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The walking rhythm of physical education teaching: an in-path analysis

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ABSTRACT

Background: While studies of teaching frequently preserve an interest in teacher–pupil encounters that take place in certain spots, this article shows how teachers' can be understood as *in-path* instructors, which is significant for student-based learning. This complements studies that have mainly focused on teachers instructional work taking place at certain spots.

Purpose: The purpose is to describe how a PE teacher's rhythmic labouring of the diverse settings in the gym creates a learning environment. By examining *emplacement* (spatial) and *empacement* (temporal) as important aspects of how learning environments are constituted, this article contributes a framework for studying and analysing a teacher's work from a *moving* vantage point.

Conclusions: Based on a video ethnographic approach and using a wearable camera attached to the teacher's chest, the analysis of a station-wise lesson show how the teacher frequently covers a large part of the room and creates a web of educational challenges and possibilities. These *brief encounters* are identified as important tools that support each pupil's rhythm and engagement in the learning activities and maintain the corporate rhythm of a class. Furthermore, by analysing the teacher's temporal and spatial *walking technique*, which helps the pupils to transit between and accomplish practical exercises, the article highlights how the teacher's ability to support pupils' progression partly builds on a *regional knowledge* that is cultivated by the array of encounters.

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Introduction

In this article we examine a phenomenon in social science that, despite not yet having been empirically investigated in PE research, is pertinent to how we understand the interaction and learning environment in the gym. While PE teaching is often researched as a sequential activity taking place in specific instructional events (e.g. Casey and Goodyear 2015) or in relation to the teacher as an *on-the-spot* instructor (e.g. Metzler 2011; Cohen and Zach 2013) this article contributes new empirical insights to teaching as an *in-path* activity. This approach to the learning environment in the gym means that instructional events (i.e. guiding pupils in the technical, material and social means of certain exercises) are conceived of as smaller parts of a larger rhythmic whole.

In recent decades anthropologists and sociologists have recognised the relation between walking practices and the rhythm of everyday interaction (e.g. Burton 1994; Sinclair 1997; Solnit 2000). For instance, building on the work of Tim Ingold, Henry Lefebvre and others, we have seen conceptual

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developments and empirical studies that describe the spatial and temporal details of how our bodies are always on the move and how walking rhythms are intimately connected to certain perceptions, norms, skills (Morris 2004; Bassett 2004; Wunderlich 2008; Middleton 2010) and pedagogical processes (Shilling 2008; Bairner 2011; Ingold 2004; Ryan 2011). This notion that we inhabit our environments by the way we traverse certain terrains constitutes a promising starting point for PE research that aims at a deeper understanding of the interaction and learning environment in the gym. For example, Ingold states that ‘Locomotion, not cognition, must be the starting point for the study of perceptual activity’ (2004, 331), Hockey and Allen-Collinson (2007) claim that participants perceive their environment ‘from a moving vantage point’ (119), while Edensor (2010) describes walking rhythm as continuously adapting to circumstances (public spaces, working life and weather). Such views of moving and knowing are here considered in an educational context and further developed within a framework of body pedagogics (e.g. Shilling 2010, 2017, 2018). This framework recognises that teachers and pupils do not merely assimilate into a pre-existing environment, but also adapt the environment for their own purposes, i.e. they actively constitute the learning environment in which they act (Andersson, Garrison, and Östman 2018; Loquet and Ranganathan 2010; Amade-Escot, Elandoulsi, and Verscheure 2015; Andersson and Risberg 2018).

By conducting an *in-path* analysis and recognising the PE teacher as part of a rhythmic environment, this article focuses on one teacher’s moving body and how specific ways of walking the gym support certain interactions and learning environments. The purpose is to describe how a PE teacher’s rhythmic labouring of the diverse settings in the gym creates a learning environment. Relying on empirical data from a three-year long video-ethnographic study of physical education, in which two classes and their teachers were followed from years 7–9, the analysis highlights the teacher’s continuous flow of transpositions, the polyrhythmic array of teacher–pupil encounters and the walking-teaching technique that relates to these spatial and temporal aspects of the gym.

Background

Scholars argue that the field of PE and sport pedagogy need broader concepts of moving capabilities and learning (e.g. Hopsicker and Hochstetler 2016; Kretchmar 2000, 2017; Tinning 2009) as well as projects that on the base of such concepts can carry out empirical studies in novel ways (Shilling 2018; Allen-Collinson 2009; Brown and Payne 2009). To some degree, empirical studies that focus on assessment (Lloyd 2015), discourse (Larsson and Nyberg 2017) and conception (Svennberg 2017; Backman and Larsson 2016) have challenged certain views of movement and learning and how we understand the classroom practice of PE teachers. However, in the following we are influenced by Swedish and French didactic research that have been analysing how interactional structures of learning environments are co-created between teachers and pupils (e.g. Quennerstedt and Larsson 2015; Amade-Escot 2000) and by recent emplacement studies (e.g. Pink 2011) in which education is always analysed as a spatial–temporal event.

Apparent in the Swedish didactic research tradition are Bourdieu influenced studies of how movement cultures are conditioned by different logics of practice (Larsson and Karlefors 2015; Engström 2008) as well as studies that promote a transactional theory of experiences. In the latter, which more closely relate to our *in-path* analysis, movement cultures are seen as constituted through transactions between teachers, pupils and their locality or actions-in-ongoing events (Quennerstedt and Larsson 2015; Quennerstedt 2013; Quennerstedt, Öhman, and Öhman 2011; Ward and Quennerstedt 2015). Connected to this vein of transactional research are also recent studies of body pedagogics that have explored the means, experiences and outcomes of how habits and reflexive thought develop through *environing* processes in encounters with the social, technological and material world (Shilling 2018; Andersson, Garrison, and Östman 2018).

Vital in the French didactic research tradition is how PE content evolves through classroom interactions, unfolds during participants’ ‘joint actions’ and how we can recognise students’ diversity while at the same time understand knowledge as shared cultural actions (e.g. Amade-Escot and

O'sullivan 2007). This perspective contributes analyses of how differential dynamics of 'didactic contracts' and 'didactic milieus' relate to teachers' intent and students' learning (Amade-Escot and Bennour 2017). For instance, Loquet (2011) analyse how different interactions of trainer/gymnast pairs results in particular didactic milieus through which certain rules and collective knowledge are incorporated. And, studying dance education Loquet and Ranganathan (2010) describe teachers' skills to managing the didactic milieu, sharing responsibility and structuring time as outcomes of a 'student-teacher-knowledge' interactivity' (p.77) and reject that we conceive of these skills as personal and psychological qualities.

Furthermore, our approach to see instructional events as smaller parts of a larger rhythmic whole picks up on Casey's (2017) recommendation to explore the often-implicit set of negotiations between teacher and students. Here, we recognise earlier studies emphasising how curriculum is enacted through micro-dynamics of classroom settings (Verscheure and Amade-Escot 2007). For example Amade-Escot and Bennour's (2017) analyse students' small group work and the productive disciplinary engagement in PE, while Amade-Escot, Elandoulsi, and Verscheure (2015) take a point of departure in Joint Action Theory to shed light on the intertwined processes of classroom interactions by studying the interplay between the teacher's practical epistemology and the students' gender positioning in the gym. Focusing on students' group work in gymnastics, Barker and Annerstedt (2016) empirically further the integrated idea of learning content and classroom interaction in relation to micro techniques of co-construction of classroom order.

Taken together, the Swedish and French didactic research traditions are characterised by their understanding of teaching practice as a particular, contextual, and meaningful relational engagement that connects to place. Still, the processes of co-construction of learning environment and subject content are very seldom investigated in terms of teachers' movement rhythm in the gym. To some degree, the relation between teachers' habits and learning outcomes is emphasised in studies of teaching styles and, more specifically, in studies with an analytical shift from categorisation of styles to how teaching styles are relevant to particular cultural contexts (Sicilia-Camacho and Brown 2008). For example, classroom ecology research has shown that teachers do not exclusively select a teaching style, but that the style develops in a mutual relationship between teachers and pupils (e.g. Tousignant and Siedentop 1983; Tinning and Siedentop 1985; Hastie and Siedentop 2006). Following this vein of research, Leriche et al. (2016) compare French didactic research and classroom ecology and discuss how we can design studies that are capable of dealing with learning content and managerial task in the same analytical framework, rather than approaching them as two separate classroom phenomena. Ecological approaches are also pursued by Rovegno and Gregg (2007) in their analysis of teaching cultural content through dance, and by Thorburn and Stolz (2015) who concludes that embodied learning in physical education must be understood in relation to a physical culture and the participants' integrated spatial and temporal experiences.

Several complementary studies to teacher-centred analyses of interaction and learning environment recognise the hidden learning and interaction in PE that could occur collaterally while the teacher is teaching subject content (Casey 2017; Casey and Quennerstedt 2015). In relating this collateral learning to movement capabilities, motion-tracking systems in PE (e.g. Chow et al. 2014; Barris and Button 2008) can potentially reveal 'hidden' patterned movements that teachers and pupils perform, but where the systems are limited when it comes to analytically explaining how these movements actually relate to learning environments. Examples of analyses that more explicitly address such a connection between didactic tasks and movement space is found in Gerdin's (2016) study of how disciplinary and gendered arrangements of movement can work as productive sources for pleasure and learning and in Jacklin's (2004) study of the discourse, interaction and spatial rhythms of pedagogic practice.

In conclusion, we have witnessed empirical projects focusing on interactional (Barker and Annerstedt 2016; Thorburn and Stolz 2015) critical (McCuaig, Öhman, and Wright 2013; Azzarito 2010) phenomenological (Owton and Allen-Collinson 2017; Bäckström 2014), and spatial (Gerdin 2016; Thorburn and Stolz 2015) dimensions of embodied learning. Despite this, teachers' habitual abilities

to traverse the educational terrain in the gym and orchestrate its diverse setting into a learning environment by walking is still a neglected research object. Interesting, though, is that recent ‘emplacement studies’ (e.g. Pink 2011; Fors, Bäckström, and Pink 2013), has focused on describing skilled performance as a sensuous interrelationship of body–mind–environment. For instance, Swedish didactic research has highlighted the knowing body in terms of how students and athletes attain to certain rhythms by a skilful coordination of certain bodily parts and how a sense of timing is developed in according to such rhythm (Bäckström 2014; Nyberg and Carlgren 2015). By putting the analytical spotlight on PE teaching as an *in-path* activity, we seek to extend these emplacement studies (e.g. Pink 2011) in which education is always a spatial–temporal event to also include a focus on the *teacher’s* moving body and how specific ways of *walking the gym* support certain learning environments.

Theoretical framework

Influenced by the concepts of movement and rhythm found in Ingold (2010, 2004) and Lefebvre (2004), we argue that in order to empirically understand people’s processes of inhabiting environments we need to focus on how they traverse certain terrains and acknowledge that walking rhythms relate to specific perceptions, norms and skills. In the context of PE, this means that we here view teaching as part and parcel of teachers’ personalised trails of walking rhythm. To analyse a PE teacher’s walking rhythm in the gym we rely on a rhythm analytical framework developed by Andersson and Risberg (2018). In the following we further develop that framework in the tradition of body pedagogics by using Dewey’s concept of habit, which facilitates an empirical description of how a PE teacher’s walking-teaching develops through environing processes. Environing processes are here described through *emplacement* and *empacement* as two central aspects in order to reach our aim of analysing the teacher’s rhythmic labouring of the diverse settings in the gym into a learning environment.

Environing

To traverse the gym, teachers need to selectively attend to some students, problems and learning and disregard others. In other words, they cannot act on every possible action or stimulus in the gym. Such discrimination would take time if teachers had to stop and deduce the meaning of every single thing they encountered along their path. In this way, everything cannot be a stimulus for the actor. This stance is most clearly expressed in Dewey’s influential paper ‘The Reflex Arc Concept in Psychology’ where he wrote that ‘it is the motor response or attention which constitutes that, which finally becomes the stimulus to another act’ (EW 5, 101-102). Stimulus here could be a stop light, a piece of apparatus, a person, or a clock. From a body pedagogic perspective, PE teachers rely heavily on intelligent habits to make their educational path through the multitude of encounters (with people, artefacts and earlier experiences) in any one lesson. In this sense, habits mean a special sensitivity or accessibility to certain classes of stimuli (MW 14, 32) and are the tools by which we coordinate the continuous flow of experiences into functional wholes (Garrison 2002; Andersson and Garrison 2016). By following and tracing a PE teacher’s habitual walk in the gym, the analysis aims to describe the spatial and temporal aspects of such a coordination of experiences and the techniques the teacher uses when attending to certain pupils and problems.

Andersson, Garrison, and Östman (2018) make a distinction between environment and surroundings that is important for our analysis of the PE teacher’s walk in the gym. This distinction derives from Dewey’s claim that anything surrounding an organism that does not enter into its functioning is not part of its environment (see LW 12, 108). In applying this distinction and the concept of habit to the walking rhythm of PE teaching, the learning environment in the gym emanates from the teacher’s growing recognition of what to act on to functionally coordinate various experiences into satisfactory walking paths that bind different events together in a lesson. By eliciting this environing *as an active process* (LW 1, 184, 184, 196, 299), which entails opening up certain learning

environments and closing down others, we make an analytical distinction between *emplacement* and *empacement*.

Emplacement

By introducing emplacement, Pink (2011) seeks to operationalise the concept of embodiment and understand 'the embodied self as part of a total environment' (348). Regarding bodies as parts of places, she recognises 'that the body provides us not simply with embodied knowing and skills that we use to act on or in that environment, but that the body itself is simultaneously physically transformed as part of this process' (Pink 2011, 347). To live is to engage bodily in different place-events and to experience how the place-events influence the body in return. In our body pedagogics, the use of the term emplacement also refers to an active environing process in which habits are transactionally developed in encounters with the world, i.e. people are also capable of transforming the environment in which they act. Movement is essential to understanding environing processes and embodied knowledge, because as Pink (2011) claims, people do not leave their environments to know or stop in order to know, but continue. Ingold (2000) expresses this insight in a similar way and explains that we know as we go from place to place, 'knowledge is regional; it is to be cultivated by moving along paths that lead around, towards or away from place, from or to places elsewhere' (229). Here, embodied knowledge is understood against the background of a continuous flow of transpositions. However, creating a transpositional flow from place to place (for example in teaching gymnastics at different stations) requires that the teaching performed in one encounter relates to what lies around it. Thus, our analytical focus on emplacement means analysing how the teacher functionally coordinates various experiences into satisfactory walking paths that bind different events together in a lesson.

Empacement

A description of a PE teacher's environing would be incomplete if it only contained the *situated* aspect of embodied knowledge. Pink (2011) declares that emplacement should also recognise the specificity, intensity, contingencies and entanglements of the place-events. Hence, the concept of empacement is introduced in order to produce an empirical description of the intensity and entanglements that occur, which implies a stronger focus on rhythm and the *relational* aspect of embodied knowledge.

Although we can view teachers' walking as personalised trails, they should not be viewed as solitary routes. Empacement refers to how teachers' and students' trajectories separate and cross in regular ways. Ingold describes it as 'the environment does not consist of the surroundings of bounded place but of a zone in which their several pathways are thoroughly entangled' (Ingold 2007, 103), while Lefebvre (2004, 89), in his critique of 'thingification', emphasises that every gathering of bodies in a certain space is a polyrhythmic (or 'symphonic', 31) event 'composed of diverse rhythms' (80). In the words of Wunderlich (2008), such 'walking practices' support and integrate various place-rhythms, or 'suggesting and representing 'tempo' and defining rhythmical continuums of life activity that impacts on a place's temporal identity and character' (137). In analysing PE, different constellations of activities, e.g. the size of the gym, the kind of apparatus used, the number of stations, the size and number of student groups etc., also imply a place-rhythm that the teacher has to tune into to maintain the focus and tempo of the lesson. This empacement focus of our analysis facilitates descriptions of the transitional rhythm in emplacement and identifications of privileged encounters with people, places and artefacts. Such privileged encounters are analytically useful, because through them it is possible to describe the walking teaching from a 'moving vantage point' and as teachers and pupils assimilating into the environment and adapting it for their own purposes. This analytical focus thereby facilitates elaboration on the intersections between the teacher's walking rhythm and the pupils' assignment rhythm.

Method

The article is part of a larger project aimed at generating knowledge about pupils' learning of practical embodied knowledge in the context of the school subject sloyd (handicraft-oriented education) and PE. The fieldwork was conducted in two classes in a middle-sized municipal secondary school in a small Swedish town. The classes were visited from six to twelve times each term from spring 2015 to spring 2017 (5 terms).

The majority of the fieldwork was conducted using a video-ethnographic approach (e.g. Heath, Hindmarsh, and Luff 2010). Such an approach facilitates an analysis of the details of embodied actions and the everyday life and interactions in the classroom by the repeated replaying of sequences (e.g. Goldman 2007). During the fieldwork period 30 PE lessons, scheduled for 60 minutes, were observed and video recorded.

One hand-held camera with a built-in microphone was used to record pupil-to-pupil situations. A second hand-held camera was used to shadow the teacher at a dynamic distance of 2–6 metres. This camera setup facilitated a traditional 'observer's perspective'. A third camera, a wireless GoPro camera with a built-in microphone, was attached to the teacher's chest (e.g. Chalfen 2014). This camera set-up had the purpose of making crucial details of actions in the gym available for analysis (Moncada 2006, 54). Watching the recordings from the GoPro resulted in a closer, almost 'first-person' embodied experience of the teacher traversing the gym and the rhythmic labouring of teaching. For instance, specific teacher movements such as walking, twisting, turning and stopping became very evident because these movement correlated with the view of the GoPro camera. This made us watch the recordings from the traditional camera view in a new way. The walking and rhythmic labouring that is foregrounded in this article had previously been seen, but remained unnoticed (see Andersson and Risberg 2018).

Ethical considerations

The planning, execution and archiving of research results has been guided by the ethical research principles of humanistic-social scientific research developed by the Swedish Research Council for the Humanities and Social Sciences 2002. Video recording and interview consent was gained from the pupils' guardians. Meta data of individuals has not been purposefully collected, i.e. pupils' and teachers' names might have been recorded in the video, but have not been collected and archived. In cases in which the teacher or pupils were equipped with a GoPro camera, a researcher was always on the spot prepared to stop recordings or delete recorded data of sensitive situations (e.g. fights and confidential talks).

The setting

The analysis focuses on a single lesson of station-wise gymnastics for a year 9 class. The class consisted of 20 pupils, 13 boys and 7 girls, and was led by a female teacher whom we here call Donna.¹ The space available for the class was a half gym. The spatial-material arrangement of the analysed lesson is illustrated in [Figure 1](#). The numbers (1-6) in the figure represent specific stations. The grey areas illustrate the carpets placed at landing spots. Arrows indicate the directions of an exercise or 'running track' connected to exercises including a jump. The stations are: (1) horizontal high bars, (2) somersault and head stands on the floor, (3) trampette for high jumps and pirouettes, (4) horse/buck/vault, (5) flying rings and (6) a pair of horizontal bars. Letter H stands for 'home', i.e. the place for the teacher's belongings, first aid kit and music facilities just outside the lines of the basketball court.

The purpose of this gymnastics lesson was to conduct self – and peer assessments in small groups (3–4 pupils). Each pupil had his/her own assessment form and info-sheets were available at all stations with the names of possible exercises and complementary/supplementary instruction

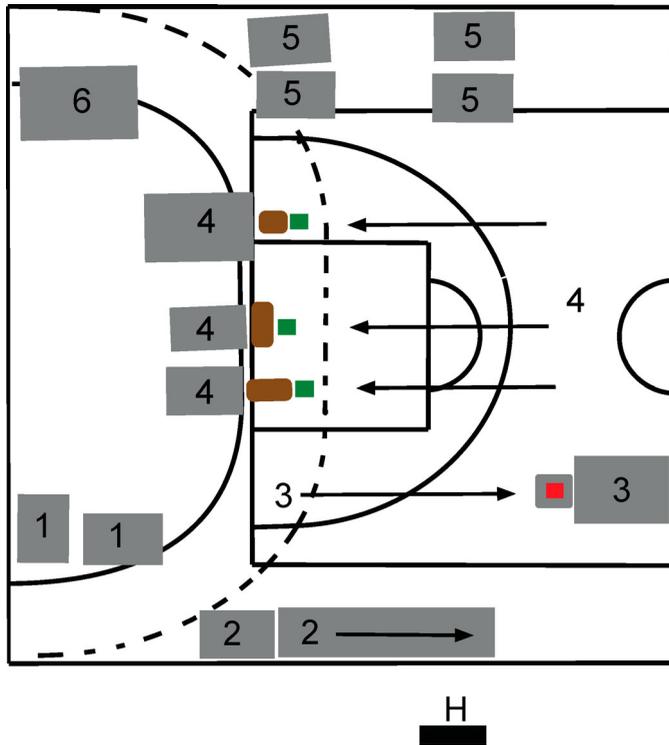


Figure 1. The spatial-material arrangement of station-wise gymnastics.

sketches. The exercises the pupils had to assess had been practised regularly in previous terms. Hence, the pupils had a general understanding of the different moves that they were expected to accomplish at each station. The teacher's instruction to the pupils was to assess their skills in groups of 3–4 at one station, tick the boxes in their assessment form and transit to the next station. Although this performing, assessing and transiting indicates a student-centred activity (see Goodyear and Dudley 2015), our analysis highlights the rhythmic labouring that is required by the teacher to support the pupils in their active participation.

Analysis

The analytical section consists of three parts. In order to analyse Donna's envioning process we make an analytical distinction between the emplacement and the empacement aspects of her teaching. Thereafter, we describe a sample of brief encounters through which she engages with the pupils. Important to our analytical approach is that we conceive these encounters as related to the spatial and temporal rhythm identified in the emplacement and empacement analyses and identify them as parts of a walking-teaching technique.

The emplacement of the teaching

In this part of the analysis we foreground the spatial dimension of Donna's teaching, which connects to a situated aspect of her envioning process. Based on our video recordings we visualise Donna's walking path through the lesson and describe her transpositions between the different place-events (stations) and her use of places.

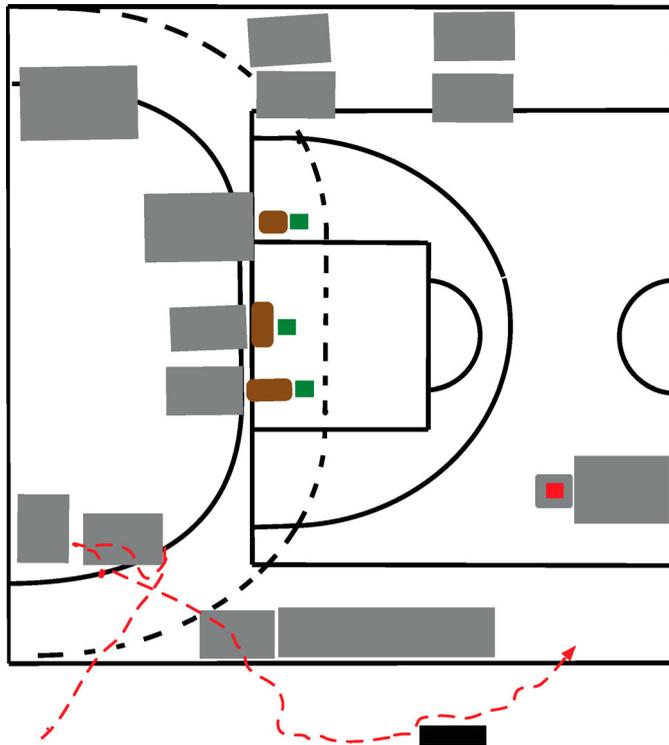


Figure 2. Donna's entrance walk with the carpet adjustment.

Donna enters the gym a couple of minutes before the scheduled time carrying her belongings in a grocery basket in her left hand.² She stops quickly at the closest station and adjusts a carpet with her right hand, after which she continues her walk to home (H) to put the basket down. Manually plotted, this walk creates a path illustrated by the dashed red line in [Figure 2](#).

Even in the observation of this very brief entrance scene and short walk some important aspects of emplacement can be highlighted. First, we highlight how Donna adjusts the carpet embodying a specific part of the material arrangement of the gym, i.e. she acts both on and in a specific environment. Second, her actions assemble in a certain purposeful path. It is noticeable that she does not enter the gym *and then stop* to search for misplaced carpets to adjust. Rather, the carpet becomes something 'quickly fixable' along her entrance path by which she purposefully continues to Home. By her walking habit of entering a classroom, carrying her belongings and moving towards Home she comes to know this 'easy-to-fix-carpet' *as she goes*, not *before* she goes (Ingold 2000, 229).

At Home she gathers the class on the floor and gives instructions about the assignment. She then initiates a warm-up exercise to get the pupils ready for the practices at the stations. During the warm-up exercise three songs are played from the music system and the pupils work together in small groups. Once the pupils set to work at the stations Donna's teaching is on the move, entangled in different place-events, e.g. 'adjusting carpets', pupils, techniques and equipment. Following and tracing Donna's walk throughout the 60-minute lesson and watching her movements through the GoPro lens, the impression that she is constantly heading somewhere is striking. As a place event in the gym, we observe her walk as both purposeful and dynamic. The full picture of Donna's walking path during the 60-minute lesson is shown in [Figure 3](#).

This path through the educational terrain results in a web that becomes part of the pupils' learning environment. Incorporated as a walking habit, the path also becomes a tool that helps Donna to

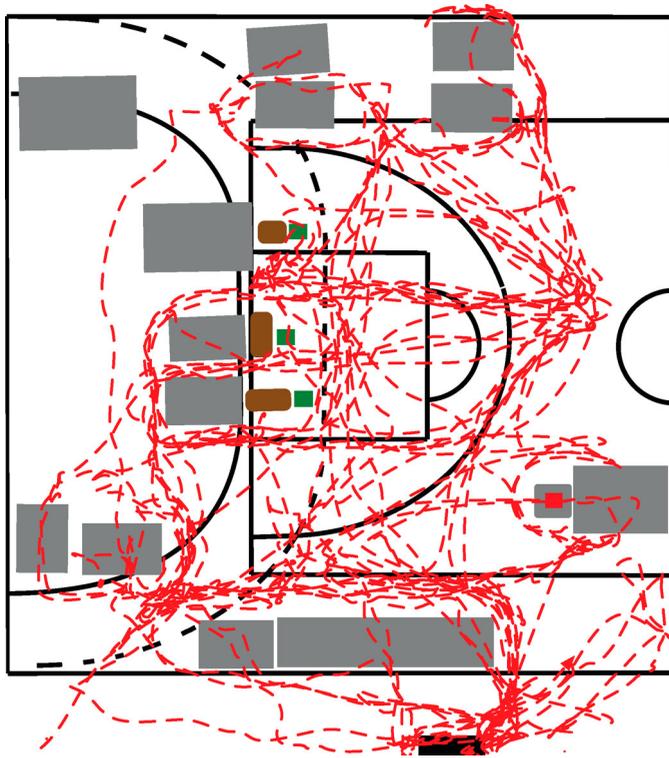


Figure 3. Donna's spatial path.

make various decisions about what to respond to and act on in the gym. That is, from an observer perspective most of her decisions are made through her sensitive and embodied walking path. Following her walk through the camera lens we can observe how she makes full use of her body. She walks in one direction, looks in another, is called for or engages herself in pupils' actions or idleness in a way that binds the pupils' practices together at the different stations. Thereby, the time-space routines of Donna's walking-teaching unfold during the lesson as she attends to certain recurrent problems, such as the height of the rings, the mat that needs constant adjustment, the tricky exercise on the horizontal bars etc. Donna's attention to particularities (her growing recognition) is a result of how her path and the pupils' paths separate and cross in certain ways. Thus, through her continuous flow of transpositions she is present at the intersections of different rhythms, i.e. the gym as a place-event can be seen as a zone of composed entanglements. In [Figure 4](#) we have added a second illustrative layer to more fully describe the intensity of Donna's walking and how it positions her in the gym. Adding a dot for Donna's position every 5th second throughout the lesson resulted in the following 'place-event' map illustrating where she mostly resides in her walk.³

In analysing her path through the lesson, we note that to get a flow of transpositions in her walk Donna cannot respond to everything that surrounds her (pupils, material, feelings etc.), i.e. she creates the environment as much as she traverses it. However, as a teacher she is not only confronted with the task of instructing in a few specific situations during a lesson, but also orchestrating various instructional events in a certain order in a limited space of time. The analysis of Donna's path shows that she covers a large part of the room frequently and that her walk creates certain intensities at specific places in the gym. Her transposition between different place-events is regulated by how she judges whatever happens to cross her path.

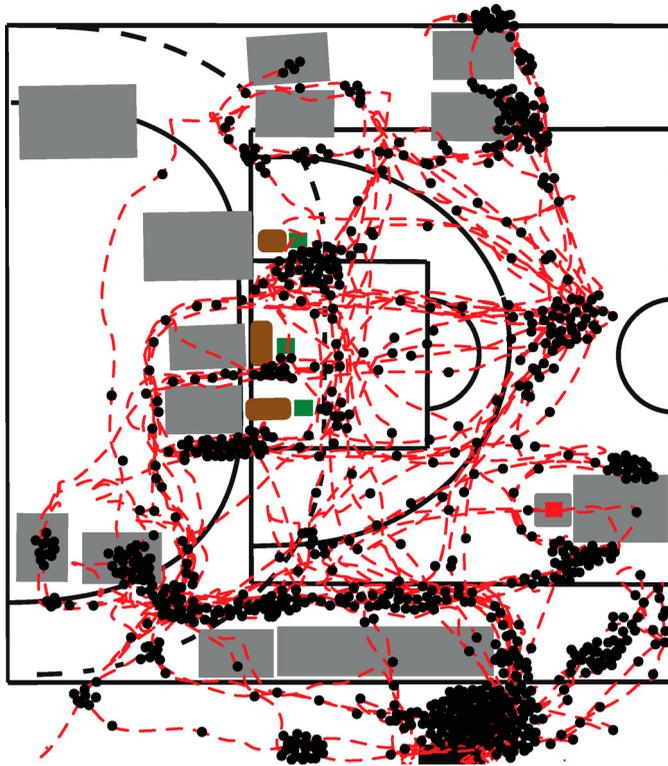


Figure 4. Place-event map.

Illustrating emplacement

In this part of the analysis we foreground a temporal/rhythmical dimension of Donna's teaching, which connects to a relational aspect of her enviroing process. The focus then slightly shifts from describing her 'moving vantage point' to explaining the continuous adaptions to particular circumstances that her walking-teaching requires. In analysing Donna's emplacement, we focus on the specificities of the entanglements of the place-events in her walk. Based on the video recordings, we plotted the length of teacher-pupil encounters and, in contrast to the analysis of Donna's emplacement and the spatial flow of transposition, we illustrate the array of teacher-pupil encounters and elaborate on the intersections between Donna's walking rhythm and the pupils' assignment rhythm.

A temporal plot of a lesson illustrates how Donna engages in a large number of pupil encounters. About 100 teacher-pupil encounters can be counted within the space of 60 minutes. This is also indicative for the large number of qualitative decisions that Donna takes along her path. Rather than just covering distance between different place-events (see Figure 4), she makes qualitative choices in relation to transitional rhythms. To describe the continuous adaptions and the transitional rhythm we analyse the temporal pace through which Donna engages directly (a) with the class as a whole and (b) with smaller groups and individual pupils. The emplacement diagram below (Figure 5) shows the scattered array of focused encounters between Donna and the pupils. Each pupil ($n = 20$) in the class has a corresponding row at y-axis. Donna's encounters with groups or individual pupils are plotted as filled squares. When she talks to the whole class, columns of filled squares appear (marked at the top of the diagram as T1, T2 ... - T10).

In the diagram, each square and column of squares are focused encounters that signify individual/group rhythms that are connected to a more corporate rhythm of the lesson. To use a metaphor, the emplacement diagram in Figure 5 looks similar to the concept of a self-playing piano roll, i.e. where

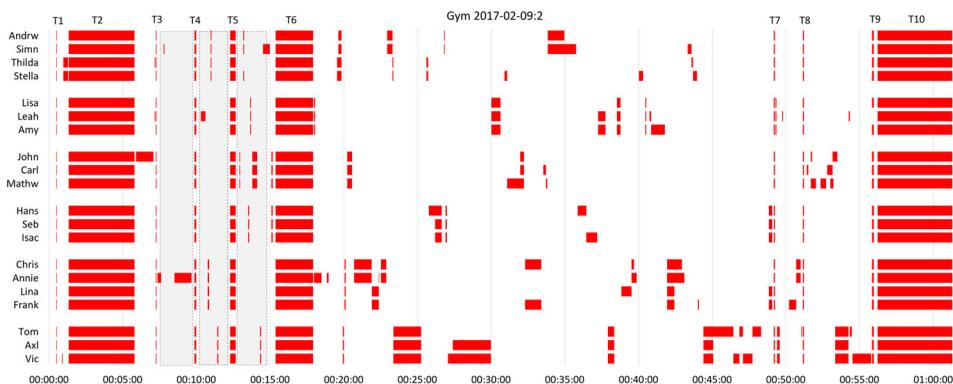


Figure 5. Emplacement diagram of encounters, including groups and individual pupils.

each separate tone comes together into a unified piece of music. Beginning with the ‘whole-class-talks’, the first short call-out (T1) ‘Gathering on the carpet!’ is performed when most of the pupils are gathered in the gym. This attention call-out functions as a bridge between the pupils’ polyrhythmic entering of the gym after the lunch break (joking and chatting in small groups and arriving at different times) and the more corporate rhythm of a gathered class (placed on the same carpet listening to the same teacher). The second talk (T2) is introductory and reveals the aims and details of the lesson. This is followed by a warming-up exercise in three sequences that the pupils perform in small groups. Each warm-up sequence is introduced (T3, T4, T5) and then delimited by the timing of the songs Donna plays from the music system. During the warm-up sequences (grey areas in Figure 5) Donna moves from group to group supporting the pupils. In this way, a corporate rhythm is reached in several ways: call-outs, the gathering on the floor, Donna’s ‘speeches’, the common exercises, the beat of the music and Donna’s cheering tour of the groups of pupils. A second introductory talk (T6) ends the pre-phase of the lesson and is followed by the main practices at the different stations.

At the individual and group level, the number of teacher–pupil encounters during this lesson is $n = 84$.⁴ During the main phase of practice (i.e. between T6 and T9) the number of close encounters is $n = 64$.⁵ On average, Donna is involved in one encounter every 36th second along her path, while also adjusting carpets, springboards, the roman rings, etc.

On the basis of the *emplacement* analysis, it is also important to note that the time-plot of the teacher–pupil encounters in the emplacement diagram should be understood as encounters performed along a path. That is, it is not an array of being present, but rather a movement of presence. Donna’s cyclic pace of moving from station to station, group to group and pupil to pupil forms a flow of transpositions in which every ‘stopping’ and ‘going’ hangs together in a rhythm. This web of paths walking-teaching rhythm becomes a context for every pupil in the classroom and supports the corporate rhythm of the class.

This corporate rhythm is made explicit 50 minutes into the lesson. T7 and T8 are preparatory call-outs aimed at helping the pupils to make the required last transitions between the stations before the final gathering of the whole class at the end of the lesson: ‘try to finish off where you are!’, ‘Five minutes left! Then we’ll gather! Make sure you finish!’ These call-outs suggest both a planning of the pupils and a supposed rhythm. The pupils might need to intensify the speed of what they are practising if they are to complete all the exercises. Call-out T9 supports a bridging between pupils’ different activities with another corporate rhythm and common focus (‘I want us to gather! Bring all documents, pens!’). The last column of filled squares at T10 is a post talk to the whole class and functions as a closure of the lesson.

A calculation of a median value for the length of individual/group encounters in this lesson is around 20 seconds.⁶ Only a few encounters exceed one minute and approximately 25% of the

encounters are 10 seconds or shorter. While this does not seem very long for educative encounters, it is important to understand such numbers from an in-path perspective (i.e. that the character of encounters is related to emplacement and emplacement). In the following section we analyse some very brief encounters and identify them as part of the walking-teaching technique through which Donna creates and maintains the corporate rhythm of the lesson.

Walking-teaching technique

Keeping the emplacement and emplacement aspects of Donna's envioning process in mind, we turn to a sample of brief teacher–pupil encounters. In contrast to more extended process-oriented and delimited educational events that are often the focus of learning analyses, we here highlight the functional use of brief encounters and the way they contribute to pupils' possibilities to participate in the lesson and to the lesson's corporate rhythm. Situated and relational aspects of knowledge illustrated by emplacement (how Donna covers many places) and emplacement (how Donna coordinates many encounters) come together in how she cultivates a *regional knowledge* that supports the corporate rhythm.

Following Donna's path through the video recordings, it is discernible how she selectively attends to pupils' idleness and assimilates this attention into her walk, i.e. she functionally coordinates her experiences of pupils' tasks. In the following, we further explain Donna's envioning process and her walking-teaching by looking at: (1) how she helps the pupils to transit between different stations and (2) how she guides the pupils in the practical meaning of an exercise.

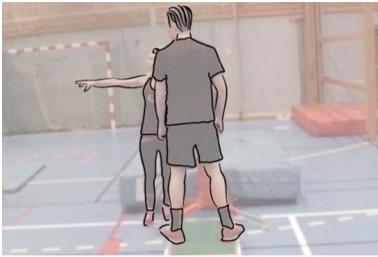
Firstly, the pupils' problems of transit between stations partly relate to the fact that six groups have to share six stations. Consequently, when the pupils finish at a station they have to wait for others to finish theirs. In the intersections between Donna's walking rhythm and the pupils' assignment rhythm new directions are always given (Figure 6) and the impression is that Donna acts as being indigenous to the different place-events in the gym and know how to coordinate them.

In a closer analysis, Donna does not merely *signpost* the directions, but slightly adjusts the introductory instruction to work in groups and transit to stations not in use (tape 1, 04:39, 170209). In the brief encounters shown in Figure 6, Donna governs the pupils' transitions by the following suggestions: 'the jump-station can be shared' (Figure 6(a)) 'you can start there if you want (turns to the girls) and you can go there too when you are done' (Figure 6(b)), 'You can take that ring and take turns in the meantime' (Figure 6(c)). She thereby makes *gradual* transitions possible. As the pupils move on, local and tiny adjustments strongly support the maintenance of the lesson's corporate rhythm and the pupils' possibilities to actively participate in it.

Part of this governing could be related to Donna's long teaching experience. However, what the examples in Figure 6 also show is that Donna attends to where the pupils have been (Figure 6(a)), where they are now (Figure 6(b)) and where they are heading (Figure 6(c)). Such attention to particularities along her path adds to her situated knowledge of how to coordinate different rhythms at different stations. For example, the utterance 'They are leaving soon' in Figure 6(c) illustrates how such knowledge is used to allow the pupils to transit in a certain direction.

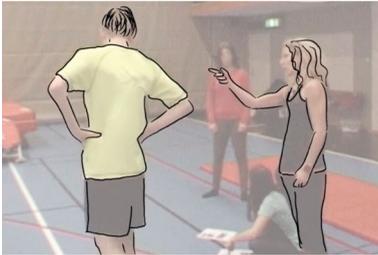
Beside transit problems, pupils often stall in relation to what perceive the practical meaning of an exercise to be. In Figure 7, Donna approaches a boy who has a problem with 'L-sitting'. She tells him that the rings must be lowered and adjusts them accordingly. He tries again but fails and Donna makes another adjustment before he succeeds, after which she confirms 'Yes, beautiful, lovely! I think you did a very nice L-sit'.

Passing the same station some minutes later, Donna notices that a boy practising the L-sit is having trouble straightening his legs. Donna makes a quick stop, grabs and lifts the boy's feet, straightens his legs and tells him that the performance was good in relation to his body conditions.⁷ At the next stop, Donna, acting as a safety net, physically supports a girl performing a backward loop on the horizontal bars. On her way from the dizzy girl who is safely back on the ground, Donna confirms the loop as accurately performed ('that's good').



(a)

Donna to the boy: *When you are done-, Where have you been now? Ok, then you can go- You can go to the carpet or the horizontal bar when it is no one there. The jump-station can be shared. Take something you feel that- And tick as you go.*



(b)

Donna to the boys: *So now you managed to do all jumps? Soon? And when you are done, you can choose a station that is free. You can go to the carpet, you can go to the rings. So, you can start there if you want (turns to the girls) and you can go there too when you are done.*



(c)

Donna to the girls: *You can-, Girls! Are you going for the rings? Then you can take that ring (points to a free pair of rings). You can share- They are leaving soon. You can take that ring and take turns in the meantime.*

Figure 6. Transits.

Looking at the brief encounters that appear frequently throughout the lesson, Donna consciously makes tiny adjustments, such as ‘lowering the rings’, ‘lifting feet’, ‘acting like a safety net’ etc., as a part of her path. However, she also places herself in a position to support the pupils and judge their performances. That is, she guides the pupils in the culturally approved norms of what, at this moment, is ‘good enough’. Such brief passing-by ‘nudges’ support the pupils in their tasks and the overall perform-assess-transit rhythm of the lesson.

Of course, Donna’s ability to teach gymnastics station-wise and coordinate the lesson as a whole is a result of her long teaching experience. However, what is crucial in our in-path analysis is that this ability should also be understood at a more local level, where she adapts to particular circumstances along a path through a number of encounters and teaches on the basis of a growing recognition of what she needs to act on, e.g. the height of the rings, the distance between the trampoline and the horse, misplaced mats and how pupils progress at different stations. Here, practical, material and social encounters are assimilated into her bodily capacities of movement and teaching, so that in each lesson she cultivates a regional knowledge that is crucial for the way she maintains the particular lesson.

The last example illustrates Donna’s walking-teaching as an in-path activity and how this technique opens up and closes down brief educational encounters. In [Figure 8](#), Donna moves towards a pupil who is hanging on the buck. Approaching a group of girls along her path, one of the girls verbally grabs Donna by asking her what a ‘jump-through’ is. Donna’s walking speed slows down

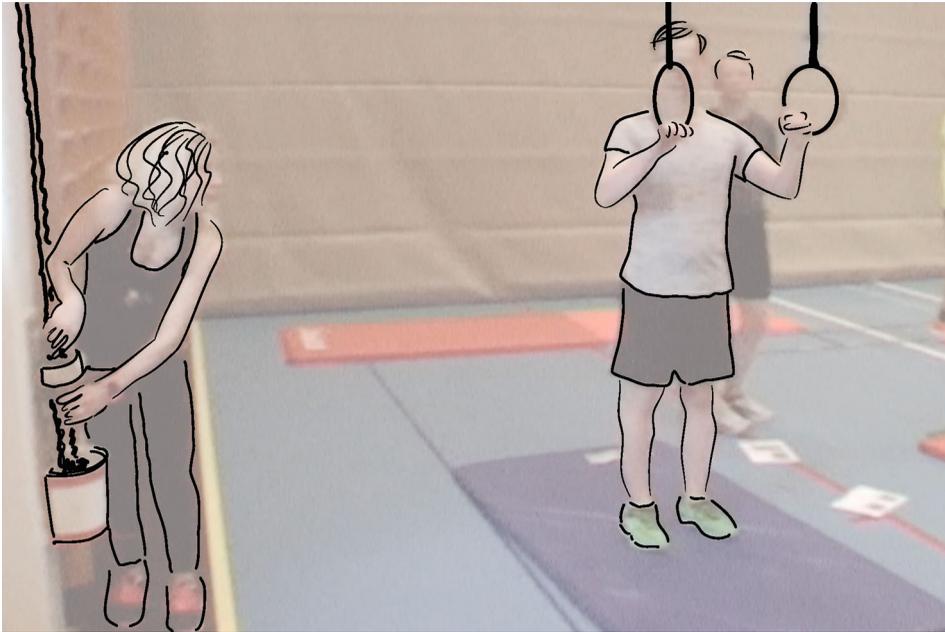


Figure 7. Transits.

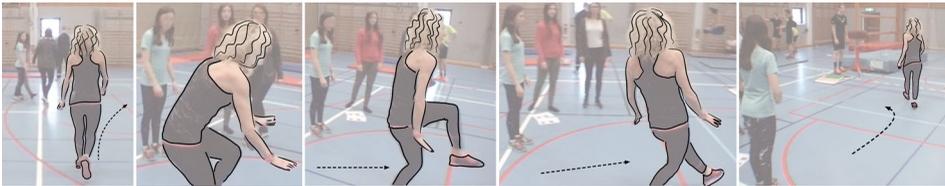


Figure 8. Transits.

and while she verbally explains the moves she demonstrates the exercise with her body as an integrated part of her path.

Performing this instruction *in path* means that at the end of her instructional movement Donna is already in transposition to the pupil at the buck. While closing down one pupil encounter by physically distancing herself from the situation she at the same time opens up another instructional activity by physically initiating another encounter.

Although educative encounters can be thought of, analysed and evaluated as delimited unities, we have here illustrated how they can be conceived as parts of a larger whole. Taken together, the brief teacher–pupil encounters, here identified as space–time entanglements of Donna’s walking-teaching technique (i.e. in-path coordination of pupils’ interests), reveal a teaching reality where every social, technical and material means of instruction must be performed in relation to a growing recognition of what to act on. We can call this *a regional knowledge*.

Discussion

In the last two decades research on sport pedagogy and PE has made great strides in recognising that learning environments are not simply structurally predetermined, but are created as a result of mutual relationships between teachers and pupils (e.g. Casey and Goodyear 2015; Barker et al. 2017; Quennerstedt et al. 2014; Amade-Escot 2000).

With a Dewey-informed body pedagogical framework (e.g. Shilling 2018; Andersson, Garrison, and Östman 2018) capable of handling spatial–temporal rhythm (Lefebvre 2004; Ingold 2004), we have approached such mutual relationships as embodied environing processes. Our study of a teacher’s environing work in the gym aligns with the integrated idea of subject content and classroom interaction that has guided classroom ecology studies (e.g. Dyson, Linehan, and Hastie 2010; Hastie and Siedentop 2006), the French didactic research tradition (e.g. Leriche et al. 2016; Amade-Escot and Bennour 2017) and the Swedish didactic research tradition.

Our study is supportive to the ideas of classroom ecology to investigate how teachers and pupils operate together to get work done (Hastie and Siedentop 2006) and to deal with learning content and managerial task within in the same analytical framework, rather than approaching them as two separate classroom phenomena (Leriche et al. 2016). *Vis-à-vis* traditional classroom ecology studies our in-path analysis of the teacher’s practical work takes a radical starting point in movement. By focusing on the teacher’s walking-rhythm we reveal how ecology dimensions as managerial (behaviour, norms), transitional (pupils’ operation to accomplish tasks) and instructional (what content goal pupils achieve) teaching tasks (Hastie and Siedentop 2006) are connected through a teacher’s habit to traverse the educational terrain in the gym. Our study thereby makes a clear empirical account of Thorburn and Stolz’s (2015) claim of understanding physical culture as participants integrated spatial and temporal experiences.

The French didactic research tradition has emphasised on the continual changes in the content taught by analysing the dynamic evolution of didactic contracts and milieus in instructional events (e.g. Amade-Escot 2000; Loquet and Ranganathan 2010; Verscheure and Amade-Escot 2007). Such prerequisites for teaching and learning are in our in-path analysis approached as the certain ways in which a teacher environing the gym by ways of walking. The micro-dynamics of classroom settings (e.g. Verscheure and Amade-Escot 2007) are here approached by describing the teacher’s rhythmic labouring of coordinating various experiences into satisfactory walking paths that bind different instructional events together in a lesson. Based on our results, contingencies of place-rhythm entanglements in the gym suggest that PE teachers need to cover many places, engage in many brief encounters and use regional knowledge to support pupils in their own inquiries. Wearable camera technique has helped us to catch this teaching reality from a first-person teacher perspective and show how even very brief encounters (20 seconds) contribute to pupils’ possibilities to participate and progress. Hopefully, these results can contribute deepened understanding of the extensive work that is required of teachers to facilitate learning (see Goodyear and Dudley 2015) in multisensory emplaced environments (e.g. Fors, Bäckström, and Pink 2013).

In line with studies of groupwork (e.g. Barker et al. 2017; Barker and Annerstedt 2016) and socio-cultural learning approaches (e.g. Quennerstedt et al. 2014), the results reveal empirical insights about how the educational terrain is never the same and that teaching always needs to be reconstituted. Employing emplacement and emplacement as important analytical aspects of the PE teacher practical work of such reconstitutions also extends earlier transactional PE studies (Ward and Quennerstedt 2015; Quennerstedt, Öhman, and Öhman 2011) as well as body pedagogic frameworks that seek to understand the interrelationships between body–mind environments (e.g. Shilling 2017; 2018; Allen-Collinson, Crust, and Swann 2017; Andersson and Östman 2015; Andersson and Maiorsdotter 2017; Evans et al. 2008).

Finally, limitations of the study exist on several levels. Firstly, the in-path analysis of the teacher’s practical work in the gym here fails to reveal the more hidden relationships in instructional activities over time, i.e. how frequently pupils encounter the teacher and how this differs between pupils’ learning outcomes. Secondly, the theoretical concepts of how teachers spatially and temporally environing the gym needs further development in order to address important didactical questions about which gendered learning environments that are opened up or closed down in PE. Moreover, it is not self-evident that PE teachers need to walk the gym more effectively to reach the intended outcomes of education. Maybe they need to walk less and focus on creating different relationship to make pupils full participant members of learning units. Thirdly, because the student-perspective is backgrounded

the study is unable to handle connections between learning environment and pupils' identity and body project. For instance, such research question might need pre- and post-interviews as well as a theory of identity formation to gain more detailed knowledge about the complex relationship between teaching means, pupils' experience and educational outcomes in PE.

Notes

1. Donna has extensive teaching experience (10–15 years) and has been teaching this class for 2,5 years. She knows pupils very well. It is considered a well-mannered class by the PE teachers and consist mainly of pupils from the Swedish middle class. The school is located just outside a larger town in Sweden.
2. Prior to the lesson, a similar lesson had taken place with another class and teacher. In a teachers' agreement the arrangement of the different stations had been left for Donna to take over. Therefore, when Donna enters the gym the place has already been physically arranged for a station-wise lesson.
3. We chose the interval of 5 seconds for the illustrative purpose of showing a path dynamic. A shorter interval would have resulted in a more blackened map that lost sight of this dynamic and would also have been harder to accomplish manually. A greater interval would have resulted in a few "hot spots", which we felt was less illustrative for walking-teaching.
4. A talk with one of the pupils while two others is listening in a close formation is marked as an encounter with each of the three students. However, from a teacher's perspective we counted this as one single encounter, e.g. the talk with pupil Tom, Axel and Vic at around 00:25 min is counted as one.
5. The diagram may look sparsely scattered between T6 and T9, but the close encounters make up approximately 80% of Donna's time. Call-outs T7 and T8 are excluded in this count
6. Depending on the delimiting method and counting the number of encounters, 17, 18, 19, 20 and 21.
7. She tells him that he is not flexible enough in his back to accomplish a straighter position.

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