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# Learning health in Swedish physical education

## A critical case study of students' encounters with physical fitness and health as a learning object

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### Abstract

The interfaces between health, physical education and schooling have a long history. Critical questions are being raised about the enforcement of learning a particular health practice in school physical education (PE). The present study departs from a practice-based research project evaluating a pedagogical model. The aim of the case study was to explore upper secondary students' learning and understandings of a specific learning object, aerobic fitness and how this influences health, after participating in a period of a longer lab work in the context of Swedish physical education. A phenomenographic approach was used when analyzing the students' written reports to identify and distinguish the variations of learning outcomes and understandings that emerged. Expectations of physical performance created tensions, and even conflicts, between the student-centred assignments and existing traditions within the field of physical education. The findings underscore the risk of neoliberal logics underpinning health education in the learning culture of PE. Further studies are needed where teaching methods/models and student learning are paid attention to in order to move away from teaching to be healthy towards students learning about health and make sense of themselves as healthy. This may offer new educational perspectives.

*Keywords:* physical education, pedagogical model, teaching methods, student learning, health literacy

## Introduction

Health education is highlighted as an important area for schools in many countries. Over the years, a strong argument for having physical education (PE) has been the importance of promoting public health in terms of a physically active lifestyle and the education of the body (Bertelsen & Thompson, 2014; Gard & Pluim, 2014; Kirk, 2011; Lundvall & Schantz, 2013; Pfister, 2003; ). To enforce this agenda, 'health' has been added to the name of the school subject in several countries during the last decades (Chin & Edginton, 2014). Despite interest in health related programs, there continues to be ambivalence about its role in PE (Penney, 2013; Haerens et al., 2011). How PE teachers and/or students understand health and health education has been a research objective, but to a limited extent. The purpose of this article is to present a case study exploring upper secondary students' learning and understandings of a specific learning object after participating in a period of lab work in the context of Swedish physical education and health (PEH). The case study is part of a practice-based research project in an upper secondary school in Sweden, using a pedagogical model where the learning object in focus was aerobic fitness and how this influences health.

## Background

According to for example Ennis (2013a), physical education has a two-fold goal: to engage students to be physically active, and to prepare them for the application and use of their knowledge and performance skills in their lives after leaving school. The expectations on schools to educate for behavioural change in young people's physical activities (PA) and health practices have generated a critique of discourses of regulation and impositions of particular messages around health (Fitzpatrick, 2011, 2013a). Scholars have put light on the complex interplay between experienced health and socio-cultural environments and how this interplay has been left out, or even ignored, in PE (see, for example Ahlberg, 2015; Fitzpatrick & Tinning, 2014). The claim is that schools and PE have become sites for neoliberal discourses. The critique draws on studies of governmentality and the risk of neoliberal logics put in motion that shape approaches to certain health imperatives (Leahy, 2014). The neoliberal ideas of an active citizenship presupposes a shift of responsibility from the state to the

citizens where the individual responsibility and self-governance of how to make (correct) healthy choices is emphasized (Leahy, 2014). Gard & Wright (2005), among others, also claim the danger of ‘healthism’, where healthism is understood as a form of a medicalization of health and the everyday (Crawford (1980). This way of positioning health and knowledge in and about health may support an uncritical acceptance of certain normative ideals and lifestyles.

Seen from the ‘healthism’ perspective and surrounding neoliberal principles, researchers in several Western countries advocate that health education within PE needs to encourage learning processes of what health is and how it is experienced (Barker, Quennerstedt, Annerstedt, 2015; Tinning, 2014; Quennerstedt & Öhman, 2014; Leahy, Flynn & Wright., 2013; Kirk, 2013; Fitzpatrick, 2013b). This has also been highlighted in the Swedish Schools Inspectorate’s (SSI) reports after unannounced inspections (SSI 2010; 2018). The latest report stated that health and lifestyle issues are still limited in terms of lesson space and seldom integrated in practice. There is also a need for broader and more varied teaching methods, as the quality of teachers’ feedback and the encouragement of students’ reflecting and reasoning around health issues needs to be developed (SSI, 2018, p. 7-8). Current Swedish studies support the findings in the SSI reports: students are lacking an understanding of learning processes and what students are to learn in the subject besides physical activity itself (Barker, Quennerstedt, & Annerstedt, 2015; Nyberg & Larsson, 2014; Quennerstedt et al., 2014). Furthermore, Karlefors and Larsson (2018) point out that PE teachers appear to have low interest in the use of different teaching methods related to what students are to learn. Teachers need guidance to improve and develop their deliberate use of teaching methods in general, and for student-centred methods especially (Karlefors and Larsson, 2018). Already in 2009, Penney and colleagues urged for more attention on how the social practice of teaching and learning can support students to become learners in physical education (Penney et al., 2009). Additionally, the school subject and physical education teacher education (PETE) are both strongly framed by traditions. The interrelatedness between PE syllabi, content and assessment has been found to be vague (Larsson, Linnér, Schenker, 2018; Redelius & Hay, 2012; Londos, 2010; Lundvall & Meckbach, 2008a; Lundvall, Meckbach & Wahlberg, 2008b).

There are few existing school steering documents internationally that mention or discuss different perspectives on health and public health (see

for example Chin & Edginton, 2014; Schantz & Lundvall, 2014; Pühse & Gerber, 2005). One exception is the Australian curriculum that was recently re-formulated towards a strength based and salutogenic approach. Through participating in PE, students 'should develop a strong sense of self' and 'develop health literacy competencies in order to enhance their own and others' health and wellbeing' (see [www.acara.edu.au](http://www.acara.edu.au)). This approach has been critically investigated as sitting within the frame of neo-liberal tenets (see Leahy, 2014).

The Swedish PE syllabus was reformed in 2011 and bears similarities with the Australian. Health, and the understanding of health as a learning area, is emphasized for both compulsory and optional school (SNAE, 2011a; SNAE, 2011b). The introduction of the PE syllabus in upper secondary school reads:

It (PEH) provides opportunities to experience and understand the importance of physical activities and their relationship with well-being and health. Skills in and knowledge of physical activities and how various lifestyle factors impact human health is fundamental in enabling people to be able to take responsibility for their health. (SNAE 2011b)

According to the literature, few studies on health education have been explicitly designed to examine application of health education in practice (Leahy, 2014; Ennis, 2013b; Haerens et al., 2011). A main goal of models used in for example interventions, has been to increase students' physical activity levels (Cale & Harris, 2007). As a consequence, health education and different perspectives on health in a broader sense seem to have had problems reaching the teaching and learning of knowledge in and about health in school PE (Leahy & McCuaig, 2014).

In their article on pedagogical models and health-based PE, Haerens et al. (2011) underline that if the aim of PE is to support students' learning of health and physical activity, and if PE teachers are serious about making a meaningful contribution to education in health, then 'traditional multiactivity sports based approaches to school physical education might no longer be an option' (p. 322). Instead Haerens et al. advocate the use of pedagogical models to find innovative and appropriate strategies, involving curricula, pedagogy and assessment. A pedagogical model is a basis for the development of particular programs or specific units of work, based on a conceptual framework, incorporating identified learning goals that structure the selection of specific unit content and

the evaluation thereof (Haerens et al. 2011; Metzler, 2005; Jewett et al. 1995).

## Aim and research questions

This case study is part of a practice-based research project with the purpose to evaluate a pedagogical model. The aim of the case study was to explore upper secondary students' learning and understandings of a specific learning object, namely aerobic fitness and how this influences health, after participating in a period of lab work in the context of school PE. The research questions were:

- What do the students describe as knowledge and understanding of the learning object in focus?
- What ways of reasoning about the learning object and the understanding thereof emerge?

Before presenting the findings, some words about the framing of the case study.

## Sample

A purposeful sampling of one upper secondary school class ( $n = 32$ , 23 girls and 9 boys, 16 years of age) in a medium-sized Swedish town was chosen for this practice-based research project (Patton, 1990). All students were on a preparatory programme (a social science programme, which is one of the most common educational programs in Swedish upper-secondary school). A criterion for the sampling was that the student group was new to the teacher, who was part of the practice-based research project. The project was conducted during a seven-week period within the framework of the students' ordinary PEH, one 70-minute-long lesson per week (see Graffman-Sahlgren, Brun Sundblad & Lundvall, 2015, for a detailed description of the project). The empirical material used in the presented study comes from the component of the students' written reports where they summarized and compared the first and last lesson of the period.

## Ethical concerns

All students were informed about the practice-based research project and the learning object of the lessons. Furthermore, all students were informed according to the ethical guidelines that they could, whenever they liked, withdraw from the part of the practice-based research project that involved data collection to be used for research purpose (see <http://codex.vr.se>). As the students were above 15 years of age, permission from their caretakers/parents was not needed for this project (guideline about informed consent, see <http://codex.vr.se/manniska2>). No student rejected to participate in the study and there was no dropouts since the project was part of the students' ordinary PE lessons.

## The foundations of the pedagogical model

This practice-based project had a multidisciplinary approach that embraced and elaborated connections between natural science as inquiry (applied basic exercise physiology) and personal fitness-oriented perspectives. The concept of health literacy together with the learning outcomes and knowledge requirements according to the PE syllabus structured the theoretical framework of the model design for the specific unit. An argument supporting the use of health literacy for the model design was that health literacy has been advocated as valuable in educational and school settings in order to improve students' learning of, and ability to reason about as well as make, healthy decisions (Nutbeam, 2000; 2008; Abel, 2008; Paakkari & Paakkari, 2012). Nutbeam's (2000) three-level hierarchy then served as the basis for how to arrange the teaching and content: the level of basic knowledge (handling everyday situations), the level of communicative (interactive) competence (applying information and using it in daily practice) and the level and ability to critically analyze the acquired information and knowledge and the use of it. Accordingly, the content of the thematic period was organized around:

- basic functional knowledge, i.e. cognitive information and the practising of different methods of exercise and physical activity,
- the integration of knowledge: problem-solving tasks to engage students in their conceptualizations of training methods and health,

- and the ability to reason about training methods and embodied experiences,
- the ability to evaluate, adapt and analyze information and knowledge in relation to changing conditions.

An overview of the design of the seven-week long period with experiential interactive labs (lessons) is presented below in table 1, where the aims, the student-centred tasks and learning activities are described. The learning object of the specific unit was to support the students' acquiring of an understanding of what cardiorespiratory fitness (aerobic fitness) is and how this influences health and the student's own development needs.

TABLE 1. *Overview of the design of the seven-week long lab period*

<i>Practical labs</i>	<i>Student tasks</i>
<i>Aim:</i> to inform the students of the basic knowledge of aerobic conditioning and its relation to health.	
2000-metre running task: the measuring of time, heart rate (HR) and perceived exertion according to the Borg scale (Borg, 1970) was documented. The Borg scale was used to increase the students' knowledge and/or experiences of how to relate the feeling of effort to bodily experiences and measured HR.	What can be measured by a 2000-metre run? How is it possible to measure HR and estimate exertion whilst running? How did it feel to run at your chosen pace?
<i>Aim:</i> to let the students experience and evaluate how it feels to run at a given HR at different intervals.	
Interval running, experience three different types of intervals (at an increased given pulse level). Measuring HR and perceived exertion according to the Borg scale.	How does your body react to different intervals, and why? How did you perceive/feel the exertion physically and mentally? How are the differences in speed when you are running at the same HR?
<i>Aim:</i> to let students evaluate two types of exercises from an aerobic fitness perspective.	
Rock and roll and basketball lab (comparing effects on aerobic condition): measuring HR and perceived exertion according to the Borg scale.	How do the two different exercises trigger your oxidative system, and why? What role does motivation play?

<i>Aim:</i> to let the students examine how physical activities of daily living influence aerobic conditioning.	
Daily fitness lab (examine the effects by measuring HR when walking, biking, vacuum-cleaning, etc., and perceived exertion according to the Borg scale).	Explore your daily physical activity habits. What can be done in your daily living to improve your aerobic condition?
<i>Aim:</i> to let the students experience HR variations in relation to different physical activities.	
Different training tasks (static, dynamic and mind influence). Measuring HR.	What happens to your HR when doing different exercises, and why?
<i>Aim:</i> to check the students' understanding of what type of exercises promote aerobic conditioning.	
Students' teamwork lab exploring exercises/methods for developing knowledge of aerobic condition.	Evaluation of presented activities: to what extent did the activities help your knowledge of aerobic fitness training?
<i>Aim:</i> to evaluate theoretical and practical knowledge as a result of the project period.	
2000-metre running task (time, HR, VO <sub>2</sub> , Borg scale). See practical lab 1.	Students' summing-up: what has happened between the first and the last lab; use all your information/knowledge and practical embodied experiences.

The desired learning outcomes of the specific unit and the learning object focused on the principles of aerobic fitness and how fitness and physical activities influence health. In the case study, the students' ability to reason about and make healthy decisions was related to their being able to choose training methods and assess their physical activity and health needs (see Swedish steering documents, SNAE, 2011b). A desirable learning outcome in the knowledge requirements for the grade Pass (E) in upper secondary school is that the student shall be able to describe in basic terms the importance of activities and lifestyle for physical ability and health. For a higher grade (C) the student shall be able to connect basic facts to relevant theories. The student shall also be able to assess his/her own development needs. In addition, for a pass with distinction (B or A), the student has to be able to adapt training to changing conditions (SNAE, 2011b).

## Teaching and learning as transacted and transformed

The theory and rationale for teaching and learning focuses on how learning is transacted and transformed from a social constructivist perspective, inspired by a salutogenic approach to the construction of health (Antonovsky, 1999). When studying teaching, learning, and students' understandings of a specific learning object, the question is not whether students learn or not – learning is always going on – but rather *what* they are learning in the situation in which they are participating (Marton & Booth, 2000, p. 30; Doolittle & Hicks, 2003). Understandings, significance and meaning are not developed separately within the individual but in coordination with other human beings. The active creation of thoughts, ideas and understandings is seen as the result of experiences in socio cultural contexts (Doolittle & Hicks, 2003; Säljö, 2000). Students must constantly construct, develop and maintain their understandings of subject matter content as social constructs, and objects of knowledge are not 'given' by nature (Ennis, 2013a, b). To enable the desired learning of something (as is the case in a school context), the learner must discern what is to be learned, i.e. what the object of learning is. In a school setting, this object or unit of learning can be defined as a 'specific insight, skill or capability that the students are expected to develop during a limited sequence of lessons' (Marton & Pang, 2006, p. 193).

The design of the model thus had an experiential and explorative approach in order to encourage the students, together with others, to engage in, experiment with, elaborate, explain and evaluate the student-centred tasks and content undertaken during the period. The students were given study material designed by the teacher, containing basic facts and established theories about the oxidative system, the respiratory and circulation process, as well as specific exercise advice. Furthermore, the students participated in group discussions and wrote individual reports, talked about and evaluated processes and results that emerged from the student labs/workshops in class and individually. These labs/workshops consisted of problem-solving inquiries based on physical activity experiments; the students investigated experienced effects after doing moderate to vigorous activities. The problem-solving character of the inquiries and tasks was intended to stimulate the students' integration of knowledge and their ability to understand and reason about the content and learning outcomes of lessons and homework. As the model was designed to engage the students, the teacher's role was to stimulate the students'

thinking and sharing of experiences, knowledge and evaluation of processes.

## Procedure of analysis

To identify and distinguish the students' encounters and ways of reasoning about the defined learning object, a phenomenographic methodological approach was used. The analyses of the students' lab reports focused on how the encounters with the phenomenon and the variations of these encounters was experienced, conceptualized and understood (Marton & Booth, 2000; Asplund-Carlsson, Fülöp & Marton, 2001). The categories of encounters were formed according to the content of the students' different descriptions of *what* they had understood from the learning objective and *how* the character of these encounters in terms of ways of reasoning and understandings emerged. The analysis tried to capture the variation of descriptions in relation to the question asked (Marton & Pang, 2006). The first step in the content analysis of student reports resulted in identifying distinguished encounters with the learning object. A category was formed whenever there was sufficient data in written form that a particular experience or knowledge had been expressed from the students in their lab reports (Marton & Pang, 2006). Four overarching categories of encounters were found:

- a basic understanding of what the measurements told
- a theoretical understanding of physiological aspects
- an understanding of what has caused changes in aerobic condition
- an understanding of which changes in aerobic condition influenced health

The next step in the analysis focused on the character of each identified category and the students' ways of reasoning. The four categories of encounters were again applied to the data with a focus on qualitatively differences in *how* the students described their understanding. This second step in the analysis resulted in three groups of learning outcomes in terms of ways of reasoning and understanding of the learning object: (i) reproducing facts without any reflections of the content; (ii) learning outcomes and experiences linked to person and to the content; and (iii)

learning outcomes and experiences linked to person and to the content put in a context.

From the students' different descriptions of *what* they had understood from the learning objective and *how* the character of their learning outcomes were described, three groups or categories of encounters representing the students' constructed or developed understandings emerged from this phenomenographically inspired procedure of data analysis (Asplund-Carlsson, Fülöp, Marton, 2001).

## Findings

Below, four examples chosen from the student reports are presented to illustrate the three main categories of encounters of the learning object in focus that were discerned through the analysis. Each example is related to the theoretical frame work of health literacy.

### *Basic functional knowledge*

The first example, Anna, was characteristic of student reports identifying and conceptualizing measurable basic information (time and heart rate [HR], etc.) and their representation of what this information meant. In this category, the students did not reason about or reflect on how their measured data related to or influenced their own health. This category of encounters represented a basic functional understanding of the learning outcomes. The students' encounter with the learning object did not go beyond repeating given knowledge. Anna's description is short. It is her way of describing and distinguishing aspects of experiencing, conceptualizing and understanding the learning object and the constructing of knowledge:

My aerobic condition has improved a bit; the first time it felt tougher because I had problems breathing. My first run was timed at 12:04 and my HR was around 200; my last run was timed at 11:07 and my HR was 177. I believe that the reason for the improved second run was that I was more determined and made a greater effort. (Anna)

Anna's report is a technical description of what has happened to the student's measured aerobic condition. She shows that she can distinguish to some extent what the HR measurement tells her; she has a basic func-

tional way of describing her understanding of aerobic condition training. Anna's described understanding is founded on reproducing facts with no reflections based on any theoretical knowledge and few reflections of her practical experiences (felt tougher, problems breathing), as requested in the summary. Her reason for the improvement is related to her being more determined and putting in greater effort, but there are no other forms of reflection on, for example, evaluating her feelings of determination or on other possible factors influencing the measured 'improvement'.

Only a few student reports came under this category of reproducing information (four out of 32). In their reports, the students did not show the ability to discern and conceptualize how the learned basic facts could or should be used in a broader aspect. These students did not communicate how to use the information to, for example, challenge their conceptualizations of health or how their assessment of results could influence decisions regarding further choices of physical activity training. Their involvement in the learning process remained a very basic functional way of structuring knowledge and learning experiences. The activity and its measurement were in the foreground.

### *The integration of knowledge*

A second category of encounters consisted of reports describing a form of integrated understanding where the students combined their personal learning experience and conceptualizations of health with an understanding of what had influenced their aerobic condition and how this affected their personal health and wellbeing. In their reports these students could distinguish basic cognitive information, and showed an ability to make simple assessments of their needs and described choices of methods for increased physical activity. They had started to reflect on the implications of the basic information and how to understand this in relation to their own physical health experiences. These students had gone beyond repeating facts and had started to gain an understanding of how to link cognitive facts and measurements to how this influenced their own health. Sven writes about his encounter with the phenomenon in focus in this way:

My aerobic condition has increased significantly compared to the first time that we performed the running lab. This has happened because I've worked out twice as much per week as before during this period

(3 times/week before compared to 6 times/week now). I've also biked a longer route back and forth to school, in an intensive tempo. For the first 2000-metre 'running lab', my time was 10.22 min., and for the final lab, I ran the 2000 m in 8.56 min., shaving almost two minutes off. My body has increased its capacity to transport oxygen to the working muscles, and my heart has become stronger. That means that my stroke volume has increased. As a result, my body is capable of more physical activity, and I feel much more energetic. Other factors that affected the outcome were how alert I felt when running and how much I had eaten before [the run]. During the first run, I felt a bit tired, and I had eaten way too many burgers, compared to the second run, when I'd slept well and had time to digest the food in my stomach. (Sven)

Sven's report shows that he understands what the measurements stand for and he can relate the results to physiological aspects. He expresses a feeling of being more energetic. At the same time, he considers factors that may have caused the change and his own role in this. He shows that he is a bit critical of the improved results by questioning factors that may have influenced these. This category of report, which totalled half of the student group, represented an understanding of where students were on their way to developing a form of communicative health literacy (Nutbeam, 2000). They were using and applying health-related information .

*The ability to evaluate, adapt and analyse  
in relation to changing conditions*

The third category of encounters consisted of students' reports describing an understanding as they integrated and expressed not only basic functional information about the principle of aerobic fitness but also aspects of how they assessed their development needs in relation to their evaluation of experiences, measurements, and changing conditions in their social context. In their summary reports, they tried to evaluate, make generalizations and raise arguments regarding the learning object in focus. This also touched upon their conceptualizations of health. An ability to discern and use the information and knowledge in an empowering way, namely how to make healthy decisions and choices, emerges. These reports included social relations and the context of the students' physical activities in their reflections on and reasoning about what influences their health and how this affected them as a person. Below is one example of this type of encounters:

My measured values have not changed that much. But it felt a lot easier the second time we ran, my body was in better shape and my state of mind was also better. I felt happier and was more motivated to run the 2000 meters. My unchanged values could be explained by the fact that I have not been practicing any running since the first running test and that my running condition is back to square one. I exercise frequently but rarely run. I train tabata which is very demanding. For my own benefit, I'll start exercise running at home.

Since I started my tabata exercise a while ago I feel more concentrated in school and I manage more. A better aerobic condition helps in daily life. (Erik)

Erik demonstrates the desired ability to reason about basic functional knowledge of aerobic fitness. He is also able to distinguish (to some extent) the specificity of training. Furthermore he reflects on how tabata, a sort of high-intensity interval training, has helped him to feel more concentrated in school and that one choice for him to meet what the steering document calls his 'developmental needs', could be to start practice running at home. Another aspect that Erik highlights is that it felt 'a lot easier' the second time he ran, although, as he writes, he had not prepared for an improvement as he had not practiced running. What this actually means is hard to explore as the description is short. But this way of reasoning highlights questions of meaning and motivation. The first time the students ran, they had just started their first semester in upper secondary school, their first period of PEH in a new student group. The second time the students knew each other a bit more and had practiced together. They probably had become accustomed to the overall learning object of the lab work period, and the meaning of the 2000 m run had become a bit clearer as well as the meaning of the self-assessed scale for physical exertion, the Borg scale.

Another example of this third category of encounters is Lena's, who chooses to reason about the learning object in focus by starting from the social context of her life:

Unfortunately, my results have worsened during this project period. I've been sick, been to a funeral, and my horse was hit by a car and died. So it has not been a great period when all of my daily exercise went out the window. I've not wanted to activate myself more than during the PEH lessons every Friday. I understand why my aerobic condition has worsened, and I want to get back to the time and heart rate I had for the first test. Now I've got a new horse, so I'll probably be able to get in shape in a short while; in spite of that, "happy hormones", endorphins,

are released when you move, and then you become pleased and happy. How nice it is to go to bed with sore muscles. The two times when I ran 2 km, the conditions were perfect: no wind and good weather; so it was psychological things that enabled the results the second time. It's just catching up with the exercise again and battling, knowing that you can always improve. (Lena)

In her lab report, Lena reasons and describes how her horse is an important factor in her physical and mental wellbeing, representing a context in which to be physically active and where training have a place and a meaning. Her engagement in physical activity and training seems dependent on the meaning of the activity. Despite the tragedy she had experienced, she reasons about being able to 'get in shape in a short while', to improve her aerobic condition in the future. Lena writes in an embodied way of how both her mind and muscles have to work together to achieve the feeling of being 'in shape' again. This student is able to identify her experienced learning with the learning object and she also relates her constructed embodied knowledge to a personal and social context. She evaluates her feeling of being less healthy, or at least less active, and why her aerobic condition has worsened, linking this to her personal and social situation, and reasons about how to make healthy choices. Again her horse or the social context for her physical activity emerges as an important aspect. In the words of Säljö (2000), Lena's reasoning and understanding goes beyond the immediate task of summing up the pulse rate from the 2000-metre run. Lena expresses aspects of self-awareness represented by her developed specific insight into what has influenced her aerobic condition and how this has happened. She 'makes sense' of the role social conditions and physical activity plays in her life as a way of conceptualizing what health means to her. Like Erik, Lena reasons about own needs, responsibility and relate them to aspects of meaning, health and wellbeing and to surrounding conditions, outside of school.

## Conflicting findings

In the analysis of what characterized the students' reasoning about the learning object, and how they make use of their measured data, 'to have improved' stood out as a characteristic that the students highlighted. The expectations of improved results were evident in almost all of the student reports, although nothing like this was requested when they were

given the task of writing a summary. When the expected improved results did not materialize, a majority of students seemed to feel they were failures, and they then gave written explanations to justify their results. This explanation was in most cases related to sickness, given a pathogenic character: 'I've been sick' or 'I didn't feel well'. When a measured improvement in the aerobic condition was evident, some of the students had expected an even bigger improvement. To explain insufficient improvements, pathogenic reasons emerge, related to ill health, for why the results had not improved even more:

[. . .] Generally speaking, the improvement was a result of me being sick and then I became well. It's a very important factor. I'm still not pleased with my time. (Pia)

Even in generally positive ways of reasoning, the 'improvement' element emerged as highly important for this 'positive' feeling. The following example illustrates how Bo chooses to write when he summarizes:

My body feels great right now, and I feel an improvement in my aerobic condition since the first lab, and I ran 1 min. and 15 secs faster the second time. The best time in the class! (Bo)

Pleasure is related to Bo's experience of his physical body— his body feels great after participating in the lesson ('feels great right now'). Simultaneously, Bo is focused on the measured results (minutes and seconds). The positive feeling, that of pleasure (being happy), is also related to 'the best time in the class!' The effort he has put in during the lesson has produced results. To be noted is that he evaluates his measured time against the others, which is a traditional and normative way of measuring performance within the learning culture of PE, as in sports in general.

## Discussion

The aim of the presented case study was to explore upper secondary students' learning and understandings of a specific learning object, namely aerobic fitness, and how it influences health, after participating in seven weekly lab workshops in the context of school PE. The intention behind the pedagogical model and the design with student-centred lab work was to support the process of becoming a learner in upper secondary school;

to support the students solving the student centred task and to reach the knowledge requirements in the syllabus.

The findings show various ways of constructing knowledge, understandings and conceptualizations of physical fitness and health. A majority of the students were able to discern the learning object, evaluated and reflected up on the phenomenon in a basic, functional way. There was one group, illustrated by Erik's and Lena's reports, where the reasoning also involved context and relationships. They were using information and applying this in their daily practice and started to critically analyze acquired knowledge. As part of the encounter with the learning object they were on their way to developing a form of communicative health literacy (Nutbeam, 2000).

Characteristic for the way of reasoning, as reflected in almost all the student reports, were the expectations of an improved (measured) aerobic condition. If they did not improve it was considered a lack of individual strength or effort that has to be overcome. The individual responsibility was emphasised. Only a few reports showed the students' ability to transform their understanding and experiences into a process of coherence and relationships, where 'success or failure' was not the issue. The design of the specific unit with its lab work could not counteract the expectation of improved results and the conceptualization of physical prowess as a normative ideal in relation to health (Fitzpatrick & Tinning, 2014). The phenomenographically inspired analysis points to a problematic situation for PE: the learning landscape of health education in PE is part of a neoliberal project put in motion. As Leahy (2014) puts it; the individual becomes both the problem and the solution. The pedagogy model, even though student-centred, appears to be framed within a discourse of risk and individual responsibility, that also becomes moralizing. Even though the design of the specific unit never asked for performance improvements, the learning culture in PE might have affected the students' perception of what was important. The teacher's decision to work with measuring of running time probably accentuated this. According to how the students reasoned and communicated their encounters with the learning object, measurable facts emerged as important for them to write about. The expectations of performance created tensions, and even conflicts, between what the students' assignments during the lab work period aimed to achieve, and how health education sits within neoliberal logics and PE traditions. A narrow focus on individual performance and responsibility seems to hinder reflections around positive and

negative dispositions towards body, movement and health. The notion that health is part of an interaction with other people, environment and society at large is lacking.

What and how we learn is a question of how we use ourselves and our resources to think and act and how we integrate this construction of knowledge as part of our understanding of our culture and environment (Säljö, 2000; Marton and Booth, 2000). Guided by our earlier experiences, we know how we should act: we feel the expectations and demands of the situation. In most environments, we are able to follow established routines that pre-interpret the situation for us, and we know of adequate actions to be taken (Säljö, 2000, p. 129). Students bring learning experiences and the conceptualizations of health from earlier school years, leisure-time activities, and the surrounding society in general. These experiences seem to lead to, not only expectations of individual performances and measurable results thereof, but also to certain health messages closely linked to defined healthy choices. These expectations of performances create tensions, and even conflicting perspectives on health between what education in health and the physical body represent. This tension can also be related to the lack of other perspectives or dimensions on health than those of a bio medical framework (Gard & Wright, 2005; Fitzpatrick, 2011; 2013a). Students' expectations of what knowledge of or learning in PE should, or ought to, contribute to, might influence ways of reasoning and engaging in learning processes in health (Quennerstedt & Öhman, 2014; Penney et al., 2009). The findings underscore the need for reframing PE towards an education where health related perspectives and questions about health are highlighted, and where coherence and relationships are made visible and critically examined. However, it is important to keep in mind that PE cannot solely take care of school health education in its broader sense.

Another aspect that has to be taken into account when trying to understand the students' encounters with the learning object is that PE is part of the current space of assessment, where tests and measures represent valid knowledge. Tinning and Rossi (2013, p. 203) highlight that what constitutes school knowledge also represents what is essential to measure. They describe a risk, due to the present goal-oriented (neoliberal) educational discourse, that what is considered essential has been reduced in complexity. This has consequences for the individual view of the learner and supports an instrumental view of education. The latest inspection by SSI also concludes that the Swedish PE educators have ad-

opted a narrow focus on knowledge requirements and learning outcomes as formulated in the syllabus. The way these are formulated may interfere with the broader goal of the subject (SSI, 2018, p.52-53). As mentioned in the introduction, the way education in health is communicated in PE has been criticized for its limited focus on individual responses to how to monitor and regulate one's own body. The individual is responsible for his or her health and healthy lifestyle (Leahy, Flynn & Wright, 2013). The Swedish steering documents could be said to reinforce this approach as the knowledge requirements mainly stress 'the individual' and physical health. This individual approach was also adopted by the students in the case study. One conclusion from the findings is a need to challenge the whole learning culture surrounding the PE subject's system of learning and thinking (see Karlefors & Larsson, 2018; Ennis, 2013b; Hodkinson, Biesta, & James, 2007).

The expectations and pressures on schools and PE to educate for behavioural change and the regulation of health practices has raised questions about the enforcement of particular health messages with the risk of developing a teaching and learning 'of' health instead of the 'educative teaching' of health (Fitzpatrick, 2013b; Leahy, 2014). PE's multidisciplinary character challenges in several ways the constraints inherent in the complex system of school and education (Ennis, 2013b). The subject involves both a medical perspective on health and the avoidance of risks of illness, as well as a more sociocultural perspective focussing on what builds resources for health and how to make healthy choices, a more salutogenic approach. The students, as described by their reasoning in their reports, had problems to sort out these almost ontological paradigms. The students were asked to self-assess subjectively their physical exertion (Borg scale) and after that reflect on the experienced work/lab-process. As described in the findings, this turned out to be a very challenging and complex assignment.

The findings also point to a need to clarify the different perspectives of what constitutes health and education in health. As we understand Nutbeam (2008; 2000), to acknowledge and understand political aspects of education to overcome structural barriers to health, is and will continuously be important aspects of public health and vital for the education of health in a school context. If PE teachers are serious about teaching health for understanding, we need to broaden both teachers' and students' ways of questioning and to challenge ways of constructing knowledge and the conceptualizing health. Health issues of concern to

young people in a sociocultural and political context have to be included (Ahlberg, 2015). And as the basis for this approach, attention has to be paid to conflicting perspectives of health. Steering documents as well as teacher education have to consider which different perspectives on health education are available and can be provided in PE. A narrow view of (biophysical) health in terms of success or failure lacks educational potential.

This case study has its limitations. Conducting the phenomenographic analysis had its challenges. The part of the students' reports that was related to the specific learning object was brief and the students were not accustomed to write texts in PE. The explored learning outcomes in terms of a variation of understandings and ways of reasoning, and the forming of categories of encounters, were both easy, and at times, hard to separate. Nevertheless, the findings from this study emphasize the complexity of, and relatedness between, education in health and PE, and that future practice-based research is needed. This also includes examining health literacy as concept. To move away from teaching students to be healthy towards seeing different ways of how students do health and make sense of themselves as healthy may offer new educational perspectives on health (Quennerstedt & Öhman, 2014). The wordless body movement tradition of PE, according to the insights from this case study, needs to more carefully and deliberately select not only teaching methods but also learning activities in order to broaden aspects of health within PE to avoid an education that risks being perceived as a moral project instead of a learning project.

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