

What the body knows about teaching music

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

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Content presentation

- The background of the concept of PCK
- Embodied cognition
- Methodology
- Findings
- Discussion and conclusion

Background pedagogical content knowledge

- Rhythm skills are seen as a key element in early childhood music education (Gordon, 2003; Young, 2009);
- How do we teach those skills?
- Models describe the musical development, including rhythmical development (e.g. Gordon, Swanwick & Tillman);
- Purpose “to advance thinking about educating and teaching the child in settings of formal schooling” (Taetle & Cutietta, 2002, p. 279);

Background pedagogical content knowledge

Teachers: models do not match personal ideas of what “works” in the classroom (De Baets & Nijs, 2013);

Teachers: develop theories in their classroom practice (Loughran, 2010) about how rhythm skills can be taught to preschoolers:

- the “what” of teaching – often given in national curricula;
- the “how” of teaching those rhythm skills.

Knowledge of these teachers might complement models of musical development and can form a bridge between theory and educational practice (Kwakman & Van den Berg, 2004)

Background pedagogical content knowledge

- Shulman (1986, p. 9) suggested: teachers develop a unique kind of knowledge through practice that intertwines their content knowledge and pedagogical knowledge: “pedagogical content knowledge (PCK)”.
- PCK: neither about subject matter knowledge per se, nor about general aspects of teaching
- → an **integration** of both types of knowledge

Background pedagogical content knowledge

Shulman (1986, p. 9) PCK: "[...] 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 [...]"

Teachers need PCK e.g.:

- to structure lessons;
- choose teaching strategies that fit with a **topic**;
- to anticipate certain learning difficulties in relation to that **topic**.

So what does PCK look like in music education? An example

Specialist music teacher: Els (Bachelor Music Education)

Topic:

Age group:

PCK: She develops teaching and learning strategies that fit with a specific topic (rhythm skills) *and* with a specific age group (preschoolers)

Els' PCK on teaching and learning rhythm skills

- 'If you want them to feel the pulse then they will have to walk . The movement has to go through the whole body'; preschoolers **feel** the pulse;
- Make-believe supports learning to **feel** the pulse and tempo in a certain way;
- Modelling: 'just give the right example yourself';
- Pulse is **audible** (drum) and **visible** (walks to the pulse);
- Els' body demonstrates beginning and end musical phrase.

Background pedagogical content knowledge

Researching PCK seems relevant because:

- the more different teaching strategies for a topic, the more effectively teachers can facilitate learning a topic (Hill, Ball & Schilling, 2008) → quality
- a form of specialised knowledge that seems to be key to the profession of teaching, thus enhance the status of the profession of teaching (Vreugdenhill, 2005)

Background pedagogical content knowledge

Nationally and internationally:

- Research into the PCK of teachers in the fields of language and maths education
- Large-scale qualitative and quantitative research “Mathematics Teaching and Learning to Teach Project” by Deborah Ball (USA)

→ what do teachers do when they teach mathematics? And what can we learn from that?

Background pedagogical content knowledge

Maths, science and language education: constructivist or information processing perspective on PCK (e.g. Cochran et al, 1993; Meijer, 1999)

These perspectives: “conceive of knowing in terms of thoughts and structures in the head” (Pozzer-Ardenghi & Roth, 2010, p.31)

Assumption studies **PCK**: internal knowledge is translated into speech from where researchers recover “the knowledge lying behind” (Pozzer- Ardenghi & Roth, 2010, p. 149)

Research methods e.g. interviews, stimulated recall interviews

Background pedagogical content knowledge

Body plays a central role in teaching music.

McCarthy (2007, p. 7) “[...] 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”.

Possibly, the music teacher’s PCK is distributed over mind and body

Pedagogical content knowledge and embodied cognition

Embodied cognition: a range of philosophies, theories and research that redress a perceived neglect of the role of the body in cognitive science (Chrisley & Ziemke, 2002).

Emphasises the intimate and dynamic relationship between body, mind and environment;

An embodied cognition perspective was taken on PCK in this research. From this viewpoint:

- spoken and written language are not the *only* form through which the teachers' PCK can be communicated;
- exploring the teacher's PCK as manifested in the body is essential.

Research question

What is the **PCK** of experienced Dutch specialist music teachers

Theoretical framework: embodied cognition

No unified view but in general an emphasis on the interplay between body, mind and the environment (Gallagher, 2009);

Specific approach:

- distinction online and offline embodied cognition (Wilson, 2002).

Online embodied cognition

“Cognitive activities [that are] performed in real life situations and [that are] intimately linked to the sensory–motor processes required to interact with the environment” (Brouillet et al, 2010, p. 2);

All sensory, somatic and motor perceptions are essential for understanding e.g. classroom events (Wilson, 2002);

Goal-directed physical action not an *expression* of internal cognitive activity
→ *part* of the cognitive activity (Lindblom, 2007);

Knowledge *itself* is embodied e.g. gestures of teachers (Pozzer-Ardenghi & Roth, 2010).

Offline embodied cognition

When cognitive processes are **decoupled** from the environment where they originally took place, the individual's sensorimotor systems can run a **simulation of this environment** as a means of representing it (Niedenthal et al., 2005);

Online and offline EC: reflected in and influence each other (Goldin-Meadow & Beilock, 2010).

→ Perspective on PCK

Methodology

A multiple case study approach within an interpretive paradigm

Participants:

- 6 *specialist* preschool music teachers;
- 4-6 year olds in the Dutch educational system (group 1-2);
- develop their own curriculum regarding the teaching and learning of rhythm skills;
- open space;
- min. 4 years experience.

Researching online embodied cognition during teaching

Stimulated recall interview

- Teachers taught a lesson with 'rhythm skills' as central theme
- Push button technique (Crasborn & Hennissen, 2010): touch button when aware of thoughts/feelings
- **After lesson:** view and stop video when you recall what you were thinking/feeling during teaching
- **Button:** an additional reminder of what they had thought/felt

Researching online embodied cognition during teaching

Two video analysis tasks of two different rhythm activities:

- indicate, describe and interpret the teacher's physical actions that reflect the instructional sequence of a rhythm activity
- indicate, describe and interpret the teacher's gestures within those two rhythm activities
- first individual analysis teacher/researcher; then co-analysis

Researching offline embodied cognition beyond the classroom

Notebook (2-3 weeks)

Semi-structured interview (1.5 hours)

- six interview questions derived from the literature (content of PCK): e.g. about teaching strategies, learning difficulties, assessment
- questions could be asked in a random order.

Analysis data: Thematic analysis

- **Data were transcribed** verbatim + explanation of gestures were matched with the time of the video clips
- **Inductive coding** (sensitising concepts): From data to code, developing a coding scheme
- After the third case: **intercoder agreement**
- **Deductive coding**: From code scheme to data
- **Triangulating data and developing main themes describing PCK** with sensitising concepts (literature on PCK)

Themes literature

Themes data

Pedagogical orientations towards teaching and learning subject matter

e.g. Grossman, 1990; Magnusson et al., 1999; Meijer, 1999

Pedagogical orientations regarding the teaching and learning of rhythm skills

Subject matter and teaching

e.g. Ball et al., 2008; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987

Teaching strategies for rhythm skills

Subject matter and learners

e.g. Ball et al., 2008; Magnusson et al., 1999; Meijer, 1999; Shulman, 1987

Dispositions and learning difficulties in relation to rhythm skills

Subject matter and the curriculum

e.g. Cochran et al., 1993; Grossman, 1990; Magnusson et al., 1999; Meijer, 1999

The curriculum in relation to rhythm skills

Subject matter and assessment

e.g. ;Magnusson et al., 1999

Assessment of the preschooler's rhythmic behaviour

Subject matter and the educational context

e.g. Cochran et al., 1993

The interaction between an educational context and the learning of rhythm skills

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Musical interaction facilitating the learning of rhythm skills

A teacher's pedagogical orientation regarding the teaching of rhythm skills plays a role in how teachers facilitate the learning of rhythm skill (Magnusson et al., 1999)

Theme 1: pedagogical orientations regarding the teaching and learning of rhythm skills

- A child-centred approach;
- Experiential learning; and
- Imitation learning.

Theme 1: pedagogical orientations regarding the teaching and learning of rhythm skills

A child-centred approach:

- work out “where the children are” rhythmically and help them move forward in their rhythmic development
- learning rhythm skills from peers;
- preschoolers contribute their rhythmic ideas

Experiential learning:

- rhythm skills are learned through moving to rhythm aspects of music and feeling the rhythm – when possible with the whole body

Imitation learning:

- preschoolers learn rhythm skills through observing and imitating the performance of rhythm skills of the teacher or peers (reduce verbal

Theme 2: Musical communication and interaction that facilitates the learning of rhythm skills of preschoolers

Theme covers the musical communication and musical interaction *within* chosen teaching strategies

Within a rhythm activity the teacher's body plays a central role

The gestures and the way the teachers use their body intended:

- to communicate rhythmic aspects;
- to elicit a rhythmic response in the preschoolers;

Theme 2: Musical communication and interaction that facilitates the learning of rhythm skills of preschoolers

Instructional gestures preceding rhythm activity

- verbally explain and simultaneously act out rhythmic activity with the use of gestures or the actual movements of the activity;
- preschoolers do not need to fully rely on language to be able to understand the intention of the shared activity.

Theme 2: Musical communication and interaction that facilitates the learning of rhythm skills of preschoolers

Guiding gestures during rhythm activity

- teachers cue preschoolers non-verbally **when** and **how** to respond rhythmically;
- teachers cue **in advance** and provide preschoolers with sufficient opportunity to respond to those changes.

Theme 2: Musical communication and interaction that facilitates the learning of rhythm skills of preschoolers

(Re)presentational gestures

- (re)presenting rhythm aspects as the beat, rhythm patterns and rhythmic phrasing with their body
- gestures become “visual signposts” of rhythm aspects

Theme 3: Assessment of the preschooler's rhythmic behaviour in relation to learning rhythm skills

This theme covers how teachers assess the rhythmic learning process of the preschoolers.

Teachers prefer using formative assessment to further the pre-schoolers' rhythmic development.

Music: teachers receive *direct* feedback of practically *all* the preschoolers at once through their continuous physical rhythmic responses.

Theme 3: Assessment of the preschooler's rhythmic behaviour in relation to learning rhythm skills

What are they assessing e.g.:

- is the group/individual picking up on a rhythm skill during the lesson or over time?
- should a rhythm activity be repeated?
- should a rhythm activity be elaborated or made complexer?

How

Theme 3: Assessment of the preschooler's rhythmic behaviour in relation to learning rhythm skills

Multi-sensoric assessment and feedback:

- “I keep my **eyes** open when they are all ticking with those rhythm sticks, then I look around, like, who is doing it well?” [Floor] **Feedback:** let preschoolers **watch** what the others are doing.
- “You **feel** when you are busy that children want to speed up” [Peter]. **Feedback:** “Then you automatically hold back. [...] Then they copy that” [Peter].
- Teachers gain **haptic** information e.g. to take the hands of a preschooler and swing them back and forth to the beat of the music → how much resistance? **Feedback:** through” tactile modelling” (Metz, 1989, p. 52)

Discussion: nature of PCK

From an embodied cognition perspective:

- PCK is a **multi-modal** form of knowing: distributed over language, sound, gestures, body positioning and physical actions;
- PCK emerges from the interaction between the (social, cultural, physical) classroom environment, the task that is performed and the *teacher's body*;
- The term “pedagogical content **knowing**” (Cochran et al, 1993) would fit an embodied cognition perspective better opposed to “pedagogical content **knowledge**” which suggests a far more static view of knowledge.

Discussion: content of PCK

During a rhythm activity, the teachers' **bodies** take on **different roles**:

- **Model**: teacher's body models a rhythm skill in a flexible and interactive way, with a minimum of language
- **Guide**: teachers employ gestures to instruct and guide preschoolers (when and how to respond). Their bodies can represent rhythm aspects and make the intangibility of music more tangible;
- **Assessor**: teachers draw on *different* senses to gain information about the rhythmic development of preschoolers and to give feedback

Discussion: content of PCK

During a rhythm activity, the teachers' **bodies** take on **different roles**:

Adaptive curriculum:

- when teachers perform a rhythm activity

level of *difficulty* of the activity *and* regulate excited *behaviour* of preschoolers through that same activity. adapt the

Conclusion

These teachers' **bodies**:

- are a mediating factor for experiencing and learning rhythmical structures of a given music;
- can create a multimodal learning environment that gives preschoolers access to a shared meaning of music;

Their bodies bridge an abstract and sonic realm to a concrete and physical world for the preschoolers.

So, what are the implications.....?

- Raise the awareness of the roles of the body in teaching and learning rhythm skills/music → example ODM

“Cultivating the teacher’s own bodily awareness and social consciousness may be a key to fostering embodied learning in the arts” (Anttila, 2015)

- Teach in an open space: body as pedagogical tool and “reading” the bodies of the learners → example ODM

So, what are the implications.....?

- Instead of explaining a music education practice with generic educational models that have been developed for more text and symbol-orientated education, develop educational models that fit music education.

Reflection

The process of teaching and learning of rhythm skills are closely linked; future research can include the pupils' perspective

When is cognition offline (designing a lesson...)?

The act of teaching is *translated* to and *presented* through language and therefore might lose “embodied aspects”

Elliot Eisner (2006, p. 45):

“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”.

I want to thank the specialist music teachers for:

- sharing their practice on video
- the co-analysis of the data

Questions?