of 'offline and online' embodied knowledge (see Chapter 2)

Category: rhythm skills and teaching	Question: What can you tell me about how you teach rhythm skills to preschoolers at your primary school?
Category: rhythm skills and learning	Question: According to you, how do preschoolers learn rhythm skills at your primary school?
Category: rhythm skills and the curriculum	Question: What can you tell me about the curriculum for 'rhythm skills' for preschoolers at your primary school?
Category: rhythm skills and assessment	Question: What can you tell me about assessing rhythm skills of preschoolers at your primary school? You may take the meaning of 'assess' in the broadest sense.
Category: rhythm skills and the educational context	Question: What can you tell me about the relationship between educational context (such as the classroom in which you teach, the groups of preschoolers you teach and the school you teach at) and the learning and teaching of rhythm skills of your preschoolers at your primary school?
Category: rhythm skills and orientations towards teaching and learning	<p>Questions:</p> <p>We have spoken in the interview about different aspects of teaching and learning rhythm skills. In conclusion, could you summarise:</p> <ul style="list-style-type: none"> • What is 'rhythm' according to you? • What are 'rhythm skills' according to you? • Is there a pedagogical and/or music pedagogical approach on which you base your pedagogy of rhythm skills of preschoolers? If so, can you illustrate this? • You have just illustrated your pedagogical and/or music pedagogical approach. Why have you chosen for this approach when developing rhythm skills during music lessons?

Appendix 2 Consent forms

- 2.1 Consent form: specialist preschool music teacher (Dutch/English)
- 2.2 The signed consent forms of the specialist preschool music teachers
- 2.3 Consent form: parents (Dutch/English)

2.1 Consent form: Specialist preschool music teacher

Geachte [...]

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de muziek-didactische kennis van vakleerkrachten muziek onderzoek, in het bijzonder het didactiseren van ritmische vaardigheden voor kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal notitieboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muziekles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op [...] opnames maken van uw muziekles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;
Ik zal twee lessen van u filmen waarin de ontwikkeling van 'ritmische vaardigheden' van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek.
2. Het aantekenboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal aantekenboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor het interview zal ik u vragen om uw digitale aantekenboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten n.a.v. de video opnames die voor het stimulated recall interview zijn gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt. In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden.

Met vriendelijke groet,

Melissa Bremmer

Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;

- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw muziek-didactische kennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende het interview kenbaar maken op exact welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het aantekenboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijdert de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord

Akkoord

[vakleerkracht muziek]

Melissa Bremmer

Dear [...],

Thank you very much for your commitment to take part in my research in which I examine the pedagogical content knowledge of specialist music teachers, especially regarding the development of rhythm skills of four- to six-year olds in preschool. By doing this research, I hope to contribute to the theory on learning and teaching music to young children. I will be happy to inform you on the progress of the research and your part in it.

In this research four methods are used after another during a time frame of three to four weeks to document your pedagogical content knowledge, namely (1) a stimulated recall interview, (2) a video analysis of the instructional sequence of two rhythm activities and gestures during teaching, (3) a digital notebook, and (4) an interview. Below I will highlight the four methods. During the research itself the methods and the different procedures will be explained in detail.

1. Stimulated recall interview: In this part of the research I will first make a video recording of your preschool music lesson, after which you will view the recording and recall what you were thinking during teaching. I will come [date and time] to make the recordings of your preschool music lesson. Your lesson will take place in the playroom or gym hall of your school. A week prior to these video recordings parents and caretakers will have to give permission for the recordings;
I will video two lessons in which the development of 'rhythm skills' is central. Rhythm skills are understood to be, for example: performing pulse, metre, rhythm patterns and tempo. You are expected to teach as you normally do and not to develop new teaching and learning activities especially for this research.
2. The digital notebook: After the stimulated recall interview I will ask you to take notes in a digital notebook for three weeks in which you describe your pedagogical content knowledge regarding the development of rhythm skills of four- to six-year olds at the preschool. I will also ask you to include some personal details such as your age, sex, education, etc. The day before (3) the interview I will ask you to email me your digital notebook in pdf format;
3. Video analysis tasks: The following part of the research concerns describing your actions and gestures during two teaching activities from the video recordings that were made for the stimulated recall interview;
4. The interview: Around three weeks after the stimulated recall interview an interview with you will take place that will last around an hour. The questions during the interview will focus on your pedagogical content knowledge regarding the development of rhythm skills of four- to six-year olds at the preschool.

The data of the four methods will be analysed by me and made into a written portrait that is complemented with video images. The portrait will be presented to you for approval before it is made public. I will study seven specialist music teachers in total and the data of these teachers will be compared to see if there are similarities or differences between these specialist music teachers. In the last phase of my research study, I will compare the pedagogical content knowledge of specialist preschool music teacher regarding rhythm skills with theory on the development of rhythm skills.

Kind regards,

Melissa Bremmer

Ethical guidelines concerning this study

Because the study is done in England at the University of Exeter, I follow the English ethical guidelines for research. In light of these guidelines I would like to inform you on the points below and ask you to sign this letter if you agree to these points. You retain the right to withdraw from this study for any or no reason, and at any time without having to explain why you are withdrawing.

- The video recordings of your lessons are analysed and may be added to my thesis. The recordings may also be presented at research conferences and used at the Bachelor Music Education at the Amsterdam Conservatory. The recordings will not be uploaded to the internet;
- In the portrait I will use your First name, not your surname. The name of your school and names of your pupils will be anonymised;
- In order to ensure that your own pedagogical content knowledge is influenced as little as possible by the research process, I will only mention to you during (4) the interview which aspects of your pedagogical content knowledge the study exactly relates to;
- The (digital) raw data of the stimulated recall, the notebook in the form of a pdf file, the interview and the video recordings will be stored by me on my personal computer and a personal external hard disk at my home. An independent person who is not involved in the study or the field of music education will help transcribing the data verbatim so I can analyse it. This person will remove the data from the computer after transcribing it. The data will not be made available to third parties unless you give your prior approval.

Approved

Approved

[Specialist Music Teacher]

Melissa Bremmer

2.2 Consent form: parents

Geachte ouder(s) of verzorger(s),

In het kader van mijn promotie onderzoek naar de muziek-didactische kennis van vakleerkrachten muziek, in het bijzonder over het didactiseren van ritmische vaardigheden van kleuters, zou ik graag op [datum] bij uw kind in de klas video-opnamen willen maken van [naam], de vakleerkracht muziek. De opnamen kunnen echter ook beelden van uw kind bevatten.

Ik wil de opnamen van [naam] analyseren voor mijn onderzoek maar ook gebruiken als voorbeeldmateriaal bij mijn proefschrift, bij presentaties op onderzoeksconferenties en in de Opleiding Docent Muziek van het Conservatorium van Amsterdam. De opnamen worden niet op het internet geplaatst.

Omdat het gebruik van de video-opnamen belangrijk is voor de goede voortgang van mijn onderzoek, hoop ik dat u geen bezwaar heeft tegen het gebruik van de opnamen. Met dit onderzoek hoop ik een bijdrage te kunnen leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters.

Als u wel bezwaar heeft en niet wilt dat uw kind in beeld komt of nog vragen heeft over het onderzoek, verzoek ik u contact op te nemen met mij.

Met vriendelijke groet,

Melissa Bremmer, docentopleider aan de Amsterdamse Hogeschool voor de Kunsten

Tel: [...]

Mail: [...]

Dear Parent(s) or Caretaker(s),

For my PhD research on the specialist music teacher's **pedagogical content knowledge** regarding rhythm skills of four to six year olds, I would like to make video recordings on [date] in your child's class of [name], the specialist music teacher. The video recordings, however, could also contain images of your child.

I would like to analyse the video recordings of [name specialist music teacher] for my research, but also use samples of the video recordings in my thesis, in presentations at research conferences and at the Bachelor Music Education at the Amsterdam conservatory. The recordings will not be uploaded to the internet.

As the use of the video recordings are important to the progress of my research, I hope you will not object to the use of the video recordings. By doing this research I hope to contribute to the theory on learning and teaching music to young children.

If you do object and do not wish your child being video recorded or if you have questions regarding the study, please contact me.

Kind regards,

Melissa Bremmer, teacher trainer at the Amsterdam School of the Arts

Tel: [...]

Mail: [...]

Appendix 3 Examples of coding throughout the different methods

3.1 Example stimulated recall interview: teacher Jette

3.1.1 Dutch version

- a. First phase of the analysis
- b. Coding thoughts referring to online cognition + blending rhythm skills and pedagogy
- c. Coding thoughts extra information + blending rhythm skills and pedagogy

3.1.2 English version

- a. First phase of the analysis
- b. Coding thoughts referring to online cognition + blending rhythm skills and pedagogy
- c. Coding thoughts extra information + blending rhythm skills and pedagogy

3.2 Example video task one: teacher Liselot + Melissa

3.2.1 Dutch version

3.2.2 English version

3.3 Example video task two: teacher Martine + Melissa

3.3.1 Dutch version

3.3.2 English version

3.4 Example notebook: teacher Jeroen

3.4.1 Dutch version

3.4.2 English version

3.5 Example semi-structured interview: teacher Floor

3.5.1 Dutch version

3.5.2 English version

3.5.3 Dutch version

3.5.4 English version

3.6 Example semi-structured interview: teacher Floor

3.6.1 Dutch version

3.6.2 English version

Original coding was done in HyperResearch

3.1 Example stimulated recall interview: Teacher Jette

3.1.1 Dutch version

a. First phase of analysis

[yellow] = Thoughts referring to online cognition + blending rhythm skills and pedagogy

[green] = Extra information + blending rhythm skills and pedagogy

Jette: ik blijf maar meedoen. Ik denk: o, vervelend. Ja, dat kun je hebben. Dat je denkt: ik weet zeker als ik niet mee doe wordt het niets. Je ziet... ik doe het dus wel. Ik blijf nu wel staan kijken, kijken hoe het gaat. En ik dacht: ik weet zeker dat het niks is. Dat dacht ik, voordat ik stil stond. Ja, hier dacht ik: moet ik nou doorgaan of niet doorgaan. Maar ik mag niet zien wat... dat dacht ik, van zal ik ze nog een keertje laten vliegen en het nog een keertje, dat ik afstand neem en kijk? Of zal ik gewoon maar even doorgaan met de les?

Melissa: Waarom ging je door?

Jette: ... in het begin van de les zei dat meisje: we gaan toch nog wel de heks doen, hè? Toen dacht ik: o ja, die heks moet ook nog. Dus eigenlijk ben je misschien iets te veel bezig bij zo'n voorstelling wat er allemaal niet moet. In plaats van dat je denkt: joh, laat dat nou nog een keer echt serieus... ja, bouw het een beetje uit. Dat kan dan niet. En dan... O... hier dacht ik... ik ging zelf zeggen wat we gingen doen, toen dacht ik: o nee, je kan ook vragen, kijken of ze het zelf weten. Dat vroeg ik en niemand wist het. Toen dacht ik: dan zeg ik het maar. Ik dacht: o, misschien doe ik het verkeerde tempo. Normaal gesproken doen ze "hallo, hallo..." [sings] doen ze dat heel enthousiast, maar nu waren ze een beetje duffig, tammetjes. Zo ken ik ze ook niet. Maar misschien doe ik het net te snel, kan... Ja, ik denk: ik kan er een spel van maken. Dat ze gewoon af zijn met twee klappen, of ik kan het niet doen. Dat zat ik een beetje te twijfelen. Maar ik zag ook dat ze het gewoon niet deden.

Melissa: Ja, ja.

Jette: Dat vinden ze heel leuk, hè. Dat je dan zo snel klapt en dan zingt. Dat vinden ze heerlijk.

Melissa: En waarom zou dat zo zijn?

Jette: Omdat ze namelijk heel erg geconcentreerd moeten luisteren wanneer die twee klappen komen. Ze vinden het helemaal leuk als je dan af bent. Dan zou je denken dat is streng, maar dat vinden ze geweldig. Ik laat ze dan ook wel eens op de grond zitten als ze af zijn, nou dat is helemaal... Ja, ik dacht hier: dit is dan echt ritme. Want ritme dat is... dat je dus inderdaad op verschillende lichaamsdelen het ritme tikt. Dat dacht ik. Hier dacht ik, bij die vorige les bij [name teacher], als je kinderen iets voor laat doen dan denkt de rest van de klas: nou, dan kan ik gaan zitten kijken. Maar ik wil juist dat ze meedoen. Dus dat ze... ik dacht: even kijken of dat nu gaat werken. Ja, ik dacht: ze zingen mee. Je hoort het nu ook.

Melissa: Ja.

Jette: Ik dacht: is dit niet een beetje een saai lied? En ik dacht.want de vorige keer, na ieder couplet dat ze dus zeg maar om mij heen sluipen op zolder. En nu had ik gedacht doe toch maar als het origineel drie coupletten achter elkaar. Eigenlijk een beetje saai. Wat hoor je die gitaar slecht.

Melissa: Ja, maar ik denk dat als we in een stillere ruimte zitten dat je het beter hoort.

Jette: Gaat maar door, hè? Ik dacht: jee, nou gaan ze dus straks weer bewegen en stoppen ze met zingen. Ik dacht: daar gaan we iets aan doen. Normaal gesproken ben ik dan een monster en rennen ze weer terug op de bank. Ik heb daar een hele les over gegeven dat er steeds dat monster komt. Dan gaan ze aaahhhh. Dat wou ik nu niet want die heks komt er aan. Dus ik zit twee dingen te denken: ik denk en ik wil dat ze dat zolder stukje opnieuw doen en beter zingen, en ik wil dat ze als heks blijven staan en niet terugrennen naar de bank. En nu denk ik: O, die heks komt nu. Dus ik zit al te denken aan die heks. En dan ben ik bang dat ze terugrennen, maar dat doen ze niet, doen ze niet. Omdat ik ze voor ben. En dan denk ik: zal het weer zo'n chaos worden als net als bij [name teacher]? Die gaan natuurlijk niet stil staan bij die heksenspreuk. Ja, ik kan het nog veel erger doen, hoor! Ik kan nog veel meer een heks spelen. Ja, hier dacht ik: oooo, ik hoop maar dat ze dan stil staan bij die heksenspreuk, en met hun handen dan. Dat ziet er leuk uit. En als de muziek komt... dus ik denk nu, ik hoop dat ik het een beetje duidelijk uitleg zodat die kinderen begrijpen wat ik bedoel. Ik had het al eerder gedaan hoor, maar die kinderen die vergeten het allemaal weer en die juffen ook. Die zijn net zo suf. Ja, dat vond ik wel goed. Ik dacht: ik ben zo te lang bezig met meedoen, nu ik moet ze even heel duidelijk maken dat het nu eventjes gaat dat ik oplet wie het goed doet.

b. Coding thoughts referring to online cognition + blending rhythm skills and pedagogy

Key of codes:

code: Learning rhythm skills non-verbally instead of verbally

code: Assessing rhythm skills formatively

code: connecting to level pre-schoolers

code: learning pulse, metre, phrasing through movement]

code: Learning rhythm skills through fanatasy figures/themes

code: concentrating on rhythm skills

[green] = Extra information + blending rhythm skills and pedagogy

Jette: ik blijf maar meedoen. Ik denk: o, vervelend. Ja, dat kun je hebben. Dat je denkt: ik weet zeker als ik niet mee doe wordt het niets [code: Learning rhythm skills non-verbally instead of verbally]. Je ziet... ik doe het dus wel. Ik blijf nu wel staan kijken, kijken hoe het gaat. En ik dacht: ik weet zeker dat het niks is. Dat dacht ik, voordat ik stil stond. Ja, hier dacht ik: moet ik nou doorgaan of niet doorgaan. Maar ik mag niet zien wat... dat dacht ik, van zal ik ze nog een keertje laten vliegen en het nog een

keertje, dat ik afstand neem en kijk? Of zal ik gewoon maar even doorgaan met de les?
[code: assessing rhythm skills formatively]

Melissa: Waarom ging je door?

Jette: ... in het begin van de les zei dat meisje: we gaan toch nog wel de heks doen, hè? Toen dacht ik: o ja, die heks moet ook nog. Dus eigenlijk ben je misschien iets te veel bezig bij zo'n voorstelling wat er allemaal niet moet. In plaats van dat je denkt: joh, laat dat nou nog een keer echt serieus... ja, bouw het een beetje uit. Dat kan dan niet. En dan... O... hier dacht ik... ik ging zelf zeggen wat we gingen doen, toen dacht ik: o nee, je kan ook vragen, kijken of ze het zelf weten [code: connecting to level preschoolers]. Dat vroeg ik en niemand wist het. Toen dacht ik: dan zeg ik het maar. Ik dacht: o, misschien doe ik het verkeerde tempo. Normaal gesproken doen ze "hallo, hallo..." [sings] doen ze dat heel enthousiast, maar nu waren ze een beetje duffig, tammetjes. Zo ken ik ze ook niet. Maar misschien doe ik het net te snel, kan. Ja, ik denk: ik kan er een spel van maken. Dat ze gewoon af zijn met twee klappen, of ik kan het niet doen. Dat zat ik een beetje te twijfelen. Maar ik zag ook dat ze het gewoon niet deden [code: assessing rhythm skills formatively].

Melissa: Ja, ja.

Jette: Dat vinden ze heel leuk, hè. Dat je dan zo snel klappt en dan zingt. Dat vinden ze heerlijk.

Melissa: En waarom zou dat zo zijn?

Jette: Omdat ze namelijk heel erg geconcentreerd moeten luisteren wanneer die twee klappen komen. Ze vinden het helemaal leuk als je dan af bent. Dan zou je denken dat is streng, maar dat vinden ze geweldig. Ik laat ze dan ook wel eens op de grond zitten als ze af zijn, nou dat is helemaal... Ja, ik dacht hier: dit is dan echt ritme. Want ritme dat is... dat je dus inderdaad op verschillende lichaamsdelen het ritme tikt [code: learning pulse, metre, phrasing through movement]. Dat dacht ik. Hier dacht ik, bij die vorige les bij [name teacher], als je kinderen iets voor laat doen dan denkt de rest van de klas: nou, dan kan ik gaan zitten kijken. Maar ik wil juist dat ze meedoen. Dus dat ze... ik dacht: even kijken of dat nu gaat werken. Ja, ik dacht: ze zingen mee. Je hoort het nu ook.

Melissa: Ja.

Jette: Ik dacht: is dit niet een beetje een saai lied? En ik dacht... want de vorige keer, na ieder couplet dat ze dus zeg maar om mij heen sluipen op zolder. En nu had ik gedacht doe toch maar als het origineel drie coupletten achter elkaar. Eigenlijk een beetje saai. Wat hoor je die gitaar slecht.

Melissa: Ja, maar ik denk dat als we in een stillere ruimte zitten dat je het beter hoort.

Jette: Gaat maar door, hè? Ik dacht : jee, nou gaan ze dus straks weer bewegen en stoppen ze met zingen [code: concentrating on rhythm skills]. Ik dacht: daar gaan we iets aan doen. Normaal gesproken ben ik dan een monster en rennen ze weer terug op de bank. Ik heb daar een hele les over gegeven dat er steeds dat monster komt. Dan gaan ze aaahhhh. Dat wou ik nu niet want die heks komt er aan. Dus ik zit twee dingen te denken: ik denk en ik wil dat ze dat zolder stukje opnieuw doen en beter zingen, en ik wil dat ze als heks blijven staan en niet terugrennen naar de bank. En nu denk ik: O,

die heks komt nu. Dus ik zit al te denken aan die heks [code: Learning rhythm skills through fanatasy figures/themes]. En dan ben ik bang dat ze terugrennen, maar dat doen ze niet, doen ze niet. Omdat ik ze voor ben. En dan denk ik: zal het weer zo'n chaos worden als net als bij [name teacher]? Die gaan natuurlijk niet stil staan bij die heksenspreuk. Ja, ik kan het nog veel erger doen, hoor! Ik kan nog veel meer een heks spelen. Ja, hier dacht ik: oooo, ik hoop maar dat ze dan stil staan bij die heksenspreuk, en met hun handen dan. Dat ziet er leuk uit. En als de muziek komt... dus ik denk nu, ik hoop dat ik het een beetje duidelijk uitleg zodat die kinderen begrijpen wat ik bedoel. Ik had het al eerder gedaan hoor, maar die kinderen die vergeten het allemaal weer en die juffen ook. Die zijn net zo suf. Ja, dat vond ik wel goed. Ik dacht: ik ben zo te lang bezig met meedoen, nu moet ik ze even heel duidelijk maken dat het nu eventjes gaat dat ik oplet wie het goed doet [dubbel codes: assessing rhythm skills formatively; Learning rhythm skills non-verbally instead of verbally].

c. Coding thoughts extra information + rhythm skills content and pedagogy

Key of codes:

code: concentrating on rhythm skills

Jette: Dat vinden ze heel leuk, hè. Dat je dan zo snel klapt en dan zingt. Dat vinden ze heerlijk.

Melissa: En waarom zou dat zo zijn?

Jette: Omdat ze namelijk heel erg geconcentreerd moeten luisteren wanneer die twee klappen komen. Ze vinden het helemaal leuk als je dan af bent. Dan zou je denken dat is streng, maar dat vinden ze geweldig. Ik laat ze dan ook wel eens op de grond zitten als ze af zijn, nou dat is helemaal...[code: concentrating on rhythm skills].

3.1.2 English version

a. First phase of the analysis

[yellow] = Thoughts referring to online cognition + blending rhythm skills and pedagogy

[green] = Extra information + blending rhythm skills and pedagogy

Jette: I keep participating. I think: Oh, that's a nuisance. Yes, these things happen. You think that: I am sure that if I do not participate it will amount to nothing. You see... I'm doing it after all. Now I'm standing and watching, watching how it's going. And I was thinking: I am sure it amounts to nothing. That is what I thought before I stood still. Yes, here I thought: do I have to continue or not? But I am not allowed to see what... that's what I thought, shall I let them fly again and shall I stand back again and watch? Or shall I just continue with the lesson activity?

Melissa: Why did you continue?

Jette: ...at the start of the lesson that girl said: we are going to do the witch, aren't we? Then I thought: Oh right, we have to do the witch as well. So really you are perhaps a bit too busy with what should not be in the performance. Instead of thinking: hey, leave that till another time to do it seriously ...yes, expand on it. That really is not possible. And then... Oh... here I thought... I started saying what we were going to do, then I thought: Oh no, you can also ask, see if they know it themselves. I asked that and nobody knew it. Then I thought: then I will say it.

I thought: oh, maybe I am doing the wrong tempo... usually they do "hallo, hallo..." [sings] they do it very enthusiastically, but now they were a bit listless, tame. That is not how I know them. But maybe I am just doing it too quickly, could be... Yes, I think: I can make a game of it. That they have to stop after two claps, or I could just not do it. I was in doubt about that. But I also saw that they were just not doing it.

Melissa: Yes, yes.

Jette: They really like that, eh. That you clap really fast and then sing. They love that.

Melissa: And why would that be?

Jette: Because they have to concentrate very much when listening when the two claps come. They all like it when they are out and have to stop. You might think it is strict, but they love it. I also let them sit on the floor sometimes when they are out, that's really. Yes, here I thought: this really is rhythm. Because rhythm is... that you really tap the rhythm on different body parts. That's what I thought. Here I thought, in that previous lesson with [name teacher], that if you let kids show something then the rest of the class thinks: well, then I can sit and watch. But I want them to participate. So that they... I thought: let's see if that will work now. Yes, I thought: they sing along. You can hear it now.

Melissa: Yes.

Jette: I thought: isn't this a bit of a boring song? And I thought... because the last time, after every verse that they, let's say, tiptoe around me in the attic. And now I had thought lets do three verses after each other just like the original. A bit boring, really. You can hardly hear the guitar.

Melissa: Yes, but I think that if we were in a more quiet space you would hear it better.

Jette: It goes on and on, doesn't it? I thought: jeez, now they will start moving again and stop with singing. I thought: we will do something about that. Normally I am the monster and they run back to the bench. I have given a whole lesson about it that the monster comes every time. Then they go aahhhh. I did not want that now because the witch comes. So I am thinking two things: I want them to do the attic part again and sing better, and I want them to stand still as a witch and not run back to the bench. And now I think: Oh, the witch comes now. So I am already thinking about that witch. And I am afraid that they will run back, but they don't. Because I beat them to it. And then I think: will it bechaome chaos again just like with [name teacher]? They will probably not stand still for the witches' spell. Yes, I can do much worse, really! I can be much more of a witch. Yes, here I thought: ooooh, I just hope that they stand still at the witches' spell, and with their hands. That looks nice. And when the music comes... so now I think: I hope that I explain it well so the children understand what I mean. I had done it before, but the children forget everything and the teachers as well. They are equally

slow. Yes, I liked that. I thought: I am participating too long this way, I now have to make it clear that I will now pay attention to who is doing it well.

b. Coding thoughts referring to online cognition + blending content and pedagogy

Key of codes:

code: Learning rhythm skills non-verbally instead of verbally

code: Assessing rhythm skills formatively

code: connecting to level pre-schoolers

code: learning pulse, metre, phrasing through movement]

code: Learning rhythm skills through fantasy figures/themes

code: concentrating on rhythm skills

[green] = Extra information + blending rhythm skills and pedagogy

Jette: I keep participating. I think: Oh, that's a nuisance. Yes, these things happen. You think that: I am sure that if I do not participate it will amount to nothing [code: Learning rhythm skills non-verbally instead of verbally]. You see... I do it after all. Now I'm standing and watching, watching how it's going. And I was thinking: I am sure it amounts to nothing. That is what I thought before I stood still. Yes, here I thought: do I have to continue or not? But I am not allowed to see what... that's what I thought, shall I let them fly again and shall I stand back again and watch? Or shall I just continue with the lesson activity? [code: assessing rhythm skills formatively]

Melissa: Why did you continue?

Jette: ...at the start of the lesson that girl said: we are going to do the witch, aren't we? Then I thought: Oh right, we have to do the witch as well. So really you are perhaps a bit too busy with what should not be in the performance. Instead of thinking: hey, leave that till another time to do it seriously... yes, expand on it. That really is not possible. And then... Oh... here I thought... I started saying what we were going to do, then I thought: Oh no, you can also ask, see if they know it themselves [code: connecting to level preschoolers]. I asked that and nobody knew it. Then I thought: then I will say it.

I thought: oh, maybe I am doing the wrong tempo... usually they do "hallo, hallo..." [sings] they do it very enthusiastically, but now they were a bit listless, tame. That's not how I know them. But maybe I am just doing it too quickly, could be... Yes, I think: I can make a game of it. That they have to stop after two claps, or I could just not do it. I was in doubt about that. But I also saw that they were just not doing it [code: assessing rhythm skills formatively].

Melissa: Yes, yes.

Jette: They really like that, eh. That you clap really fast and then sing. They love that.

Melissa: And why would that be?

Jette: Because they have to concentrate very much when listening when the two claps come. They all like it when they are out and have to stop. You might think it is strict, but they love it. I also let them sit on the floor sometimes when they are out, that's really... Yes, here I thought: this really is rhythm. Because rhythm is... that you really tap the rhythm on different body parts [**code**: learning pulse, metre, phrasing through movement]. That's what I thought. Here I thought, in that previous lesson with [name teacher], that if you let kids show something then the rest of the class thinks: well, then I can sit and watch. But I want them to participate. So that they... I thought: let's see if that will work now. Yes, I thought: they sing along. You can hear it now.

Melissa: Yes.

Jette: I thought: isn't this a bit of a boring song? And I thought... because the last time, after every verse that they, let's say, tiptoe around me in the attic. And now I had thought lets do three verses after each other, just like the original. A bit boring, really. You can hardly hear the guitar.

Melissa: Yes, but I think that if we were in a more quiet space you would hear it better.

Jette: It goes on and on, doesn't it? I thought : jeez, now they will start moving again and stop with singing [**code**: concentrating on rhythm skills]. I thought: we will do something about that. Normally I am the monster and they run back to the bench. I have given a whole lesson about it that the monster comes every time. Then they go aahhhh. I did not want that now because the witch comes. So I am thinking two things: I want them to do the attic part again and sing better, and I want them to stand still as a witch and not run back to the bench. And now I think: Oh, the witch comes now. So I am already thinking about that witch [**code**: Learning rhythm skills through fantasy figures/themes]. And I am afraid that they will run back, but they don't. Because I beat them to it. And then I think: will it become chaos again just like with [name teacher]? They will probably not stand still for the witches' spell. Yes, I can do much worse, really! I can be much more of a witch. Yes, here I thought: ooooh, I just hope that they stand still at the witches' spell, and with their hands. That looks nice. And when the music comes... so now I think: I hope that I explain it well so the children understand what I mean. I had done it before, but the children forget everything and the teachers as well. They are equally slow. Yes, I liked that. I thought: I am participating too long this way, I now have to make it clear that I will now pay attention to who is doing it well [**dubbel codes**: assessing rhythm skills formatively; Learning rhythm skills non-verbally instead of verbally].

c. Coding thoughts extra information + blending rhythm skills and pedagogy

Key of codes:

code: concentrating on rhythm skills

Jette: They really like that, eh. That you clap so quickly and then sing. They love that.

Melissa: And why would that be?

Jette: Because they have to concentrate very much when listening when the two claps come. They all like it when they are out and have to stop. You might think it is strict, but

they love it. I also let them sit on the floor sometimes when they are out, that's really...
...[code: concentrating on rhythm skills].

3.2 Example video task analysis one: Teacher Liselot + Melissa

3.2.1 Dutch version

Key of codes:

code: sequence one

code: sequence two

code: sequence three

Melissa: Ja. Ok, we hebben hem nu helemaal eigenlijk gezien. Zou je hem nog voor jezelf even willen samenvatten qua opbouw. Van: “dit is de opbouw en daarom heb ik de opbouw zo”.

Liselot: Dat kan. Begint dus visueel met het aanbieden van het patroon [van de muziek]. Dan het patroon koppelen aan klanken. Dan die klanken weer koppelen aan het geluidsfragment dat ik heb gekozen waarbij de afwisseling zit tussen de stokjes en in de boemwhackers. En dan door voordoen en laten kijken, zeg maar, de eerste aanzet geven waar ik naar toe wil [**code:** sequence one].

Dan volgt de eerste zelfstandige actie, zeg maar, dat ze moeten. Daar ben ik nog behoorlijk bij betrokken, en de rest van de kinderen ook merk je. Die leveren nog veel commentaar [op de andere kinderen] bij wanneer ze wat moeten doen [**code:** sequence two].

En bij de tweede groep zijn ze eigenlijk alleen aan het spelen nog, hoef ik me niet ermee te bemoeien. En het commentaar vanuit de kring [op de andere kinderen] is ook minder geworden en dan kan je inderdaad zien wat er ontstaat aan ritmes [**code:** sequence three].

3.2.2 English version

Key of codes:

code: sequence one

code: sequence two

code: sequence three

Melissa: Yes. OK, we have seen the whole thing now. Could you just summarise for yourself what the sequence is. Like: "this is the sequence and that is why I chose this sequence".

Liselot: That's possible. So, starts with the demonstration of the structure [of the music] in a visual manner. After that, the linking of the sounds to the structure. Then again, linking the sounds to the music fragments that I have chosen whereby the variation is in the alternation between the sticks and the boomwhackers. So by modelling and observing, say, giving them an idea of the course of the rhythm activity [**code:** sequence one].

After that they have to perform, say, their first independent action. I am still involved quite a bit, as are the other children, as you can see. They still supply a lot of commentary [to the other children] on what they have to do when [**code:** sequence two].

And with the second group, they more or less play independently, I don't need to interfere a lot. And the comments from the circle [of children] have lessened and then you can observe what kind of rhythms patterns come into being [**code:** sequence three].

3.3 Example video analysis task two: teacher Martine + Melissa

3.3.1 Dutch version

Key of codes:

code: preparing the body for the rhythm activity

code: representing the pulse/bar

code: representing rhythmic phrasing

code: learning rhythm skills non-verbally instead of verbally

code: cueing start or end of rhythmic activity

code: instructional gestures

6.32

Martine: Nou, ja. Goed. Maar ik weet niet, dat is natuurlijk niet echt muziekdidactische, maar ik ga ook heel erg recht op zitten. Zo van: we gaan beginnen. Dus ik ga... Ik zat eerst gewoon gebogen, en ik was nog aan het vertellen. Dan zeg ik dus eigenlijk al, zeg ik van: hé! Ga klaar zitten. En hoe zit je klaar bij muziek? Dat is natuurlijk ook weer heel erg dat klassieke verhaal: recht op, benen voor je, hoofd recht. Goede houding zeg maar voor muziek maken [**code:** preparing the body for the rhythm activity]. En dan geef ik met mijn hand eigenlijk al bijna, ja, de maat aan. Dan laat ik zien natuurlijk hoe je het instrument bespeelt en in de maat. Dus laat ik ook de maat zien, zeg maar, met mijn handen [**code:** representing the pulse/bar].

Ja, dat was eigenlijk ook weer, hè. Dat is de frasering die je aangeeft van het liedje. Dus je hangt even stil en haalt adem. Eigenlijk ook een soort dirigeren om de frasering van de muziek aan te geven, van het lied [**code:** representing rhythmic phrasing]. Grappig hoe veel je onbewust eigenlijk doet, hè? Je zou eigenlijk alles dus met mimiek en beweging, eigenlijk veel meer dan je alleen maar praat. Je kan natuurlijk heel veel doen [**code:** learning rhythm skills non-verbally instead of verbally].

6.43

Melissa: Ja, wat je hier ook doet... Je geeft ook heel even met je hand, dat is wel heel leuk om te zien... je verlengt de frase en je geeft nog... je zet met je arm... [**code:** representing rhythmic phrasing]

6.51

Martine: Ja, die bedoel ik. Dat gebaar bedoelde ik, wat hier zeg maar naar boven kwam. Ja. Ja, ik hou hem gewoon heel bewust stil. Het einde is gewoon stil, geen beweging meer [**Code:** cueing start or end of rhythmic activity].

Melissa: Ja. Ja.

Martine: Goed, ik geef het voorbeeld natuurlijk hoe ze het instrument moeten vasthouden en laat zien hoe de beweging is. Dus dat is natuurlijk wel de [niet te verstaan] puur voor hoe gebruik je het instrument [code: instructional gestures].

Melissa: Ja, en dat laat je heel duidelijk zien.

[instrumenten worden uitgedeeld]

11.05

Martine: Ja, het gaat echt om een opmaat, hè. Gewoon, ik tel vooraf. Hoe heet dat?

Melissa: Ja, om een inzet te geven.

Martine : Ja, de inzet.

Melissa: Een soort draaiende beweging maak je [code: cueing start or end of rhythm activity]

11.09

Melissa: ook hier, hè. Verlenging, of frasering doe je daar eigenlijk. Frasering en inzet geven daar ... [code: representing rhythmic phrasing]

11.19

Martine: Stopgebaar. Lekker didactisch!

Melissa: Ja maar, het is wel... Het is stopgebaar, hand naar voren en vinger voor de mond om het einde van het stuk aan te geven.

Martine: Ja, gewoon eigenlijk zorgen dat je dirigeert, eigenlijk een soort super dirigentenstokje bij wijze van spreken [code: cueing start or end of rhythm activity].

3.3.2 English version

Key:

code: preparing the body for the rhythm activity

code: representing the pulse/bar

code: representing rhythmic phrasing

code: learning rhythm skills non-verbally instead of verbally

code: cueing start or end of rhythmic activity

code: instructional gestures

6.32

Martine: Well, yes. Good. But I don't know, this of course is not really a pedagogical... but I straighten up. Like: we're getting ready to begin. So I am... First, I was sitting bent forwards, and I was still talking. Then I really already say, I say: Hey! Get ready. And how do you get ready for a music lesson? So that of course is the usual story: sit up straight, put your legs in front of you, head straight. Take on a good posture for making music [**code:** preparing the body for the rhythm activity]. And then with my hand I demonstrate, really, almost, yes, the beat. Of course, I then demonstrate how to play the instrument and how to play on the beat. So I also show the beat, say, with my hands [**code:** representing the pulse/bar].

Yes, that was actually again, huh. It's the phrasing of the song that you show. So you freeze slightly and take a breath. Really, it's a kind of conducting to indicate the phrasing of the music of the song ... [**code:** representing rhythmic phrasing].

Funny how much you actually do unconsciously, huh? You would be able to do everything with mimicry and movement, actually much more than you could do by only talking. Of course you can do a lot [**code:** learning rhythm skills non-verbally instead of verbally].

6:43

Melissa: Yes, what you're also doing here ... You're also briefly showing with your hand, that's really nice to see... you prolong the phrase and you also give ... you put your arm... [**code:** representing rhythmic phrasing].

6:51

Martine: Yes, that's the one I mean. That's the gesture I meant, what you were just discussing. Yes. Yes, I deliberately freeze. The end is just quiet, no more movements [**code:** cueing start or end of rhythm activity].

Melissa: Yes. Yes.

Martine: Well, of course I set an example of how the instrument should be held and what the movement should be. So that's obviously the [inaudible] purely how to use the instrument [code: instructional gestures].

Melissa: Yes, you clearly demonstrate that.

[Instruments are distributed]

11:05

Martine: Yes, it's about an upbeat. Just, I count beforehand. How do you call that?

Melissa: Yes, signalling that they can start

Martine: Yes, can start

Melissa: You make a circular kind of motion [code: cueing start or end of rhythm activity].

11:09

Melissa: here too, huh. Extending, or really you're demonstrating a phrase there. Phrasing and een inzet geven [code: representing rhythmic phrasing].

11:19

Martine: "Stopgesture". Very "pedagogical"!

Melissa: Yes, but it's ... it's a stop gesture, hand forward and finger to the mouth to indicate the end of the piece.

Martine: Yes, you're making sure that you're conducting, actually a kind of super conductor baton, so to speak [code: cueing start or end of rhythm activity].

3.4 Example notebook: teacher Jeroen

3.4.1 Dutch Version

Key of codes:

code: influence background on PCKg

code: influence teacher training college

code: predisposition to learn rhythm skills

code: connecting to level of pre-schoolers

code: Learning by doing

code: incorporating rhythmic ideas

code: integrating rhythm skills with other skills

a. Achtergrond informatie

1. Wat is uw leeftijd?: 40
2. Wat is uw geslacht?: M
3. Hoeveel jaar geeft u muziekles aan kleuters?: 8
4. Heeft u naast uw opleiding tot vakleerkracht muziek aan een conservatorium (Schoolmuziek of Opleiding Docent Muziek), nog een andere opleiding afgerond? Zo ja, welke?: nee [**code:** influence background on PCKg]
5. Hoe heeft het door u gevolgde onderwijs aan het conservatorium (Schoolmuziek of Opleiding Docent Muziek) uw ontwerpen en uitvoeren van een curriculum voor “ritmische vaardigheden” beïnvloed?: Op het gebied van leerlijnen, werkvormen, didactiek, pedagogisch inzicht, repertoire(analyse) [**code:** influence teacher training college]
6. Geeft u muziekles vanuit een persoonlijke, en/of muziekpedagogische, en/of een didactische opvatting? Zo ja, welke?: Muziek is een algemeen menselijke eigenschap [**code:** predisposition to learn rhythm skills]. Of je er “goed” in bent is niet relevant voor mijn lesgeven [**code:** connecting to level of preschoolers]. Ik probeer vanuit het doen de leerlingen op verschillende manieren te laten ervaren wat muziek (maken) met je doet [**code:** Learning by doing]. Daarnaast geef ik de leerlingen de ruimte en middelen om zich op een persoonlijke manier uit te drukken in/met muziek [**code:** incorporating rhythmic ideas].
7. Korte beschrijving van uw huidige werkzaamheden: [informatie op persoonlijke website]

b. Notities

26-6-12

- Iedereen heeft gevoel voor ritme. Niet per sé op uitvoerend niveau, maar wel fysiek en fysiologisch [**code:** predisposition to learn rhythm skills]. Alles in het leven bestaat uit trillingen, trillingsverhoudingen en periodieke afwisseling. Muziek is voor mij een

manier om je tot die universele trillingen te verhouden. Ik kan daar desgewenst behoorlijk metafysisch over worden.

Bij jonge kinderen begint het met luisteren, bewegen, en ervaren van muziek gekoppeld aan of geïntegreerd met andere zintuigelijke waarnemingen [code: Learning by doing].

- Laatst viel mij op bij een workshop op ZMLK onderwijs (VSO) dat “in de maat spelen” meer te maken heeft met ontwikkelingsniveau dan ik dacht. Ik dacht dat het vooral een motorische ontwikkeling vereist om dat te kunnen, maar daar waren kinderen van 14-15 jaar die het duidelijk niet voor elkaar kregen om in een groep in een puls mee te spelen. Ze hadden gewoon meer tijd nodig om die hand op dat vel te krijgen en waren dus steevast te laat. Aan de andere kant kunnen mijn kleuters op Bartimeus (SO) wel al redelijk in een liedje op de maat slaan. Interessant.

8-7-2012

- Bij het terugkijken van de video-opnames viel me op dat het soms moeilijk is om ritmische ontwikkeling te isoleren. Ook vanuit mijn achtergrond met wereldmuziek vind ik het vaak gevoelsmatig “gek” om een strikte scheiding te maken. Ik houd er van om kinderen muziek te laten ervaren waarbij ik het samenspel tussen alle betrokken elementen (melodie, ritme, beweging, beleving, sociale aspecten, etc.) waardevol vind [dubbel code: integrating rhythm skills with other skills/ Influence background on PCK]

3.4.2 English version

Key:

code: influence background on PCKg

code: influence teacher training college

code: predisposition to learn rhythm skills

code: connecting to level of pre-schoolers

code: Learning by doing

code: incorporating rhythmic ideas

code: integrating rhythm skills with other skills

a. Background information

1. What is your age?: 40
2. What is your gender?: M
3. How many years have you been teaching music to preschoolers?: 8
4. Have you completed any other degrees besides your degree at a conservatory (School Music or Music Teacher)? If so, which?: no [code: influence background on PCKg]

5. How has your education (School Music or Music Teacher) influenced your designs of and execution of a curriculum for “rhythm skills”? In the field of curricular strands, learning activities, didactics, pedagogical insight, repertoire (analysis) [code: influence teacher training college]
6. Do you teach music from a personal and/or music pedagogical and/or didactic view? If so, which?: Music is a general human property [code: predisposition to learn rhythm skills]. Whether you are “good” at it is not relevant for my teaching [code: connecting to level of preschoolers]. I try to let the pupils experience what (playing) music does to you in different ways [code: Learning by doing]. Besides, that I give the pupils space and means to express themselves in a personal manner in/with music [code: incorporating rhythmic ideas].
7. Short description of your current work: [information on personal website]

b. Notes

26-6-12

- Everybody has a feeling for rhythm. Not necessarily on an executive level, but physical and physiological [code: predisposition to learn rhythm skills]. Everything in life is made up of vibrations, vibration ratios and periodic changes. For me music is a way to relate to those universal vibrations. If needed, I can get quite meta-physical about it, if you want.

With young children it starts with listening, moving and experiencing music coupled with or integrated with other sensory perceptions [Learning by doing].

A while ago I noticed in a workshop at special needs education (secondary level) that “playing to the beat” has more to do with development level than I had thought. I thought that motoric development was mainly required to be able to do it, but there were children of 14-15 years old that clearly were not able to play to a pulse within a group. They just needed more time to get their hand on the drum and were thus always too late. On the other hand, my preschoolers at Bartimeus (Special education primary level) can generally already drum to the beat of a song. Interesting.

8-7-2012

- When watching the video recordings I noticed that it is sometimes difficult to isolate rhythmic development. Also from my background in world music I often find it instinctively “strange” to make a strict division. I like to let children experience music whereby I find the interplay between all involved elements (melody, rhythm, movement, experience, social aspects, etc.) valuable [dubbel code: integrating rhythm skills with other skills/ Influence background on PCK].

3.5 Example semi-structured interview [Teacher: Floor]

Key of codes:

code: Learning rhythm skills through fantasy figures/themes

code: Learning pulse, metre, phrasing through movement

code: Learning through repetition, variation, contrast

code: music induces rhythmic movement

code: integrating rhythm skills with other skills

code: recognising the quality of rhythm skills

code: Synchronising rhythmic movements to external source of music

code: Learning rhythm skills non-verbally instead of verbally

code: Learning behaviour pre-schoolers

code: Translating inner hearing to rhythmic output

code: connecting to level pre-schoolers

code: predisposition to learn rhythm skills

code: Learning by doing

3.5.1 Dutch version

Floor: Ja, dat is ook met ritmische vaardigheden. We hebben toen rondom, nou ja, Koninginnedag en dat de koning werd gekroond zeg maar, hebben we... nou, doe ik het zo, dat we gaan oefenen hoe we naar de koning gaan zwaaien en dat het er vrolijker uitziet als we linten hebben [**code:** Learning rhythm skills through fantasy figures/themes]. Daar sta je met z'n allen te zwaaien op de muziek. Daar zit dan zeker het ritmische in, daar zit de puls in inderdaad [**code:** Learning pulse, metre, phrasing through movement]. Maar daar zit ook weer in, want ik had daar ook muziekjes van, toch ook weer snel en langzaam en dat soort dingen [**code:** Learning through repetition, variation, contrast]. Of... Ik deed ook wel van een, twee en draai een rondje, en een twee en draai een rondje. Nou ja, daar moeten ze gewoon wel ritmisch mee doen [**code:** Learning pulse, metre, phrasing through movement]. En ja, dat is ook heel erg leuk om dat te doen. Daar zit ook natuurlijk ook weer de muziek bij die ons ondersteunt [**code:** music induces rhythmic movement]. Nou ja, voor het motorische is het natuurlijk ook wel... de juffen vinden het altijd leuk om te zien. Ook met de stokjes, en ook met de linten en ook... het linten is natuurlijk ook van het schrijfdansen wel, dat soort dingen... maar ja, kijk, het is niet altijd alleen maar ritmische vaardigheden die je in je les hebt. Je kan ergens je focus op hebben, maar in zo'n les zit bijvoorbeeld ook het hoog en het laag. Bij het "uitdeel"-liedje daar zit al bijvoorbeeld... daar zing ik hoog: "hoog in de lucht" of "bij de grond", "hoog in de lucht" of "bij de grond". Dan moeten ze luisteren en doen. Het is hoog en laag. Het is natuurlijk niet alleen maar ritmische vaardigheden in een les. Het is echt gecombineerd [**code:** integrating rhythm skills with

other skills].

Melissa: En kun je ook over het combineren, kun je daar wat meer over zeggen?

Floor: Nou ja, wat ik net noemde over het hoog en laag... en, dan bij de linten bijvoorbeeld nog?

Melissa: Of in zijn algemeenheid?

Floor: Of in zijn algemeenheid... ja, ik denk dat er... je kan natuurlijk echt een les hebben over hoog en laag, maar als er dan een liedje bij zit over hoog en laag dan krijg je vanzelf ook weer de puls er ook bij. Ik denk dat dat altijd wel een soort combinatie is [code: integrating rhythm skills with other skills]. En dan... ja, ik... dat is grappig dat je het vraagt, want ik denk dat het zo vanzelfsprekend is dat je... maar dat te vanzelfsprekend is dat je er bijna niet meer aan denkt van... ja, dat je dingen combineert en... ja, het is ook, nou ja, het voorbeeld dat ik dan gaf van die zomerles van "Hoi, het is vakantie", daar oefen ik op een gegeven moment het over de golven springen [code: Learning rhythm skills through fantasy figures/themes]. Dat is niet alleen op de puls springen of zo, nee het is als ik op een bekken sloeg, mochten ze springen. Maar dat is natuurlijk ook een soort concentratieoefening die er weer bij komt. Ja, dat vind ik ook altijd heel goed, hoor, dat soort punten er bij voor de concentratie. En dat je met elkaar, ik bedoel dat is ook gewoon, met elkaar springen. Let maar eens op elkaar. Ja. Als mij een voorbeeld te binnen schiet dan van het combineren... ja..als ik bij zo'n stokjesles is het dan ook de fantasie die de kinderen nog... hun eigen ideeën, ja. Fantasie die je prikkelt, of liedjes met onzinteksten of zo. Laat de kinderen maar bedenken wat ik daar aan het zingen ben en dan kom je ook weer meer op de taal uit. Ja [code: integrating rhythm skills with other skills].

Melissa: Ja, dat is zo. Ik ga even door naar de volgende vraag. Je hebt er al een aantal dingen over gezegd, maar de focus is eerst een beetje op hoe doceer je het. En je hebt ook al een beetje verteld van hoe de kleuters die ritmische vaardigheden leren. Dat ze het leuk vinden om meegenomen te worden in een thema maar dat ze het soms moeilijk vinden, motorisch, dus dat daarom instrumenten moeilijk zijn. Je hebt iets over concentratie gezegd, over herhalen. Zijn er nog andere punten die je specifiek voor kleuters vindt? Van hoe zij, hoe jij denkt dat zij die ritmische vaardigheden leren of wat je tegenkomt bij kleuters als ze...

Floor: Nou, ik denk dat je veel herhaalt. De herhaling er in is... [code: Learning through repetition, variation, contrast] en dat je best wel wat van een kleuter kan vragen. Dat het helemaal niet is dat alles meteen maar goed is. Je kan natuurlijk best enthousiast zijn maar ze dan net weer prikkelen van zullen we... of doe het nu eens zo, doe het nu eens zo [code: recognising the quality of rhythm skills]. En dat je toch altijd ook bij kleuters wel, ook door herhaling dus, het ook wel weer beter kan krijgen. En dat je het ook niet op een bepaald, niet alleen maar met bewegen aanleert maar toch ook op verschillende didactische werkvormen om een mooi woord te gebruiken. Dat dat kinderen dus wel dan, ja, blijft boeien. En dan, zoals ik al zei, kinderen vinden het echt een heel leuk spelletje altijd, dat kan je best een paar keer per jaar doen, om ook eens ritmes te spelen voor ze en dat ze dan, nou ja, dat ze dat dan kunnen... dat ze dan gaan raden van welk liedje dat ritme dan is. Dat is dan een werkvorm, maar het is ook de werkvorm bijvoorbeeld, wat ik al...[code: Learning through repetition, variation, contrast], de simpele werkvorm je speelt op de trommel een ritme en ze lopen op die manier [code: Learning pulse, metre, phrasing through movement]. Maar dan terug is

het ook leuk dat ik ga lopen en dat de kinderen juist mogen spelen of mogen klappen hoe ik loop. Ja, dat is dan wel weer... blijf ze prikkelen, blijf ze uitdagen. Blijf op verschillende manieren werken [code: Learning through repetition, variation, contrast]. En juist ook, het kan ook met kleuters hoor, het voor en het naklappen. Nou, en als ik dan zeg tegen de oudste kleuters: dat gaan we in groep 3 ook doen, dan is het helemaal... voor de jongsten is het klappen motorisch gezien wel lastig, maar, ja goed, ik laat mij er niet helemaal van weerhouden omdat dan toch voor de oudste kleuters te doen [dubbel code: Differentiating rhythm skills for group 1 and group 2/Synchronising rhythmic movements to external source of music]. Maar ook het voor en het naklappen is een werkvorm. Dus zo heb je natuurlijk veel... en ook ja, of bepaalde zinnestukjes uit een liedje die je eens een keertje voor of een keertje naklapt. Voorklappen zodat ze het kunnen naklappen [code: Learning rhythm skills non-verbally instead of verbally]. Dat je denkt, nou dat kan beter of leuker gezongen worden. En, dat gewoon toch laten ervaren.

Melissa: Ik zit even te kijken... Wat zouden kleuters moeilijk vinden aan het leren van ritmische vaardigheden?

Floor: Kleuters, moeilijk... nou, volgens mij zijn ze zo, ja, ze willen zo graag leren, ja [code: Learning behaviour preschoolers]. Jeetje, vinden ze het moeilijk? Ik denk dat het eerder de motoriek die misschien ze tegen zit nog, de vaardigheden die ze maar... in hun koppie... [code: Translating inner hearing to rhythmic output] ja, denk ik toch... ja, jeetje, vinden ze het moeilijk? Ja, ja, goed, ja zoals bij het huppelen, de ene huppelt makkelijker dan de ander... maakt mij het uit of ze al precies huppelen, ik ben ook niet de kleuterjuf. Maar als ze al laten zien aan mij dat ze het verschil horen tussen ritmes dan... wat vinden ze lastig? Jeetje... ja, nou ja, ik sprak al een beetje over kinderen die toch misschien, die ene is sowieso wat ritmisch vaardiger dan de ander, maar...

Melissa: Waar zou dat aan liggen, denk je?

Floor: Misschien wordt er thuis meer gezongen? Ja... dat zou... door de juf meer gezongen. Door de juf ook al meer aan gedaan. Dat ze het vaker in de week krijgen dan alleen het half uurtje bij mij. Dat scheelt ook nog wel eens. Of ze het nou speciaal moeilijk... ze hoeven ook niet alleemaal in een keertje te kunnen [code: connecting to level preschoolers]. En... maar wat zouden ze nou... ik denk dat als je dat zo spelenderwijs aan ze leert, dat daar niet echt... dat het dan meer... ja, gewoon, die motorische vaardigheden zijn die ze tegenzitten dan [code: synchronising rhythmic movements to external source of music]. Ik denk dat het een heel natuurlijk verloop wel is, ja. Ja, ik denk dat het gewoon ook wel in kinderen zit [code: predisposition to learn rhythm skills]. En als je daarom ook met die beweging, die beweging bij kinderen, als je daarom ook veel met bewegingen juist laat doen dat het dan wel een prettige manier van ervaren is voor kinderen [code: Learning by doing]. Ja, en waarom de ene dat nou makkelijker doet dan de andere? Ja, wist je dat eigenlijk maar.

3.5.2 English version

code: Learning rhythm skills through fantasy figures/themes

code: Learning pulse, metre, phrasing through movement

code: Learning through repetition, variation, contrast

code: music induces rhythmic movement

code: integrating rhythm skills with other skills

code: recognising the quality of rhythm skills

code: Synchronising rhythmic movements to external source of music

code: Learning rhythm skills non-verbally instead of verbally

code: Learning behaviour pre-schoolers

code: Translating inner hearing to rhythmic output

code: connecting to level pre-schoolers

code: predisposition to learn rhythm skills

code: Learning by doing

Floor: Yes, that's also the case with rhythm skills. Around Queen's Day, we had, well, when the king was crowned, we have... well, this is how I do it, we are going to practise waving to the King and it just looks nicer if we have ribbons [**code:** Learning through fantasy figures/themes]. Then, there we are, all of us waving to the music. That certainly has something rhythmical, it really has the pulse in it [**code:** Learning pulse, metre, phrasing through movement]. But it also contains, because I also had that kind of music, again quick and slow and those types of things [**code:** Learning through repetition, variation, contrast]. Or... I also did a bit of one, two and turn around. Well, there they have to join in rhythmically [**code:** Learning pulse, metre, phrasing through movement]. And yes, it is also very fun to do. Of course, the music supports us [**code:** Music induces rhythmic movement]. Well yes, for the motor skills it's also... the teachers always like to see it. Also with the sticks, and also with the ribbons and also... the ribbons are of course also used with "write-dancing" [a special writing programme], those types of things... but yes, look, it is not always just rhythm skills that you have in your lesson. You can have a focus on something, but in such a lesson there is also, for example, the high and the low. With the "hand-out"-song there is for example... there I sing high: "high in the air" or "at the ground", "high in the air" or "at the ground". Then they have to listen and do it. It is high and low. Of course it is not only rhythm skills in a lesson. It really is combined [**code:** integrating rhythm skills with other skills].

Melissa: And about the combining, can you tell a bit more about that?

Floor: Well yes, what I just mentioned about high and low ...and, also with the ribbons for example?

Melissa: Or generally?

Floor: Or generally... yes, I think that there... you can of course really have a lesson about high and low, but if there is a song about high and low then you automatically get the pulse with it. I think that there is always a kind of combination [code: integrating rhythm skills with other skills]. And then... yes, I ...it's funny that you ask, because I think that it is so natural that you... but so natural that you almost don't think about it and ... yes, it is also, well yes, the example that I gave of the Summer lesson of "Hurray, it's holiday", at a certain moment I practise jumping over the waves [code: Learning through fantasy figures/themes]. It's not only jumping on the pulse or something like that, no it is when I hit a cymbal, they are allowed to jump. But that is also a kind of concentration exercise, of course, that is added to it. Yes, I always find that very good, those types of things included for concentration. And that you do it together, I mean it's also, jumping with each other. Try to take note of each other. Yes. I find that when an example of combining comes to mind... yes, with such a [rhythm] sticks lesson it is also the fantasy that the children... their own ideas, yes. Fantasy that stimulates you, or lyrics with nonsense lines or something. Let the children think of something that I am singing and then you end up with the language. Yes [code: integrating rhythm skills with other skills].

Melissa: Yes, that's right. I will just go on to the next question. You have already said some things about it, but the focus is first of all on how do you teach it. And you have also told a little about how preschoolers *learn* those rhythm skills. That they like to be enticed by a theme but that they sometimes find it difficult, motorically, so that is why instruments are difficult. You have said something about concentration, about repetition. Are there any other points that you specifically would like to mention concerning preschoolers? How they, how you think they learn those rhythm skills or what you encounter with preschoolers when they ...

Floor: Well, I think you repeat a lot. The repetition in it is... [code: Learning through repetition, variation, contrast] and that you can certainly ask a lot from a preschooler. It's not the case that everything is good immediately. You can of course be enthusiastic but then just stimulate them to do... or let's do it this way now, do it that way now [code: recognising the quality of rhythm skills]. And that you always have with preschoolers, also through repetition, it can get better. And that you also don't do it in one certain way, not only teach the movements but also apply different teaching activities, to use a nice word. That it keeps the children, yes, engaged. And then, like I already said, children always really very much like the game, you can easily do that a couple of times a year, to play rhythms for them and that they then, well yes, that they then can... that they will guess which song the rhythm belongs to. That is a teaching activity, but it is also the teaching activity for example, what I already [code: Learning through repetition, variation, contrast]...the simple teaching activity you play a rhythm on the drum and they walk in that manner [code: Learning pulse, metre, phrasing through movement]. But turning it around, it is also fun that I walk and that the children play or may clap how I should walk. Yes, that again is... keep stimulating them, keep challenging them. Teach in different ways [code: Learning through repetition, variation, contrast] ...And also, you can also do it with preschoolers, clapping through call and response. Well, and if I then tell the eldest preschoolers: will we also do it in Group 3, then it is really ...for the youngest the clapping is difficult motorically, but, yes well, it doesn't stop me from doing it for the eldest preschoolers doen [dubbel code: Differentiating rhythm skills for group 1 and group 2/Synchronising rhythmic

movements to external source of music]. But also the clapping in a call and response form is a teaching activity. So you of course have a lot... and also yes, or certain lines from a song that you can sometimes clap for example. Clapping it for them so they can imitate it [code: Learning rhythm skills non-verbally instead of verbally]. That you think, well it can be sung better or nicer. And, just let them experience that.

Melissa: I am just looking... What could preschoolers find difficult when learning rhythm skills?

Floor: Preschoolers, difficult... well, according to me they are so, yes, they want to learn so very eagerly, yes [code: Learning behaviour preschoolers]. Jeez, do they find it difficult? I think that it is more the motor skills that are holding them back, the skills that they just... but in their heads... [code: Translating inner hearing to rhythmic output]. Yes, I think that... yes, jeez, do they find it difficult? Yes, yes, good, yes like skipping, the one skips easier than the other ...do I care if they are skipping correctly, I'm not the preschool teacher. But if they show me that they can hear the difference in rhythms then... what do they find difficult? Jeez... yes, well yes, I already spoke a bit about children that perhaps, the one is definitely more rhythmically skilled than the other, but ...

Melissa: What would be the reason for that, do you think?

Floor: Maybe there is more singing at home? Yes... that would... more singing done by the teacher. The teacher has also worked on it more. They might have it more than just the half hour with me. That also makes a difference. Whether they especially find it difficult... they also don't have to be able to do it at once [code: connecting to level preschoolers]. And... but what would they... I think that if you teach them playfully, that they're not really... that it is more, yes, just, those motor skills that hold them back [code: Synchronising rhythmic movements to external source of music]. I think that it is a natural progression, yes. Yes, I think all children have the ability [code: predisposition to learn rhythm skills]. And therefore also with that movement, that movement with children, if you just have a lot done with movement that it is a pleasant way of experiencing for children [code: Learning by doing]. Yes, and why the one does it more easily than the other? Yes, if only you knew.

Appendix 4 Final coding manual (Original in Dutch)

Name code	Content code	Examples from data
Connecting to level of preschoolers	Teachers mention/demonstrate: that they connect to the learning level of the preschooler with regard to rhythm skills or that they allow preschoolers to perform rhythm skills at their own level	<ul style="list-style-type: none"> - connect to what a preschooler can do rhythmically; - children can participate at their own level; - trust that preschoolers develop themselves; - you don't have to be able to do something; there is no good or bad /right or wrong - teacher offers the same rhythm activities and content to all preschool ages (4-6 years) because the assumption is that children learn at their own level
Incorporating rhythmic ideas	Teachers mention/demonstrate: reacting to, incorporating, extending rhythmical ideas of preschoolers (in broad sense: e.g. rhythmic movement)	<ul style="list-style-type: none"> - I incorporate the ideas of preschoolers - asking for rhythmic ideas of preschoolers (video) - reacting to rhythmic ideas of preschoolers (video) - extending rhythmic ideas (video)
Learning rhythm skills from peers	Teachers mention/demonstrate: peers being able to exchange musical information and learn from each other. NB: Data can also refer to the degree to which the teacher thinks it is possible or appropriate to work child-centred	<ul style="list-style-type: none"> - learning (rhythm skills) by seeing and hearing peers - gestures focusing attention on peer that is setting a good example (video) - peers being able to exchange musical information at the same developmental level
Learning rhythm skills non-verbally instead of verbally	Teachers mention/demonstrate: learning rhythm skills in a non-verbal manner opposed to a verbal manner	<ul style="list-style-type: none"> - modelling - don't explain, just do - I show it and the kids copy - you can talk, but also show it - kids are allowed to join in immediately
Learning rhythm skills through observation	Teachers mention/demonstrate: preschoolers learn rhythm skills through observation	<ul style="list-style-type: none"> - by listening and observing other preschoolers you also learn rhythm skills - preschoolers sometimes don't join in, but nonetheless they pick up a lot - preschoolers don't have to participate
Learning by doing	Teachers mention/demonstrate: preschoolers learn rhythm skills through experiencing and feeling rhythmic movement	<ul style="list-style-type: none"> - preschoolers have to <u>experience</u> music through e.g. movement - preschoolers learn or discover rhythm skills by movement - preschoolers learn rhythm skills by feeling the movement - preschoolers have a need to move that I connect to
Learning pulse, metre, phrasing through movement	Teachers mention/demonstrate: learning pulse, and/or metre, and/or phrasing and/or form through the use of movement	<ul style="list-style-type: none"> - preschoolers moving rhythmically to music, e.g. walking to the beat of the music (video) - dance to pulse, metre, rhythmic phrasing
Learning rhythm skills through fantasy figures/themes	Teachers mention/demonstrate: learning rhythm skills through the use of fantasy figures or themes, or refers to learning the 'quality' of different metres through fantasy figures or themes	<ul style="list-style-type: none"> - preschoolers move like a certain fantasy figure - I let preschoolers act out a situation

Learning through touch	Teachers mention/demonstrate: touching and moving the pupils body in the process of learning rhythm skills	<ul style="list-style-type: none"> - I touch the body to show them how the rhythm patterns feels
Learning through repetition, variation, contrast	Teachers mention/demonstrate: preschoolers learning rhythm skills through: <ul style="list-style-type: none"> - repetition (repeating an activity within a lesson and throughout lessons), - variation within rhythm activities, between rhythm activities - contrast 	<ul style="list-style-type: none"> - continue an activity until the pupils are able to do it, repeat an activity often - contrast in bars, rhythmical expressiveness, tempi
Music induces rhythmic movement	Teachers mention/demonstrate: choosing certain music because it induces a rhythmic movement or response in preschoolers	<ul style="list-style-type: none"> - music is chosen because it 'evokes' movement, such as the pulse of the music, or the character of the music
Learning rhythm skills through language	Teachers mention/demonstrate: learning rhythm skills through the use of language	<ul style="list-style-type: none"> - the lyrics of a song support the learning of a rhythm - using a rhythm language
Learning rhythm skills through visual aids	Teachers mention/demonstrate: using visual aids when learning rhythm skills	<ul style="list-style-type: none"> - a visual symbol is linked to a sound, rhythm or shape (a shape or a graphic score)
Sequence one	Teachers mention/demonstrate: the first sequence of their rhythm activity	<ul style="list-style-type: none"> - e.g. introduction to activity
Sequence two	Teachers mention/demonstrate: the second sequence of their rhythm activity	<ul style="list-style-type: none"> - e.g. modelling
Sequence three	Teachers mention/demonstrate: the third sequence of their rhythm activity	<ul style="list-style-type: none"> - e.g. observation
Instructional gestures	Teachers mention/demonstrate: gestures that coexist with the instruction of an activity before the start of the rhythm activity	<ul style="list-style-type: none"> - verbally explains and simultaneously acts out rhythmic activity with the use of gestures or the actual movements of the rhythm activity
Preparing the body for the rhythm activity	Teachers mention/demonstrate: getting their body ready for the musical task – or having children getting their body ready for the rhythm activity (a musical task)	
Cueing start or end of rhythm activity	Teachers mention/demonstrate: Cueing the beginning or ending of a rhythm activity	<ul style="list-style-type: none"> - makes a "stop" gesture with hands at end activity - "freezes" at the end of the activity - makes a "start" gesture at beginning activity
Cueing beginning new rhythmic movement or rhythm pattern	Teachers mention/demonstrate: cues that a change will take place during rhythm activity, e.g. a change of rhythmic movement, rhythmic pattern	<ul style="list-style-type: none"> - The specialist teacher can give a signal that the rhythmic next phrase will start and anticipates that by giving the pupils a signal - Signals with e.g. hand gesture that a new rhythmic pattern will be played
Cueing character rhythm	Teachers mention/demonstrate: cues the expressive character of music	<ul style="list-style-type: none"> - expressing expressive nature of the music, e.g. small gestures when it concerns a softer phrase during the music

Cueing rhythmic response	Teachers mention/demonstrate: cues during a rhythm activity that preschooler/s should give a rhythmic response	<ul style="list-style-type: none"> - nodding or pointing to a preschooler to cue that it is their turn to respond rhythmically - teacher points to him/herself and consequently to the group of preschoolers to indicate that it is the group's turn to respond rhythmically
Signalling focus activity	Teachers mention/demonstrate: signals to preschoolers what the focus of the rhythm activity is	<ul style="list-style-type: none"> - specialist teacher gazes or points to movement or instrument
(Re)presenting the pulse/bar	Teachers mention/demonstrate: Pulse / bar through gesture	<ul style="list-style-type: none"> - nodding the pulse/bar with the head, tapping the pulse/bar with a foot, showing the pulse/bar with the whole of the body
(Re)presenting a rhythm pattern	Teachers mention/demonstrate: rhythm pattern through gesture	<ul style="list-style-type: none"> - nodding a rhythm pattern with the head, conducting a rhythm pattern with the hand - visualising the length of the note through e.g. an arm gesture
(Re)presenting the rhythmic phrasing	Teachers mention/demonstrate: rhythmic phrasing through gesture/movement	<ul style="list-style-type: none"> - gestures/movements that reflect the antecedent and consequent of a phrase - indicating phrase by horizontal movement of the head, or subdividing the phrase by nodding the head
(Re)presenting the rhythmic character	Teachers mention/demonstrate: expressive character of rhythm through gesture/movement	<ul style="list-style-type: none"> - a gesture or facial expression expresses the character of a rhythm, or gives an expressive charge to the rhythm
Predisposition to learn rhythm skills	Teachers mention/demonstrate: "nature-nurture" debate: are preschoolers naturally predisposed to learn rhythm skills	<ul style="list-style-type: none"> - all preschoolers can learn rhythm skills - aptitude of preschoolers - preschooler's brain will detect rhythmical patterns such as pulse, metre and structure - preschoolers react naturally to music
Gender difference in relation to learning rhythm skills	Teachers mention/demonstrate: differences in the way male/female learn rhythm skills	<ul style="list-style-type: none"> - different pace of learning - different preferences in relation to certain rhythm skills
Concentrating on rhythm skills	Teachers mention/demonstrate: preschoolers can have difficulty concentrating on learning rhythm skills or staying engaged/motivated during rhythm activity	<ul style="list-style-type: none"> - difficulty concentrating on the rhythm pattern that has to be played on an instrument - children having trouble coordinating their part with others because they are "over"-focused on their own part - difficulty concentrating on two things at once: e.g. singing and moving at the same time, or singing and playing rhythms at the same time - Difficulty staying motivated or engaged during the learning process of rhythm skills
Synchronising rhythmic movements to external source of music	Teachers mention/demonstrate: preschoolers can have difficulty synchronising their rhythmic movements to the music	<ul style="list-style-type: none"> - having trouble synchronising one's movements to the music - having trouble dancing to the pulse (dancing to the beat) - having trouble motorically playing an instrument to the pulse
Translating inner hearing to rhythmic output	Teachers mention/demonstrate: preschoolers can have difficulty translating the sounds they hear in their heads to the actual rhythmic output	<ul style="list-style-type: none"> - the difficulty of translating the sounds one can imagine to a sounding result
Difficulty playing certain rhythms	Teachers mention/demonstrate: preschoolers can have difficulty playing certain (complex or unknown) rhythm patterns	<ul style="list-style-type: none"> - preschoolers have difficulty playing certain rhythms
Emerging understanding rhythmic phrasing	Teachers mention/demonstrate: the emerging understanding of rhythmic phrasing of preschoolers can become clear when they stop movement shortly before a rhythmic	<ul style="list-style-type: none"> - based on the movement of preschoolers it can be determined if they understand the rhythmic phrasing

	phrase ends	
Learning behaviour preschoolers	Teachers mention/demonstrate: learning behaviours with regard to rhythm skills that they find to be typical for preschoolers	<ul style="list-style-type: none"> - join in immediately - immediately wanting to touch the instruments - copying each other (e.g. not wanting to play different rhythm patterns) - preschoolers want to do their own thing
Developmental curriculum	Teachers mention/demonstrate: ideas about the rhythmic development of preschoolers and adapting the curriculum to the rhythmic development of preschoolers	<ul style="list-style-type: none"> - describing phases of the rhythmic development of preschoolers - how the curriculum is adapted to preschoolers - phases in the rhythmic development of preschoolers
Content-orientated curriculum	Teachers mention/demonstrate: the way in which the content of the curriculum is a starting point for teaching rhythm skills	<ul style="list-style-type: none"> - content is a starting point for teaching rhythm tasks from simple to complex
Goals curriculum rhythm skills	Teachers mention/demonstrate: the goals with regard to a curriculum of rhythm skills for preschoolers	<ul style="list-style-type: none"> - learning pulse, metre, rhythm patterns - being able to move to rhythm aspects - performing rhythm aspects on instruments - rhythmic improvisation - expressiveness
Integrating rhythm skills with other skills	Teachers mention/demonstrate: the choice to integrate the teaching and learning of rhythm skills with other musical or non-musical skills	<ul style="list-style-type: none"> - music is a unity, I do not isolate rhythmic skills but operate from a larger musical whole - developing rhythm skills appeals to and integrates other skills such as social skills, self-confidence
Excluding certain rhythm skills	Teachers mention/demonstrate: the choice to exclude certain rhythm skills from the curriculum	<ul style="list-style-type: none"> - choosing 'simple' or especially 'complex' rhythms/songs - notation, yes or no - explicitly labelling terms, yes or no
Goal of assessing rhythm skills	Teachers mention/demonstrate: the choices with regard to the way they assess preschoolers and what they find important about assessing	<ul style="list-style-type: none"> - explain what the goal of assessment is - why summative assessment is or is not useful for assessing rhythm skills
Assessing rhythm skills formatively	Teachers mention/demonstrate: formative assessment during lessons: <ul style="list-style-type: none"> - assessing group level - assessing individual level 	<ul style="list-style-type: none"> - a child/group has shown improvement - child can/cannot play steady beat - child moves in a random manner - you have to repeat an activity for the group - you can elaborate on activity - group/child is picking up activity in a right way
Assessing rhythm skills over time	Teachers mention/demonstrate: formative assessment over the course of several lessons	<ul style="list-style-type: none"> - noticing that a preschooler has improved a rhythm skill over time
Recognising the quality of rhythm skills	Teachers mention/demonstrate: the quality of the performance of rhythm skills	<ul style="list-style-type: none"> - play immediately, start immediately, - keeping to the beat well - listening well
Musical backgrounds preschoolers	Teachers mention/demonstrate: the musical backgrounds of preschoolers and whether that impacts on teaching rhythm skills	<ul style="list-style-type: none"> - opportunity to listen to (certain) music at home - the amount of (certain) music that preschoolers hear - access to music lessons
Classroom space	Teachers mention/demonstrate: whether space plays a role in teaching and learning rhythm skills	<ul style="list-style-type: none"> - the need for space to be able to move - space can be overwhelming
Differentiating rhythm skills for	Teachers mention/demonstrate: differentiating the rhythm skills to	<ul style="list-style-type: none"> - does/does not offer more complex skills difficult in order to challenge 'advanced' children

group 1 and group 2	different levels of preschoolers	
Duration music lesson	Teachers mention/demonstrate: the duration of the lesson impacts on teaching and learning rhythm skills	<ul style="list-style-type: none"> - time is long enough for preschoolers - would wish for more time
Instruments	Teachers mention/demonstrate: the way they use instruments with regard to teaching and learning rhythm skills	<ul style="list-style-type: none"> - which instruments can or cannot be used - the manner in which instruments are used
Size class	Teachers mention/demonstrate: the way teachers note that the size of class plays a role in teaching and learning rhythm skills	<ul style="list-style-type: none"> - optimal size for teaching and learning rhythm skills - the need for smaller groups
Other		
Influence background on PCKg	Teachers mention/demonstrate: that their broader background, e.g. as a musician or courses they might have undertaken influences their teaching	<ul style="list-style-type: none"> - e.g. world music background, background in classical music - other degrees or courses
Influence teacher training on PCKg	Teachers mention/demonstrate: the way their teacher training college (Bachelor Degree in Music Education) has influenced the way their PCKg has developed	
Missing training in teaching preschoolers	Teachers mention/demonstrate: that they have had no specific training in teaching preschoolers	
Influence of filming	Teachers mention/demonstrate: the way the filming of their lesson for the research has influenced the way they taught	- e.g. refrained from teaching certain activities
Influence of push-button technique	Teachers mention/demonstrate: the way they experienced the use of the push-button technique	

Appendix 5 Final overview development main themes

Theme one: Pedagogical orientations with regard to learning rhythm skills of preschoolers
Subtheme: A child-centred approach to teaching and learning rhythm skills
Codes: <ul style="list-style-type: none"> - Connecting to level of preschoolers - Learning rhythm skills from peers - Incorporating rhythmic ideas of preschoolers
Subtheme: Teaching and learning rhythm skills through imitation learning
Codes: <ul style="list-style-type: none"> - Learning rhythm skills non-verbally instead of verbally - Learning rhythm skills through observation
Subtheme: Teaching and learning rhythm skills through experiential learning
Codes: <ul style="list-style-type: none"> - Learning by doing
Theme two: Teaching strategies for rhythm skills of preschoolers
Subtheme: general teaching strategies teaching rhythm skills to preschoolers
Codes: <ul style="list-style-type: none"> - Learning pulse metre phrasing through movement - Learning rhythm skills through fantasy figures or themes - Learning through touch - Music induces rhythmic movement - Learning rhythm skills through repetition, variation, contrast - Learning rhythm skills through language - Learning rhythm skills through visual aids
Subtheme: Instructional sequences of rhythmic activity for preschoolers
Codes: <ul style="list-style-type: none"> - sequence lesson in relation to learning rhythm skills 1 - sequence lesson in relation to learning rhythm skills 2 - sequence lesson in relation to learning rhythm skills 3
Theme three: Musical communication and musical interaction that facilitates the learning of rhythm skills of preschoolers
Subtheme: Instructing a rhythmic activity of preschoolers
Codes: <ul style="list-style-type: none"> - Instructional gestures - Preparing the body for learning rhythm skills
Subtheme: Guiding a rhythmic activity of preschoolers
Codes: <ul style="list-style-type: none"> - Cueing start or end of rhythm activity - Cueing beginning new rhythmic movement or rhythm pattern - Cueing character rhythm - Cueing a rhythmic response

<ul style="list-style-type: none"> - Signalling focus activity
Subtheme: (Re)presenting rhythm skills to preschoolers
Codes: <ul style="list-style-type: none"> - Representing character of rhythm - Representing a rhythmic pattern - Representing pulse/ metre of a rhythmical phrase - Representing rhythmic phrasing
Theme four: Teacher's understanding of preschooler's learning behaviour with regard to learning rhythm skills
Subtheme: Understanding the preschoolers' predisposition for learning rhythm skills
Codes: <ul style="list-style-type: none"> - Predisposition to learn rhythm skills - Gender difference in relation to learning rhythm skills
Subtheme: Understanding the learning behaviour of preschoolers regarding learning rhythm skills
Codes: <ul style="list-style-type: none"> - Concentrating on rhythm skills - Synchronising rhythmic movements to external source of music - Translating inner hearing to rhythmic output - Difficulty playing certain rhythms - Emerging understanding rhythmic phrasing
Subtheme: Typical preschooler learning behaviour with regard to learning rhythm skills
Codes: <ul style="list-style-type: none"> - Learning behaviour preschoolers
Theme five: The curriculum in relation to the development of rhythm skills of preschoolers
Subtheme: Curriculum orientations with regard to learning rhythm skills
Codes: <ul style="list-style-type: none"> - Developmental curriculum - Content-orientated curriculum
Subtheme: Goals for curriculum with regard to rhythm skills
Codes: <ul style="list-style-type: none"> - Goals curriculum rhythm skills
Subtheme: Choices regarding the content of the curriculum
Codes: <ul style="list-style-type: none"> - Integrating rhythm skills with other skills - Excluding certain rhythm skills

Theme six: Assessment of the preschoolers' behaviour in relation to learning rhythm skills
Subtheme: Choosing between summative or formative assessment of the preschoolers' rhythm skills
Codes: <ul style="list-style-type: none"> - Goal of assessing rhythm skills
Subtheme: Assessing the rhythmic skills of preschoolers in a formative way
Codes: <ul style="list-style-type: none"> - Assessing rhythm skills formatively - Assessing rhythm skills over time
Subtheme: Defining the quality of the performance of rhythm skills of preschoolers
Codes: <ul style="list-style-type: none"> - Recognising the quality of rhythm skills
Theme seven: The interaction between an educational context and the learning of rhythm skills of preschoolers
Subtheme: Musical backgrounds
Codes: <ul style="list-style-type: none"> - Musical backgrounds of preschoolers
Subtheme: Preconditions of the school that impact on the learning of rhythm skills
Codes: <ul style="list-style-type: none"> - Classroom space - Differentiating rhythm skills for group 1 and group 2 - Duration music lesson - Instruments - Size class

Appendix 6 Original Dutch citations

Chapter 4

4.5.4 The video analysis tasks

- [VA, Jeroen, 1]: “hoofdbeweging zal ik het even noemen... lastig hoe je dat kort moet omschrijven... hoofdbeweging”

4.5.7 Flexibility of the methods

- [SRI, Martine, 2]: “Ik merkte dat, dit was de tweede les, dan realiseer ik me gelijk een aantal dingen die ik anders heb gedaan in de eerste les en die ik dan ook anders wil hebben in de tweede les. Dus ik leer op het moment zelf elke keer opnieuw en dat is eigenlijk wel jammer dat het zo is. Van, o ja, eigenlijk moet ik eerst even laten zien hoe het instrument werkt, hoe hou je hem vast. En dan zie ik, dan reflecteer ik eigenlijk zelf even die eerste les en dan probeer ik dat te veranderen in de vervolgles, bij de nieuwe groep.”

4.7.3 For whom is the research

- [SI, Peter, 3]: “door er nu over te praten en door je opnames terug te kijken, en door zo'n dagboekje of door analyses of door zelf ook weer te reflecteren, nou dan kijk je toch heel anders naar het vak dat je geeft”.

Chapter 5

5.3.2 Phase two of the analysis: Reducing the data

- [SRI, Floor, 1]: “De ene groep gaat weg en de andere groep komt aan. Dat is best wel een drukke overgang, zeg maar. Ze gaan wel door de ene deur er in en door de ene deur, hè, komen ze binnen en de andere deur gaan ze uit. Dat is dan wel een moment, maar het is eventjes de kinderen bij de les krijgen, zeg maar.”
- [VA, Jeroen, 2]: “wenkbrauwen gaan omhoog als een kind op de grond valt. Dit zorgt ervoor dat het kind contact maakt met het kind om te zien of alles goed is. ”
- [SRI, Jeroen, 3] “Het is voor mij ook, merk ik, als ik het aan het doen ben, lekker trommelen. Dat doe ik niet zo vaak, gewoon als muzikant.”
- [SI, Jeroen, 4]: “Heel natuurkundig gezien alle materie is opgebouwd uit trillende deeltjes. En ik vind het wel leuk om me voor te stellen dat muziek daar eigenlijk een soort uitkomst van is.”

5.3.3 Phase three of the analysis: inductive coding

- [SI, Liselot, 5]: “Bij jonge kinderen koppel ik heel vaak iets visueels aan geluid [o.a. ritmes]”
- [SI, Jeroen, 6]: “Maar steeds ook, wat ik in het begin ook had bij deze oefening, een hoop van de vaardigheden die ze bij dit soort dingen laten zien, die moeten gewoon er even in slijpen. Het heeft dan niet zoveel zin om te stoppen en te zeggen: het moet zo. Maar, doorgaan, doorgaan, doorgaan en dan op een gegeven moment valt bij de meesten wel het kwartje van: zo moet het.”
- [VA, Martine, 7]: “Nou ja, ik vertel eerst natuurlijk gewoon wat we gaan doen. Gewoon het totaal. We gaan het lied zingen met, met... en bij het spelen op instrumenten, met raspen in dit geval, in de maat.”
- [VA, Jeroen, 8]: “de puls... dat is een fysieke benadrukking van de puls in dit geval, als ik het zo goed zeg... of misschien ook wel het ritme... ter ondersteuning van het, ja, kinderen laten voelen van waar we mee bezig zijn. Ritmische puls, denk ik eigenlijk, in dit geval.”
- [VA, Floor, 9]: zwaait met stokjes in de lucht ter afsluiting, blijft hangen in een freeze.

Chapter 6 Findings

6.2.1 Subtheme: A child-centred approach to teaching and learning rhythm skills

- [SI, Jeroen, 1]: “In de ideale situatie volg je wat ze [ritmisch] kunnen. Of je kijkt wat ze kunnen en je biedt iets dan telkens wat aan wat daar op aansluit.”
- [SI, Peter, 2]: “Je [gaat] er toch van uit dat kinderen zichzelf moeten kunnen ontwikkelen. En dat moet je niet opleggen, dat doen ze in hun eigen tempo.”
- [SRI, Martine, 3]: “Bijvoorbeeld een kindje kon de beweging [op de maat] niet, dan vind ik het ook prima dat ze het op een andere manier doet. [...] ik wil dat kinderen dan vrij zijn om de beweging dan aan te passen, zeg maar, zoals ze dat zelf kunnen of doen.”
- [SI, Jeroen, 4]: “als ze gelijk, op elkaars niveau dingen van elkaar kunnen uitwisselen, dat dat sterker werkt. Dat ze, dat ze zich misschien ook meer herkennen in wat een ander doet. Dat meer aansluit op wat zij eventueel zouden kunnen doen.”
- [SI, Jette, 5]: “Als ze naar elkaar kijken dan zie je dat ze eigenlijk geconcentreerder zijn. Ze kunnen moe worden als ik altijd alles voor doe.”
- [SI, Floor, 6]: “...dat ik niet altijd [alle ritmes] voor doe maar dat ik ook de kinderen [ritmes] laat bedenken. En dat is misschien niet altijd even ritmisch, maar daar kun je wel dan weer wat ritmisch van maken.”
- [NB, Martine, 7]: “Je probeert de kinderen ook erbij te betrekken door ze zelf bewegingen te laten verzinnen”
- [SI, Liselot, 8]: “maar uiteindelijk zorg ik dan dat ik toch weer de regie weer overneem door het in een ander tempo te doen [...]”
- [SI, Liselot, 9]: “dus het wordt elke keer een uitdaging van hoeveel ruimte geef ik ze om te doen waar ze op dat moment zin in hebben en in hoe verre ben ik de juf die zegt van ‘nee’”.
- [SI, Liselot, 10]: “Een stuk zelfstandig. Dat is in mijn praktijk van nu een te smal onderdeel vind ik, dat kinderen zelfstandig met een opdracht aan de slag gaan”
- [SI, Liselot, 11]: “kinderen [kunnen] zelfstandig met een opdracht aan de slag gaan. Nou is dat met jonge kinderen in een muzikles ook niet zo makkelijk, maar het kan wel want ze kunnen het in de klas ook.”
- [SI, Liselot, 12]: “Maar het is mij nog niet helemaal gelukt om dat ook, zeg maar, in het dynamische geheel van zo’n les te doen”

6.2.2 Subtheme: Teaching and learning rhythm skills through imitation learning

- [EI, Martine, 13]: “Je ziet dat als ze om je heen zitten, gaan ze [de ritmische vaardigheden] ook kopieëren.”
- [SI, Jette, 14]: “op een gegeven moment gaan ze [de ritmische vaardigheden] observeren dus eigenlijk, hoe die oudere kinderen het doen [...]. En dan kopieëren ze dat gedrag, als een soort sponsje gaan ze dat langzaam ook doen.”
- [EI, Liselot, 15]: “Hier was het belangrijker vooral om de volgorde en de bedoeling te laten zien. Dat werkt vaak ook wel goed omdat je dan niet zoveel hoeft te praten”

6.2.3 Subtheme: Teaching and learning rhythm skills through experiential learning

- [SI, Peter, 16]: “Bewegen is voor mij wel het meest essentiële onderdeel voor kleuters [...] omdat naar mijn idee kinderen al bewegend leren.”
- [SI, Jeroen, 17]: “bij het werken aan ritmische vaardigheden van kleuters zal ik altijd beweging gebruiken.”
- [SI, Martine, 18]: “Dat ze de maat voelen met hun lijf, dat vind ik bij kleuters heel belangrijk. Dus dat ze het ervaren. Dus niks eigenlijk met noten of noten lezen. Het is puur het voelen door klappen, door instrumenten, maar vooral door hun hele lijf.”

6.3.1 Subtheme: General teaching strategies for teaching rhythm skills to preschoolers

Teaching and learning rhythm skills through different ways of moving

- [SI, Martine, 19]: “Dus ze stampen in de maat maar tegelijkertijd bewegen ze zich ook voort in de maat.”

- [NB, Martine, 20]: “Bij ‘slagwerkboogie’ vindt er bij elke maatwisseling een andere beweging plaats. Bijv. bij de eerste 4 tellen 4 stappen naar voren lopen, daarna 4 stappen naar achter lopen, dan 4 tellen een rondje draaien etc.”
- [SI, Martine, 21]: “Het is eigenlijk nooit vrij. Het is altijd georganiseerd. Het is nooit dat ze zelf los, helemaal los zijn.”
- [SI, Jeroen, 22]: “omdat ik denk dat zeker jonge kleuters daar nog niet zo erg aan toe zijn [vaste danspassen uitvoeren]”.
- [SI, Floor, 23]: “De kinderen zijn bij die les dan gaan ze mee naar het strand. Daar loop je op verschillende manieren. Dus het zand is heet, dus dan loop je met snelle pasjes.”
- [SI, Peter, 24]: “die is ziek, dus als je ziek bent dan voel je je niet zo lekker. Ga je langzamer werken. Het ritme blijft wel gewoon doorgaan [...] maar je blijft gewoon een beetje er in hangen.”
- [SI, Martine, 25]: “Als je [ritmische vaardigheden] heel droog aanbiedt, dan leren ze het niet. Denk ik. Zou echt met verbeelding en dan leren ze alles denk ik heel snel”.

Selecting music that induces movement

- [SI, Liselot, 26]: “meestal begin ik bij zo’n specifieke ritmeles met bewegen op muziek waarbij de muziek een hele duidelijke aanjager is om op een bepaalde manier te bewegen: snel, langzaam.”
- [SI, Jeroen, 27]: “[De kinderen] gaan meteen in beweging als ze het geluid [van de djembe] horen. Als ik dat met een fluit iets doe is dat heel anders.”
- [SI, Floor, 28]: “er zat wel een flinke, ja, een goeie, een soort marstempo en ja, ik denk dat dat het aanstekelijke is.”

Teaching and learning rhythms through repeated and varied exposure

- [SI, Jeroen, 29]: “Herhaling is bij kleuters toch wel heel belangrijk. Van herhaling binnen een activiteit, maar ook herhaling van een activiteit.”

Teaching and learning rhythm skills through modelling

- [SI, Floor, 30]: “Ik loop voorop en de kinderen lopen in een rij achter mij aan en doen mijn bewegingen na en de manier waarop ik loop doen zij na.”
- [NB, Martine, 31]: “Je geeft ‘lichamelijker’ les. Je beweegt mee, helpt ze door voor ze te zitten en het ‘mee te doen.’
- [VA, Peter, 32]: “De eerste keer dat je [een nieuwe beweging] doet een strakke beweging pakken. [...] Dus ook weer, waarbij ik denk dat helpt de kinderen met het bevorderen van overnemen van het ritme.”
- [NB, Martine, 33]: “door bijv. de handen [van het] kind vast te pakken en ze het ritme te laten ‘voelen’.”

Learning rhythm skills through different entry points: language and visual aids

- [SI, Floor, 34]: “bij het woord huppelen denken [ze al]: hé, dat is die beweging! En komen dan beter in het ritme dan als ze alleen wat [ritmes] horen. [...] Ik denk dat ze het beter voor zich zien als ik dan die steuntekstjes gebruik.”
- [SI, Liselot, 35]: “om te voorkomen dat ze gaan zwemmen, en ik hou ook de controle over waar ze zich mee bezig kunnen houden, zeg maar. Als je dat niet hebt, dan is het veel moeilijker om, ook voor de kinderen, bij te kunnen houden of ze nog snappen waar ik mee bezig ben.”

6.3.2 Subtheme: Instructional sequences of rhythmic activities for preschoolers

- [VA, Jeroen, 36]: “Ik zit aan de zijkant en zij rennen rond en dansen rond in het midden. [...] ik [ben] niet de centrale figuur maar de muziek [is] de centrale figuur.”
- [VA, Martine, 37]: “ik [trek] mij dus terug, zeg maar. Dat ik ga luisteren ook of zij hem zelf kunnen en dat ze het ook zelf zonder mij moeten kunnen doen. Dus nu draag ik een stuk verantwoordelijkheid aan hun over.”
- [EI, Jette, 38]: “daarom ga ik ook apart staan. En dat weten ze ook. Dus zij weten [...] OK, nu gaat ze even checken en dan gaan we extra ons best doen.”

6.4.1 Subtheme: Instructing a rhythmic activity of preschoolers

- [SI, Martine, 39]: “ik laat altijd eigenlijk wel altijd eerst een keertje even zien wat het is. Dat ze even en beeld hebben. Een soort totaalbeeld van wat wil ze.”
- [VA, Jeroen, 40]: “bij dingen waarvan ik denk dat ze moeilijker voor ze zijn dan kom ik veel meer in actie. Dan ga ik ook meer gebaren gebruiken.”
- [VA, Martine, 41]: “ik ga ook heel erg recht op zitten. Zo van: we gaan beginnen. Dus ik ga... Ik zat eerst gewoon gebogen, en ik was nog aan het vertellen. Dan zeg ik dus eigenlijk al, zeg ik van: hé! Ga klaar zitten. En hoe zit je klaar bij muziek?”

6.4.2 Subtheme: Guiding a rhythmic activity of preschoolers

- [EI, Martine, 42]: “een soort stopteken dat werkt heel goed. Je realiseert je dat je afspraken maakt met ze en omdat ze het zo vaak herhaald hebben [...] en er op terug komt dat ze het dan ook uitvoeren.”
- [VA, Jette, 43]: “Bij kleuters moet je alles altijd superduidelijk aangeven. Heel erg duidelijk. Van te voren.”

6.4.3 Subtheme: (Re)presenting rhythm skills to preschoolers

- [VA, Jeroen, 44]: “En dat is denk ik zowel voor de kinderen als mijzelf. Ik ben natuurlijk zelf de ritmische motor en het ritmisch voorbeeld voor deze oefening. Ik moet er zelf echt helemaal in zitten om het goed te laten lopen en zij hebben ook, zeg maar, een muzikale en visuele houvast aan mij. Dus dat is denk ik voor zowel mij als voor hun dat ik dat doe.”
- [VA, Jeroen, 45]: “met mijn lijf en vooral met mijn hoofd zie ik dat ik vooral de, eigenlijk ook de puls er in heb zitten.”
- [VA, Jette, 46]: “Dan ga je op een hele staccato manier op de grond stampen, dus dat is zowel de maat als een expressie die je geeft hoe het ritme moet klinken.”

6.5.1 Subtheme: Understanding the preschoolers' predisposition for learning rhythm skills

a. How preschoolers are predisposed to learn rhythm skills

- [SI, Jette, 47]: “ik denk inderdaad dat iedereen muzikaal is. [...] En dat er grote verschillen tussen zitten, is natuurlijk wel zo.”
- [NB, Liselot, 48]: “Jonge kinderen bewegen vaak al van nature al vanuit de puls en maat.”
- [SI, Liselot, 49]: “Dus vanuit het natuurlijke in beweging komen, voeg je daar steeds iets aan toe.”
- [SI, Jeroen, 50]: “Wat ik hoop dat er gebeurt, is dat zij eigenlijk zo regelmatig met allerlei aspecten van muziek in aanraking komen in mijn les [...] dat hun hersenen daar zelf de ritmische ontwikkeling uit halen.”

b. Difference between gender in learning rhythm skills

- [SI, Jette, 51]: “je ziet dat veel meisjes houden van draaien. Jongetjes niet zo. Daar is echt een verschil in. Jongens bewegen heel anders op muziek dan meisjes.”

6.5.2 Subtheme: Understanding the learning behaviour of preschoolers regarding the learning of rhythm skills

a. Difficulty in engaging, focusing, concentrating on learning rhythm skills

- [SI, Jeroen, 52]: “In het algemeen wat ze zo moeilijk vinden is de concentratie die wel nodig is voor sommige dingen.”

b. Difficulty in synchronising rhythmic movements to an external music source

- [SI, Liselot, 53]: “Als ik een kind op de maat wil laten lopen moet ik er wel voor zorgen dat ik muziek heb die past. Bij die korte beentjes, weet je.”

c. Difficulty translating inner hearing to rhythmic output

- [EI, Liselot, 54]: “dus dat lichamelijke is wel gekoppeld aan ook hoe je het hoort, maar ook hoe het er uit komt.”

d. Difficulty playing certain rhythms

- [SI, Martine, 55]: “Maat zit natuurlijk in je lijf, denk ik. Je adem, je hartslag. Ik weet het niet. Ik denk dat het dichterbij zit.”

e. Emerging understanding of rhythmic phrasing

- [EI, Jeroen, 56]: “Meestal is het omdat ik in, meestal in regelmatige structuren trommel zie je het vlak van te voren al. Je ziet kinderen al stoppen vlak voor dat de klap komt.”

6.5.3 Subtheme: Typical preschooler learning behaviour with regard to learning rhythm skills

- [SI, Jette, 57]: maar kinderen in groep 8 staan ten opzichte van die muziek. Die hebben daar ook een mening over. Van: hmm, vind ik dit wel een leuk liedje? Is dit cool of niet cool?”
- [SI, Liselot, 58]: “Als ik instrumenten neerleg en ze willen daar naar toe, dan is dat wat je wil. Het is niet handig, het is niet praktisch [...] maar de eerste impuls is precies wat je wil. De behoefte om ergens aan te zitten, om iets aan te raken.”

6.6.1 Subtheme: Curriculum orientations with regard to learning rhythm skills

a. Developmental curriculum

- [SI, Peter, 59]: “Ik denk dat je daar mee [het gevoel] moet beginnen en vanuit het gevoel ontstaat een bepaalde beweging, een bepaalde puls.”
- [SI, Liselot, 60]: “Ik denk dat ze dan reageren op het karakter van de muziek, dus niet zozeer een puls voelen, een maat voelen of ritme voelen.”
- [SI, Jeroen, 61]: “In eerste instantie is het meer een vrije reactie [...] dat gaat steeds meer toe naar in de maat lopen of op de maat bewegen.”
- [SI, Jette, 62]: “En dan op een gegeven moment gaan ze dat observeren dus eigenlijk, hoe die oudere kinderen het doen [...] En dan kopieëren ze dat gedrag.”

b. Content-orientated curriculum

- [SI, Floor, 63]: “bij de kleuters, dan leg ik de basis, de grondverf zeg maar.”

6.6.2 Subtheme: Curriculum goals with regard to rhythm skills

- [SI, Martine, 64]: “Ik denk wel dat als je je doelen... als je dat gaat afbakenen dat je verder komt. Dat je een hoger niveau haalt.”

6.6.3 Subtheme: Choices regarding the content of the curriculum regarding rhythm skills

a. Integrating rhythm skills with other skills

- [SI, Jette, 65]: “ik geloof niet zozeer dat je het ritme kan isoleren van het lied [...] want daar wordt het heel a-muzikaal van. Het is een geheel en dat ritme staat in dienst van de melodie.”
- [NB, Liselot, 66]: “Bij jonge kinderen werk ik heel bewust vanuit een geheel. Voor jonge kinderen is maat en ritme een logisch onderdeel van bezig zijn met muziek. Het past bij het totaal en ze voelen het niet als een afzonderlijk gegeven.”
- [NB, Liselot, 67]: “Laten zien wat je in je mars hebt op gebied van maat, puls en ritme doet een beroep op je sociale gedrag in de groep, je zelfvertrouwen, het kunnen luisteren en je lijf onder controle houden.”

b. Rhythm skills that are excluded in the music curriculum for preschoolers

- [SI, Jeroen, 68]: “tweestemmig laten klappen, dat zouden ze moeilijk vinden [...] dat ligt dan naar mijn idee buiten het gebied van wat ze sowieso zouden kunnen.”
- [SI, Liselot, 69]: “Ik merk dat ze dat wel moeilijk vinden, bijvoorbeeld om een kwart noot en een achtste tegelijk te spelen.”

6.7.1 Subtheme: Choosing between summative or formative assessment of the preschoolers' rhythm skills

- [SI, Liselot, 70]: “Dan toets je ongemerkt ook welke kinderen, zeg maar, begrepen hebben waar je naar toe wilde [...] zonder dat het een druk legt op die kinderen.”
- [SI, Jette, 71]: “Nou, ik vind dat [toetsen] niet nodig. Nee, want ik denk dat je er ook een hoop plezier mee weghaalt. En ook, ja, die kinderen moeten al zoveel weet je.”
- [SI, Liselot, 72]: “Als je jezelf een doelstelling voorhoudt, iets wat jij wil bereiken, dan is eigenlijk de enige manier om er achter te komen of dat ook zo is, is toch door te toetsen.”

6.7.2 Subtheme: Assessing the rhythmic skills of preschoolers in a formative way

- [SI, Floor, 73]: “Ik geef mijn ogen de kost als ze allemaal met die stokjes aan het tikken zijn en zo'n versje, dan kijk ik wel eventjes rond van goh, wie heeft dat toch al goed te pakken?”
- [SI, Jeroen, 74]: “ik voel dan aan of er genoeg concentratie is om dit te kunnen doen [uitbreiden van ritmische activiteit].”
- [SRI, Peter, 75]: “Maar je voelt gewoon terwijl je bezig bent dat kinderen willen versnellen. Dan ga je automatisch ietsjes rekken. Gewoon laid back spelen, als het ware. Dan nemen zij dat over.”
- [EI, Jette, 76]: “Die [een meisje] doet dat heel hekserig, met allerlei sprongen. Niet helemaal in de maat, maar dat geeft niet. [...] Je ziet ook een jongetje die heel erg goed in de maat die puls aangeeft.”

6.7.3 Subtheme: Defining the quality of the performance of rhythm skills of preschoolers

- [SI, Floor, 77]: “je [kan] best wel wat van een kleuter vragen. Dat het helemaal niet is dat alles meteen maar goed is.”
- [SI, Floor, 78]: “Je kunt kinderen er wel op wijzen. En luister er eens naar. Of een kind laten kijken, van zie je alle voetjes tegelijk gaan?”
- [EI, Jette, 79]: “Ik observeer ze en er moet iets veranderen. Ze moeten meer expressie tonen, niet zo timide.”

6.8.1 Subtheme: The musical background of the preschoolers

- [SI, Peter, 80]: “Bij deze kinderen staat voornamelijk Turkse en Marokkaanse muziek op, dus dat metrum zit er heel goed in. Maar goed, op het moment dat ik kies voor iets samba-achtig dan wordt het moeilijk voor ze.”
- [SI, Jeroen, 81]: “Dat kinderen van deze leeftijd bijvoorbeeld al complexere ritmes aankunnen dan 30 jaar geleden. Gewoon omdat er veel meer is op dat gebied vanuit bijvoorbeeld de wereldmuziek, of de popmuziek en de jazz.”

6.8.2 Subtheme: Preconditions of the school that impact on the learning of rhythm skills

a. Instruments in relation to learning rhythm skills

- [SI, Floor, 81]: “leuk om dat ook af en toe wel te doen met instrumenten, maar ik denk dat het [leren van ritmische vaardigheden] vanuit beweging veel sneller goed gaat voor kleuters dan met moeilijkere motorische handelingen [op een instrument].”

b. Taking into account the differences between group 1 and 2 class

- [SI, Floor, 82]: “het klappen [is] motorisch gezien wel lastig, maar, ja goed, ik laat mij er niet helemaal van weerhouden om dat dan toch voor de oudste kleuters te doen.”

c. Classroom space in relation to teaching rhythm skills

- [Sl, Jeroen, 83]: “misschien voor zo'n kleuter de meest passende reactie op wat hij op dat moment hoort. Als je dan niet kan rennen, dan mis je die stap.”

d. Duration of a music lesson in relation to learning rhythm skills

- [Sl, Jette, 84]: “Dat je ook een beetje kan experimenteren en zo. Je kan het nog moeilijk maken.”

e. Size of the class

- [Sl, Liselot, 85]: “Als kinderen gewend zijn om zich te focussen op iemand die wat doet [...] dan kan je heel veel bereiken. Dan kun je met 100 kinderen ritmes opbouwen.”
- [Sl, Jeroen, 86]: “Dus de groepsgrootte heeft als gevolg dat ik het algemener moet houden. Dat ik met gemiddelde vaardigheden moet werken.”

Chapter 7

7.2.2 The specialist preschool music teacher's PCKg regarding rhythm skills is partly context dependent

c. The cultural context shapes the specialist preschool music teacher's PCKg

- [El, Peter, 1]: “decrecendo dat kleiner groter worden, dat is een algemeen muzikaal gebaar. [...] Dat zijn echt didactische gebaren die wij vanuit school hebben meegekregen en die ik op de een of andere manier danwel bewust danwel onbewust gewoon steeds gebruik.”
- [El, Martine, 2]: “de gebaren die ik heb afgesproken, in de loop van de jaren oefen ik die natuurlijk altijd.”

d. Developing and communicating PCKg within the context of the school

- [Sl, Liselot, 3]: “Sommige scholen hebben een speellokaal, dan moet ik afdwingen dat ik er in mag.”

7.2.3 Wider experiences that define the nature of the specialist preschool music teacher's PCKg

- [Sl, Jeroen, 4]: “soms [is het] moeilijk om ritmische ontwikkeling te isoleren. Ook vanuit mijn achtergrond met wereldmuziek vind ik het vaak gevoelsmatig 'gek' om een strikte scheiding te maken [tussen muzikale elementen].”
- [El, Martine, 5]: “ik denk in dit geval [aan] een orkest. Dat je tegelijkertijd begint, in de maat muziek maakt, tegelijkertijd stopt. Dus daar denk ik dan aan. Dus daar corrigeer ik ook heel vaak op.”
- [Sl, Peter, 6]: “daar [Bachelor Musical Theatre] leer je heel veel met drama werken. En mijn ervaring was ineens dat doordat wat ik in Tilburg deed toepaste hier bij kinderen: [...] dat lukt, dat slaat aan, dat vinden kinderen leuk.”
- [Sl, Jeroen, 7]: “ik vind het heel moeilijk om dan te benoemen van dit komt daarvan en dit komt daarvan.”
- [Sl, Jeroen, 8]: “Je zag ook net dat ik moeite heb om al die namen moeilijk terug vind te halen, dat is een beetje een teken van ik heb het wel allemaal geleerd maar zo geïnternaliseerd en me eigen gemaakt dat het nu gewoon mijn ding aan het worden is.”

7.2.4 7.3.3 The teacher's body observes, assesses and provides feedback on the rhythmic development of preschoolers

- [Sl, Jeroen, 9]: “een hoop van de [ritmische] vaardigheden [...] Het heeft dan niet zoveel zin om te stoppen en te zeggen: 'het moet zo'. Maar, doorgaan, doorgaan, doorgaan en dan op een gegeven moment valt bij de meesten wel het kwartje.”

Chapter 8 Implications

8.4.1 Teaching in early childhood music education

- [NB, Martine, 1]: “Geen specifieke lessen op de opleiding gehad over muziekles geven aan kleuters, dus ook niet op ritmisch gebied. Geen observaties gedaan bij kleuters (ook geen beeld informatie) en geen stages hoeven te lopen bij kleuters. Armoede”.
- [SI, Peter, 2]: “Mijn eerste jaar, op dat gebied, vond ik mijzelf slecht presteren.”
- [SI, Floor, 3]: “Ik schaamde me soms diep.”

Appendix 7 Ethical approval certificate and signed consent forms



Graduate School of Education

Certificate of ethical research approval

DISSERTATION/THESIS

To activate this certificate you need to first sign it yourself, and then have it signed by your supervisor and finally by the Chair of the School's Ethics Committee.

For further information on ethical educational research access the guidelines on the BERA web site: <http://www.bera.ac.uk/publications/guidelines/> and view the School's statement on the GSE student access on-line documents.

READ THIS FORM CAREFULLY AND THEN COMPLETE IT ON YOUR COMPUTER (the form will expand to contain the text you enter). **DO NOT COMPLETE BY HAND**

Your name: Melissa Bremmer
Your student no: 610046163
Return address for this certificate: Schellingwouderdijk 113, 1023 NB Amsterdam, The Netherlands
Degree/Programme of Study: PhD Education
Project Supervisor(s): Susan Young and Elizabeth Wood
Your email address: m.bremmer@ahk.nl
Tel: 0031 (0)6 400 66 541

I hereby certify that I will abide by the details given overleaf and that I undertake in my dissertation to respect the dignity and privacy of those participating in this research.

I confirm that if my research should change radically, I will complete a further form.

Signed:  date: 08/05/12

NB For Masters dissertations, which are marked blind, this first page must not be included in your work. It can be kept for your records.

**Certificate of ethical research approval
DISSERTATION**

Your student no: 610046163

Title of your project: The Pedagogical Content Knowledge of Experienced Dutch Preschool Specialist Music Teachers on the Teaching and Learning of Rhythm Skills

Brief description of your research project: This research project explores the possibility of (1) refining and adjusting the concept of pedagogical content knowledge (PCK) for specialist music teachers; (2) mapping the PCK of rhythm skills of experienced Dutch preschool specialist music teachers; and (3) comparing the PCK of experienced Dutch preschool specialist music teachers to theoretical knowledge of teaching and learning rhythm skills.

Give details of the participants in this research (giving ages of any children and/or young people involved):

- specialist music teachers
- preschool pupils (four-six year olds)

Give details (with special reference to any children or those with special needs) regarding the ethical issues of:

- informed consent: Where children in schools are involved this includes both head teachers and parents). Copy(ies) of your consent form(s) you will be using must accompany this document.
- in keeping with usual school procedures in the Netherlands, the head teacher will be fully informed about the research project and will give verbal consent for the video recording of the specialist music teacher;
- written consent will be asked of the specialist music teachers (see appendix);
- Substitute, voluntary consent will be asked of the parents/caretakers whose children could be captured on video during the recording of the specialist music teacher a week prior to the video recording of the specialist music teacher (see appendix);
- the purpose of video recording the music lessons will be explained to the preschool pupils verbally and they will be asked to give their consent by verbal reply.

a) anonymity and confidentiality

- The consent forms of the specialist music teacher clarifies that their video recordings will be made public at research conferences or at the Bachelor Music Education at the Amsterdam Conservatory and not uploaded to the internet. The specialist music teachers will be asked for permission to use their First name (not their surname) in the portraits, however, the name of their school and their pupils will be anonymised.
- The consent form of the parents/caretakers clarifies that the video recordings will be made public at research conferences or at the Bachelor Music Education at the Amsterdam Conservatory, however not uploaded to the internet. The parents will be given my email and telephone number if they had any further questions, or if they do not wish their child to be videoed.
- Children under child protection will not be videoed.

Give details of the methods to be used for data collection and analysis and how you would ensure they do not cause any harm, detriment or unreasonable stress:

The consent form of the specialist music teachers clarifies the process of the research in which the teachers will be engaged, namely taking part in a stimulated recall interview, keeping a logbook, and taking part in an interview and video analysis. The teachers will be informed that their data will be triangulated into portraits and compared to theory. It is explicitly mentioned that in order to influence their PCK as little as possible by the research process, I will only let them know during (3) the interview and (4) the video analysis which aspects of their PCK the research is concerning. Further, the consent form clarifies how their data will be transcribed verbatim by me and by an independent third person that is not involved in the research or the field of Music education and that this person will remove the data from the computer after transcribing it. The specialist music teachers will be informed that they are expected to send a pdf-file of their logbook to protect against tampering with the data. The specialist music teachers will be presented their portraits, including the video fragments, for approval before the data is made public.

The specialist music teachers will be informed that they had the right to withdraw from the research for any or no reason, and at any time

Give details of any other ethical issues which may arise from this project (e.g. secure storage of videos/recorded interviews/photos/completed questionnaires or special arrangements made for participants with special needs etc.):

The specialist music teachers will be informed that their complete digital (raw) data will be kept on my personal computer at my home and backups will be kept on a personal hard drive at my home. Certain portions of data will be kept for educational purposes at the Bachelor Music Education at the Amsterdam Conservatory and for research conferences, but the remainder will be destroyed one year after the conclusion of my PhD. The data will not be made available to third parties unless the specialist music teacher gives prior approval.

Give details of any exceptional factors, which may raise ethical issues (e.g. potential political or ideological conflicts which may pose danger or harm to participants):

This research project is undertaken in The Netherlands. All research done as part of this PhD is done in compliance with the Dutch Data Protection Act (Wet bescherming persoonsgegevens).

http://wetten.overheid.nl/BWBR0011468/geldigheidsdatum_09-05-2012#Aanhef

This form should now be printed out, signed by you on the first page and sent to your supervisor to sign. Your supervisor will forward this document to the School's Research Support Office for the Chair of the School's Ethics Committee to countersign. A unique approval reference will be added and this certificate will be returned to you to be included at the back of your dissertation/thesis.

N.B. You should not start the fieldwork part of the project until you have the signature of your supervisor

This project has been approved for the period: May 2012 until: September 2014

Susan Young

By (above mentioned supervisor's signature):

date: 23rd May 2012

N.B. To Supervisor: Please ensure that ethical issues are addressed annually in your report and if any changes in the research occur a further form is completed.

GSE unique approval reference:.....D/11/12/52.....

Signed:.....*Saleh Tronlev*.....date: 28/5/12
Chair of the School's Ethics Committee

This form is available from <http://education.exeter.ac.uk/students/>

Appendix Consent form specialist music teacher

Dear [...],

Thank you very much for your commitment to take part in my research in which I examine the pedagogical content knowledge of music teachers regarding the development of rhythm skills of four to six year olds. By doing this research I hope to contribute to the theory on learning and teaching music to young children. I will be happy to inform you on the progress of the research and your part in it.

In this research four methods are used after another during a time frame of three to four weeks to document your pedagogical content knowledge, namely (1) a stimulated recall interview, (2) a digital logbook, (3) an interview and (4) a video analysis of your physical actions and gestures during teaching. Below I will highlight the four methods. During the research itself the methods and the different procedures will be explained in detail.

1. Stimulated recall interview: In this part of the research I will first make a video recording of your preschool music lesson, after which you will view the recording and recall what you were thinking during teaching. I will come [date and time] to make the recordings of your preschool music lesson. Your lesson will take place in the playroom or gym hall of your school. A week prior to these video recordings parents and caretakers will have to give permission for the recordings.

I will video a lesson in which the development of rhythm skills of four to six year olds is central. Rhythm skills are understood to be: a sense of pulse, metre, melodic rhythm and tempo. You are expected to teach as you normally do and not to develop new teaching and learning activities especially for this research. I will first make a test recording so you can get used to being videoed. Afterwards I will make the recording for the research.

2. The digital logbook: After the stimulated recall interview I will ask you to keep a digital logbook for three weeks in which you describe your pedagogical content knowledge regarding the development of rhythm skills of four to six year olds. I will also ask you to include some personal details such as your age, sex, education, etc. The day before (3) the interview I will ask you to email me your digital logbook in pdf format;
3. The interview: Around three weeks after the stimulated recall interview I will hold an interview with you that will last around one and a half hours. The questions during the interview will focus on your pedagogical content knowledge regarding the development of rhythm skills of four to six year olds;

4. **Video-analysis:** The last part of the research process concerns describing your physical actions and gestures of two teaching activities of the video recordings that were made for the stimulated recall interview.

The data of the four methods will be analysed by me and processed into a written portrait that is complemented with video images. The portrait will be presented to you for approval before it is made public.

I will study seven specialist music teachers in total and the data of these teachers will be compared to see if there are similarities or differences between these specialist music teachers. In the last phase of my study I will compare the pedagogical content knowledge of the specialist music teachers regarding the development of rhythm skills with theoretical knowledge of the development of rhythm skills of four to six year olds.

Ethical guidelines concerning this study

Because the study is done in England at the University of Exeter, I follow the English ethical guidelines for research. However, this research is also in compliance with the Dutch Data Protection Act. In light of these guidelines and the Data protection Act I would like to inform you on the points below and ask you to sign this letter if you agree to these points: You retain the right to withdraw from this study for any or no reason, and at any time without having to explain why you are withdrawing.

- The video recordings of your lessons are analysed and may be added to my thesis. The recordings may also be presented at research conferences and used at the Bachelor Music Education at the Amsterdam Conservatory. The recordings will not be uploaded to the internet;
- In the portrait I will use your First name, not your surname. The name of your school and names of your pupils will be anonymised;
- In order to ensure that your own pedagogical content knowledge is influenced as little as possible by the research process, I will only mention to which aspects of your pedagogical content knowledge the study relates during (3) the interview and (4) the video analysis of your physical actions and gestures;
- An independent person who is not involved in the study or the field of music education will help transcribing the data verbatim so I can analyse it. This person will remove the data from the computer after transcribing it;
- The (digital) raw data of the stimulated recall, the logbook in the form of a pdf file, the interview and the video recordings will be stored by me on my personal computer and a personal external hard disk at my home. Certain portions of data will be kept for educational purposes at the Bachelor Music Education at the Amsterdam Conservatory and for research conferences, but the remainder will be destroyed one year after the conclusion of my PhD. The data will not be made available to third parties unless the specialist music teacher gives prior approval.

Approved

[Specialist Music Teacher]

Approved

Melissa Bremmer

Appendix consent form parents or caretakers

Dear Parents or Caretakers,

For my PhD research on the pedagogical content knowledge of specialist music teachers regarding the development of rhythm skills of four to six year olds, I would like to make video recordings on [date] in your child's class of [name], the specialist music teacher. The recordings, however, could also contain images of your child.

I would like to analyse the recordings of [name specialist music teacher] for my research, but also use samples of the recordings in my PhD, in presentations at research conferences and at the Bachelor Music Education at the Amsterdam conservatory. The recordings will not be uploaded to the internet.

As the use of the video recordings is important to the progress of my research, I hope you will not object to the use of the recordings. By doing this research I hope to contribute to the theory on learning and teaching music to young children.

If you do object and do not wish your child being recorded, or if you have questions regarding the study, please contact me.

Kind regards,

Melissa Bremmer, teacher trainer at the Amsterdam School of the Arts

Tel: 06-40066541

Mail: melissa.bremmer@ahk.nl



Amsterdam, 24 juni 2013

Beste Floor de Wijs,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muzikles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op 26 mei opnames maken van uw muzikles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;

2. Een notitieboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal notitieboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale notitieboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten naar aanleiding van de video opname die voor het stimulated recall interview is gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis over ritmische vaardigheden' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijderd de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord

Floor de Wijs

Akkoord

Melissa Bremmer

Geachte Jeroen Schipper,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muziekles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op maandag 18 juni 2012 opnames maken van uw muziekles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;

2. Het logboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal logboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale logboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten nav de video opname die voor het stimulated recall interview is gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer anderhalf uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten

muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

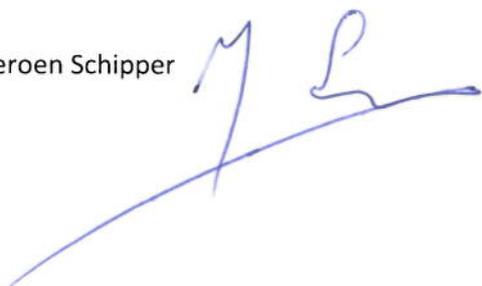
Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijderd de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord

Jeroen Schipper



Akkoord

Melissa Bremmer





10 oktober

Amsterdam, [datum] 2013

Beste Jette van Steenis,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muzikles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op [datum] opnames maken van uw muzikles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;

2. Het aantekeningenboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal aantekeningenboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale aantekeningenboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten nav de video opname die voor het stimulated recall interview is gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

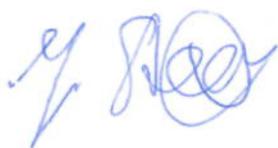
Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijderd de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord

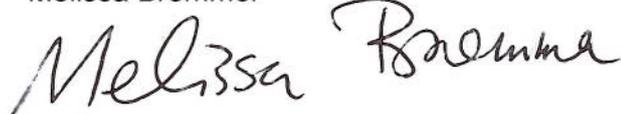
Jette van Steenis



Akkoord



Melissa Bremmer





Amsterdam, 16 november 2012

Beste mevr ten Broeke,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een *stimulated recall interview*, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. *Stimulated recall interview*: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muziekles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op dinsdag 11 december opnames maken van uw muziekles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;
2. Het aantekeningenboek: Na het *stimulated recall interview* zal ik u vragen om gedurende drie weken een digitaal aantekeningenboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale aantekeningenboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten nav de video opname die voor het *stimulated recall interview* is gemaakt;
4. Het interview: Ongeveer drie weken na het *stimulated recall interview* zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

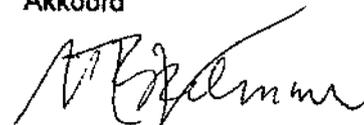
- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijdert de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord



Liselot ten Broeke

Akkoord



Melissa Bremmer



Amsterdam, 21 januari 2013

Beste mevr Senden,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muzikles en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op woensdag 6 februari opnames maken van uw muzikles in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;

2. Het aantekeningenboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal aantekeningenboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale aantekeningenboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten nav de video opname die voor het stimulated recall interview is gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

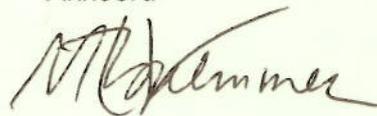
- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijdert de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord



Martine Senden

Akkoord



Melissa Bremmer



Amsterdam, 14 maart 2013

Beste Peter van Os,

Hartelijk dank voor uw toezegging om deel te nemen aan mijn onderzoek waarin ik de praktijkkennis van vakleerkrachten muziek onderzoek over het ontwikkelen van ritmische vaardigheden bij kleuters. Ik hoop door dit onderzoek een bijdrage te leveren aan de theorievorming rondom het leren en doceren van muziek aan kleuters. Graag informeer ik u verder over het verloop van het onderzoek en uw aandeel daarin.

In dit onderzoek worden vier methodes achtereenvolgens gebruikt over een tijdsspanne van drie tot vier weken om uw praktijkkennis in kaart te brengen, namelijk (1) een stimulated recall interview, (2) een digitaal logboek, (3) een video analyse van uw handelingen en gebaren tijdens het lesgeven, en (4) een interview. Hieronder licht ik de vier methodes globaal toe. Tijdens het onderzoek zelf zullen de methodes en de procedures uitvoerig toegelicht worden.

1. Stimulated recall interview: In dit onderdeel van het onderzoek ga ik eerst een video opname maken van uw muzikales en daarna bekijkt u de video en geeft u aan wat u dacht tijdens het lesgeven. Ik kom op donderdag 4 april opnames maken van uw muzikales in groep 1 en 2. Uw les zal plaatsvinden in de speel- of gymzaal van uw school. Het is overigens de bedoeling dat ouders en verzorgers *vooraf* aan de feitelijke opnames toestemming geven voor deze opnames;

Ik zal twee lessen van u filmen waarin de ontwikkeling van ritmische vaardigheden van kleuters centraal staat. Onder ritmische vaardigheden versta ik 'puls en maat kunnen houden, het kunnen uitvoeren van ritmes en tempo kunnen houden'. Het is de bedoeling dat u lesgeeft zoals u normaal gesproken ook doet, en niet nieuwe werkvormen of nieuwe lessen ontwikkelt speciaal voor dit onderzoek;

2. Het aantekeningenboek: Na het stimulated recall interview zal ik u vragen om gedurende drie weken een digitaal aantekeningenboek bij te houden waarin u uw praktijkkennis beschrijft over het ontwikkelen van de ritmische vaardigheden van kleuters. Ik zal u ook vragen om een aantal persoonlijke gegevens te vermelden zoals uw leeftijd, geslacht, opleiding etc. De dag voor (4) het interview zal ik u vragen om uw digitale aantekeningenboek naar mij te mailen in de vorm van een pdf-bestand;
3. Video analyse: het volgende onderdeel in het onderzoek betreft het beschrijven van uw handelingen en gebaren van twee lesactiviteiten nav de video opname die voor het stimulated recall interview is gemaakt;
4. Het interview: Ongeveer drie weken na het stimulated recall interview zal er een interview met u plaatsvinden van ongeveer een uur. De vragen uit het interview zijn gericht op uw praktijkkennis over het ontwikkelen van de ritmische vaardigheden van kleuters.

De gegevens van de vier methodes zal ik analyseren en verwerken tot een geschreven portret dat aangevuld wordt met video beelden. U krijgt het portret ter goedkeuring voorgelegd *voordat* het openbaar wordt gemaakt.

In totaal zal ik zeven vakleerkrachten onderzoeken, en de gegevens van de vakleerkrachten met elkaar vergelijken om te zien of er overeenkomsten of verschillen zijn tussen deze vakleerkrachten muziek. In de laatste fase van mijn onderzoek vergelijk ik de praktijkkennis van de vakleerkrachten muziek over de ontwikkeling van ritmische vaardigheden met theoretische kennis over de ontwikkeling van ritmische vaardigheden van kleuters.

Met vriendelijke groet,

Melissa Bremmer

Ethische richtlijnen betreffende dit onderzoek

Omdat het onderzoek in Engeland aan de Universiteit van Exeter wordt gedaan, volg ik de Engelse ethische richtlijnen van onderzoek. In het kader van deze richtlijnen breng ik u graag van onderstaande punten op de hoogte en vraag ik u deze brief te ondertekenen als u akkoord gaat met deze punten. U heeft overigens te allen tijde het recht heeft om zich terug te trekken uit het onderzoek zonder vermelding te maken waarom u zich wilt terug trekken.

- De video opnames van uw les worden geanalyseerd en mogen toegevoegd worden aan mijn proefschrift. De opnames kunnen ook gepresenteerd worden op onderzoeksconferenties en gebruikt worden op de Opleiding Docent Muziek aan het Conservatorium van Amsterdam. De opnames worden niet op het internet geplaatst;
- In het portret gebruik ik uw voornaam, niet uw achternaam. De naam van uw school of namen van uw leerlingen worden niet vermeld;
- Om ervoor te zorgen dat uw eigen praktijkkennis zo min mogelijk beïnvloed wordt door het onderzoeksproces, zal ik u pas gedurende (3) de video analyse van uw handelingen en gebaren en (4) het interview kenbaar maken op welke aspecten van uw 'praktijkkennis' dit onderzoek betrekking heeft;
- De (digitale) ruwe data van de stimulated recall, het logboek in de vorm van een pdf-file, het interview en de video opnames worden door mij persoonlijk bewaard op mijn persoonlijke computer en een harde schijf. Een onafhankelijk persoon die niet betrokken is bij het onderzoek of het werkveld muziekeducatie zal meehelpen de data woord voor woord uit te schrijven zodat ik het kan analyseren. Deze persoon verwijdert de data van de computer na het uitschrijven van de data. Uw data wordt niet doorgespeeld aan een derde partij, tenzij u daar zelf toestemming voor geeft. Data die niet gebruikt worden in het proefschrift worden een jaar na het onderzoek vernietigd.

Akkoord



Peter van Os

Akkoord



Melissa Bremmer