

# PhD Dissertation

**Louise Stjerne Knudsen**

Understanding and scaffolding Danish  
schoolteachers' motivation for using  
classroom-based physical activity

August, 2019

PhD thesis

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Faculty of Health, University of Southern Denmark  
Department of Sports Science and Clinical Biomechanics  
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Odense 2019

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August, 2019

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## **Preface and acknowledgements**

This thesis represents an independent research study carried out between 2016-2018 at the Research and Innovation Centre for Human Movement and Learning, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark and University College Lillebælt.

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**Louise Stjerne Knudsen**

Odense, December 2018.

## List of Papers

- **Paper I:** Knudsen LS, Skovgaard T, & Bredahl T. Understanding and scaffolding Danish schoolteachers' motivation for using classroom-based physical activity: study protocol for a mixed methods study. *BMJ Open* 2018;8:e019857 (status: published).
- **Paper II:** Knudsen LS, Skovgaard T, & Bredahl TVG. "I like it": Exploring teachers' motivation for using classroom-based physical activity in Danish public-schools from a Self-Determination perspective. Results from a mixed methods study. Manuscript attached.
- **Paper III:** Knudsen LS, Bredahl, TVG, Skovgaard T, & Elf, NF. Identification of Usable Ways to Support and 'Scaffold' Danish Schoolteachers in the Integration of Classroom-Based Physical Activity: Results from a Qualitative Study. *Scandinavian Journal of Educational Research*, December 2018 (status: accepted for publication).

## List of appendices

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## **English summary**

### **Background**

It is well established that physical activity (PA) is beneficial for both mental and physical health as well as cognition and academic performance for children and young people. Research has also emphasised that schools can be optimal settings for promoting healthy and active behaviour among this target group. Schools are therefore increasingly called upon to implement different forms of PA during school days. A viable component of many school-based initiatives is *classroom-based physical activity* (CBPA) putting teachers at centre stage as facilitators. Generally, teachers have a positive view of PA. However, integrating additional PA into teaching is not without difficulty and is often associated with a number of barriers. Furthermore, little is about teachers' motivation as well as the best ways to support teachers in their efforts to integrate PA into daily teaching routines.

### **Objectives**

The purpose of this thesis was to: 1) explore teachers' motivation for integrating classroom-based physical activity in their daily practice; and 2) identify usable ways to support teachers' sustained use of classroom-based physical activity.

### **Research design**

Two underpinning theories were used to inform and shape data collection and data analysis. Teachers' motivation was measured and assessed through the theoretical framework of *Self-Determination Theory* (SDT). Identification of usable ways to support was guided by concepts from the socio-cultural theory of *Scaffolding*. The thesis applied a sequential explanatory mixed methods design comprising two distinct phases – a quantitative and qualitative. The initial

phase applied an adapted version of the *Work Task Motivation Scale for Teachers*, specifically designed to measure teachers' motivation towards a specific task – based on SDT. The qualitative phase consisted of in-depth semi-structured interviews with teachers recruited based on data from the survey. The purpose of the qualitative phase was to identify and explore factors related to teachers' motivation as well as factors influencing and supporting their day-to-day adoption of CBPA. Schools and teachers from across Denmark were included in the sample.

## **Results**

In total, 206 teachers answered the survey. Nine teachers, showing different levels of motivation, were interviewed. The descriptive analysis of the survey data revealed that teachers scored high on autonomous/intrinsic types of motivation for using CBPA (e.g. because CPBA is perceived as enjoyable, interesting and important) and low on controlled/external types of motivation (e.g. CBPA is used to avoid feelings of guilt). Thematic analysis of the qualitative data confirmed teachers' interest in and willingness to integrate CBPA. The analysis also revealed a number of additional factors associated with teachers' motivation. Results indicated that 1) a sense of teaching autonomy – being able to freely choose and organise CBPA; 2) course participation relevant for CBPA (e.g. building competence); and 3) teacher collaboration focusing on collegial support all positively influenced motivation for integrating CBPA. Didactical skills and reflections; PA-related resources and materials; and a supporting teaching environment with elements of teacher collaboration, collegial support, constructive feedback and co-creation of CBPA were pinpointed as usable support for teachers' sustained use of CBPA. A crowded curriculum, scheduling and time constraints negatively influenced

teachers' sustained use of CBPA. Additional teacher-perceived barriers for sustained use of CBPA were lack of school support, lack of competency, and lack of relevant training.

## **Conclusion**

This thesis has found that teachers are indeed both interested in and willing to use CBPA. In addition, they are willing to enhance their knowledge of CBPA suited for their day-to-day practice. While teachers in this study identify critical barriers, they also identify both individual and contextual factors that could support their sustained use of CBPA. Findings from this thesis has the potential to address key factors of importance for designing future school-based interventions aiming to increase students' level of PA. The findings may also have the potential to inform stakeholders such as school management, and subject/educational researchers and advisors on how to foster teachers' motivation for integration CBPA. Finally, the outcomes of this thesis may be used to inform future training programmes aiming to improve the skills of current and future teachers on effective ways to integrate CBPA in daily teaching practices.

## **Danish summary**

### **Baggrund**

Det bliver stadig mere tydeligt, at fysisk aktivitet har en positiv og gavnlig indflydelse på børn og unges fysiske og mentale sundhed samt deres læring og kognition. Derudover har forskning udpeget skolen som en ideel arena for promovering og forøgelse af fysisk aktivitet og bevægelse blandt netop denne målgruppe. Det gør, at skoler i stigende grad anvendes til implementering af forskellige former for idræts- og bevægelsesindsatser. Helt konkret, har bevægelse integreret i undervisningen (BIU) vist sig at være en givtig komponent i mange skolebaserede indsatser. Bevægelse, der integreres i undervisning eller klasserum, sætter uden tvivl læreren i centrum som en vigtig facilitator. Lærere har, generelt set, et positivt syn på BIU, men det er ikke uden udfordringer at gøre skoledagen og undervisningen mere aktiv. Oftest er BIU forbundet med en række barrierer, og vi ved forholdsvis lidt om, hvad der egentlig motiverer lærere til at anvende BIU. Derudover mangler vi endnu at udpege konkrete og brugbare måder at støtte lærere i deres bestræbelser på at integrere bevægelse i daglige undervisningspraksisser.

### **Formål**

Formålet med denne afhandling er at 1) udforske og undersøge læreres motivation for at integrere bevægelse i deres daglige undervisning, og 2) udpege brugbare måder at støtte lærere på i deres brug af bevægelse.

### **Metode**

Både dataindsamling og -analyse blev guidet og struktureret efter to konkrete teorier. I tråd med afhandlingens formål, blev læreres motivation målt og analyseret gennem *Selvbestemmelsesteorien* (på engelsk *Self-Determination Theory*). Som analytisk værktøj blev den

socio-kulturelle teori *Stilladsering* anvendt til at udpege brugbare måde at støtte lærere på. Derudover blev didaktisk teori inddraget i studiets kvalitative fase, for at udforske læreres didaktisk praksis. Studiet anvendte et sekventielt design, der bestod af to separate faser – en kvantitativ og kvalitativ. I den første indledende fase blev læreres motivation kortlagt gennem en tilpasset version af spørgeskemaet *The Work Task Motivation Scale for Teachers* – et survey-instrument, der er udviklet og designet på baggrund af Selvbestemmelsesteorien. I den efterfølgende kvalitative fase blev der afholdt dybdegående semi-strukturerede interview med lærere rekrutteret gennem spørgeskemaet. Formålet med den kvalitative fase var uddybe kvantitative resultater samt identificere og udforske faktorer, der har betydning for og influerer på læreres motivation. Desuden var formålet at identificere brugbare måde at støtte lærerne på i deres brug af bevægelse. Skoler på tværs af Danmark blev inkluderet i studiet.

## **Resultater**

I alt besvarede 206 lærere og pædagoger spørgeskemaet. Ni lærere med forskellige motivationsniveauer blev efterfølgende interviewet. Den deskriptive analyse af data fra spørgeskemaet indikerede, at lærere scorede højere på de selvbestemmende motivationstyper som fx indre motivation. Det vil sige, at BIU anvendes, fordi det anses for at være sjovt, interessant og vigtigt. Lærerne scorede dermed lavere på de mere kontrollerende, eksterne motivationstyper, hvor BIU anvendes på baggrund af eksternt pres eller krav. Udover, den deskriptive analyse, blev der foretaget en række statistiske analyser, der blandt andet viste på baggrund af *The Relative Autonomy Index*, der måler graden af autonomi/selv-bestemmelse inden for bestemte settings, at lærere i signifikant lavere grad oplever at være selvbestemmende end pædagoger gør. Overordnet set, så bekræftede den tematiske analyse af interviewdata de kvantitative fund. Analysen frembragte dog også en række andre faktorer,

som blev udpeget som betydningsfulde og vigtige for læreres motivation: 1) en følelse af undervisningsautonomi, hvor den enkelte lærer frit kan bestemme, hvornår BIU er relevant og meningsfuldt; 2) kursusdeltagelse med fokus på BIU (fx opkvalificering af viden og kompetencer); og 3) lærersamarbejde med fokus på kollegial støtte. Tilsammen blev disse udpeget som væsentlige faktorer for læreres motivation for at integrere BIU. Lærere udpegede desuden didaktiske refleksioner, BIU-relevante ressourcer og materialer, og et støttende undervisningsmiljø med elementer af samarbejde, konstruktiv feedback, og samskabelse som brugbare og meningsfulde former for støtte. Derimod blev et tætpakket skema, tidsrestriktioner, mangel på støtte fra skolen, mangel på kompetencer samt mangel på relevante kurser udpeget som centrale barrierer for læreres vedvarende brug af BIU. Samtidig blev det udpeget som faktorer, der negativt influerer på deres motivation.

## **Konklusion**

Resultaterne fra afhandlingen peger på, at lærere både er interesseret i og villige til at anvende bevægelse i undervisningen. Derudover peger resultaterne også på, at lærere er villige til at øge deres viden om bevægelse. Mens en række dominerende og centrale barrierer træder frem, identificeres samtidig en række individuelle og kontekstuelle faktorer, der kan støtte op om lærerens vedvarende brug af BIU. Faktorer, der kan være væsentlige at medtænke, når bevægelse integreres i skoledagen. Samlet set, adresserer resultaterne fra denne afhandling vigtige og essentielle faktorer, der potentielt kan have betydning for, hvordan fremtidige skolebaserede indsatser designes og implementeres. Samtidig kan resultaterne anvendes til at informere interessenter på skoleområdet som fx skoleledelser og -bestyrelser, fag- og uddannelses-rådgivere samt uddannelsesforskere, om hvordan læreres motivation kan fordres og støttes.

## **Abbreviations**

|       |   |
|-------|---|
| PA    | Physical Activity                           |
| MI    | Movement Integration                        |
| CBPA  | Classroom-Based Physical Activity           |
| PE    | Physical Education                          |
| SDT   | Self-Determination Theory                   |
| SE    | Self-Efficacy                               |
| ZPD   | Zone of Proximal Development                |
| ESD   | Explanatory Sequential Design               |
| WTMST | The Work Task Motivation Scale for Teachers |
| IQR   | The Interquartile Range                     |
| RAI   | The Relative Autonomy Index                 |

## **Thesis outline**

The thesis starts out with an introductory section, which presents the role of physical activity in school settings as well as teachers' role as facilitators. In addition, the introduction presents contemporary physical activity practice in Danish public-schools before outlining the thesis' research objectives. The following section presents the scientific approach focusing on epistemology, methodology and theoretical frameworks. In the next section, the selected mixed methods design is outlined and visualised. After these initial sections, findings across papers are presented. The last part of the thesis is a discussion of main findings related to relevant national and international research as well as a theoretical and methodological reflections and discussion. In the final section, findings of the study are summarised in the conclusion before outlining implications for future research and practice.

## 1. Introduction

It is well documented that physical activity (PA) is important and beneficial for children and young people. Research has found that physical activity is beneficial for not only mental and physical health (Biddle & Asare, 2011; Martin & Murtagh, 2017; Watson, Timperio, Brown, Best, & Hesketh, 2017), but also for learning and cognition (Fedewa & Ahn, 2011; Singh et al., 2018). It is also well established that schools can optimal settings for increasing, encouraging and promoting PA for children and young people. Although students, typically, engage in sedentary behaviour as part of formal teaching practices, research has shown that schools are ideal avenues for promoting healthy behaviours such as increased PA time (Berg et al., 2017; McMullen, Kulinna, & Cothran, 2014; Naylor et al., 2015; Naylor & McKay, 2009; Webster, Russ, Vazou, Goh, & Erwin, 2015).

In an effort to increase levels of PA and reduce sedentary behaviour, schools often serve as a setting for *whole school PA approaches*. Often, the purpose of whole-school approaches is to encourage PA and provide access to PA opportunities – for instance through in-class activities, physical education (PE) or activities that are placed during or after school days (Webster et al., 2015). PA integrated into academic, subject-specific lessons, often labelled ‘movement integration’ (MI) or ‘classroom-based physical activity’ (CBPA), has become a viable component of many whole school approaches as a way of reducing sitting time and enhancing physically active behaviour during teaching (Routen, Johnston, Glazebrook, & Sherar, 2018; Watson et al., 2017; Webster et al., 2015). Throughout this thesis the concept *classroom-based physical activity* (CBPA) is used, and it refers to in-class activities where PA is integrated into teaching – either supporting the academic content of the subject or as small, separate breaks during

lessons. Although schools provide an ideal setting for additional PA, schools are at the same time complex and at times hectic environments, where learning and education constitute the centrepiece for school staff and management (Naylor & McKay, 2009). Often initiatives such as additional PA is influenced not only by existing school and classroom practices, but also by individual preferences and beliefs among schools' teaching staff. Likewise, PA initiatives are often influenced by the involvement from teaching staff (Berg et al., 2017). There may even be a difference in opinion among teachers whether schools are obligated to engage in and encourage, for instance, additional PA (Viig & Wold, 2005).

### **1.1 Teachers as facilitators**

With the increased interest in using classrooms as avenues for PA, teachers of *all* subjects become important stakeholders. In light of this, some have even labelled teachers as fundamental agents for the implementation of classroom-based interventions and initiatives (Beets et al., 2008; Leger, 2000; Viig & Wold, 2005; Viseu, Jesus, Rus, & Canavarro, 2016). Teachers are constantly present in the classroom and in contact with students, and they are in charge of teaching and learning. For reasons such as these teachers are identified as key personnel and facilitators in the implementation of a physically active classroom – regardless of implementation method (Cothran, Kulinna, & Garn, 2010; Routen et al., 2018; Webster et al., 2015). Beets and colleagues point out that the implementation of any school-based initiative ultimately relies on teachers' acceptance and willingness to change existing teaching practices (Beets et al., 2008). Appointing teachers as key stakeholders, makes it relevant to study their perception of CBPA, and their willingness and motivation to engage in, for instance, additional PA, as well as their readiness to change existing teaching practices. In addition, it is equally relevant to identify any supporting and inhibiting factors related to teachers' sustained use of

CBPA (Leger, 2000; Webster et al., 2015). However, only a few studies have directly measured teachers' motivation (Benes, Finn, Sullivan, & Yan, 2016). Accordingly, only a few studies have examined how to facilitate, support and sustain teachers' involvement in school-based initiatives (Viig & Wold, 2005).

## **1.2 Teachers' perception of classroom-based physical activity**

Studies have found that teachers, in general, have a positive view and perception of using CPBA (Cothran et al., 2010; Graham, Lucas-Thompson, & O'Donnell, 2014; Parks, Solmon, & Lee, 2007; Stylianou, Kulinna, & Naiman, 2015). A study by Benes and colleagues (2016) indicated that teachers are, in fact, willing to use the classroom as a setting for promoting PA (Benes et al., 2016). Often positive teacher-attitudes or willingness towards CBPA are linked with students' joy and excitement during and after activities. From a personal perspective, teachers' experience with sport, exercise and PA have been highlighted as important facilitators for increased usage of CBPA (Goh, Hannon, Webster, & Podlog, 2017; Parks et al., 2007; Webster, Erwin, & Parks, 2013). Additionally, from a contextual viewpoint, administrative support, teacher collaboration, and co-creation have also been identified by teachers as important resources (Benes et al., 2016; Hodges, Hodges-Kulinna, & Kloeppel, 2015). Furthermore, research has found that teachers prefer activities that are easy to implement. Likewise, research indicates that teachers prefer activities that connects to the academic content of subjects (McMullen et al., 2014; Stylianou et al., 2015).

Many of the studies on teachers' perception of PA have concluded that successful integration is, in fact, dependent on increased support and training for teachers. Thus, it should be the goal of any school-based PA promotion, initiative or approach to provide adequate and appropriate

support for all teachers enabling them to take part in increasing children's' level of PA – on a daily basis (Dinkel, Schaffer, Snyder, & Lee, 2017; Parks et al., 2007; Webster et al., 2017). To that end, we need more knowledge on best ways to support teachers in their efforts to integrate CBPA.

While teachers generally experience PA as a positive element in school life, there are still challenges associated with incorporating additional PA into school days. Research suggests that integration of additional PA into the classroom, and teachers' motivation for using PA on a daily basis, often is affected and sometimes even hampered by a number of factors (Dinkel et al., 2017; McMullen, Martin, Jones, & Murtagh, 2016; Webster et al., 2015). Teacher-perceived barriers are typically concerned with contextual factors such as time management, curriculum pressure, classroom management, school and classroom infrastructure, lack of resources and lack of support from school management. On a more personal level, barriers are often associated with lack of confidence and competence for finding relevant and suitable activities (Benes et al., 2016; Goh et al., 2017; McMullen et al., 2016; Stylianou et al., 2015; Webster et al., 2015; Webster et al., 2017). Other critical barriers are lack of motivation and lack of readiness to change teaching practices among teaching staff (Berg et al., 2017; Webster et al., 2015).

### **1.3 Promoting health and physical activity in Danish public-schools**

The focus of this thesis is teachers employed at Danish public-schools. Like many other countries in Europe, public-schools in Denmark have been recognised as an obvious setting for promoting and enhancing health and PA levels among children and young people (Larsen, Samdal, & Tjomsland, 2012; Leger, 2000; Skovgaard, 2016). Public-schools in Denmark are ideal environments for PA initiatives or other health promoting efforts, because schools have

the opportunity to reach a large portion of Danish children – regardless of, for instance, socio-economic status. In Denmark, a vast majority of children and young people aged 6-15 receive their formal education through public-schools (primary and lower secondary education). Typically, PE and recess have been avenues for increasing PA levels during school days. However, it has increasingly been acknowledged that these two settings cannot stand alone in the prevention of sedentary behaviour. For this reason, Danish public-schools and teachers are increasingly called upon to promote and enhance PA *across* the curriculum and school day (Simovska, Nordin, & Madsen, 2016; Skovgaard, 2016).

### ***1.3.1 The Danish public-school setting – key structural factors and the 2014 reform***

In 2014 the Danish Government launched an educational reform that applies to all public-schools in Denmark. Besides a mandatory claim of 45 minutes of PA during school days, the reform also instructs several changes in key structures of the Danish public-school system. One of the key aspects in the reform is a longer and more varied school day. As part of this initiative, schools are obligated to include an increased number of lessons in major subjects such as Math and Danish as well as introducing a new teaching setting labelled *assisted learning*. Assisted learning was, as part of the reform, introduced as an alternative teaching setting, typically placed at the end of the day. The ambition with assisted learning is to give students and teachers time for in-depth studies, homework assistance and different sorts of PA. Essentially, it offers a platform for varied teaching within or outside classroom walls (Government, 2013; Rasmussen, Holm, & Rasch-Christensen, 2015). Another key aspect in the reform is increased collaboration between teachers and teaching assistants. For instance, teaching assistants are increasingly called upon to support teachers during subject-divided teaching as well as handling and being responsible for assisted learning. Teachers are still responsible for all aspects of teaching as

well as researching learning objectives of each individual subject. This involvement of the entire school staff in teaching routines – such as teaching assistants - marks a new way of working and collaborating among school staff, as well as giving teaching assistants new types of teaching tasks and responsibilities (Government, 2013).

On a more general level, it lies with the *Law of Primary Education* to set the overall structure for the public-school system establishing, for instance, national objectives of teaching and learning, responsibilities and obligations among school staff, and determining, who is responsible for organising and operation of schools. The Law of Primary Education is governed by the Danish Government – thus making them influential of structures, objectives and organisation of the public-school system. The actual organisation of public-schools lies with the municipality. Hence, it lies with the municipal council to make any decisions regarding each individual school within the municipality. On a school level, school management is responsible for the administrative and pedagogical management as well as managing school staff and any decisions regarding students.

As part of this nationwide reform of the public-school system, it became mandatory to integrate, on average, 45 minutes of additional PA during the school day. This means that, throughout the school day, school staff is obligated to enact PA that corresponds to 45 minutes, on average – either as part of subject-divided teaching across the curriculum (i.e. Math, Danish, English, Science, PE etc) or as part of assisted learning. Finally, PA can also take place in co-operation with the local community and sports clubs. This initiative has been labelled the *open school* (Government, 2013). In the classroom, PA may be enacted as activity sequences that directly or indirectly link to the academic content of the subject or it may be shorter activities,

such as brain breaks. The purpose of brain breaks is to give students an intermission from the academic content by offering them short, and sometimes energetic, breaks. The overall purpose of the 45 minutes of additional PA is to enhance students' health and well-being – as well as their motivation and learning across subjects. It lies with the school management to ensure that the 45 minutes of daily PA is, in fact, carried out. In terms of structuring and organising PA at a school level, only a very limited amount of schools has a clear formulated school policy for the enactment of daily PA (Oxford Research, 2018). The same Oxford study shows that it typically lies with the teacher to organise, plan and integrate daily PA.

In terms of key structural factors for teachers' everyday work and teaching responsibilities, the reform has indeed introduced new elements that influence the way teachers work, organise and carry out teaching. Moreover, the reform influences on a contextual level the collaborative environment among school staff. Moreover, since the operation of schools lies with the municipality, there may exist local guidelines that influence the way schools choose to handle and organise, for instance, elements such as health, physical activity, well-being etc.

#### *Preliminary research on the reform*

Preliminary research on the school-reform indicate that more and more public-schools are integrating the required 45 minutes of PA during school days. Current reports also indicate that, in light of the reform, the majority of teachers and teaching assistants use PA in teaching one or more times a week. However, only a very limited number of teachers use PA on a day-to-day basis (Jacobsen et al., 2017; Jacobsen, Flarup, & Søndergaard, 2015; Jensen, Skov, & Thranholm, 2018; Pilgaard & Rask, 2016). In recent reports published by The Danish Centre for Social Science Research, it was found that teachers and teaching assistants generally acknowledge the

positive benefits PA may have on students' readiness to learn. The reports also note that it typically lies with the teacher or teaching assistant to define the activities relevant for their teaching (Jacobsen et al., 2017; Jensen et al., 2018). Although Danish teachers and teaching assistants have an overall positive attitude towards PA, integrating of 45 minutes of additional PA per day is not without difficulties. Similar to international research, Danish teachers identify challenges and barriers for integrating PA on a day-to-day basis. In general, teachers problematise that it is difficult to find interesting activities suitable for the subject taught. Moreover, in accordance with international research, time constraints are identified as a major barrier for daily PA (Jacobsen et al., 2017).

#### **1.4 Research objectives**

Teachers are indeed central to the integration of the physically active classroom. Given that teachers increasingly are called upon to activate the classroom it is essential that attention is directed not only at motivational factors, but also at understanding how teachers work, teach, and what support they need. A strong commitment from schools' teaching staff is vital for the facilitation and sustainability of PA, and with a national policy of 45 minutes of additional PA during school days, it seems more vital than ever to explore factors associated with teachers' sustained use of CBPA.

The objectives of this thesis are to: 1) explore teachers' motivation for integrating classroom-based physical activity in their daily practice; and 2) point out usable ways to support teachers' sustained use of classroom-based physical activity.

In accordance with the overall objectives, each of the three articles included in this thesis have a specific research objective:

- ***Paper I:*** The purpose of *Paper I* was to present the rationale behind the study and outline the theoretical frameworks and mixed methods design chosen for the study.
- ***Paper II:*** The purpose of *Paper II* was to explore and outline teachers' motivation for using classroom-based physical activity - within the self-determination framework. *Paper II* only reports on motivational data from the quantitative and qualitative phases.
- ***Paper III:*** The purpose of *Paper III* was to identify factors associated with teachers' sustained use of classroom-based physical activity and to point out usable ways to support teachers. *Paper III* only reported on qualitative data.

## **2. The scientific approach**

In this section, I present and elaborate on the scientific approach of this thesis. I present my epistemological view, methodology, and theoretical frameworks. Together all these components have informed, structured and guided the research process in this thesis.

### **2.1 Pragmatism – *my point of departure***

My point of departure for the research process in this thesis is inspired by the view of *pragmatism*. Pragmatism is a philosophical and scientific approach originally formulated by the philosopher Charles Sanders Peirce, the psychologist William James, and the philosopher and educationalist John Dewey (Brinkmann, 2006). A main focus of pragmatism is to offer a middle position both philosophically and methodologically between objectivism/positivism on one side and constructivism on the other side. Hence, it is argued that the aim of pragmatism is to find a ‘workable and practical solution’ to problem solving guided by the formulated research objectives (Brinkmann, 2006; Dewey, 1910; Greene, 2007; Johnson & Onwuegbuzie, 2004; Morgan, 2007). However, pragmatism is more than just practical problem solving (Morgan, 2014). In line with Dewey’s original thoughts, pragmatism is, essentially, about *human experience*. For pragmatics, human experience concerns action and participation in and with real world settings, and according to Dewey, human experience is always situated – both historically and culturally - within a specific social context (Dewey, 1910; Greene, 2007; Morgan, 2014). Thus, a main focus of conducting pragmatic research is researching and uncovering practical problems and generating knowledge that is both useful and applicable for practice. Within this stance, practice is both a catalyst for knowledge and also the place where knowledge is tested and validated (Brinkmann, 2006; Dewey, 1910).

The aim of this thesis is to unfold and understand teachers' motivation. Moreover, this thesis aims to identify and point out usable ways to support teachers in their integration of CBPA. In line with these objectives, I intend to generate knowledge that is based on and represents teachers and the context they are part of. For this, I assume that understanding and exploring teachers' motivation, as well as their actions, functions, skills, behaviours etc. cannot be done without looking at the context they are part of. Hence, I presume that teachers are shaped by and deeply anchored in their particular school settings, and that their everyday work as teachers are situated in their specific classroom practices. While I acknowledge the practically oriented focus of pragmatism, where practice is both catalyst for and the place where knowledge is tested, the aim of this thesis is not to test, apply or implement knowledge directly into teachers' practice, or to direct or indicate action. Instead, the aim of this thesis is to offer practice-oriented knowledge and insights, which may point to future research questions, directions and implications relevant and meaningful for teachers and school practices.

## **2.2 Theoretical and methodological view – *my plan of action***

In line with my pragmatic approach, the research conducted in this thesis is guided by the research objectives (Brinkmann, 2006; Greene, 2007). The choice of theoretical frameworks and the mixed methods design for this thesis, is guided by the objective to unfold teachers' motivation and point out usable support. Thus, the theoretical frameworks of *Self-Determination Theory*, *Scaffolding* and *Didactic Theory*, which are described in detail in the following sections, are chosen, because they provide relevant frameworks for identifying and unfolding perspectives related to teachers' motivation and factors associated with motivation within and across school and teaching practices. Their role in the research process has been to structure and shape data collection procedures and analytical processes.

Methodologically, the research conducted in this thesis is driven by a mixed method approach that in two distinct phases will enable the process of *outlining* and *understanding* teachers' motivation as well as identifying usable support for teachers. As a plan of action for a research process, pragmatism argues that methods from different scientific fields is a meaningful way to solve problems (Greene, 2007; Johnson, Onwuegbuzie, & Turner, 2007). In this light, I have chosen a mixed method design that works best for fulfilling the research objectives of this thesis. Inspired by the words of Jennifer Greene, a mixed methods design will, essentially, provide a better and more robust understanding (Greene, 2007). For this reason, I have chosen the *Explanatory Sequential Mixed Methods Design* (ESD), which offers a structured two-phased design that makes it possible to shape and direct the research process – in accordance with the selected theoretical frameworks (Creswell & Clark, 2018; Ivankova, Creswell, & Stick, 2006). The rationale behind this mixed methods approach and the exact sequential design are presented in the *Mixed Methods* section.

## **2.3 Theoretical frameworks**

The purpose of the following section is to outline the theoretical frameworks chosen for this thesis. The section starts out with a brief introduction to research in teacher motivation.

### ***2.3.1 Researching teacher motivation***

Since the 1990s there has been a growing research interest in and awareness of teacher motivation (Dörnyei & Ushioda, 2011; Han & Yin, 2016; Jesus & Lens, 2005; Kaplan, 2014; Viseu, Jesus, Rus, & Canavarro, 2016; Viseu, Jesus, Rus, Canavarro, & Pereira, 2016). The need to address teacher motivation is primarily driven by teachers' increasingly vital position in the classroom (Viseu, Jesus, Rus, & Canavarro, 2016). Accordingly, there continuous to exist a

strong link between teacher motivation and student motivation. This suggests a need to address teachers' intentions, engagement, and motivation in their work, and not only how it affects students' motives and outcomes, but also what motivates teachers to teach and commit to the teaching profession (Han & Yin, 2016; Richardson, Karabenick, & Watt, 2014). Looking at the literature, teacher motivation is often defined as a 'complex' and 'complicated' issue. Typically, this is due to the many professional roles and identities teachers have in the classroom, and due to the uniqueness, that characterises the teaching profession (Dörnyei & Ushioda, 2011; Urdan, 2014). In Denmark, for instance, teachers are part of a Danish teaching profession consisting of number of both contextual and personal aspects that influence the everyday work of teachers and, most likely, also their motives and attitudes towards teaching (Christiansen, Elf, Hobel, Qvortrup, & Troelsen, 2018; Gundem, 2000; Jørgensen, 2003). Across school contexts, teaching is undoubtedly a changeable affair, and it is difficult to predict what precisely motivates and sustains teachers' behaviour and actions (Dörnyei & Ushioda, 2011; Kaplan, 2014).

In light of this increased interest in teachers' motivation, a variety of theoretical and analytical perspectives have been applied to research teachers' engagement, commitment, and motivation (Dörnyei & Ushioda, 2011; Han & Yin, 2016; Urdan, 2014). Teachers' motivation has, typically, been studied through major theoretical lenses such as *Self-Efficacy* (SE) (Bandura, 1977; Skaalvik & Skaalvik, 2017; Urdan, 2014; Webster et al., 2013), and *Self-Determination Theory* (SDT) (Deci & Ryan, 2008; Gorozidis & Papaioannou, 2014; Muller, Andreitz, & Palekcic, 2008; Roth, 2014). In short, SE focuses on competence belief – either from an individual or collective perspective (Bandura, 1977; Urdan, 2014). In general, SE studies have found that higher levels of self-efficacy positively relate to teachers' belief about teaching, higher levels of

job satisfaction (Dinham & Scott, 2000; Scott & Dinham, 2003; Skaalvik & Skaalvik, 2017), and lower levels of stress and burnout (Fernet, Chanal, & Guay, 2017). SE has also been used to analyse teachers' efficacy beliefs about integrating additional PA (Parks et al., 2007; Webster et al., 2013). For instance, Parks and colleagues (2007) found a positive correlation between teachers' willingness to integrate PA and collective efficacy concluding that integration of PA may require collective efforts (Parks et al., 2007).

Several studies have demonstrated that *Self-Determination Theory* (SDT) offers a relevant framework for investigating teachers' motivation (Fernet et al., 2017; Fernet, Trépanier, Austin, & Levesque-Côté, 2016; Gorozidis & Papaioannou, 2014; Han & Yin, 2016; Jesus & Lens, 2005; Schellenbach-Zell & Gräsel, 2010). Within an educational setting, SDT has been applied to investigate the link between teachers' autonomous motivation and positive student outcomes. Research has, for instance, demonstrated a link between teachers' autonomy-supportive teaching styles and students' development and growth (Deci, Vallerand, Pelletier, & Ryan, 1991; Han & Yin, 2016; Muller et al., 2008; Roth, Assor, Kanat-Maymon, & Kaplan, 2007; Schellenbach-Zell & Gräsel, 2010). Both SE and SDT offer suitable frameworks for assessing teachers' motivation. Where SE mainly focuses on an individual's competence belief, SDT distinguishes between different types of motivation (including competence belief) making it possible to understand and analyse motivational reasons from different perspectives. Within SDT, a primary focus is to understand what drives people to act, learn and commit. Furthermore, SDT does not only account for individual and inherent motivational reasons. It also accounts for the influence and power that lie within cultural and contextual environments (Deci & Ryan, 2008; Ryan & Deci, 2000a, 2000b).

### **2.3.2 The Self-Determination Theory**

SDT is a psychological theory of motivation that places human beings as active agents with motivation as an inherent trait (Deci & Ryan, 1975; Ryan & Deci, 2000a). Central to SDT is human development and growth. The theory does not only focus on goal-orientation, but also on human functioning and well-being. As such, SDT posits that it is a basic human trait to seek out interesting activities, to develop, and to engage in meaningful, social relationship (Ryan & Deci, 2000b). For this reason, a central focus for SDT is the surrounding environment, because conditions or elements within a particular environment can either facilitate or diminish motivation. According to SDT, an important step towards understanding the nature of human activity and motivation, is understanding those environmental factors and conditions (Deci & Ryan, 1975; Ryan & Deci, 2000a, 2000b).

At the heart of SDT is three psychological needs: *competence*, *relatedness* and *autonomy*. According to founders Richard M. Ryan and Edward L. Deci, these three needs are inherent in all humans and are essential for performance, engagement and well-being (Ryan & Deci, 2000b). According to Ryan and Deci, a social environment can either facilitate and satisfy or diminish these three basic needs – i.e. supporting autonomy, competence and relatedness will, most likely, foster motivation (Deci & Ryan, 2008). Ryan and Deci (2000b) describe the three needs as follows: *Competence* is the feeling of being able to achieve a certain goal, and mastering skills. As such, it refers to the ability to accomplish or achieve a desired outcome. *Relatedness* is described as a feeling of belonging. It means having a feeling of connectedness to others when, for instance, taking on a new task or being part of a developmental process. Lastly, is the need for *autonomy*. This feeling refers to an experience of choice and volition. Autonomy is described as a feeling of self-determination where an individual's actions are based on and in line with

own desires and values (Deci & Ryan, 2000b; Pelletier & Rocchi, 2016). At the core of SDT is also a motivational continuum ranging from *amotivation* to *intrinsic* motivation. The regulations indicate different motives for engaging in a behaviour or task, and their place along the continuum indicates level of autonomy or self-determination (Ryan & Deci, 2000b). Along this continuum of motivational regulations or behaviour, Deci and Ryan identify six types of motivation: *intrinsic motivation*, four types of *extrinsic motivation*, and *amotivation*. The four types of extrinsic motivation are labelled regulations: *external*, *introjected*, *identified*, and *integrated regulation* (Ryan & Deci, 2000b). These four types of ‘regulations’ reflect the degree to which an individual value and take in a certain task and regulate behaviour accordingly. For instance, is a task carried out based on inherent values or based on external demands such as rewards (Ryan & Deci, 2000b). Figure 1 is an illustration of the self-determination continuum ranging from amotivation (non-autonomous) to intrinsic motivation (autonomous).

**Figure 1:** The Self-Determination Continuum (adapted from Ryan & Deci, 2000b)

| <b>Non-self-determined</b><br>Controlling<br>(Low autonomy)                                       | <b>Extrinsic Motivation</b>   |  |   |  | <b>Self-Determined</b><br>Autonomous<br>(high autonomy)                       |
|---|---|--|---|--|---|
| <b>Amotivation</b>  | <b>External Regulation</b>  | <b>Introjected Regulation</b>  | <b>Identified Regulation</b>  | <b>Integrated Regulation</b>   | <b>Intrinsic Motivation</b>   |
| <b>Keywords</b><br>Lacking the intention or willingness to act<br>Incompetence<br>Lack of control | <b>Keywords</b><br>Compliance to external demands<br>Gaining external benefits or rewards<br>Avoiding external punishment | <b>Keywords</b><br>Achieving internal rewards<br>Avoiding feelings of guilt or anxiety | <b>Keywords</b><br>Personal values<br>Personal importance<br>Personal conviction. | <b>Keywords</b><br>Congruence and synthesis with self<br>For separate outcomes rather than inherent outcomes | <b>Keywords</b><br>Interest, enjoyment, and pleasure<br>Inherent satisfaction |

A key strength of SDT is that it provides a framework for exploring and unfolding teachers' underlying reasons for integrating CBPA – i.e. to explore the *quality* of motivation rather than just to establish *if* teachers are motivated - including the factors that directly or in-directly influence their engagement, commitment and motivation for enacting CBPA (Han & Yin, 2016; Pelletier & Rocchi, 2016). Not only does SDT offer insight into intrinsic and extrinsic types of motivation, it also provides a framework for analysing environmental conditions within a school context that may facilitate/support or hamper/control teachers' motivation. For instance, it is possible to account for the impact and power social and cultural conditions may have on teachers' motivation as well as analysing how a school environment may foster and support basic psychological needs such as autonomy, competence and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2000b). In line with the thoughts of pragmatism, SDT offers a suitable theoretical instrument for assessing different motivational reasons for integrating CBPA and generating knowledge of practical relevance for school teachers and other relevant stakeholders. Findings from SDT may prove to be significant for schools, teachers and teaching practices, because they offer valuable information and knowledge of essential elements of motivation, and the conditions/factors that influence that motivation. This information may be relevant for school managers or other relevant stakeholders, who want to facilitate and foster teachers' motivation and commitment for work and teaching tasks – including CBPA.

### ***2.3.3 The conceptual framework of scaffolding***

Building on Lev Vygotsky's *Zone of Proximal Development* (ZPD) (Vygotsky, 1978), Wood, Bruner and Ross (1976), originally, conceptualised scaffolding as an instructional strategy (Wood, Bruner, & Ross, 1976). ZPD is most commonly perceived as the joint venture on task solving between a more competent person and less competent person – most often a

parent/teacher and a child/student. The aim is for the less competent person to become less dependent and more proficient. It is within this developmental and instructional process, scaffolding found its place (Chaiklin, 2003; Wood et al., 1976). Scaffolding has been widely used in educational and pedagogical settings often valued as a key instructional component (Lajoie, 2005; Pol, Volman, & Beishuizen, 2010; Sharpe, 2006; Wood et al., 1976). Wood, Bruner and Ross (1976) defined *scaffolding* as a process of human guidance and assistance - often in one-to-one interactions - primarily aimed at supporting children not by telling them what to do, but by using six types of 'scaffolds' (Wood et al., 1976). Central to the process of scaffolding is a shared understanding of the goal between the learner and tutor. Moreover, the role of the tutor/adult/teacher is central and according to Wood, Bruner and Ross (1976) the tutor is a 'domain expert' and holds all the information regarding the task as well as being an important facilitator for motivation and encouragement (Puntambekar & Hubscher, 2005; Wood et al., 1976). It is the job of the tutor to provide the following scaffolds in a suitable and meaningful manner (Wood et al., 1976) (p. 98):

- 1) *Recruitment*: Enlistment and recruitment of the learners' interest in the requirements of the task.
- 2) *Reduction of degrees of freedom*: Simplification of the task by reducing the number of steps required to reach a workable solution. This basically involves reducing the size and requirements of the task.
- 3) *Direction maintenance*: This involves maintaining the learners' interest in the task. This basically involves keeping the learners motivated. A way of maintaining direction and motivation is, for instance, helping the learner to take risks.

- 4) *Marking of critical features*: This step involves the marking of central and relevant features of the task. The purpose is to identify and analyse discrepancies between what the learner has achieved so far and what would be the correct solution.
- 5) *Frustration control*: A process of appropriate support in stressful and frustrating phases without making the learner dependent on the tutor.
- 6) *Demonstration*: Demonstrating or 'modelling' solutions to a task. It often involves an idealisation process where the tutor imitates in idealised form an attempted solution tried by the learner. The aim for the learner is to imitate it back in a more appropriate form.

In accordance with the research objectives and context of this study, scaffolding is applied and conceptualised to *teachers* within *teaching practices*. In *Paper III* this is operationalised into the objectives: *to identify factors associated with teachers' sustained use of classroom-based physical activity and to point out usable ways to support teachers*. While I acknowledge the original intent and design of scaffolding, the theoretical and analytical focus is *not* on student-teacher interactions – instead I aim at pointing out relevant scaffolds that potentially can support teachers' motivation and process of enacting CBPA – both at an individual and contextual level. For this reason, and in line with my pragmatic departure, scaffolding serves, primarily, as an analytical tool aiming at generating insights of support and supportive resources relevant and usable for teachers' motivation and PA practice.

Based on my motivational viewpoint from SDT, the choice and application of scaffolding as a conceptual framework was, basically, based on the notion – as presented by Ryan and Deci - that all human motivation needs supportive conditions and a supportive environment to thrive

(Ryan & Deci, 2000b). In line with this notion formulated by Ryan and Deci, I am interested in exploring and analysing how this supportive practice is created, and how an environment – such as a school context – can either support or hinder teachers’ motivation. If we follow the assumption presented by Ryan and Deci (2000b), that the sustainment and maintenance of motivation and the basic psychological needs require supportive conditions, then it is important to understand those conditions and how they may facilitate motivation – in this case teachers’ motivation within school and teaching practices (Ryan & Deci, 2000b; Ryan & Deci, 2000a).

In the application of scaffolding, I therefore argue that teachers need assistance and guidance, or so-called ‘scaffolds’, when dealing with changes or developmental processes as part of their work (Shabani, 2016; Tharp & Gallimore, 1988; Dinkel et al., 2016). Dinkel, Lee and Schaffer (2016) used Vygotsky’s ZPD to examine teachers’ current knowledge of CBPA. They argued that in order to understand how to assist or scaffold teachers to implement additional CBPA (more specifically PA breaks), one must first determine teachers’ ZPD, i.e. by assessing current knowledge and capability for integrating CBPA. They concluded that ZPD served as a usable theory for assessing teachers ZPD – and not only in terms of establishing current level of knowledge, but also as a way of identifying strategies for building on and supporting that knowledge regarding CBPA (Dinkel et al., 2016). Another way of exploring supportive conditions or structures is to distinguish between different *levels* of scaffolding. Based on her research, Philipsen (2009; 2012) argues that scaffolding can be categorised as: *institutional scaffolding* (e.g. when an institution defines the conditions and place structures); *team scaffolding* (e.g. when members of a team guide and instruct each other); and *individual scaffolding* (e.g. when individuals define their own conditions) (Philipsen, 2009, 2012).

Philipsen has, in her research of creative processes, found that especially team scaffolding can be helpful for the creative process – for instance in reaching a desired outcome collectively (Philipsen, 2009, 2012).

In line with the abovementioned perspectives on teacher support, I aim at pointing out scaffolds or levels of scaffolding that potentially could support teachers' motivation and sustained use of CBPA (Lajoie, 2005). As such, scaffolding serves as a tool for identifying concrete supportive elements and resources that may exist within school and teaching practices at an individual, collective and contextual level.

#### **2.3.4 Didactic theory**

In line with this thesis' strong empirical and analytical focus on teachers, teaching practices and the public-school context, a framework for assessing teachers' didactic practice and reflections regarding subject-specific content, teaching practices and the enactment of CBPA were needed. I have chosen to label this additional framework *didactic theory* (Westbury, 2000). It is perhaps noteworthy to mention that didactic theory was not chosen as a theoretical framework from the start. However, it became obvious during the analytical process of the interview data that the data also contained significant perspectives concerning teachers' didactic practice, reflections and reasonings (cf. *Paper III*). When collecting and analysing the interview data through the lens of scaffolding, I learned that an important supportive resource for teachers was their didactic practice, and as the analytical work progressed this practice proved to be closely associated with teachers' sustained use of CBPA and, in fact, influenced their motivation for integrating CBPA. In the following, I present additional and supplementary didactic theory relevant for this thesis.

Didactic theory concerns both *a general level of didactics*, which essentially deals with questions such as aim and goals of schooling, curriculum, and selection of content. However, my approach to didactic primarily concerns *school subject didactics*, which is about the content, structure and scope of each subject (Gundem, 2000). Essentially, content is the substance of each school subject – i.e. what is being taught and learnt (Gundem, 2000). Within a Danish/Nordic didactic tradition, teachers are seen as autonomous practitioners able to independently decide his or her own teaching and classroom practices *within* the national guidelines for curriculum and schooling. This provides teachers with a high degree of autonomy and authority regarding classroom and teaching routines – i.e. *how* research desired teaching objectives within each subject (Gundem, 2000; Westbury, 2000). Didactic is essentially a teacher’s foundation for acting and carrying out teaching, and a Danish school teacher’s didactic practice, generally, concerns the choices and reflections that take place before, during and after the actual teaching situation. For teachers, the most central didactical questions are: *who* (students’ prerequisites), *what* (content), *where* (organisation), *how* (approach and method) and *why* (motive and aim) (Lund, 2017, Christensen, Elf, Hobel, Qvortrup, & Troelsen, 2018). Basically, a teachers’ didactic practice can be understood as a set of structured questions regarding content, method and justification of teaching – most often driven by an intention of wanting something or by the desire to reach a certain outcome from what is being taught. Often, a teacher’s didactic practice is guided by a certain mission or vision as well as personal ambition (Christensen, Elf, Hobel, Qvortrup, & Troelsen, 2018, Bengtson & Qvortrup, 2013). To this end, and in light of the PA policy, a part of teachers’ didactic practice may be to reflect upon how to enact PA during lessons – for instance by using new or different types of learning activities where students actively use their bodies to learn. This may involve a translation of this new type of practice into an existing practice or it may involve the creating of an entirely new way of teaching (Lund,

2017). Didactically, this may also involve a new reflective practice concerning the organisation and planning of lessons.

In line with the second aim of this thesis, which is to identify usable support for teachers' motivation and sustained use of CBPA, the aim of applying an additional theoretical perspective is, first of all, to identify teachers' didactic practice and reflections focusing on teachers' choices, reasonings and practice – mainly concerning content and choice of activities (*what*), the justification of CBPA (*why*) and methods (*how*) for integrating CBPA. Moreover, I aim to explore how concepts such as meaning and meaningful CBPA is created in the enactment of CBPA – more specifically how teachers find and establish meaning and how this may link to their motivation (Christensen, Elf, Hobel, Qvortrup, & Troelsen, 2018). And finally, following this study's notion on teacher support, I aim to identify and analyse how teachers' didactic practice may be useful – or perhaps even supportive – for teachers' handling of CBPA (Gundem, 2000; Westbury, 2000).

### **3. Mixed methods design**

In the following section, I outline the mixed methods design chosen for this thesis. The section is structured in accordance with *Paper I*.

#### **3.1 The Explanatory Sequential Design (ESD)**

The Explanatory Sequential Design (ESD) is characterised by two separate phases – a quantitative phase followed by a qualitative phase (Creswell & Clark, 2018). The purpose of the second phase is to elaborate and extend the initial quantitative data. Practically, this means that I, initially, collected and analysed the quantitative data, before moving on to the qualitative phase. My rationale for choosing this type of design is that the quantitative data will provide a general, descriptive understanding of teachers' motivation. The qualitative approach will help to refine, elaborate on, and extend that understanding by offering in-depth perspectives and views from teachers on a range of factors associated with the integration of CBPA (Ivankova et al., 2006). Thus, by combining a quantitative and qualitative approach, I draw in the strength of each enabling me to reach a more robust account of this thesis objectives as well as accounting for the complexity of teachers' motivation (Dörnyei & Ushioda, 2011; Han & Yin, 2016; Morgan, 1998).

#### **3.2 Phase I: The Quantitative Phase**

The primary purpose of the quantitative phase was to measure and assess teachers' motivation. Figure 2 on the next page offers a visual model of the mixed methods design.

**Figure 2:** Visual model of the Explanatory Sequential Mixed Methods Design (adapted from Ivankova, 2006).

| Phase   | Procedure  | Product   |
|---|--|---|
| <b>Quantitative data collection</b>                             | Sampling and recruitment for the survey.<br>Email invitation and follow-up<br>Distribution of web-based survey                                   | Numeric data (n = 206)  |
| <b>Quantitative data analysis</b>                               | Double-entering survey data<br>Summarise and categorise data (e.g. counts and frequencies).<br><br>Screening for participants for the interviews | Descriptive analysis (incl. missing data).<br><br>17 email addresses. |
| <b>Connecting Quantitative and Qualitative Phases</b>           | Sampling and recruitment for the interviews  | Interview participants (n = 9)  |
| <b>Mixing stage</b>   | Finding relevant survey data and developing interview protocol questions   | Semi-structured interview protocol                                    |
| <b>Qualitative data collection</b>                              | In-depth individual interviews<br>Email follow-up  | Recordings, interview transcripts, notes.                             |
| <b>Qualitative Data analysis</b>                                | Deductive/inductive thematic analysis<br>Coding procedures<br>Double coding procedures   | Codes and themes  |
| <b>Integration of the Quantitative and Qualitative Findings</b> | Interpretation and exploration of the quantitative and qualitative results   | Paper II<br>Paper III<br>Thesis                                       |
| <b>Mixing stage</b>   |  | Discussion<br>Implications for future research and practice.          |

### **3.2.1 Setting, participants, and recruitment procedures**

This study is carried out in a Danish school context and it involves Danish schoolteachers and teaching assistants employed at a public-school – across *all* subjects and grade levels. During the survey pilot phase, it became clear that teaching assistants also are responsible for delivering CBPA. For this reason, they were included in the sample. Thus, the inclusion criteria for Phase I were: 1) employment at a public-school, and 2) teaching responsibilities (both subject-divided teaching and assisted learning). To gain a multiple and rich perspective of teachers’ motivation, a variety of schools were included using a *probability cluster sampling*

procedure (Teddlie & Yu, 2007). Probability cluster sampling involves randomly selecting groups or clusters of interest (Teddlie & Tashakkori, 2009; Teddlie & Yu, 2007). A cluster of municipalities were chosen from all five regions in Denmark in the first stage of sampling. This meant that within each region, municipalities that varied in size and geographical location were selected. In line with the probability cluster sampling procedure, *all* schools within the chosen municipalities were contacted and invited to participate in the study. In total, 100 schools were contacted. When contacting schools, I had no knowledge of their actual usage levels of CBPA or whether the schools had any local policies or guidelines regarding PA. However, based on the sampling procedure, I hoped to include a variety of schools with different approaches to CBPA. Figure 3 on the next page is a flowchart of the recruitment process for *both* phases. Sampling for the qualitative phase is described in detail in a following section.

The survey was distributed via school management to *all* teachers and teaching assistants employed at the included schools, which were 14 schools in total. During the recruitment process, all 14 included schools were asked to give the exact number of employed teachers and teaching assistants. The total sample size – across the 14 recruited schools - was 734 teachers. The entire sample of teachers were invited to take part in the survey. In the initial recruitment email schools were asked about their preferred distribution channel, and apart from one school, all preferred to distribute the survey via an internal mailing system. One school distributed the survey via teachers' personal email. The final result was 206 survey responses (cf. figure 3). To reach a larger sample of survey respondents, steps were taken to recruit more schools for Phase I. For instance, I persistently contacted schools and invited them to participate in the study. Moreover, I sent survey reminders to included schools. However, in the

end it was deemed necessary, due to time constraints and ethical considerations to complete data collection and start analysing the data for the qualitative phase.

**Figure 3:** Flowchart of recruitment procedures (cf. *Paper I*).

|                |  |                                    |
|----------------|--|------------------------------------|
| <b>Phase 1</b> | <p style="text-align: center;"><b>Quantitative Data Collection</b></p> <p style="text-align: center;">A cluster of Danish public-schools randomly selected and contacted through school management – <i>100 schools in total</i></p> <p style="text-align: center;">Inviting email sent<br/>Two follow-up reminders sent</p>   | <b>January 2017 – August 2017</b>  |
| <b>Phase 2</b> | <p style="text-align: center;"><b>Quantitative Data Collection</b></p> <p style="text-align: center;">14 schools recruited</p>   |                                    |
| <b>Phase 3</b> | <p style="text-align: center;"><b>Quantitative Data Collection</b></p> <p style="text-align: center;">Web-based survey distributed via schools' internal mail system (n = 734)<br/>- including the survey question: <i>"If you wish to participate in a personal interview, please write your email address, and you will be contacted."</i></p> <p style="text-align: center;">Two reminders sent via school management</p> |                                    |
| <b>Phase 4</b> | <p style="text-align: center;"><b>Quantitative Data Analysis</b></p> <p style="text-align: center;">Screening of survey data (n = 206)<br/>to identify teachers for the interviews</p>   |                                    |
| <b>Phase 5</b> | <p style="text-align: center;"><b>Qualitative Data Collection</b></p> <p style="text-align: center;">17 teachers identified and contacted via email<br/><br/>Three-four reminders sent</p>   | <b>August 2017 – December 2017</b> |
| <b>Phase 6</b> | <p style="text-align: center;"><b>Qualitative Data Collection</b></p> <p style="text-align: center;">17 teachers contacted via email<br/>14 teachers responded<br/>9 teachers interviewed</p>  |                                    |

### **3.2.2 Data collection - survey**

The data collection procedure in the quantitative phase was a web-based survey (appendix 1b).

The core of the survey was an adapted version of the *Work Task Motivation Scale for Teachers* (WTMST) (Fernet, Senécal, Guay, Marsh, & Downson, 2008). Additional questions in the survey

focused on: teachers' use and perception of CBPA; facilitators and barriers for using CBPA; overall work motivation; and demographic information (gender, age, working experience, current subjects, and current grade levels). In regard to teacher-perceived barriers and facilitators, five dominant factors, which in previous research has been found to impact integration of additional PA in schools, were selected (Naylor et al., 2015). As part of the survey, teachers were asked to rank the following five factors on a scale from one to five: *time* (e.g. time during lessons and time for preparation), *relevance* (to the academic content of the subject), *resources* (e.g. space and materials), *support* (e.g. from colleagues and school management), and *individual competency* (e.g. for finding relevant and suitable CBPA). On a scale from 1-5, *five (5)* represented the most important facilitator/largest barrier for CBPA and *one (1)* represented the least important facilitator/smallest barrier for CBPA. To ensure that survey respondents were not influenced by a pre-determined order of factors, a validation was chosen for both questions. This meant that each individual survey respondent received the five factors in a random order.

Developed by Claude Fernet and colleagues (2008), *The Work Task Motivation Scale for Teachers* (WTMST) is designed to measure teachers' situational motivation towards six tasks that is part of teachers' work day: class preparation, teaching, evaluation of studies, classroom management, administrative tasks, and complementary tasks (Fernet et al., 2008). As such, this scale does not account for or measure future intentions or behaviours or work-level motivation. However, according to Fernet and colleagues (2008), who developed and validated the WTMST, it is possible, through this scale, to attain an increased understanding of teachers' situational motivation (Fernet et al., 2008). Due to the focus on CBPA, and the use of activities during teaching practices, the task of *teaching* was chosen for this study. The scale consists of 15 items,

which measures, based on the theoretical framework of SDT, intrinsic and extrinsic motivational reasons. More specifically it measures reasons such as intrinsic, identified, introjected, external, and amotivation. Each motivational type contains three questions addressing possible reasons for using CBPA - for example: “*Because, I find movement activities interesting to use*” (intrinsic reason); “*Because, I feel guilty if I don’t*” (introjected reason); “*Because, I am paid to use movement activities*” (external reason) (cf. appendix 1a and *Paper I-II*). The 15 items are scored on a 7-point Likert scale ranging from “*Does not correspond at all*” (1) to “*Corresponds completely*” (7). In line with the original validation of WTMST, the motivational regulation *integrated* is not included in the survey (Fernet et al., 2008).

### **3.2.3 Translation of the Work Task Motivation Scale for Teachers**

In order to adapt the WTMST to fit a Danish school context, the scale went through a *systematic back-translation process* (Brislin, 1970; Cha, Kim, & Erlen, 2007; McGorry, 2000). The process is based on Richard W. Brislin’s (1970) *back-translation model*, which offers a suitable strategy for appropriately translating the scale (Brislin, 1970). The back-translation process involved a translation of the English version of the WTMST to Danish by using a bilingual translator. Subsequently, the translated Danish survey was checked, adjusted and prepared for pilot-testing on a public-school representative of the overall study sample. The pilot-testing took place in the autumn of 2016 at a large public-school located in a municipality on Funen. 18 teachers participated in the pilot test. The aim was to make sure that the survey was understandable and meaningful to teachers. Therefore, as part of the pilot testing three teachers representing different grade levels were interviewed and asked about whether certain words, phrases and sentences, in their opinion, made sense and were suitable for a Danish school context (Brislin, 1970). After the pilot test, a group of qualified researchers reviewed

and discussed the scale and interview responses. The reference group consisted of researchers with a knowledge of the Danish school context specifically in regard to PA, well-being and learning. Based on their review and feedback, I made further adaptations and adjustments of the scale. Afterwards, the scale was translated back to English by another bilingual translator. A final step of the back-translation process was, together with an expert committee consisting of a native English speaker and experts with specific knowledge of teaching and school contexts, to compare and evaluate the back-translated English scale and the original English scale. During this committee meeting all meaning variations were thoroughly discussed. Thus, wording and translation of specific words that did not easily translate from English to Danish were discussed. In the end, the committee assessed that there were no significant variations in meaning between the two scales, and the adapted Danish survey was prepared for distribution with the rest of the survey questions. The English version and the final Danish version can be found in appendix 1a. The complete survey can be found in appendix 1b.

#### ***3.2.4 Validation of the WTMST - Confirmatory Factor Analysis***

In their initial validation study by Fernet and colleagues (2008), the purpose was, first of all, to develop a scale consisting of items that assess SDT-based motivational reasons and regulations (intrinsic, identified, introjected, external and amotivation) towards six different tasks carried out by teachers. The second purpose of the original study was to verify the construct validity of the scale. In their study they found good support for the scale construction, and their factor analysis revealed that it is possible to assess five different motivational reasons in accordance with the SDT continuum (Fernet et al., 2008).

Construct validity of the WTMST was, in a later study, supported by Gorozidis and Papaioannou (2014). In their Greek study they explored teachers' motivation by using an adapted version of the WTMST. Following a translation process to fit the scale into a Greek school context, they verified scale construction by using a *confirmatory factor analysis*. The purpose was to test whether the SDT continuum was suitable for exploring teachers' domain-specific motivation in a Greek setting. The result of the confirmatory factor analysis was satisfactory supporting the purpose of the study. Similar to my study, the second aim of the Greek study was to explore teachers' motivation to implement new innovations into teaching practices. Hence, it was expected, as it is in my thesis, that this can be done via the SDT continuum (Gorozidis & Papaioannou, 2014).

To verify the scale construction of WTMST in a Danish school setting, I conducted a confirmatory factor analysis in SPSS. In short, a confirmatory factor analysis is used to test whether a construct or scale is consistent with a researcher's understanding of a given factor and often this understanding is based on prior theory or research. Thus, when using a confirmatory factor analysis all factors are pre-determined and specified in accordance with, for instance, a theory. In this case, the SDT continuum, which in the WTMST consist of five motivational factors each measuring three items (Brown, 2015). In most studies, confirmatory factor analysis is used in scale development to examine the latent structure of that particular scale. In this sense, confirmatory factor analysis is used to verify the number of underlying factors of the particular scale or instrument (Brown, 2015). Moreover, a confirmatory factor analysis is an important tool for analysing scale reliability and construct validity, for instance, when you need to confirm or validate an instrument when it is used in a different context or culture for which it was created (Brown, 2015; Kyriazos, 2018).

In this study, the WTMST is used to measure Danish school-teachers' and teaching assistants' motivation towards a specific work task (teaching), and based on the scale construction, by comprising five subscales following the SDT continuum. Thus, based on SDT it is expected that the scale measures motivation based on the five motivational factors: intrinsic, identified, introjected, external and amotivation. Each factor consists of three related items. Following the systematic back-translation and adaption process, it is beneficial to explore - via factor analysis - if the scale actually holds for a Danish context. The basic idea of factor analysis - in SPSS - is to group the different items that measures for instance intrinsic motivation, identified regulation and so on. To exemplify, if item number 1, 2 and 3 measures intrinsic motivation - thus, the correlation between them should be substantial. This means that respondents, who scores high on one item of intrinsic motivation, should score high on the other two items as well (Brown, 2015). Table 1 shows correlations between the five motivational factors. Overall, the correlation matrix show that it was possible for SPSS to separate the autonomous forms of motivation (intrinsic and identified) and controlled forms of motivation (introjected, external and amotivation). For instance, the correlation between item number 6 and 7 goes from .700 to -.277, which indicates a low correlation between the two. Looking at the first six items (1-6), it seems that they are more difficult to separate, because the intrinsic and identified values are very similar - for instance in row 1 the values range from .700 - .816 indicating that their mutual relationship is high. Same goes for row 2 and 3. Looking at the controlled values, it seems that especially *introjection* has a clear correlation (grey box), because it clearly separates from both identified and external regulation. The same goes for amotivation (grey box). Regarding *external regulation* there seems to be an issue, where especially item 12 are very similar to item 7, 8, 9 and 13. This indicates - again - that these factors may be difficult to separate.

In summary, based on the confirmatory factor analysis and supported by previous studies by Fernet (2008) and Gorozidis (2014) it is reasonable to suggest that it is possible to measure teachers' motivation across five SDT-based subscales each consisting of three items. Moreover, it seems that it is possible to separate particularly autonomous (intrinsic and identified) and controlled (introjected, external, and amotivation) forms of motivation. However, it also seems that it may be more difficult to separate intrinsic and identified reasons for integrating CBPA and some of the external values. A way of solving this issue in future studies could be to collapse or reduce the number of factors to, for instance, intrinsic, external and amotivation. However, future studies are needed to explore this approach further.

**Table 1:** Correlation matrix computed via SPSS (n = 206).

|                 | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1) Intrinsic    | 1,000 | ,769  | ,780  | ,816  | ,715  | ,700  | -,277 | -,299 | -,255 | -,326 | -,417 | -,344 | -,587 | -,516 | -,585 |
| 2) Intrinsic    | ,769  | 1,000 | ,745  | ,748  | ,821  | ,767  | -,227 | -,277 | -,230 | -,355 | -,388 | -,323 | -,653 | -,605 | -,640 |
| 3) Intrinsic    | ,780  | ,745  | 1,000 | ,795  | ,759  | ,762  | -,245 | -,271 | -,258 | -,346 | -,335 | -,331 | -,636 | -,563 | -,591 |
| 4) Identified   | ,816  | ,748  | ,795  | 1,000 | ,664  | ,685  | -,275 | -,269 | -,218 | -,342 | -,344 | -,331 | -,593 | -,478 | -,550 |
| 5) Identified   | ,715  | ,821  | ,759  | ,664  | 1,000 | ,801  | -,228 | -,288 | -,287 | -,303 | -,398 | -,287 | -,592 | -,583 | -,613 |
| 6) Identified   | ,700  | ,767  | ,762  | ,685  | ,801  | 1,000 | -,281 | -,296 | -,238 | -,275 | -,340 | -,291 | -,550 | -,526 | -,565 |
| 7) Introjected  | -,277 | -,227 | -,245 | -,275 | -,228 | -,281 | 1,000 | ,756  | ,691  | ,497  | ,402  | ,131  | ,198  | ,239  | ,249  |
| 8) Introjected  | -,299 | -,277 | -,271 | -,269 | -,288 | -,296 | ,756  | 1,000 | ,786  | ,430  | ,487  | ,225  | ,267  | ,319  | ,335  |
| 9) Introjected  | -,255 | -,230 | -,258 | -,218 | -,287 | -,238 | ,691  | ,786  | 1,000 | ,420  | ,475  | ,223  | ,227  | ,322  | ,311  |
| 10) External    | -,326 | -,355 | -,346 | -,342 | -,303 | -,275 | ,497  | ,430  | ,420  | 1,000 | ,621  | ,402  | ,425  | ,350  | ,346  |
| 11) External    | -,417 | -,388 | -,335 | -,344 | -,398 | -,340 | ,402  | ,487  | ,475  | ,621  | 1,000 | ,499  | ,417  | ,399  | ,419  |
| 12) External    | -,344 | -,323 | -,331 | -,331 | -,287 | -,291 | ,131  | ,225  | ,223  | ,402  | ,499  | 1,000 | ,297  | ,270  | ,296  |
| 13) Amotivation | -,587 | -,653 | -,636 | -,593 | -,592 | -,550 | ,198  | ,267  | ,227  | ,425  | ,417  | ,297  | 1,000 | ,697  | ,762  |
| 14) Amotivation | -,516 | -,605 | -,563 | -,478 | -,583 | -,526 | ,239  | ,319  | ,322  | ,350  | ,399  | ,270  | ,697  | 1,000 | ,845  |
| 15) Amotivation | -,585 | -,640 | -,591 | -,550 | -,613 | -,565 | ,249  | ,335  | ,311  | ,346  | ,419  | ,296  | ,762  | ,845  | 1,000 |

### ***3.2.5 Analysis of survey data***

After a systematic and thorough double-entering of all survey data into SPSS by myself and another researcher, all data were analysed using SPSS Statistical Software (v.24). In order to gain a nuanced and detailed account of teachers' motivation, the analytical process involved both a basic descriptive analysis and a more advanced statistical approach.

#### *Descriptive analysis*

Motivational data and demographic information were initially - and mainly in a descriptive manner - organised and summarised in tables to use in *Paper II*. The analysis for *Paper II* included measures of mean, median, standard deviation, and range (including the interquartile range (IQR)) (Antonius, 2011). These measures were used to analyse the degree of dispersion in the dataset - specifically measuring the distribution of survey respondents in relation to intrinsic and extrinsic values. Relevant numerical features of the data can be seen in the result section in *Paper II* and in the result section in this thesis. In line with the sequential design chosen for this thesis, survey data were also used as a stepping stone between the two phases - specifically concerning recruitment and interview protocol development (Creswell & Clark, 2018).

#### *The Relative Autonomy Index (RAI)*

In a more advanced statistical analysis of survey data, I included the *Relative Autonomy Index* (RAI). RAI directly measures motivational autonomy. As such, it measures whether a persons' motivation for his or her behaviour in a specific domain is fairly autonomous as opposed to controlled (Ryan & Deci, 2000b; Deci & Ryan, 2012; Vaz, Pratley & Alkire, 2016). In accordance with SDT, this means that people, who feel autonomous act in accordance with their own values

and beliefs. Reversely, a person’s actions are more controlled, if they are driven by external factors such as pressure and demands (Ryan & Deci, 2000b). Using both the WTMST and the RAI score provide a detailed account of teachers’ and teaching assistants’ motivation and whether their actions and behaviour are predominantly autonomous or controlled (Vallerand & Bissonette, 1992, Vaz, Pratley & Alkire, 2016). RAI is calculated by a mathematical formula where each motivational reason is given either a positive or negative weight depending on its position on the SDT continuum. Autonomous forms of motivation are weighted positive and controlled types are weighted negative. This means that a positive RAI score indicates that behaviour is based on autonomy or autonomous reasons. Reversely, a negative RAI score would indicate that behaviour is based on controlled reasons. The standard structure for RAI for all six motivational types (ranging from -3 to +3) can be seen in figure 4 (Vallerand and Bissonette, 1992):

**Figure 4:** Illustration of the RAI weighting structure (Vallerand & Bissonette, 1992).

|   |                             |                               |                              |                              |   |
|---|-----------------------------|-------------------------------|------------------------------|------------------------------|---|
| <b>Non-self-determined</b><br><br>Controlling<br>(Low autonomy) | <b>Extrinsic Motivation</b> |                               |                              |                              | <b>Self-Determined</b><br><br>Autonomous<br>(high autonomy) |
| <b>Amotivation</b>  | <b>External Regulation</b>  | <b>Introjected Regulation</b> | <b>Identified Regulation</b> | <b>Integrated Regulation</b> | <b>Intrinsic Motivation</b>                                 |
| -3  | -2                          | -1                            | +1                           | +2                           | +3  |

In this study, integrated regulation (+2) is left out of the survey and is therefore not part of the RAI calculation. To exemplify, the actual calculation of RAI, for a survey respondent who obtained the following scores on a 7-point Likert scale is: 5 (amotivation), 4 (external), 5

(introjected), 3 (identified), 2 (intrinsic) is:  $(5 \times -3) + (4 \times -2) + (5 \times -1) + (3 \times +1) + (3 \times +3) = -14$ . The result is a negative RAI score indication that this person behavior within the specific domain is based on controlled reason. For this thesis, and based on this mathematical procedure presented by Vallerand and Bissonnette (1992), the following formula was computed via SPSS:  $(s_5 \times -2) + (s_6 \times -1) + (s_7 \times +1) + (s_8 \times +3) + (s_9 \times -3) + (s_{10} \times +3) + (s_{11} \times -1) + (s_{12} \times -2) + (s_{13} \times -1) + (s_{14} \times +1) + (s_{15} \times +3) + (s_{16} \times -3) + (s_{17} \times -3) + (s_{18} \times -2) + (s_{19} \times +1) = \text{RAI score}$ . The items s\_5 to s\_19 are each individual item/statement in the WTMST. A detailed illustration of the calculation procedure can be found in table 2, which also shows that the range of the relative autonomy continuum - across all 15 items in the WTMST - ranges from - 123 to + 84. Hence, the highest possible score is + 84 and lowest possible score is - 123. It is within this range we find teachers' and teaching assistants' RAI score.

**Table 2:** Illustration of RAI calculation (n = 206).

| Calculation                        | Total weight | Item   | Motivational reason | Weight |
|------------------------------------|--------------|--------|---------------------|--------|
| $(s_8 \times +3) 7^*+3 =$          | 21           | s_8    | Intrinsic           | +3     |
| $(s_{10} \times +3) 7^*+3 =$       | 21           | s_{10} |                     |        |
| $(s_{15} \times +3) 7^*+3 =$       | 21           | s_{15} |                     |        |
| $(s_7 \times +1) 7^*+1 =$          | 7            | s_7    | Identified          | +1     |
| $(s_{14} \times +1) 7^*+1 =$       | 7            | s_{14} |                     |        |
| $(s_{19} \times +1) 7^*+1 =$       | 7            | s_{19} |                     |        |
| $(s_6 \times -1) 7^*-1 =$          | -7           | s_6    | Introjected         | -1     |
| $(s_{11} \times -1) 7^*-1 =$       | -7           | s_{11} |                     |        |
| $(s_{13} \times -1) 7^*-1 =$       | -7           | s_{13} |                     |        |
| $(s_5 \times -2) 7^*-2 =$          | -14          | s_5    | Extrinsic           | -2     |
| $(s_{12} \times -2) 7^*-2 =$       | -14          | s_{12} |                     |        |
| $(s_{18} \times -2) 7^*-2 =$       | -14          | s_{18} |                     |        |
| $(s_9 \times -3) 7 \times -3 =$    | -21          | s_9    | Amotivation         | -3     |
| $(s_{16} \times -3) 7 \times -3 =$ | -21          | s_{16} |                     |        |
| $(s_{17} \times -3) 7 \times -3 =$ | -21          | s_{17} |                     |        |

### *Simple linear regression analysis*

To explore the relationship between RAI and age, gender, experience and job type (teachers and teaching assistants), I used a *simple linear regression analysis* (Diez, Barr & Centikaya-Rundel, 2015). This type of analysis is most commonly used, if you aim to predict one variable on the basis of another variable. In my linear regression analyses, I used RAI as the outcome (*dependent variable*) and job type, age, gender, and experience as the *independent variables*. As such, I am interested in exploring if gender, age, experience and job type influence how high or low respondents score on the *Relative Autonomy Index*. To start with I used the custom tables function in SPSS to compare RAI with the chosen demographic information. This was done to create a basic overview before continuing to the linear regression analysis, which was used to explore whether there was a significant difference – for instance between teachers’ and teachings assistants’ RAI scores. Results from all statistical analyses from SPSS - both the descriptive and advanced analyses - can be found in the result section.

### **3.3 Phase II: The Qualitative Phase**

The purpose of the qualitative phase was to elaborate on the understanding of teachers’ motivational reasons for integrating CBPA. In addition, a purpose of the qualitative phase was to point out usable ways to support teachers’ motivation and sustained use of CBPA.

#### ***3.3.1 Participants, sampling, and recruitment procedures***

The selection of participants for Phase II was based on a number of criteria. First of all, it was important to include teachers with different motivational reasons for integrating CBPA. All interview participants delivered CBPA to some extent (from daily to a few times a month). Thus, including teachers with different approaches, motives and reasons made it possible to explore

what might facilitate or hinder teachers' integration of CBPA. In order to reach a variety of participants, I also included teachers across ages, experiences, grade levels and subjects. Practically, participants for Phase II, were recruited through the survey. Respondents were asked to provide their email address, if they wanted to participate in an in-depth interview. When the survey closed, 17 survey respondents had typed in their email addresses. In the overall sample, 7 were male and 10 were female. 13 were employed as teachers whereas the remaining three participants were employed as teaching assistants or held a position as head of department. Mean age was 45,8 years and mean working experience were 13,3 years. The mean age and mean experience of the nine interviewed teachers were 46 years and 12,1 years – as such they do not differ greatly from the entire interview sample. Neither do they differ from the survey sample where mean age is 42,9 years and mean experience is 13,3 years. In the final interview sample, 8 were female and 1 were male and the sample only consisted of teachers. Looking at the entire sample of 17, it is more balanced in gender, and even though a large part of the sample are teachers, it could have been possible to include, for instance, teaching assistants or more male participants into the final interview sample. Looking at their motivational level, I was able to recruit teachers showing different motives for integrating CBPA – i.e. both intrinsically and extrinsically teachers are represented in the final sample (cf. table 4, p. 57). However, had I been able to recruit all or most of the entire interview sample would have provided a more solid foundation for interviewing teachers with different motives and reflections concerning the integration of CBPA.

### ***3.3.2 Data collection - interview***

In Phase II data were collected through in-depth semi-structured interviews (a Danish version of the interview guide can be found in appendix 2). In accordance with the mixed methods

design, I began development of the interview protocol after data from the survey was analysed and summarised. As an overall guide, concepts from SDT and scaffolding were used to shape and direct questions. In line with SDT and survey findings teachers were asked to reflect on motivational reasons for integrating CBPA. In addition, other topics concerning teachers' experiences and feelings of autonomy, competence and relatedness – the three basic needs defined by SDT – were addressed, because I wanted to explore the level and influence of these basic components for teachers' motivation. In line with the concepts of scaffolding, teachers were asked to reflect upon current levels of support – both at an individual, collegial and school level. Accordingly, I was interested in their opinion on practical and usable support for sustained use of CBPA. Topics such as perception of the PA policy, perceived barriers and facilitators related to daily teaching and classroom routines, didactical reflections as well as implications for teaching practices in and across school subjects were also addressed. By using a semi-structured approach containing open-ended questions, it was possible for teachers to share and express their feelings, reflections, opinions and experiences with CBPA in detail (Kvale, 2007). In addition, I added follow-up/probing questions to explore a view or opinion in detail. To secure relevance and accuracy, the interview guide was pilot-tested before data collection began in August 2017. Only minor adjustments of the interview guide were needed.

### ***3.3.3 Analysis of the qualitative data – thematic analysis***

Thematic analysis has been the primary tool for analysing the qualitative data. Thematic analysis offers a flexible and suitable tool for identifying, analysing and reporting on patterns and features across interview data (Braun & Clarke, 2006). In line with the thoughts of pragmatism, thematic analysis also serves as a tool for staying close to and analysing contextual characteristic/issues that may influence the experiences and perspectives told by the teachers.

This means that teachers' interpretations and reflections on a given situation, action or behaviour is the most appropriate account (Joffe & Yardley, 2011; Vaimoradi, Turunen, & Bondas, 2013). Another important feature of thematic analysis, which also informed the analytical processes in this thesis, is the possibility of approaching the data either deductively (theory-driven) and inductively (data-driven) (Braun & Clarke, 2006). Practically, thematic analysis involves six steps: 1) *familiarising yourself with the data*; 2) *generating initial codes*; 3) *searching for themes*; 4) *reviewing themes*; 5) *defining and naming themes*; and 6) *producing the report* (Braun & Clarke, 2006). Guided by the different objectives of *Paper II* and *Paper III*, thematic analysis was carried out in two separate sequences. Each analysis followed the six steps by Braun and Clarke, but they differed in their analytical approach to the data. While this thesis is primarily theory-driven, the thematic analysis for *Paper III* took a more inductive coding approach. In the following, I will briefly describe the process of the two analytical sequences for *Paper II* and *Paper III* respectively.

*Paper II:* In the first phase of familiarisation, I transcribed all interview data independently immediately after each interview. This was done to ensure consistency and accuracy in the analytical work. I used the NVivo Software (v.12) to systematically organise all transcripts. During this first phase of the analytical work, I carefully read all interview transcripts. During this process, I began generating initial coding ideas guided by the concepts and principles of SDT. Hence, I searched for codes related to the three core concepts – autonomy, competence, and relatedness as well as motivational aspects related to the SDT continuum. In line with the sequential design, I searched for topics that could explain and elaborate initial findings from the WTSMT – such as for instance motivational reasons for integrating CBPA. During the coding process, step 2, 3, and 4 occurred rather dynamic. Thus, at times, I moved back and forwards

between the steps, before I finally refined and specified themes in step 5. In order to check for reliability and trustworthiness of the emerging codes and themes, another researcher conducted a systematic double-coding process in Nvivo. During this double-coding process it was possible to discuss codes and themes and check for accuracy. In case of differences, we discussed the particular code or theme. The final themes can be found in *Paper II*. Overall, the analytical work carried out for *Paper II*, followed a somewhat structured and systematic thematic analysis – informed and shaped by the principles of SDT with the purpose of elaborating on teachers’ motivation for integrating CBPA.

*Paper III*: In line with the second objective of this thesis, the purpose of *Paper III* was to identify factors associated with teachers’ sustained use of CBPA and point out usable ways to support teachers. As part of the initial familiarisation step, I re-read all interview data. I deemed that this step was necessary to familiarise myself with the interview data again. The initial reading as well as initial coding ideas were inspired and informed by the scaffolding framework. Hence, scaffolding was used as a preliminary deductive coding scheme searching for concepts or more concretely, examples of ‘scaffolds’. After this, a more data-driven inductive coding process began. This meant that I took an open-minded perspective on the data, not trying to fit the data into the scaffolding framework. In my opinion, this provided a richer analysis of the data. As part of this inductive process, co-author of *Paper III*, Nikolaj Elf and myself, re-read the entire data set separately. In the following steps, notes and initial coding ideas were compared and discussed. Later, we refined and specified themes and checked for accuracy. This second analytical process for *Paper III* enabled an extended identification of a variety of aspects related to teachers’ integration of and commitment to CBPA. For instance, concepts such as meaning,

meaningfulness and didactical reflections emerged during the open inductive analysis. For this reason, supplementary didactic theory was adopted. The final themes can be seen in *Paper III*.

### **3.4 Ethical considerations**

All participants in this study received detailed information about the purpose of the study and their participation. Before the distribution of the survey, teachers received written information through schools' internal mailing system distributed by the school management. Before each interview, participants received oral and written information about the purpose of the study and purpose of the interview. Each participant gave consent to participate and signed a written consent form before the interview began (a Danish version of the consent form can be found in appendix 3). All participants' names and names of schools/places are anonymised in all documents, articles, and publications. Ethic approval was requested from The Regional Committee on Health Research Ethics for Southern Denmark (ID S-20162000-40), and The Danish Data Protection Agency (ID 16/15491). The study was deemed not notifiable by both authorities. The study is registered at Clinical Trials with ID NCT02894346.

## **4. Findings**

In the following section, I present findings from both the quantitative and qualitative phase. The section starts out with a presentation of demographic information of both survey respondents and interview participants. Next, I descriptively present general survey findings mainly on frequency and placement of CBPA as well as teacher-perceived facilitators and barriers. In the next section, I focus on teachers' motivation where I present findings from the WTMST as well as general findings from the interviews on teachers' motivational reasons for integrating CBPA. It is also in this particular section I include results from the *Relative Autonomy Index* and the regression analysis. Next, I present findings on teachers' motivation and go deeper into the factors closely related to motivation as well as identify usable support for teachers.

### **4.1 Demographic information**

#### ***4.1.1 Survey respondents***

206 teachers and teaching assistants answered the survey. Respondents were from 14 different public-schools in Denmark. Schools ranging in size from small country-side schools (less than 100 students) to large city schools (more than 1000 students) were included in the sample. 76,2 % of the survey respondents were employed as teachers. All teachers had received formal teacher training. The remaining respondents were primarily teaching assistants. Survey respondents' mean age was 42.9 years, and mean experience (i.e. length of employment as a teacher or teaching assistant) was 13.3 years. 74.3 % of the respondents were female. From pre-school to 10<sup>th</sup> grade respondents were distributed almost equally with a slightly higher number of respondents in the pre-preparatory grades (pre-school – 3<sup>rd</sup> grade). Respondents

were asked to check of all of their current subjects, and the five most dominant were: Danish (49%); Math (41,7 %); PE (32,5 %); English (25,7 %); and Religion (30,6 %). Table 3 offers an overview of selected demographic information of survey respondents:

**Table 3:** Demographic information of survey respondents (n = 206) (copied from *paper II*).

| Demographic information   | Total (n)  | Total %    |
|---|------------|------------|
| <b>Gender</b>   | <b>206</b> | <b>100</b> |
| Male  | 53         | 25.7       |
| Female  | 153        | 74.3       |
| <b>Distribution of age</b>  | <b>206</b> | <b>100</b> |
| 20-29   | 27         | 13,1       |
| 30-39   | 55         | 26.7       |
| 40-49   | 68         | 33.0       |
| 50-59   | 44         | 21.4       |
| 60-70   | 12         | 5,8        |
| <b>Experience – i.e. working as a teacher or teaching assistant</b>   | <b>206</b> | <b>100</b> |
| 0-10  | 89         | 43.2       |
| 11-20   | 82         | 39,8       |
| 21-30   | 22         | 10.7       |
| 31-40   | 13         | 6.3        |
| <b>Job type</b>   | <b>206</b> | <b>100</b> |
| Teacher   | 157        | 76,2       |
| Teaching assistant  | 30         | 14.6       |
| Other (e.g. teacher student, intern, substitute, teaching consultant) | 19         | 9,2        |

#### **4.1.2 Interview participants**

Nine teachers were interviewed in the qualitative phase. Eight females and one male were interviewed. Participants mean age was 46 years, and their mean teaching experience was 12.1 years. All interview participants were employed as teachers and had received formal teacher training. Two out of nine teachers had – at the time of the interviews – attended a course focusing on CBPA. As table 4 on the next page shows, participants teach in a variety of subjects and grade levels. Concerning their level of motivation measured by the WTMST, interview participants range from *highly intrinsically motivated* (participant 1, 2, 3, 5, 9), *both intrinsically and extrinsically motivated* (participant 6) to *mostly extrinsically motivated* (participant 4, 8) for using CBPA (cf. *Paper II*). All demographic information was generated via survey data. Overall, interview participants resemble the demographic data of survey respondents – both in terms of mean age, and experience, and in terms of primary subjects and representation across grade

levels. Overall, interview participants' motivational level matches the general findings from the survey (cf. table 9).

**Table 4:** Characteristics of interview participants including level of motivation pulled from the WTMST (n = 9) (copied from *Paper II*).

| Participant | Age   | Gender | Experience | Subject(s)   | Grade level                             | Level of motivation (mean)   |
|-------------|-------|--------|------------|--|---|--|
| 1           | 30-39 | Female | 10         | Danish, History, Religion and PE                   | 7 <sup>th</sup> grade                   | Intrinsic: 6.3<br>Identified: 6.3<br>Introjected: 1.0<br>External: 3.7<br>Amotivation: 1.0 |
| 2           | 50-59 | Female | 2          | Nature and Technology, Maths, and PE               | 1 <sup>st</sup> – 4 <sup>th</sup> grade | Intrinsic: 7.0<br>Identified: 7.0<br>Introjected: 1.7<br>External: 3.3<br>Amotivation: 1.7 |
| 3           | 40-49 | Female | 16         | Danish   | 3 <sup>rd</sup> grade                   | Intrinsic: 7.0<br>Identified: 7.0<br>Introjected: 1.0<br>External: 1.0<br>Amotivation: 1.0 |
| 4           | 60-69 | Female | 12         | Danish and English                                 | 6 <sup>th</sup> grade                   | Intrinsic: 2.3<br>Identified: 2.3<br>Introjected: 4.3<br>External: 4.3<br>Amotivation: 4.0 |
| 5           | 30-39 | Female | 13         | Danish, History, Religion, PE, and Home Economics  | 7 <sup>th</sup> – 9 <sup>th</sup> grade | Intrinsic: 6.7<br>Identified: 6.7<br>Introjected: 1.0<br>External: 3.7<br>Amotivation: 1.0 |
| 6           | 50-59 | Male   | 22         | Danish, Maths, and Craft & Design                  | 7 <sup>th</sup> – 9 <sup>th</sup> grade | Intrinsic: 6.0<br>Identified: 5.7<br>Introjected: 6.0<br>External: 4.3<br>Amotivation: 2.0 |
| 7           | 20-29 | Female | 2          | Maths, History, Religion, and Nature & Technology. | 4 <sup>th</sup> – 6 <sup>th</sup> grade | Intrinsic: 4.7<br>Identified: 3.7<br>Introjected: 1.0<br>External: 2.7<br>Amotivation: 3.7 |
| 8           | 40-49 | Female | 12         | Danish, History, Religion, and Craft & Design.     | 4 <sup>th</sup> grade                   | Intrinsic: 2.7<br>Identified: 2.3<br>Introjected: 4.7<br>External: 4.3<br>Amotivation: 6.3 |
| 9           | 40-49 | Female | 20         | PE, Maths, Religion, and Nature & Technology.      | 4 <sup>th</sup> – 6 <sup>th</sup> grade | Intrinsic: 7.0<br>Identified: 7.0<br>Introjected: 1.0<br>External: 3.7<br>Amotivation: 1.0 |

## 4.2 General survey findings

### 4.2.1 Frequency and placement of classroom-based physical activity

To generate knowledge of how often and where teachers, generally, deliver CBPA, survey respondents were asked about frequency and typical placement of CBPA in the survey. Table 5 shows that the majority of teachers and teaching assistants in this study use CBPA *several times a week* (47,6 %). 25,7 % use CBPA on a daily basis. This suggests a rather high PA frequency among the survey sample. Only five teachers use CBPA less than one time a month. Table 5 also shows that teachers and teaching assistants, typically, place CBPA in *subject-divided teaching* (i.e. Math, English, Danish etc.) or *both* (i.e. subject divided teaching and assisted learning). Only 16 survey respondents place CBPA exclusively in *assisted learning* lessons. The low usage level of CBPA in assisted learning may be due to the fact that the majority of respondents are teachers, who, typically, are responsible for subject-divided teaching, and therefore use this as a setting for enactment of CBPA.

**Table 5:** Frequency and placement of CBPA (n = 206).

|  | <b>Total (count)</b> | <b>Total (%)</b> |
|--|----------------------|------------------|
| <b><i>“How often do you use CBPA?”</i></b> |                      |                  |
| Every day                                  | 53                   | 25,7             |
| Several times a week                       | 98                   | 47,6             |
| Once a week                                | 30                   | 14,6             |
| 1-3 times a month                          | 20                   | 9,7              |
| Less than one time a month                 | 5                    | 2,4              |
| <b>Total</b>                               | <b>206</b>           | <b>100</b>       |
| <b><i>“Where do you use CBPA?”</i></b>     |                      |                  |
| Subject-divided teaching                   | 101                  | 49,0             |
| Assisted learning                          | 16                   | 7,8              |
| Both                                       | 89                   | 43,2             |
| <b>Total</b>                               | <b>206</b>           | <b>100</b>       |

In line with frequency and placement of CBPA, survey respondents were also asked *to what degree* CBPA is linked to the content of subjects, and to *what degree* they find it meaningful to link PAs and subject-specific content. Table 6 shows that the majority of teachers and teaching assistants link PA to subject-specific content. This finding suggests that respondents to a rather

high degree link CBPA with subject-specific content. However, it does not show what types of activities are chosen (e.g. brain breaks or content-related PA). Neither does it show *how* or to what degree activities are, in fact, integrated. In line with findings in table 7, the majority of teachers and teaching assistants find it somewhat meaningful to integrate CBPA with subject-specific content.

**Table 6:** "To what degree is CBPA linked to the academic content of the subject?" (n = 206)

|                       | <b>Total (count)</b> | <b>Total (%)</b> |
|-----------------------|----------------------|------------------|
| To a very high degree | 29                   | 14,1             |
| To a high degree      | 60                   | 29,1             |
| To some degree        | 87                   | 42,2             |
| To a low degree       | 22                   | 10,7             |
| To a very low degree  | 8                    | 3,9              |
| <b>Total</b>          | <b>206</b>           | <b>100</b>       |

**Table 7:** "To what degree do you find it meaningful to link CPBA with the academic content of the subject?" (n = 206)

|                       | <b>Total (count)</b> | <b>Total (%)</b> |
|-----------------------|----------------------|------------------|
| To a very high degree | 43                   | 20,9             |
| To a high degree      | 73                   | 35,4             |
| To some degree        | 74                   | 35,9             |
| To a low degree       | 14                   | 6,8              |
| To a very low degree  | 2                    | 1,0              |
| <b>Total</b>          | <b>206</b>           | <b>100</b>       |

#### **4.2.2 Teacher-perceived barriers and facilitators**

Regarding teachers' general perception of integrating CBPA into teaching practices and to gain an insight of most important facilitators and barriers on a personal and contextual level, respondents were asked about five specific known to influence teachers' integration of CBPA. As shown in table 8, respondents identified *relevance* (3.75) and *time* (3.48) as the most important facilitators for CBPA. Reversely, respondents identified *support* as the least important facilitator (1.85). Table 8 also shows that *time* is perceived as a major barrier for integrating CBPA (4.20). *Resources* - or lack of resources - is identified as the second largest barrier for CBPA (3.23). The least important barrier for CBPA is *support* (2.28).

**Table 8:** Teacher-perceived facilitators and barriers for CBPA (n = 206)

|                                       | Mean | Scale |
|---------------------------------------|------|-------|
| <b>Teacher-perceived facilitators</b> |      |       |
| Relevance                             | 3.75 | 1-5   |
| Time                                  | 3.48 | 1-5   |
| Individual competency                 | 2.96 | 1-5   |
| Resources                             | 2.94 | 1-5   |
| Support                               | 1.85 | 1-5   |
| <b>Teacher-perceived barriers</b>     |      |       |
| Time                                  | 4.20 | 1-5   |
| Resources                             | 3.23 | 1-5   |
| Relevance                             | 2.89 | 1-5   |
| Individual competency                 | 2.39 | 1-5   |
| Support                               | 2.28 | 1-5   |

In summary, these general findings from the survey indicate that most teachers use CBPA several times a week, and that CBPA typically is placed in subject-divided teaching. Findings also suggest that while most teachers find it meaningful to integrate CBPA, teachers also identify barriers and facilitators associated with CBPA, where time is seen both as a major barrier and facilitator. Based on these general survey findings, which establishes that teachers in this study do, in fact, use CBPA rather frequently and to some extent acknowledge that it can be meaningful, the following sections focus on motivation.

### 4.3 Teachers' motivation

#### 4.3.1 Teachers' intrinsic and extrinsic motivation – WTMST findings

The descriptive analysis of WTMST data revealed that teachers and teaching assistants scored high on autonomous forms of motivation (*intrinsic* and *identified*) for using CBPA, and low on controlled types of motivation (*introjected*, *extrinsic*, and *amotivation*) (cf. Paper II).

**Table 9:** Teachers' and teaching assistants' level of motivation measured by the WTMST (n = 206) (cf. paper II) (IQR: Inter Quartile Range).

| Variables   | Total | Missing | Mean (SD)   | Median (IQR) | Range | Scale |
|-------------|-------|---------|-------------|--------------|-------|-------|
| Intrinsic   | 206   | 5       | 5.01 (1.44) | 5.00 (2.00)  | 6.00  | 1-7   |
| Identified  | 206   | 5       | 4.77 (1.44) | 5.00 (2.00)  | 5.00  | 1-7   |
| Introjected | 206   | 5       | 2.49 (1.40) | 2.00 (2.00)  | 6.00  | 1-7   |
| Extrinsic   | 206   | 5       | 2.66 (1.34) | 3.00 (1.00)  | 6.00  | 1-7   |
| Amotivation | 206   | 5       | 2.17 (1.33) | 2.00 (2.00)  | 6.00  | 1-7   |

The findings in table 9 indicate that the majority of teachers and teaching assistants find CBPA both enjoyable, interesting and important to use, which, based on SDT, is *intrinsic* and *identified* reasons. Intrinsically motivated teachers integrate CBPA, because they perceive this particular task as inherently satisfying or because they find it pleasurable or enjoyable – simply because this task in itself is interesting and satisfying. In line with SDT, this could indicate that the positive benefits resulting from using CBPA are what drives and motivates teachers. Accordingly, teachers find CBPA both satisfying and rewarding, which in line with SDT, is an identified reason occurring when an activity or task is seen as valuable and important for achieving a desired outcome (cf. figure 1). Concerning CBPA, this could indicate that teachers have identified the task of CBPA as valuable and beneficial for achieving a desired outcome – for instance a certain learning outcome that they deem to be important for their students.

The descriptive analysis of survey findings also revealed reasons based on introjection, external motivation or amotivation suggesting that teachers in this study also integrate CBPA based on controlled reasons. In line with SDT, external and introjected reasons imply that teachers have somewhat lost a sense of autonomy thereby making room for feelings of pressure and compliance – for instance, they are controlled by the PA policy demand or school management to integrate PA. Other controlled reasons for integrating CBPA is to avoid feelings of guilt - i.e. teachers know they must carry out this task, but their reason for it is not based on interest or enjoyment. They carry out this task to not feel bad or guilty. Payment also constitute an external reason for carrying out a task. Thus, teachers carry out CBPA because they are paid to do it and/or because it is part of their teaching responsibilities, not because they value or find CBPA interesting or inherently satisfying. Those teachers feeling amotivated carry out CBPA without intent – i.e. they no longer see the relevance of integrating CBPA – mainly because they do not

see the value of it or because they do not feel competent enough to gain a desired outcome of CBPA.

#### **4.3.2 Findings from the Relative Autonomy Index (RAI)**

For the purpose of creating a more nuanced account of teachers' and teaching assistants' motivation, I have calculated survey respondents RAI score. As table 10 shows, the average RAI score is 0.85. Compared to the findings from the WTMST, which established that teachers and teaching assistants are predominately autonomously motivated, the RAI score is relatively low. However, it is still positive, which indicates that teachers' and teaching assistants' behaviour – within the school context - is somewhat motivated by interest and personal values rather than controlling external factors.

**Table 10:** Mean RAI score

| <b>Total (n)</b> | <b>Mean RAI score (SD)</b> |
|------------------|----------------------------|
| 206              | <b>0.85</b> (29,224)       |

#### **4.3.3 Regression analysis**

Table 11 and table 12 shows RAI score compared to job type, gender, age and experience. In the first table (11), which is a custom table generated via SPSS, the RAI score is negative for teachers (-4), indicating that their behaviour is somewhat controlled. Reversely, teaching assistants seems to be considerably more autonomous in their behaviour with a RAI score of +20. It also seems that female teachers feel slightly more autonomous than male teachers. Regarding age there seems to be a rather large gap between the age 20-29 and 30-39, ranging from +9 to -7. This could indicate that younger teachers feel more autonomous than older teachers. Regarding length of employment (experience), the largest gap can be found between

21-30 (+4) years and 31-40 years (-4) indicating that teachers with a rather long length of employment feel less autonomous than those who have worked fewer years in a public-school

**Table 11:** RAI score compared to job type, gender, age and experience – descriptive custom table.

|                    | Total (n)  | RAI score |
|--------------------|------------|-----------|
| <b>Job type</b>    | <b>206</b> |           |
| Teacher            | 157        | -4        |
| Teaching assistant | 30         | 20        |
| Other              | 19         | 10        |
| <b>Gender</b>      | <b>206</b> |           |
| Male               | 53         | -1        |
| Female             | 153        | 2         |
| <b>Age</b>         | <b>206</b> |           |
| 20-29              | 27         | 9         |
| 30-39              | 55         | -7        |
| 40-49              | 68         | 4         |
| 50-59              | 44         | 3         |
| 60-70              | 12         | -5        |
| <b>Experience</b>  | <b>206</b> |           |
| 0-10               | 89         | 1         |
| 11-20              | 82         | 0         |
| 21-30              | 22         | 4         |
| 31-40              | 13         | -4        |

A simple linear regression analysis was conducted in SPSS to predict RAI based on job type, gender, age and length of employment. Table 12 shows that there is a significant difference between teachers' and teaching assistants RAI score controlled for gender, age and experience. This underlines that teaching assistants feels more autonomous than teachers. The table also show that the difference between age groups 20-29 and 30-39 is significant. This means that – across survey respondents – those aged 30-39 feels significantly more controlled.

**Table 12:** RAI score compared to job type, gender, age and experience – linear regression analysis (n = 206).

|                    | Unstandardized Coefficients |            | Sig.        | 95,0 % Confidence Interval for B |             |
|--------------------|-----------------------------|------------|-------------|----------------------------------|-------------|
|                    | B                           | Std. Error |             | Lower Bound                      | Upper Bound |
| (Constant)         | 6,406                       | 5,476      | ,244        | -4,394                           | 17,205      |
| Teaching assistant | 26,361                      | 5,630      | <b>,000</b> | 15,258                           | 37,465      |
| Other              | 12,642                      | 6,833      | ,066        | -,833                            | 26,117      |
| Male               | -1,720                      | 4,492      | ,702        | -10,578                          | 7,138       |
| Age 30-39          | -20,047                     | 6,902      | <b>,004</b> | -33,660                          | -6,435      |
| Age 40-49          | -9,058                      | 7,381      | ,221        | -23,615                          | 5,499       |

|                  |         |        |      |         |        |
|------------------|---------|--------|------|---------|--------|
| Age 50-59        | -12,424 | 8,256  | ,134 | -28,707 | 3,859  |
| Age 60-70        | -22,919 | 12,892 | ,077 | -48,345 | 2,507  |
| Experience 11-20 | 2,678   | 5,005  | ,593 | -7,194  | 12,549 |
| Experience 21-30 | 6,004   | 8,060  | ,457 | -9,893  | 21,900 |
| Experience 31-40 | 8,089   | 11,388 | ,478 | -14,372 | 30,549 |

a. Dependent variable: RAI

b. Reference categories: Teacher (job type), Female, Age 20-29, Experience 0-10

c. Significant value set to 0,05.

#### **4.3.4 Teachers' intrinsic and extrinsic motivation – interview findings**

In general, findings from the interviews support survey findings regarding teachers' motivational reasons – both autonomous and controlled reasons for enacting CBPA. Teacher statements such as *“I think it works, and I think that I benefit from it” ... “I like it” ... “I think it is liberating”* are – in line with SDT - indications of intrinsic and identified reasons for integrating CBPA (cf. *Paper II*). Other types of identified reasons expressed by the teachers are predominately based on the importance of addressing PA in schools and positive student outcomes such as health, well-being and enjoyment (cf. *Paper II*). While, there were no indications of *amotivated* teachers among the interview participants, there were a number of teachers, who expressed extrinsic reasons for integrating CBPA. A few teachers reported reasons or feelings that could suggest introjected regulation, where the reason for using CBPA is linked to feelings of guilt: *“I have to admit, I do it because I feel guilty ... It's my own conscience”*. Other types of extrinsic reasons were typically associated with feelings of pressure or adherence to external demands. Teachers explained that, in some cases, pressure came from school management or the actual PA policy: *“It is put on me by the school management” ... and “I can't decide whether or not to do it, but I can decide the type and frequency”* (cf. *Paper II*).

#### **4.4 Factors associated with teachers' motivation**

In the following section, I present findings across papers. I have framed the presentation of results in accordance with concepts from SDT (autonomy, competence and relatedness). Next,

I present additional findings on factors closely associated with teachers' motivation for integrating CBPA as well as the most important supportive resources. In the end, I summarise findings on teacher-perceived facilitators and barriers.

#### **4.4.1 Teaching autonomy**

“In our school the approach is that physical activity is a good idea, but we do not have any clear guidelines of how much. I think the ministry says 45 minutes per day. I think it is nice that I can just put it in when it makes sense for my teaching, and when it makes sense for my students”  
(Participant 7, *Paper II*).

Even though teachers are instructed by a national policy to integrate CBPA, teachers reported that they are able to choose, organise and place CBPA when it is meaningful and suitable (cf. *Paper II*). Most often teachers reported feeling autonomous regarding teaching practices, classroom-routines and choices regarding students' learning and well-being. Thus, feeling free to choose and place activities when it is relevant for teaching, subject-content and students. This is – in line with SDT – an indication of autonomy, because teachers are free to self-organise and determine when and how to integrate CBPA (Ryan & Deci, 2000b). All teachers expressed that this feeling of *teaching autonomy* is a highly valued, appreciated and motivating work-related condition. The abovementioned quote also illustrates that this particular school does not have any 'clear guidelines or instructions' for enactment of CBPA. As this particular teacher states this 'lack of instruction' is preferred, because it establishes autonomy and self-determination rather than control. Thus, guidelines and instruction may be seen as inhibiting or perhaps even as a controlling external factor for CBPA, because it might hamper their autonomy over teaching and classroom practices. Looking at this particular quote in light of

scaffolding, it may also illustrate a lack of *institutional scaffolding*, where an institution – such as the school and school management – guide teachers use of CBPA.

#### **4.4.2 Teachers' level of competence**

“I don't think that CBPA is such a big issue as it is made out to be, because you can keep it on a level where it makes perfect sense” (Participant 8, *Paper II*).

In the interviews, teachers expressed different levels of competence and confidence toward the PA task. While some teachers explained that they feel highly competent and confident viewing CBPA as a manageable task, others explained that PA is a daily struggle and that they feel less competent (cf. *Paper II*). In *Paper II* the majority of teachers reported that their feeling of competence was based on prior personal experience with sport, exercise and PA. Most teachers mentioned that this gave them the ability to identify and find relevant activities. Other teachers mentioned that relevant courses and training programs focusing on building competence and knowledge of PA helped them to 'crack the code' – especially regarding content-related PA (cf. *Paper II*). This building of 'individual competency' is – in line with findings from the survey – an important teacher-perceived facilitator. In fact, most teachers identified courses as significant for their motivation for CBPA as well as an important supportive resource for continuous use of CBPA (cf. *Paper II* and *Paper III*). Those teachers, who had participated in a PA-related course, specifically highlighted that courses with 'hands-on' elements were particularly useful and supportive for building and – in line with SDT - facilitating a sense of competence (cf. *Paper III*). These teachers expressed that trying activities for themselves as well as observing actual demonstrations of PAs by instructors made them more comfortable and confident in their own integration of CBPA. In line with scaffolding, this was, in *Paper III*, labelled *demonstration* – an

important supporting 'scaffold' in the facilitation of CBPA. In fact, demonstration was by the majority of teachers identified as a helpful supportive resource, because they believed that trying activities for themselves would, first of all, make them more comfortable in the handling of CBPA, and secondly, it would help to reduce the complexity of the task, because demonstration of activities help teachers to see what PA is. The following quote also illustrates that *demonstration*, in fact, becomes a motivating factor for CBPA:

“Actually, I think the part where we try things, I think that is the part we remember and that we have laughed and had fun together. And that we were able to see what it [CBPA] is. Nothing else is really needed” (Participant 1, *Paper III*).

Reversely, teachers also stated that CBPA is a complex task that requires many hours of preparation to enact meaningfully. Moreover, a number of teachers also expressed that they find it hard to find suitable and fun activities. One teacher in particular expressed a concern regarding the identification of suitable activities: “*The hardest part is to come up with something. How do I do it and how do I come up with something new?*” (Participant 1, *Paper II*). This quote also underlines teachers' desire to create something new and interesting.

In *Paper III*, teachers highlighted a number of supportive resources that may benefit their feeling of competence and confidence. Besides PA-related courses and training programs, *PA-related school projects* were found to be a useful and supportive resources for successful delivery of CBPA in daily teaching practices as well as a motivating factor (cf. *Paper III*). When asked to exemplify, teachers explained that projects often provided much-needed and relevant PA materials that are easy to implement into a busy work schedule. Moreover, teachers

explained that these school-based projects are an important resource for fresh, new ideas (cf. *Paper III*). Looking at the survey results, support and resources are the least important facilitators for integrating CBPA. Contrary to these findings, interviews suggest that resources are important, because they not only facilitate competency, they also provide resources that are useful, motivating and supportive for enacting CBPA into teaching routines.

#### **4.4.3 Teacher relatedness and collaboration**

Across papers, teachers reported a need to work closer with colleagues regarding the PA task. In *Paper II*, the majority of teachers reported that collaboration and a professional relationship between teachers could be a key motivational driver. Thus, the majority of teachers in this study expressed a need for handling, organising and approaching the PA collectively. If collaboration occurs, teachers explained that it is mostly informally through subject-meetings, small staff-meetings or during breaks between lessons. In *Paper II*, a number of teachers also associated relatedness and collaboration as a feeling of shared responsibility, and that collaborating with colleagues gave them a feeling of not being alone. In line with SDT, relatedness among teachers in this study, is a way of taking care of each other as well as helping and supporting each other to take on this new task. In fact, a number of teachers mentioned that collaboration among teaching staff – for instance across school-subjects or grade levels – could, potentially, ensure that CBPA is carried out – thus becoming an important contextual resource (cf. *Paper II*):

“PA is a huge job, and there is nobody who holds you accountable. If we had a community, then we would hold each other accountable and make sure that PA is, in fact, carried out” (Participant 2, *Paper II*).

In *Paper III*, teachers reported that a supportive environment focusing on developing, creating and sharing activities could benefit their day-to-day adoption of CBPA. In fact, most teachers mentioned that sharing of ideas is a highly motivating factor as well as highly supportive. Especially, ideas that are easy to implement and does not require a huge amount of time and efforts to integrate are highly valued by teachers. As such, teacher collaboration could become an important and viable 'scaffold' that, potentially, could support and facilitate teachers use of CBPA – both in a broad general term as a sort of *team scaffolding*, or more concretely, teacher collaboration could provide a setting for reducing the complexity of the PA task *collectively* (cf. *Paper III*). In line with scaffolding, teacher collaboration could be a setting for enacting the scaffold *Reduction of degrees of freedom* (Wood et al., 1976). This particular scaffold is a sort of task-simplification with the purpose of finding out 'how to do it': "It would be great to have a community at our school, where we, to an even greater extend, could meet with concrete PAs and talk about how we could do it ... a sort of 'what do you do' and 'what do I do'." (Participant 7, *Paper III*). Thus, collaboration and sharing of ideas also becomes an important supportive step in teachers' didactic practice mainly because it helps teachers to collectively handle this task as well as translating activities into teaching practices.

Most of the teachers in this study explained that collaboration, typically, is initiated by teachers, and not something that is organised at a school level – for instance by school management. Again, this illustrates a lack of *institutional scaffolding*. Most teachers identified school management as responsible for initiating and maintaining this type of collaboration. Contrary to findings regarding *teaching autonomy*, where teachers find school managements 'lack' of control motivating, teachers do in fact state that school management has a role in the daily integration of CBPA – in this case the facilitation of a collaborative environment.

#### ***4.4.4 Teachers' didactic practice and reflections***

During the interviews *meaning* and *relevance* stood out as major determinants for teachers' motivation and sustained use of CBPA. This is supported by the survey where teachers identified relevance as a key facilitator. However, it was also found in the survey that teachers only *to some degree* link CBPA with subjects (42%). Moreover, survey findings also suggest that teachers only *to some degree* find it meaningful to integrate CBPA into subjects (35,9%). In comparison, interviews suggest – and perhaps even extends this particular survey finding - that CBPA can be meaningful and it can be meaningful in a number of ways.

Teachers expressed in the interviews that a key motive for integrating CBPA into teaching routines and classroom practices is relevant and meaningful activities – and meaningful not only for teaching, but also for the subject taught and the students in the classroom. For this reason, teachers expressed different approaches to and ways of creating meaningful CBPA – most often guided by a didactic *what-how-why* approach. Findings suggest that teachers actively use didactical reasonings and reflections as a way of approaching the PA task as well as a tool for reaching a desired outcome with CBPA (cf. *Paper III*). Looking at this through the scaffolding lens, teachers' didactic practice reflects a sort of *individual scaffolding*, because teachers use their own didactic practice and reflections as a supportive tool when approaching and handling the PA task. And because, they only to very limited degree are offered instructions and guidelines from school management, this creation of meaningful CBPA is based on teachers own interpretations of what meaningful CBPA is.

### *Content and subject-related CBPA*

For some teachers, CBPA is only meaningful when it is content and subject-related. In fact, a number of teachers felt very strongly about this issue – namely that any given activity has to be content-related and benefit students' learning. Otherwise they would not use CBPA: *"It has to fit into the overall context, otherwise it is just burden. It has to benefit teaching"* (Participant 2, *Paper III*). In this sense, the choice of activities (*what*) and the justification of using CBPA (*why*) is driven by the content (cf. *Paper III*). Teachers' didactic practice concerning CBPA is to use their subject and the specific content as a guide for approaching and handling CBPA as well as tool for creating meaningful CBPA. In this sense, it is perhaps not surprising that some teachers mentioned that there are subjects where CBPA is easier or more meaningful. In fact, some teachers mentioned that there are subjects where CBPA is more compatible and suitable (cf. *Paper III*). This may also refer back to teachers' level of competency – namely that they choose to integrate CBPA into subjects where it is not only more meaningful and relevant, but also easier due to the subjects' format and purpose:

"I think it is easier in math, than in history and religion, because I think those are subjects where it is difficult to do something alternative ... it is subjects with more talking, analysing, listening and reading that we do in math. I think it is easier to make math more practical, because math is in everything (Participant 7, cf. *Paper III*).

### *Students*

For other teachers it is about looking exclusively at students' needs. This means, that justification of a given activity goes beyond the enhancement of students' learning (cf. *Paper III*). In *Paper III*, a teacher explained that the choice of and reason for using CBPA depends on a

matter of timing. For instance, PA is strategically timed in accordance with students' need for a break from the academic content. As such, teachers enact activities such as brain breaks or walk & talks and find this type of PA both appropriate and meaningful. This particular finding also underlines the important role students have on teachers' everyday choices and reasonings. Hence, as stated earlier, students' needs and mood not only justify activities, but is also a strong motivating factor for teachers to enact CBPA.

### *Integration difficulty*

Although teachers reported that they are able to find and justify suitable CBPA meaningful for content and/or students, the majority of teachers mentioned across papers that they find the *meaningful integration* into subject-specific content particularly challenging – indicating a sort of 'integration-difficulty'. In fact, a few teachers mentioned that integrating or translating an activity into a subject can, at times, be a highly frustrating task, and that this integration issue often hampers their use of CBPA, because they do not know *how* to do it (cf. *Paper III*). Correspondingly, a teacher reported, in *Paper II*, that it is unclear what it actually means to *integrate* PA into subject-specific content:

“How do I exercise in the language subject Danish? How do I integrate PA into Danish? It is very, very difficult when I don't know how to do it”  
(Participant 6, *Paper III*).

### **4.4.5 Teacher-perceived barriers and facilitators**

In the survey teachers identified time and lack of resources as major barriers. This is supported by the interviews where the majority of teachers expressed concerns about time and scheduling constraints (cf. *Paper II* and *Paper III*). First of all, the majority of teachers in this

study reported that they experience time as a major contextual barrier for the daily integration of CBPA, and that this constitutes an external pressure that regulates and controls their daily integration of CBPA as well as their motivation. Across papers, teachers reported that time constraints influence their ability to find relevant PAs, and they stated that there is not nearly enough time for preparing content-related activities. As a result, they feel inclined to choose activities that are less relevant to the academic content – as a sort of quick fix (cf. *Paper II*). Moreover, the ability to initiate collaboration and experience a sense of relatedness among teachers is also influenced by time and scheduling constraints. Looking at these particular findings in an SDT perspective, suggests that time constraints not only influence the logistical and practical integration of CBPA on a daily basis, it also influences a number of important facilitators for teachers' motivation and sustained enactment of CBPA. If teachers feel *inclined* to choose activities that are less relevant and meaningful, because they are pressured by time could suggests compliance with an external demand. This influence their autonomous behaviour. Moreover, it may also be the case that teachers have a feeling of personal responsibility towards the 45 minutes of CBPA. "*It is put on me*" indicates a rather controlling statement, even though teachers are provided with autonomy to self-organise and determine when CBPA is meaningful. Findings suggest that time is a critical barrier not only influencing daily integration, but also for teachers' autonomous behaviour.

Another critical barrier reported by teachers in both papers is the lack of collaboration among teaching staff. When asked about the actual, current status of collaboration at a contextual level, several teachers reported in *Paper II* that collaboration rarely occurs, and each individual teacher is responsible for creating and integrating CBPA on their own. Some teachers even called CBPA 'my own, private project'. In *Paper III* the majority of teachers expressed a need for

closer collaboration with colleagues, because it is seen as a highly supportive resource and facilitator for sustained enactment of CBPA.

Another barrier reported by the teachers as lack of training and relevant courses. Teachers explained in *Paper III* that courses, which build competence and confidence are needed if CBPA has to be sustained. Courses are therefore an important facilitator, and as the survey showed respondents identified individual competency as an important facilitator for integrating CBPA. Reversely, as the interview findings suggest, not feeling competent may act as a barrier for enacting CBPA – especially concerning the didactic reflection of *how* to integrate CBPA meaningfully.

#### **4.5 Summary**

Findings from the survey and interviews suggest that teachers are more autonomously motivated for integrating CBPA – i.e. reasons for integrating additional PA into teaching is based on interest and because the task is perceived to be important. However, there are also teachers who showed external regulations, where reasons for integrating CBPA are based on more controlled types (e.g. pressure and demands). Survey findings also indicated that teachers do, in fact, integrate CBPA several times a week, and that additional PA to some degree can be meaningful and relevant to integrate into subject-specific curricular. As an external demand, the policy instructs teachers to integrate, on average, 45 minutes of additional PA during school days. However, at a local school level it seems that teachers are provided with an autonomy supportive work environment, where teachers are able to determine when PA is relevant and meaningful for content, students and/or the individual teacher. However, RAI scores indicate

that especially teachers feel controlled whereas teaching assistants are significantly more autonomous in their behaviour towards CBPA.

Teachers identified *teaching autonomy* as a key motivational driver for the integration of CBPA into daily teaching routines. Teacher collaboration and team support were also identified as key motivational drivers for teachers' commitment to CBPA. However, based on teacher statements collaboration is rare. Teachers also expressed different levels of competence and confidence for the PA task. Most teachers identified continuous training as an important motivating factor as well as a highly supportive resource in the integration of CBPA. Specifically, teachers ask for instructions and guidance to overcome barriers and frustrations concerning 'integration-difficulty' - especially concerning *how to* integrate content-related PA.

Teachers also highlighted a number of supportive resources such as school-based projects, and school-based databases. In terms of scaffolding, demonstration and reduction on degrees of freedom were identified as usable scaffolds. Teachers also pointed to school management as a resource for allocation of resources such PA-relevant courses and training as well as being responsible for allocating time for collaboration. These can all be labelled as contextual resources that facilitate and support teachers in their daily integrating of CBPA as well as influencing their commitment to and motivation for enacting CBPA. On a more personal level, teachers' didactic practice may act as a supportive resource. Moreover, and in line with interview statements teachers also enact CBPA – and feels motivated to do so – based on students' need, and findings suggest a close relationship between teachers and students that act as a motivating factor. Reversely, findings across survey and interview highlight a number of crucial barriers that influence teachers' commitment to and enactment of CPBA on a daily

basis. In general, teachers ask for allocation of time and priority. Time is a huge barrier that influence not only preparation of content-related activities, but also influences the ability to create a meaningful relationship with colleagues.

## **5. Discussion**

The objectives of this thesis were to *explore teachers' motivation for integrating classroom-based physical activity in their daily practice, and to point out usable ways to support teachers' sustained use of classroom-based physical activity*. The following section is divided into three parts. In Part I, I discuss and compare main findings with international and national research. In Part II, I reflect upon the chosen theoretical frameworks. In Part III, I reflect upon and discuss the strength and limitations of the mixed methods research process.

### **5.1 Part I: Discussion of main findings**

#### ***5.1.1 Teachers' motivational reasons for integrating classroom-based physical activity***

While survey and interview findings suggested both intrinsic and external reasons for integrating CBPA, the most predominant reasons were intrinsic and identified reasons – i.e. autonomous motivation. Interview findings elaborated on survey findings and revealed that teachers' intrinsic and identified motives and reasons for integrating CBPA, primarily, were based on enjoyment among students, positive student outcomes as well as the importance of addressing PA in schools. Similar to what other studies have found, this could indicate that the opportunity to address and enhance students' levels of PA as well as experiencing enjoyment, engagement and readiness to learn among students motivates teachers to integrate CBPA. Moreover, this particular finding underlines the important, perhaps even motivating, role students have in teachers' everyday work, and how teaching activities most often are prioritised and chosen based on students' needs and reactions (Benes et al., 2016; Berg et al., 2017; Goh et al., 2013; Martin & Murtagh, 2017; McMullen et al., 2016; Stylianou et al., 2015; Webster et al., 2015).

When interpreting these particular results concerning teachers' intrinsic and external motivation for integrating CBPA, it is important to take their RAI score into account. While teachers seem to be autonomously motivated, the regression analyses showed that their RAI score was negative. Even though teachers in this study indicate a feeling of teaching autonomy, their RAI score indicates a somewhat controlled behavior. Contrary, teaching assistants are significantly more autonomous in their behavior. A reason for this difference between teachers and teaching assistants, may be the different roles these two professional groups take during school days. While teachers are guided by school and teaching objectives for students' learning, it could be the case that teaching assistants are less controlled by contextual elements such as teaching objectives and national standards and therefore feels more autonomous to enact other types of teaching activities during the school day such as for instance CBPA. Similar findings are found in the recent Danish reports on the implementation of the school reform, where it seems that teaching assistants are more positive towards CBPA than teachers – especially in regard to the possibility of enhancing learning via PA (Jacobsen et al., 2017). This is interesting, and it calls for further research to explore the difference between these two professional groups as well as their handling of and motives for enacting CBPA.

Via survey and interview analyses, this study has found that extrinsic reasons also play a role in teachers' behaviour and decisions to integrate CBPA. Controlled reasons were mostly linked to feelings of guilt (introjected reason), pressure, and adherence to external demands (external reasons) (cf. *Paper II*). Consistent with findings from international implementation research regarding teacher-perceived barriers, the majority of teachers linked external pressure and demand to time and scheduling constraints. Similar to what implementation research have concluded, lack of time is one of the most influential barriers for teachers' implementation of

CBPA as well as their continuous commitment to this task (Beets et al., 2008; Benes et al., 2016; Berg et al., 2017; Dyrstad, Kvalø, Alstveit, & Skage, 2018; Goh et al., 2013; Leger, 2000; Naylor et al., 2015; Webster et al., 2015; Webster et al., 2017). In fact, Naylor and colleagues (2015) found that teachers' long-term commitment and motivation for integrating CBPA is hampered by continuous time constraints (Naylor et al., 2015). Based on the fact that CBPA in Denmark is a mandatory additional work task for teachers, it seems reasonable to suggest that allocating time for finding, planning and carrying out daily PA is essential. As previous research has underlined, it is essential, for the sustainability of CBPA, that teachers are supported in their efforts to overcome time constraints and barriers (Dwyer et al., 2003; Leger, 2000; Parks et al., 2007; Stylianou et al., 2015). And as the findings in my study suggest, time not only influences the logistical and practical integration of day-to-day CBPA, it also critically influences what teachers have pointed out as important facilitators and predictors for sustained enactment of CBPA – such as increased collaboration and time for didactic reflection to meaningfully integrate CBPA. The latter an important motive for teachers to integrate CBPA at all.

In line with what other studies have concluded, teachers in this thesis identified school management as responsible for allocation of time and priority (Berg et al., 2017; Martin & Murtagh, 2017; McMullen et al., 2016). However, since teachers' favour teaching autonomy, and to integrate meaningful and relevant subject-specific and content-related PA, new ways of lesson and curriculum planning may help teachers to overcome time constraints. Moreover, it suggests that school management does have a role in supporting teachers' integration of CBPA – not only by facilitating autonomy, but also by providing contextual support in terms of practical solutions for collaboration as well as time for training and courses. This is supported by Jourdan and colleagues (2010), who identified a number of actions that, potentially, could

help the integration of CBPA in school contexts (Jourdan, Pommier, & Quidu, 2010). The authors suggested linking PA more strongly to schools' curriculum – and thereby also to subject-specific content – instead of seeing PA as an extra work load. This could, according to Jourdan and colleagues, be a way of overcoming time and curriculum constraints (Jourdan et al., 2010). This also suggest that it may not lie solely with school management. It may also lie with the entire teaching staff to find a viable solution. Nonetheless, since time constraints, curriculum restrictions and priority issues are constantly marked as major implications for teachers' integration of PA in school and classroom practices, perhaps even hampering, teachers' motivation and long-term commitment to CBPA, it calls for further research and action (Benes et al., 2016; Berg et al., 2017; Dinkel et al., 2017; Tjomsland, 2010; Viig & Wold, 2005; Webster et al., 2015).

### ***5.1.2 Key motivational driver: teaching autonomy***

Teaching autonomy was identified as a highly appreciated work-related condition and key motivational driver by the teachers in this study (cf. *Paper II*). Overall, this is consistent with SDT-based research and literature, which have found that an autonomy-supportive environment is highly valued and appreciated by teachers (Deci & Ryan, 2008; Pelletier & Rocchi, 2016; Pelletier & Séguin-Lévesque, 2002; Vangrieken, Grosemans, Dochy, & Kyndt, 2017). Similar to findings from this thesis, SDT-based studies have found that when schools create and support teachers' autonomous behaviour it is more likely that teachers will participate in and integrate new innovations and learning methods (Fernet et al., 2016; Katz & Shahar, 2015; Lam, Cheng, & Choy, 2010; Schellenbach-Zell & Gräsel, 2010). Together these findings suggest that school management have a crucial role in creating and welcoming an autonomy-supportive teaching environment. Thus, for teachers' long-term commitment to

CBPA, it is fair to suggest that fostering and stimulating teaching autonomy is an important task for school management. However, within a Danish school context, it is important to acknowledge that teachers' autonomy exists under current national educational guidelines – including the PA policy. So does the work of school management.

In light of this, teachers' teaching autonomy and independent teaching routines are classroom-based, and it is within this setting that each individual teacher can choose and make decisions regarding content, subjects and students. Findings also suggest that instead of asking for actual instructions and guidelines, teachers enact a sort of *individual scaffolding* primarily guided by their didactic practice and personal past experiences. In line with Philipsen's definition, teachers' didactic practice of *what-how-why* becomes of sort of personal scaffolding approach where a teacher defines the 'rules' or method for using CBPA (Philipsen, 2009). Similar findings are found in a study by Lund (2016), who in her study found that when working alone in the classroom, teachers often make use of and lean on their personal experiences when dealing with changes in the classroom. Moreover, as Lund concludes in her study, teachers' didactic reflections and developmental processes within teaching practices could benefit from active dialogue and support between teachers (Lund, 2016). Even though teachers during the interviews expressed a rather high autonomous feeling, where they independently organise teaching – typically guided by didactical and pedagogical reasonings (Christiansen et al., 2018; Gudem, 2000; Gudem, 1995; Vangrieken, Grosemans, et al., 2017; Westbury, 2000), there is reason to believe that this feeling of autonomy is pressured by compliance to external demands – such as for instance time and curriculum constraints. This notion is supported by the findings from the *Relative Autonomy Index*, which suggests that teachers' behaviour is controlled rather than autonomous.

### ***5.1.3 “It has to make sense” – the concept of meaningful classroom-based physical activity***

Closely connected to the feeling of teaching autonomy, this study has found, that teachers appreciate, and value didactical-reflected *meaningful CBPA* (cf. *Paper III*). While content-related seemed to be the preferred type of CBPA, teachers in this study also felt motivated to integrate activities based on students’ needs – for instance, strategically timing CBPA in accordance with students’ need for a break. This refers back to the important motivating relationship between teachers and students pinpointed earlier. The appreciation of meaningful content-related CBPA has been found in other studies. Hence, teachers are encouraged to integrate CBPA when it is beneficial and makes sense for students’ learning (Berg et al., 2017). Moreover, as my study also has found, teachers prefer and are most comfortable with meaningful content-related PA, because teaching and students’ learning is the number one priority (McMullen et al., 2014).

In line with the preference for meaningful CBPA, it could seem that the integration of CBPA has to be compatible with not only teachers’ didactic practice, but also their professional and educational missions – such as students’ learning and well-being. This link between teachers’ motives for promoting and integrating CBPA, and teachers’ professional identity, is supported by previous research (Jourdan, Simar, Deasy, Carvalho, & McNamara, 2016; Schellenbach-Zell & Gräsel, 2010; Tjomsland, 2010). For instance, it was found by Jourdan and colleagues (2016) that meaningful integration of and engagement in health promotion initiatives are dependent on teachers’ perceptions of its relevance. If teachers identify with and believe that, for instance, PA is relevant and beneficial for enhancement of students’ learning it is more likely they feel motivated to use it (Jourdan et al., 2016). In this thesis, this notion or level of professional identity becomes particularly apparent in the way teachers didactically find, justify, and organise CBPA (cf. *Paper III*). Based in a Danish/Nordic teaching tradition, didactical reflections

comprise an important component in Danish schoolteachers' professional identity. To this end, it is also reflected in their motives for integrating CBPA into teaching practices (Westbury, 2000). Findings suggest that teachers actively use their didactic reasonings and choices in their approach to and reasons for integrating CBPA – particularly in regard to finding activities and justifying why particular activities are relevant and meaningful. Hence, the handling and creation of meaningful CBPA is strongly guided, perhaps even supported, by teachers didactical reasonings, choices and skills.

This thesis has found that a number of teachers struggled with the meaningful integration of content-related PA – i.e. *how* to do it (Gundem, 1995) (cf. *Paper III*). However, contrary to what international research have found this 'integration-difficulty' does not seem to directly hamper teachers' motivation for the PA task – at least not for the majority of teachers (Parks et al., 2007; Quarmby, Daly-Smith, & Kime, 2018; Webster et al., 2015). For instance, it was found by Quarmby and colleagues (2018) that teachers were reluctant to commit to CBPA because they were not able to see past current teaching routines and practices, and because teachers were too stuck in their 'didactic ways' (Quarmby et al., 2018). Although it may not be ideal to compare international and Danish school settings, this study has found that the majority of teachers make use of their didactical skills and reflections in order to change current teaching routines and adapt to this task. This change of teaching practices may require a shift in the way teachers think and reflect about teaching and learning. Based on the findings concerning motivational reasons for integrating CBPA it is fair to suggest that teachers may be interested and ready to do so. However, it is important to acknowledge that the majority of teachers in this thesis is, in fact, autonomously motivated – at least based on findings from the WTMST. For this reason, they may be more positive towards changing teaching practices to match CBPA. Those who

struggle and integrate CBPA based on more controlled reasons are perhaps more reluctant and less motivated to change teaching practices – in line with what Quarmby and colleagues found (Quarmby et al., 2018). Nonetheless, since some teachers struggle with the meaningful integration, future research and school-based PA initiatives should explore this notion of ‘integration difficulty’ – for instance by finding ways to better present and describe *how* to meaningfully integrate PA. As such, teachers may better understand and didactically reflect upon the match between traditional subject-specific content and PA. This notion is indirectly supported by previous studies (Cothran et al., 2010; Larsen et al., 2012). Cothran and colleagues found that teachers, generally, lacked a systematic understanding of and planning for integrating PA into the content (Cothran et al., 2010). Contrary to this notion, findings from this thesis suggest that teachers are able to find and justify relevant CBPA – it is the purposeful and meaningful integration that is difficult.

#### ***5.1.4 Teachers’ experience of competence***

This thesis has found a number of factors associated with teachers’ feeling of competence (cf. *Paper II*). Consistent with other studies, prior experiences with sport and PA - either personal or teaching-related – may help teachers to feel more competent and confident (Cothran et al., 2010; Dinkel et al., 2017). Moreover, teachers identified PA-related courses, and PA-related materials and projects as highly beneficial for their feeling of competence and confidence as well as highly supportive for their integration of CBPA (cf. *Paper II* and *Paper III*). In fact, this study has found that PA-related resources and materials - most often provided by an external organisation - played a vital role in teachers’ daily integration of CBPA. Similar to other studies, teachers noted that it is the easy implementation as well as the relevance and compatibility materials have with teaching practices that appeals to them. Moreover, the easy

implementation may also be a way of overcoming time constraints in a busy work schedule – a major barrier noted earlier. As such, these materials help teachers to save time (Goh et al., 2017; McMullen et al., 2014; Webster et al., 2017). In most cases, teachers in my study expressed that school management does not offer *institutional scaffolding*. Instead teachers find and use guidelines and resources offered by external providers. A reason for this may be that these types of external instructions and guidelines are exactly the type of scaffolding teachers need. Thus, it seems fair to suggest, that these particular resources offered to teachers are both relevant for teachers' didactic practice by offering activities that corresponds to teachers' *what-how-why* approach to CBPA as well as becoming an important institutional scaffold – not provided by school management, but offered to teachers, who freely can choose those activities and resources that are relevant and usable for their particular teaching practice.

A number of teachers in this study expressed that CBPA is a huge task that is somewhat undefined and complex. Most often, this was found to influence teachers' level of competency and confidence. In line with other studies concerning teacher-perceived barriers, this particular issue of 'task-complexity' have been found to influence teachers' willingness and commitment to CBPA (Martin & Murtagh, 2017; McMullen et al., 2016; Webster et al., 2017). When asked how to overcome this particular barrier – and to feel motivated for integrating CBPA - teachers across the interviews asked for more relevant training as a way to build competence. Similar to other studies, the majority of teachers believed that training and courses could positively benefit and support daily use of CBPA (Benes et al., 2016; McMullen et al., 2016; Stylianou et al., 2015). This indicates that teachers are willing to increase and build competence on how to integrate CBPA into teaching practices. In fact, most teachers in this study expressed a specific need for appropriate training on meaningful and relevant subject-specific and content-related

PA. Moreover, teachers pointed to practical *demonstrations* of ways to meaningfully integrate CBPA as helpful. This type of ‘scaffold’ was identified as particularly helpful by those teachers, who had participated in a course. Given the low number of participants, who identified this concrete scaffold, it is suggested that this particular ‘hands-on’ item is further investigated. Regardless, it could be one out of many course items offered to teachers on relevant PA-related training courses. Hence, future research could explore appropriate and practical didactical designs of courses and teacher training – for instance focusing on what-why-how reasonings.

Like many other studies, teachers in this thesis point to school management as responsible for supporting not only the process of implementing additional PA but also supporting their professional development (cf. *Paper II* and *Paper III*) (Berg et al., 2017; Deschesnes, Tessier, Couturier, & Martin, 2013; Hodges et al., 2015; Lam et al., 2010; Stylianou et al., 2015). However, as this thesis has found it is important that it does not influence teachers’ autonomy – hence support from school management must be provided in accordance with a autonomy supportive environment. Still, this underlines the important role school management has in teachers’ everyday work practices. It seems reasonable to suggest that school management is a key resource for practicalities such as allocating of time and priority for continuous training and support in regard to CBPA. Similar to what Lam and colleagues found (2010), findings in this thesis indicate that it is essential that school management support and help teachers to build competence - especially considering that CBPA is a mandatory, additional work task, that for some teachers in this study, is a daily struggle (Lam et al., 2010).

### ***5.1.5 Key motivational driver: teacher collaboration and collegial support***

This study has found that collaboration among teachers can be a key motivational driver. In fact, this thesis has found that teachers are eager to collaborate and work collectively with the PA task (cf. *Paper II* and *Paper III*). For this reason, sharing of ideas and inspiration has also been identified as a highly supportive resource for teachers' delivery of CBPA. These findings are to a large extent similar to what previous research has demonstrated. Collegial support and collaboration are highly beneficial for teachers' commitment to CBPA, but most often it is an underutilised resource (Dinkel et al., 2017; Goh et al., 2017; Tjomsland, 2010; Webster et al., 2015). Correspondingly, research has found that teacher collaboration can be highly supportive when dealing with new teaching tasks, such as CBPA, and that it often requires a higher level of collective efforts to successfully deliver CBPA (Parks et al., 2007; Tjomsland, 2010). This thesis has found that collaboration may also constitute a setting for scaffolding - for instance as a way of simplifying the PA task together, or as it is labelled within the scaffolding framework: *Reduction of degrees of freedom* (cf. *Paper III*). Moreover, collaboration could also constitute a setting for solving the beforementioned 'integration difficulty' mentioned by some of the teachers in this study.

In light of these collaborative benefits, the lack of collegiality, found in this thesis, related to CBPA, is concerning. A collaborative teaching environment has, in general, been found to be highly beneficial for teaching and teachers' professional development (Tjomsland, 2010; Vangrieken, Meredith, Packer, & Kyndt, 2017; Welch, 1998; Lund, 2016). Correspondingly, and in line with SDT, this feeling of relatedness is highly influential and important for motivation (especially the intrinsic kind), and schools that support and welcome collegiality may have more motivated teachers ready to take on new teaching tasks (Lam et al., 2010; Ryan & Deci,

2000b; Schellenbach-Zell & Gräsel, 2010). Together these findings underline the necessity and importance of supporting PA-related collaboration - particularly to ensure long-term commitment to CBPA. However, more research is needed to explore the uniqueness that characterises teacher collaboration within a Danish school context. Moreover, it seems vital to explore whether it lies with the school management or teaching staff to initiate collaboration. As this thesis has pinpointed, teachers desire to work autonomously when dealing with CBPA, but they also wish to collaborate, and they point to school management as the responsible party for prioritising collaboration (cf. *Paper II*). Vangrieken and colleagues (2017) have explored this interesting, paradoxical relationship between teachers' need for autonomy and the collaborative nature of teachers. As the authors argue there seems to be a tension between the two (Vangrieken, Grosemans, et al., 2017). This thesis has not specifically explored the relationship between autonomy and collaboration among Danish teachers but has found that both can be key motivational drivers in the integration of CBPA. To this end, it should be explored if autonomy is either a facilitating or hindering factor for teacher collaboration. As a facilitator, autonomy has, interestingly, been found to be a key ingredient in successful teacher collaboration (Vangrieken, Dochy, Raes, & Kyndt, 2015). Moreover, in line with findings from this thesis, it is beneficial to explore *who* should be responsible for initiating collaboration.

#### ***5.1.6 Team scaffolding***

To my knowledge only a limited amount of studies has directly linked or extended scaffolding to teachers. A few studies have found that scaffolding could serve as a viable and usable framework for assessing teachers need for support or current levels of support (Dinkel, Lee, & Schaffer, 2016; Lajoie, 2005; Shabani, 2016; Sharpe, 2006). As such, this thesis provides important insights into how teachers may be supported - or scaffolded - in the process of

integrating CBPA. Team scaffolding stood out as a potentially useful way to support teachers – and not only as a setting for collaboration, but also as a setting for developing subject and PA practices collectively (cf. *Paper III*). As a construct, team scaffolding could provide a setting for instruction, guidance and feedback among teachers. Although it is a different research setting, this type of support has been found to be highly beneficial in creative filmmaking processes – for instance in reaching a desired outcome while supporting and helping each other as a team (Philipsen, 2009, 2012). This means that team scaffolding consists of pre-defined structures and ‘scaffolds’ defined by the team members (Philipsen, 2009). In line with teachers desire to work autonomously, this type of structured design may be too constraining. It is also noteworthy to mention that, I draw on studies from a different research area. Although it is within an educational setting, it is an entirely different research focus than CBPA. However, it is fair to suggest that teacher collaboration could benefit from ‘scaffolding’ – both in terms of creating a motivating and supportive environment for teachers’ successful delivery of CBPA as well as supportive of teachers’ long-term commitment to this task. However, this calls for future research. Thus, more knowledge is needed to explore if this type of scaffolding is applicable to a Danish teaching context, and how it precisely could benefit and support teachers in the integration of CBPA in light of teachers desire to work autonomously.

## **5.2 Part II: Theoretical reflections**

### ***5.2.1 The analytical process of combining three theoretical frameworks***

This thesis has been strongly guided by three theoretical frameworks. As an overarching theory, SDT has played a major part in understanding and analysing teachers’ motivation. It has applied methodologically by framing the quantitative phase placing teachers along the SDT continuum. Moreover, it has been used a guide for interviewing teachers in the qualitative

phase. Finally, SDT has modelled the analytical work – both in terms of analysing the data and presenting the data in this thesis as well as in *Paper II*. Scaffolding and didactic theory have also – perhaps not as strongly as SDT – played an important analytical role in this thesis. It has been through the lens of these two frameworks that I have addressed and analysed issues such as teacher support, teaching practices as well as teachers’ didactic practices. In this thesis, it has not been my intent to develop these theoretical frameworks. However, when joining three theories in one research process both methodologically and analytically have indeed provided new perspectives that may have implications for future research on teacher motivation.

A key strength of using this kind of systematic theoretical approach is the way it has structured and guided the mixed methods design chosen for this thesis (Bazeley, 2018). As such, SDT has provided a framework that has helped to plan and organise both the quantitative and qualitative phase. In the quantitative phase, I chose a SDT based scale to measure teachers’ motivation and in the qualitative phase I used concepts from SDT to explore teachers’ motivation further. As such, SDT has guided the research process across two phases, and has in this light provided coherence between two different sources of data. Moreover, using theoretical frameworks such as for instance SDT and scaffolding has helped to approach complex issues such as teacher motivation and teacher support. In line with my pragmatic standpoint, theories have helped me to understand the complexity of teachers’ motivation and the practice they are part of. Reversely, a theoretical framework also influences the way a researcher understands and looks at a phenomenon (Bazeley, 2018). A consequence of a strongly theory-driven research process is that it may shape and direct the questions that are asked, and how answers to these questions are interpreted by the researcher. This may pose a limitation in this thesis, because there are indeed nuances, variations and perspectives that

have not been unfolded. I have throughout this thesis framed and modelled survey questions and interview questions based on concepts from SDT – thereby choosing a certain definition and perspective of motivation. For instance, I have very explicitly asked teachers about their experience of relatedness, competence and autonomy in the interviews. And not only asking, but also defining the concept before asking teachers about them. Contrary to this SDT based interviewing, scaffolding was more indirectly included in the interviews. I did not – as I did with SDT – ask teachers about the different levels of scaffolding directly. Instead, I chose a more open approach asking about support and supporting structures – both at an individual and contextual level. I also address the issue of interviewing teachers in the section entitled “5.3 *Part III: Methodological reflections and discussion*”.

While SDT and scaffolding primarily have been used both deductively, didactic theory was included more inductively as part of the qualitative phase - basically as a way of understanding teachers’ reflections and perspectives regarding their teaching practices. As such, it was the data that called for a new framework. Based on this new and important discovery in the data, I took a more flexible approach to the data – not casting aside existing theories – but instead moving back and forth between data and theory and in the end choosing to include a third framework for truly understanding teachers’ perspectives. As such, while findings based on SDT and scaffolding are more theory-driven, findings based on didactic theory are more data-driven. In the following sections, I reflect upon the chosen theoretical frameworks in relation to the findings from this thesis.

### ***5.2.2 Self-Determination Theory***

Looking across SDT-based research and literature there is substantial evidence of SDT's usefulness within a variety of domains such as health, education, and sport, and it has been argued that SDT offers a comprehensive motivational theory (Deci & Ryan, 2008; Gorozidis & Papaioannou, 2014; Hagger et al., 2014; Muller et al., 2008; Roth, 2014; Urda, 2014). Based on the findings in this thesis, there are still a few issues that I wish to reflect upon. First of all, it seems fair to suggest that researching teachers' motivation requires a look into both individual differences as well as a look into the nature of the social context, teachers are part of. It may be the case that teachers, on a personal level, are motivated by very different things - what motivates one teacher may not motivate another (Richardson, Watt & Karabenick, 2014). It may also be the case that some of the findings in this thesis regarding teachers' motivation is somewhat case sensitive or special to a Danish school context.

SDT is indeed a comprehensive theory of human motivation. However, based on the findings from this thesis, prompts me to ask if it is possible through SDT to really unfold the social and individual differences that typically lies within different settings and contexts into account? For instance, does the three psychological needs (autonomy, competence and relatedness) play exactly the same role in all teachers' lives, and how are these basic needs influenced by a school context and culture? One could argue that a teacher's need for autonomy, competence and relatedness are influenced not only by context and culture, but also by personality or other individual traits. According to Ryan and Deci (2000a; 2000b), the three basic needs are universally essential for human functioning and well-being (Ryan and Deci 2000a; 2000b). However, in a study by Chen, Vansteenkiste and colleagues (2015) this 'universality claim' is put to the test under the notion that different cultures and contexts undoubtedly will influence

how people benefit from need satisfaction – such as for instance autonomy or competence support (Chen, Vansteenkiste, Beyers, Boone, Deci et al., 2015). Based on a study across four different nationalities and cultures, the authors argue that people constantly are under the influence of different contexts, and that an individual's needs (and motivation) must be seen as a social construct as well as highly personal. Hence, an individual's motivation and need satisfaction are to a large extent shaped by and under the influence of the specific culture or context he or she is part of (Chen, Vansteenkiste, Beyers, Boone, Deci et al., 2015). Even though their study is based on context across countries, their arguments for the diversity that lies within a particular culture is interesting. Even though their findings support the universality claim of SDT, they conclude that this does not exclude the possibility of important individual and personal differences in how people are motivated as well as how people perceive the need for autonomy, competence and relatedness (Chen, Vansteenkiste, Beyers, Boone, Deci et al., 2015). It could be interesting to explore further if this is also the case if attention is directed to other cultures – not across countries – but for instance within more specific contexts such as educational settings.

Inspired by the view of pragmatism, I have in this thesis been interested in unfolding teachers' motivation based on the notion that motivation is always situated in a social context. And for this reason, I assume that motivation cannot be explored without looking at the culture or context teachers are part of. To do this, I have applied SDT to unfold not only *if* teachers are motivated, but also what motivates teachers to integrate CBPA. Likewise, SDT have been used to analyse environmental factors that may diminish or facilitate teachers' motivation. Dewey's approach to motivation is that human beings are by definition active and exploring creatures. Thus, being alive is being active and motivated. For Dewey, motivation concerns how human

being are motivated in the right direction (Brinkman, 2007). With this focus on human experience and motivation, it is perhaps problematic to truly unfold – through SDT – how teachers’ motives, actions and behaviour are guided by values and norms within the school context. In light of this, it could be interesting to explore how concepts such as, for instance, autonomy and relatedness – which have been identified as particularly supportive for teachers’ motivation in this thesis - is defined and constructed in a Danish school context. It would perhaps be worthwhile to look at these concepts from a different perspective than SDT. And lastly, when highlighting the critical and important role of social contexts and cultures and when claiming that motivation is a social construction, may require a somewhat social constructivist view on or approach to human motivation rather than a psychological view on motivation.

### ***5.2.3 The conceptual framework of scaffolding***

In this thesis, I argue that teachers too need appropriate support when integrating additional CBPA. For this purpose, I used the conceptual framework of scaffolding – mainly as an analytical tool. Scaffolding has, to a wide extent, been used in educational research as a metaphor for the crucial role adults, teachers or educators have in the guidance, support and instruction of a child’s development. Research has indeed demonstrated the practical value of scaffolding for students in a variety of teaching and educational practices (Lajoie, 2005; Sharpe, 2006; Wood et al., 1976). Inspired by this last notion, my intent with scaffolding was to apply the framework or concept to the domain of teachers and teaching. During the analytical work, I was able to identify a number of scaffolds (i.e. demonstration) as well as scaffolding levels (i.e. team scaffolding and individual scaffolding). What I also found during the analytical work through the lens of scaffolding, was the importance of environmental conditions and how they influence

teachers' behaviour and motivation. One of these motivating conditions or contextual aspects is teacher collaboration. This thesis has found that it may constitute an important supportive resource in the integration of CBPA as well as for teachers' motivation. Looking at this within an SDT perspective, one could argue that motivation needs scaffolding – and not only on a personal level, but also on a contextual level. In line with the SDT logic of creating supportive conditions for motivation (Ryan & Deci, 2000b), scaffolding proved to be beneficial for analysing and pointing out structures and levels of support for teachers, and how these – based on teacher statements – could act as supportive resources.

Another reflection concerning the application of scaffolding is that different people requires different types of support – i.e. the need for support is highly individual. For instance, an issue that became particular apparent during the analytical work as well as during the interviews was understanding teachers' ZPD – i.e. what was, in fact, teachers' zone of proximal development regarding this particular task? Tharp and Gallimore argued that any skill or domain includes a ZPD, and while participating in an activity, individuals – regardless of domain – is in a process of development (Tharp & Gallimore, 1998; Tharp & Gallimore, 1988). Therefore, it is perhaps fruitful to identify each individual teacher's zone of development (Chaiklin, 2003). It is reasonable to suggest – based on the analyses in this thesis – that teachers draw on, for instance, didactic experiences and past experiences in the integration of CBPA as a sort of *individual scaffolding*. To this end, it is possible that I would have been able to more strategically and purposefully pinpoint usable ways to support teachers within the scaffolding framework, if I had accounted for or examined teachers' zone of proximal development such as their current skills and knowledge of CBPA. As Dinkel and colleagues (2016) argue: “one must

*first determine teachers' current knowledge in order to understand how to purposefully assist teachers in the implementation of CBPA" (Dinkel et al., 2016).*

### **5.3 Part III: Methodological reflections and discussion**

#### ***5.3.1 Key strengths of the mixed methods design***

The strength of the explanatory sequential mixed methods design (ESD) was, first of all, that it was possible for me to collect, organise and analyse data in a well-defined and straightforward two-phased process (cf. figure 2) (Ivankova et al., 2006). For me, the research procedures in this PhD study have been manageable in terms of time consumption and implementation of the two phases. Secondly, validity and reliability of the study were increased through the mixed methods design (Greene, 2007; Ivankova, 2014; Ivankova et al., 2006). Thus, the combination of the two methods provided a much more robust account of this thesis' objectives. In my opinion, neither the quantitative or qualitative phases could sufficiently fulfil the research objectives. However, when used in combination the two phases allowed for a nuanced and detailed exploration of teachers' motivation and the factors associated with motivation within a school context (Creswell & Clark, 2018; Greene, 2007; Ivankova et al., 2006; Teddlie & Tashakkori, 2009).

#### ***5.3.2 Overall limitations of the mixed methods design***

Despite the well-defined and straightforward design, I encountered issues of integrating and implementation of data across the quantitative and qualitative phases (Creswell & Clark, 2018; Greene, 2007; Ivankova et al., 2006). In line with the ESD (cf. figure 2), it was important to end the quantitative data collection and analysis of survey data *before* recruiting teachers for the interviews. Moreover, design of the interview protocol for the qualitative phase was dependent

on findings from the quantitative phase. This became a rather lengthy period, and it took some time before I began recruiting for the interviews. This may have influenced the accessibility and availability of teachers. Moreover, even though the mixed methods approach chosen for this thesis has increased validity and reliability of the study, there are still issues that needs to be taken into account. In the following sections, I address a number of key methodological strengths, issues and weaknesses across the quantitative and qualitative phases. More specifically, I focus on recruitment and composition of the study sample; survey construct; and finally, development of interview protocol and interviewing teachers.

### ***5.3.3 Recruitment and composition of the study sample***

*a) Quantitative phase:* Even though steps were taken it was not possible, within the time frame of the PhD study, to recruit the desired number of schools and respondents for the quantitative phase. During the quantitative phase, after distribution of the survey, I tried persistently to get more survey responses. Via contacts in the school management office, I sent out a number of reminders to teachers and teaching assistants working at the recruited schools. However, when schools replied that it was too time consuming and difficult to get more teachers to answer the survey, I deemed that it was necessary to stop the recruitment process due to ethical reasons. The level of non-responding does indeed pose a threat to that validity of the study and it represents a limitation in this study. In terms of the size of the survey sample, it seems fair to suggest that a larger survey sample would have provided not only a much more robust and nuanced account of teachers' and teaching assistants' motivation. Moreover, the rather small sample makes it difficult to generalise findings to all teachers working at public-schools in Denmark. Finally, and perhaps most importantly the size of the survey sample influences the recruitment process for the qualitative phase. A larger survey sample would have provided a

larger number of teachers and teaching assistants to recruit from. Moreover, it would have been possible to more purposefully select participants from the survey based on, for instance, job type and motivational level.

There are also issues concerning the composition of the final survey sample. While the final survey sample represented a wide range of ages, working experience, grade levels and subjects, it is not balanced in gender (153 were female and 53 were male). Even though this is fairly representative of the general population of teachers employed at a public-school, it seems reasonable to suggest that the survey sample could have benefitted from a more gender-balanced sample. The survey is neither balanced in terms of job type. During the pilot study it became obvious that teaching assistants also are responsible for carrying out CBPA, and they were therefore included in the study. The level of non-responding teaching assistants is therefore problematic, and as it can be seen in the final survey sample there is a very high skewness between teachers (157) and teaching assistants (30). Even though it is possible to detect a significant difference between teachers and teaching assistants RAI score, the number of teaching assistants in the final survey sample pose a threat to the findings. Therefore, findings from the regression analysis must be read with caution due to the unbalanced sample.

*b) Qualitative phase:* Recruitment of interview participants was an integrated part of the survey. My initial intent with this recruitment strategy was to purposefully identify and select participants based on motivational level, gender, age, and working experience. The purpose of applying this type of purposeful sampling allowed for further exploration of what might facilitate or hinder teachers' and teaching assistants' integration of CBPA from different motivational reasons and perspectives. In my opinion, the survey served as an opportune

platform for recruiting participants for the interviews. However, in the end, recruitment is based on voluntariness and willingness to participate, because of the response level in the quantitative phase (Teddlie & Yu, 2007). When the survey closed 17 survey respondents had typed in their email address, and even though steps were taken to recruit all participants, it was only possible to recruit nine out of the seventeen. Had I been able to recruit all seventeen, it would have been possible to a higher degree to purposefully select participants based on background, job type and motives. Similar to the quantitative phase, there are also issues of size and composition of the qualitative interview sample. First of all, the interview sample is not balanced in gender (eight female and one male). Neither was it possible to recruit teaching assistants for the interviews. Findings from the interviews are therefore solely based on teachers' views. In my opinion, I was able to recruit teachers showing different levels of motivation as well as teachers. Moreover, I was able to recruit teachers across eight very different schools – both in terms of size and location. Only two teachers worked at the same school. However, in terms of their motivational reflections during the interviews it may be the case that some of the teachers are especially dedicated to – for instance – CBPA, and that this influence their level of motivation, and the way they talk about CBPA as well as pointing out, for instance, barriers and facilitators. Likewise, it may influence their need for support and what types of supportive resources they identify.

Because of their role in daily teaching routines, and because teaching assistants increasingly are becoming a key professional group in the handling of CBPA (Jacobsen et al., 2017), it seems fair to suggest that teaching assistants could have provided valuable information and insights. More importantly, in light of findings from the *Relative Autonomy Index*, which suggest that teaching assistants are considerably more autonomous in their behaviour as opposed to

teachers, it would indeed have been highly relevant to interview teaching assistants to explore this particular finding further and to gain a much more nuanced account of motivation for integrating CBPA within a school context from this particular professional group. This particular sampling issue in the qualitative phase is problematic and as a result poses a threat to the validity of the study.

#### **5.3.4 Survey construct**

A major focus of the quantitative phase was the *Work Task Motivation Scale for Teachers* (WTMST). A key strength of the WTMST lies within the design, because the scale is specifically designed for teachers, and in line with the theoretical focus of this thesis, it is SDT-based. The WTMST offered a suitable scale that accounts for multiple dimensions of teachers' motivational reasons for integrating CBPA. To my knowledge no other study has used this scale to measure teachers' motivation towards this specific task, which makes it difficult to compare and discuss findings against other studies. A few studies have found similar results when applying this particular scale, which support findings from this study (Fernet et al., 2017; Gorozidis & Papaioannou, 2014).

When using a scale in a different context than the one it was initially intended calls for a verification of the scale. The confirmatory factor analysis presented on page 42 shows that scale does hold for a Danish context, and it is possible to measure – in line with the SDT continuum - five different motivational reasons at a task level among Danish school teachers and teaching assistants. However, there are factorial issues of the scale, which calls for future research to further verify the scale. For instance, I have suggested – based on the confirmatory factor

analysis – to reduce the number of factors, because some of the items are difficult to separate – especially the intrinsic and identified values.

When dealing with task-level motivation it is also important to pay attention to the specific task. In this case the task is a mandatory, policy instructed PA (as opposed to a voluntary task) (Fernet et al., 2008). While the scale does offer a variety of reasons (15 items in total), the fact that it is a mandatory task may have influenced the way teachers responded. It may be difficult to meaningfully reply to autonomous reasons, because the task in itself constitutes an external demand. Another limitation of the WTMST, in this study, concerns the translation of the scale. Even though efforts were made to systematically translate and adapt the scale to fit a Danish school context, there may also be issues of transferability. For instance, I allowed for adjustments concerning the cultural and contextual adaption. Thus, it was necessary to make linguistic adjustments of certain words, in order to reach an understandable phrasing of items (e.g. the word ‘pleasant’ does not translate easily to Danish) (appendix 1a). This may not constitute a concrete limitation or weakness, but it is important to be aware of issues with, for instance, wording, because it potentially threatens validity of the scale. In efforts to increase construct validity of the scale during the systematic translation process, a number of expert panel sessions were carried out in order to discuss the construct and adaptability of the scale. In addition, the scale was pilot tested at a public-school representative of the sample.

### ***5.3.5 Development of interview protocol and interviewing teachers***

In this thesis, the intent of the qualitative phase was to explore and deepen the understanding of teachers’ motivation, identify and explore factors associated with teachers’ motivation, and point out usable ways to support teachers in their integration of CBPA. For this, I used

individual in-depth semi-structured interviews. The intent of the semi-structured approach was, first of all, to collect rich and relevant data and in line with the mixed methods design follow-up on initial survey findings. Moreover, the semi-structured interview protocol was informed by the theoretical frameworks (e.g. SDT and scaffolding concepts). At the same time, I wanted to make room for more open-minded exploratory questions, which were less linked to any theory or framework. A key strength of the semi-structured approach was that I was able to focus my questioning in accordance with the theoretical frameworks and create a meaningful structure in order to ensure rich and relevant data (Kvale, 2006, 2007). Reversely, a semi-structured interview guide informed by theoretical frameworks, and perhaps also my assumptions regarding teachers' motivation, may also be somewhat narrow and limited. For instance, even though I primarily used open-ended questions, I may not have uncovered all aspects of teachers' motivation or need for support. For instance, in my questioning I may have pointed or led the interviews in a certain direction. In doing so, I may have affected responses and may have lost aspects that also would have been valuable or insightful for this thesis' objectives. However, I tried to remain as objective as possible during the interviews and ensure that the findings of the qualitative phase are based on teachers' views and descriptions (Shenton, 2004). In addition, I sought to increase validity and reliability by creating transparency through detailed descriptions of data collection and data analysis procedures in this thesis and in the papers (Shenton, 2004). Moreover, steps were taken to ensure transparency and credibility in the qualitative phase. For instance, I recruited a second researcher in the first phase of analysis to carry out a systematic double-coding process. This gave me an opportunity to check for reliability by discussing codes and themes (cf. *Paper II*) (Shenton, 2004). For *Paper III*, both deductive and inductive codes and themes were discussed with a co-author in order to ensure accuracy and trustworthiness of the findings.

## 6. Conclusion

In the integration of classroom-based physical activity during school days, this thesis has found that teachers are indeed key stakeholders. This affirms existing research, which have established and emphasised the vital role teachers have as facilitators of CBPA. This thesis also underlines the importance of addressing and facilitating teachers' motivation when implementing school-based initiatives that instructs changes in teaching practices. Especially for the long-term commitment from teachers, this thesis underlines the necessity of continuously motivating and supporting teachers to integrate CBPA into daily teaching practices. Findings from the quantitative phase revealed various levels of motivation for using CBPA. The majority of teachers expressed autonomous reasons for integrating CBPA. In line with SDT, motives for integrating CBPA were based on enjoyment, interest and importance. These findings were supported by qualitative findings, which indicated that teachers are interested in and willing to use CBPA in their daily practice and that they anticipate positive student outcomes when using PA. In line with SDT, findings also revealed a number of key motivational drivers such as teaching autonomy, competence support and teacher collaboration (including sharing of ideas and co-creation). All were found to positively influence teachers' motivation for and commitment to integrate CBPA. In addition, teachers also identified factors such as meaningful CBPA; and PA-related courses, projects and materials as influential as well as supportive of their sustained use of CBPA. Reversely, findings also suggested critical barriers affecting not only teachers' motivation, but also their sustained use of CBPA. Teachers especially implied that daily integration of CBPA could benefit from more training, collaboration and allocation of time. These findings indicate that work still needs to be done in order to support and facilitate teachers' delivery of CBPA into daily practices. Findings

also suggest that school management plays an important role in teachers' integration of CBPA. In the enactment of CBPA, this thesis has found that teachers appreciate an autonomy-supportive work environment, that they welcome teacher collaboration as well as competence-support in the form of training and courses. As a contextual and environmental factor, teachers point to school management for supporting these basic psychological needs.

This thesis has also found that Danish schoolteachers' motivation is a somewhat complex, multi-layered construct highly influenced by public-schools' social and contextual environment. Analyses suggest that teacher's motivation for and commitment to the PA task is not just based on a singular set of characteristics. Instead it is influenced by the diversity that characterises teachers everyday work and teaching practices. Within a Danish/Nordic didactic teaching tradition, findings indicated that Danish schoolteachers' daily handling of CBPA is characterised by didactical reflections and choices. This underlines that the integration of CBPA – into a Danish teaching practice – is a highly reflective practice, and that activities are not just an 'add on'. Instead it has to make sense – for the content of subjects, the students and the individual teacher.

This thesis supports and supplements previous studies, which have analysed and explored teachers' motivation within a Self-Determination framework. Including all three psychological needs as well as the exploring motivational reasons across the SDT continuum, this thesis has provided a comprehensive and detailed account of teachers' motivation as well as the individual, social and contextual factors that may influence motivation. In summary, this thesis has found that SDT-based elements such as teaching autonomy, competence support and teacher collaboration are essential for teachers' motivation. As an analytical tool, scaffolding

brought new insights of support and supporting elements to the domain of teachers, and to my knowledge not many studies have applied or directed scaffolding to teachers. For this reason, more research is needed to fully explore the usefulness and application of this framework – especially regarding the individual differences among teachers, and how enactment of CBPA could benefit from different types of scaffolds and scaffolding.

### **6.1 Implications for future research and practice – *next steps***

This thesis provides insights from teachers on factors that either motivate or hinder their integration of CBPA into daily teaching practices. Insights and perspectives that may be valuable or central for the development of future school-based PA initiatives. Thus, since teachers have been marked as vital facilitators, findings may be relevant for future school-based PA interventions by addressing key factors for implementation. Moreover, findings may be used to frame new research questions or guide future research in the area of teacher motivation. Or findings may be used to inform policy-makers, and school management on ways to foster and facilitate teachers' motivation. In line with my pragmatic starting point, and on the basis of the knowledge and insights generated in this thesis, I am able to suggest a number of implications for future research and practice.

Based on my findings, I suggest that future school policies or school-based interventions, designed to increase students' level of PA, should have an increased focus on the role of autonomy. For instance, in the light of a public-school reform, it seems important to further explore the nature or construct of teachers' autonomy, and how it should be facilitated and supported when national school reforms and policies are implemented. Another interesting implication concerns teachers' desire to work autonomously and their desire to collaborate.

This interesting, paradoxical relationship calls for further research. A question for future research could be to explore the interplay between autonomy and collaboration. Such findings could perhaps have implications for schools and teachers helping them to create environments inclusive of both collaboration and autonomy among teachers.

While most teachers in this study are able to justify CBPA as relevant, teachers struggled with the meaningful integration of CBPA. This calls for further research to explore this notion of 'integration difficulty'. For instance, it may be fruitful to find ways to better present and describe how to meaningfully integrate CBPA. This may have crucial implications for teachers' understanding and didactic reflections of the match between traditional subject-specific content and CBPA. Correspondingly, I suggest that future research on school-based PA address the issue or link between teachers' motivational processes, and their professional identity. It could prove to be highly informative and relevant to explore aspects such as teachers' identity, beliefs, actions and motivation, and how this may influence the commitment to CBPA.

I also suggest that teachers continuously are provided with relevant training, courses and materials suitable for a Danish teaching context. For the sustainability of CBPA, it could be relevant to explore if professional training on, for instance, didactical strategies of how-what-why related to CBPA has a significant influence not only on teachers' confidence and individual competency, but also on their motivation for and commitment to CBPA. Since a key facilitator for teachers is to integrate meaningful and didactically reflected PA this issue should continue to be a primary concern for those responsible for training courses, and the professional development of teachers as well as researchers in the field of education.

Finally, since teacher collaboration has been identified as a key motivational driver, more research is needed to understand the nature and uniqueness of team work and collaboration among teachers, and how it may influence, benefit and/or support teachers' motivation for integrating CBPA. Furthermore, the analyses show that processes of developing and integrating CBPA into teaching practices, could benefit from *team scaffolding*. Overall, this thesis has found that schools should promote and welcome a collaborative and supportive environment for teachers, wherein teachers can handle and approach the PA task collectively. Research on, for instance, the construct of teachers' collaboration and how it may alter teaching and subject practices could be highly relevant. In addition, it should be further explored how scaffolding or 'scaffolds' could be helpful strategies, and not only in the design of teacher collaboration, but as a way to support teachers in general. This thesis has found that teachers make use of their didactic practice and skills as a sort of individual scaffolding. Moreover, analyses suggest that teachers ask for more clear guidelines – or institutional guidelines – on how to integrate CBPA into teaching practices – specially to overcome difficulties with integrating PA meaningfully into subjects. Work still needs to be done in order for teachers to overcome this 'integration difficulty' and it could be interesting to explore if teachers' motivation for enactment of CBPA could benefit from institutional scaffolding – either provided by school management and/or external providers. Overall, it could be interesting to explore how these different types or levels of scaffolding could support teachers in their handling of CBPA – or if this kind of instruction or guidance is too restrictive for teachers. For this reason, scaffolding or scaffolds may be beneficial for supporting teachers in, for instance, developmental processes of changing current teaching practices.

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# Appendices

## Appendix 1a – English and Danish version of the WTMST

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### The Work Task Motivation Scale for Teachers (WTMST) – English version

The 15 Items Assessing the Motivational Constructs for Each Task

*Why are you doing this task?*

|                 |   |               |   |   |           |   |
|-----------------|---|---------------|---|---|-----------|---|
| 1               | 2 | 3             | 4 | 5 | 6         | 7 |
| Not at all true |   | Somewhat true |   |   | Very true |   |

#### **Intrinsic Motivation**

Because it is pleasant to carry out this task.

Because I find this task interesting to do.

Because I like doing this task.

#### **Identified Regulation**

Because it is important for me to carry out this task.

Because this task allows me to attain work objectives that I consider important. Because I find this task important for the academic success of my students.

#### **Introjected Regulation**

Because if I don't carry out this task, I will feel bad.

Because I would feel guilty not doing it.

To not feel bad if I don't do it.

#### **External Regulation**

Because my work demands it.

Because the school obliges me to do it.

Because I'm paid to do it.

#### **Amotivation**

I don't know, I don't always see the relevance of carrying out this task.

I used to know why I was doing this task, but I don't see the reason anymore.

I don't know, sometimes I don't see its purpose.

## The Work Task Motivation Scale for Teachers (WTMST) – Danish version (final)

Hvordan vil vurdere at følgende udsagn passer på dig? Jeg anvender bevægelsesaktiviteter i undervisningen ...

| 1                             | 2                    | 3           | 4                    | 5               | 6                      | 7                      |
|-------------------------------|----------------------|-------------|----------------------|-----------------|------------------------|------------------------|
| Passer<br>overhovedet<br>ikke | Passer<br>meget lidt | Passer lidt | Passer<br>nogenlunde | Passer<br>meget | Passer rigtig<br>meget | Passer<br>fuldstændigt |

Fordi skolen pålægger mig at anvende bevægelsesaktiviteter

Fordi jeg får dårlig samvittighed, hvis jeg ikke anvender bevægelsesaktiviteter

Fordi det er vigtigt for mig at anvende bevægelsesaktiviteter

Fordi jeg synes, bevægelsesaktiviteter er interessante at anvende

Jeg ved det ikke, nogle gange kan jeg ikke se formålet med det

Fordi det er givende at anvende bevægelsesaktiviteter

For ikke at få dårlig samvittighed, hvis jeg ikke anvender bevægelsesaktiviteter

Fordi mit arbejde kræver, at jeg anvender bevægelsesaktiviteter

Fordi jeg føler mig skyldig, hvis jeg ikke anvender bevægelsesaktiviteter

Fordi jeg synes, at bevægelsesaktiviteter er vigtige for mine elevers faglige udbytte

Fordi jeg godt kan lide at anvende bevægelsesaktiviteter

Normalt ved jeg hvorfor, jeg anvender bevægelsesaktiviteter, men jeg kan ikke se grunden til det længere

Jeg ved det ikke, jeg kan ikke altid se relevansen af at anvende bevægelsesaktiviteter

Fordi jeg får løn for det at anvende bevægelsesaktiviteter

Fordi bevægelsesaktiviteter giver mig mulighed for at opnå de mål, som jeg synes er vigtige for undervisningen

## Appendix 1b – Complete survey (in Danish)

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**Følgende spørgeskema handler om din motivation for at anvende bevægelsesaktiviteter i undervisningen – både den fagopdelte og understøttende undervisning.**

I den danske skolereform er det beskrevet, at der på alle klassetrin skal indgå motion og bevægelse i et omfang, der i gennemsnit svarer til ca. 45 minutter dagligt. Motion og bevægelse kan indgå i både den fagopdelte og understøttende undervisning. Bevægelsesaktiviteter kan være korte sekvenser af aktiviteter som f.eks. løb, hop, dans, boldspil, Brain Breaks eller lignende.

I det følgende præsenteres du for en række udsagn og spørgsmål vedrørende din anvendelse af bevægelsesaktiviteter i undervisningen samt din motivation herfor.

Spørgeskemaet besvares anonymt, og alle besvarelser opbevares og behandles fortroligt. Data vil være anonymiseret på alle tidspunkter, og det er kun undertegnede, der har adgang til den data, der udgår fra spørgeskemaet.

Der findes ingen rigtige eller forkerte svar. Du bedes besvare spørgeskemaet alene. Det tager ca. 10 minutter at besvare spørgeskemaet.

**Ved at besvare spørgeskemaet bidrager du til forståelsen af, hvad der motiverer lærere og pædagoger til at anvende bevægelse i undervisningen.**

Mange tak for din hjælp.

Har du spørgsmål, er du velkommen til at kontakte ph.d. studerende Louise Stjerne Knudsen (lsknudsen@health.sdu.dk)

Forsknings- og Innovationscenter for Idræt, Bevægelse og Læring  
Institut for Idræt og Biomekanik  
Syddansk Universitet

**Følgende spørgsmål handler om din anvendelse af bevægelsesaktiviteter i undervisningen.**

Undervisning dækker over den fagopdelte og understøttende undervisning. Bevægelsesaktiviteter kan være korte sekvenser af aktiviteter som f.eks. løb, hop, dans, boldspil, Brain Breaks eller lignende.

**Hvilke(t) fag underviser du i lige nu?**

- (1)  Billedkunst
- (2)  Biologi
- (3)  Dansk
- (4)  Engelsk
- (5)  Fransk
- (6)  Fysik/kemi
- (7)  Geografi
- (8)  Historie

- (9)  Håndværk/design
- (10)  Idræt
- (11)  Kristendomskundskab
- (12)  Madkundskab
- (13)  Matematik
- (14)  Musik
- (15)  Natur/Teknologi
- (16)  Samfundsfag
- (17)  Tysk
- (18)  Valgfag - angiv venligst \_\_\_\_\_
- (19)  Andet - angiv venligst \_\_\_\_\_
- (20)  Ingen af ovenstående

**Hvor ofte anvender du bevægelsesaktiviteter i din undervisning? (Sæt ét kryds)**

- (1)  Hver dag
- (2)  Flere gange om ugen
- (3)  Én gang om ugen
- (5)  1-3 gange om måneden
- (4)  Mindre end én gang om måneden
- (6)  Jeg anvender ikke bevægelsesaktiviteter

**Hvor anvender du bevægelsesaktiviteterne? (Sæt ét kryds)**

- (1)  I den fagopdelte undervisning
- (3)  I den understøttende undervisning
- (4)  I begge dele

**Tænk på de bevægelsesaktiviteter, du anvender som en del af din undervisning, og vurder i hvilken grad følgende udsagn passer.**

|  | I meget høj<br>grad          | I høj grad                   | I nogen grad                 | I ringe grad                 | I meget<br>ringe grad        |
|--|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| I hvilken grad kobles bevægelsesaktiviteterne til det faglige indhold i undervisningen?                            | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| I hvilken grad finder du det meningsfuldt at koble bevægelsesaktiviteter til det faglige indhold i undervisningen? | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |

**I det følgende præsenteres du for fem faktorer, der kan tænkes at være vigtige for dig, når du anvender bevægelsesaktiviteter i undervisningen.**

**Prioritér de fem faktorer fra 1-5, hvor 1 er den faktor, der er vigtigst for dig, og 5 er den faktor der er mindst vigtig for dig. Du prioriterer de fem faktorer ved at trække i dem med musen.**

|                  | <b>1</b>                     | <b>2</b>                     | <b>3</b>                     | <b>4</b>                     | <b>5</b>                     |
|------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Ressourcer       | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Egne kompetencer | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Tid              | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Relevans         | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Opbakning        | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |

**Hvis der er andre ting, som du vurderer, har betydning eller er vigtige for dig, når du skal anvende bevægelsesaktiviteter i undervisningen, så skriv dem venligst her.**

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**I det forrige spørgsmål blev du bedt om at prioritere, hvad du mener, der er vigtigst for dig, når du anvender bevægelsesaktiviteter i undervisningen.**

I det følgende spørgsmål bedes du prioritere, ud fra de samme fem faktorer, hvad der udgør den største barriere for at anvende bevægelse i undervisningen.

**Prioritér de fem faktorer fra 1-5, hvor 1 er den faktor, der udgør den største barriere, og 5 er den faktor der udgør den mindste barriere. Du prioriterer de fem faktorer ved at trække i dem med musen.**

|                  | <b>1</b>                     | <b>2</b>                     | <b>3</b>                     | <b>4</b>                     | <b>5</b>                     |
|------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Ressourcer       | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Egne kompetencer | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Tid              | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Relevans         | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Opbakning        | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |

**Oplever du andre barrierer eller har du kommentarer til ovenstående, så skriv det gerne her.**

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De følgende spørgsmål handler om din motivation for at anvende bevægelsesaktiviteter i undervisningen – både den fagopdelte og understøttende undervisning.

**Jeg anvender bevægelsesaktiviteter i undervisningen ...**

|  | Passer<br>overhovedet<br>ikke | Passer<br>meget lidt         | Passer<br>lidt               | Passer<br>nogenlunde         | Passer<br>meget              | Passer<br>rigtig<br>meget    | Passer<br>fuldstændigt       |
|--|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Fordi jeg er forpligtet til at anvende bevægelsesaktiviteter       | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi jeg får dårlig samvittighed, hvis jeg ikke gør det           | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi det er vigtigt for mig                                       | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi jeg synes, bevægelsesaktiviteter er interessante             | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| ... Jeg ved det ikke, nogle gange kan jeg ikke se formålet med det | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |

**Jeg anvender bevægelsesaktiviteter i undervisningen ...**

|   | Passer<br>overhovedet<br>ikke | Passer<br>meget lidt         | Passer<br>lidt               | Passer<br>nogenlunde         | Passer<br>meget              | Passer<br>rigtig<br>meget    | Passer<br>fuldstændigt       |
|---|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Fordi det er givende at anvende bevægelsesaktiviteter                                 | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| For ikke at få dårlig samvittighed, hvis jeg ikke gør det                             | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi min arbejdsgiver kræver det   | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi jeg føler mig skyldig, hvis jeg ikke gør det                                    | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi jeg synes, at bevægelsesaktiviteter er vigtige for mine elevers faglige udbytte | (1) <input type="checkbox"/>  | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |

### Jeg anvender bevægelsesaktiviteter i undervisningen ...

|   | Passer overhovedet ikke      | Passer meget lidt            | Passer lidt                  | Passer nogenlunde            | Passer meget                 | Passer rigtig meget          | Passer fuldstændigt          |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Fordi jeg godt kan lide at anvende bevægelsesaktiviteter                                    | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| ... Normalt ved jeg hvorfor, men jeg kan ikke se grunden til det længere                    | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| ... Jeg ved det ikke, jeg kan ikke altid se relevansen                                      | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi jeg får løn for at anvende bevægelsesaktiviteter                                      | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |
| Fordi bevægelsesaktiviteter giver mig mulighed for at opnå de mål, som jeg synes er vigtige | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> | (6) <input type="checkbox"/> | (7) <input type="checkbox"/> |

**Følgende spørgsmål handler om din generelle jobtilfredshed og engagement. Du bedes for hvert af de nedenstående udsagn angive i hvilken grad udsagnene passer på dig.**

### I hvilken grad ... (Sæt ét kryds ud fra hvert udsagn)

|  | I meget høj grad             | I høj grad                   | I nogen grad                 | I ringe grad                 | I meget ringe grad           |
|--|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Giver dit arbejde dig selvtillid?                    | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Giver dit arbejde dig arbejdsglæde?                  | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Synes du, dine arbejdsopgaver er interessante?       | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Synes du, dine arbejdsopgaver er inspirerende?       | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Er dit arbejde vigtigt for dig (ud over indkomsten)? | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Føler du dig veloplagt, når du går på arbejde?       | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |
| Bliver du opslugt af dine arbejdsopgaver?            | (1) <input type="checkbox"/> | (2) <input type="checkbox"/> | (3) <input type="checkbox"/> | (4) <input type="checkbox"/> | (5) <input type="checkbox"/> |

**Hvor tilfreds er du med dit job som helhed - alt taget i betragtning? (Sæt ét kryds)**

- (1)  Meget tilfreds
- (2)  Tilfreds
- (5)  Hverken eller
- (3)  Utilfreds
- (4)  Meget utilfreds

**Er du?**

- (1)  Mand
- (2)  Kvinde

**Hvor gammel er du? (Angiv venligst antal år)**

—

**Hvilken gruppe ansatte tilhører du?**

**(Sæt ét kryds)**

- (1)  Lærer-uddannede lærere
- (2)  Ikke lærer-uddannede lærere
- (3)  Lærer-vikarer
- (4)  Lærer-studerende
- (5)  Pædagoger (inkl. pædagoger med særlige undervisningsopgaver)
- (6)  Andet - angiv venligst. \_\_\_\_\_

**Hvilke fag er du linjefagsuddannet i? (Sæt kryds ved alle de linjefag, du er linjefagsuddannet i)**

- (1)  Billedkunst
- (2)  Biologi
- (3)  Dansk
- (4)  Engelsk
- (18)  Fransk
- (5)  Fysik/Kemi
- (6)  Geografi
- (7)  Historie
- (8)  Håndværk/Design
- (9)  Idræt
- (10)  Kristendomskundskab/Religion
- (11)  Madkundskab
- (12)  Matematik
- (13)  Musik
- (14)  Natur/Teknologi
- (15)  Samfundsfag
- (16)  Tysk
- (19)  Valgfag - angiv venligst \_\_\_\_\_
- (17)  Andet - angiv venligst? \_\_\_\_\_
- (20)  Ingen af ovenstående

**På hvilke(n) årgang(e) underviser du? (Sæt kryds ved den eller de årgange du underviser på)**

- (1)  0. årgang
- (2)  1. årgang
- (3)  2. årgang
- (4)  3. årgang
- (5)  4. årgang
- (6)  5. årgang
- (7)  6. årgang
- (8)  7. årgang
- (9)  8. årgang
- (10)  9. årgang
- (11)  10. årgang

**På hvilken skole er du ansat? (Sæt ét kryds)**

(NB: to anonymise respondents, the name of schools has been replaced by 'XXX')

- (1)  XXX
- (2)  XXX
- (3)  XXX
- (4)  XXX
- (5)  XXX
- (6)  XXX
- (7)  XXX
- (8)  XXX
- (9)  XXX
- (10)  XXX
- (11)  XXX
- (12)  XXX
- (13)  XXX
- (14)  XXX
- (15)  Anden skole - angiv venligst \_\_\_\_\_

**Hvor mange år har du arbejdet som skolelærer/pædagog? (Angiv venligst antal år)**

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**Har du nogle yderligere kommentarer, så skriv dem gerne her.**

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**I forbindelse med den videre undersøgelse vedrørende læreres motivation søger jeg lærere, der har lyst til at deltage i et interview. Hvis du er interesseret i at deltage, må du meget gerne skrive din mail i nedenstående boks, og du vil blive kontaktet.**

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## **Appendix 2 - Danish version of the interview protocol**

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### **Inden interviewet:**

- Præsentation af interviewer
- Præsentation af formålet med interviewet og strukturen for interviewet.
  
- Præsentation af interviewpersonens rettigheder
  - o Din deltagelse er frivillig, og du kan til enhver tid trække din deltagelse og samtykke tilbage
  - o Du vil til enhver tid være anonymiseret i alt materiale, der udgår fra projektet
  - o Data opbevares og behandles med stor fortrolighed (jf. persondataloven)
  - o Interviewet optages på diktafon og transskriberes efterfølgende.
  
- Der er ingen rigtige eller forkerte svar, og du svarer bare, hvad der falder dig ind.
- Der kan undervejs være gentagelser, hvor vi måske kredser om det samme spørgsmål/svar. Dermed kan samtalen måske sommetider virke kunstig.
  
- Inden vi går i gang, vil jeg bede dig om at underskrive en samtykkeerklæring. Det er for at beskytte dine rettigheder som interviewperson.

### **DEL 1: Afdækning af læreres forståelse af bevægelse**

Spm. 1: Med dine egne ord, hvad er så bevægelse – helt overordnet?

Spm. 2: Og hvorfor bevægelse, tror du?

### **DEL 2: Afdækning af anvendelsen af bevægelse – både på et skole- og individuelt niveau.**

Spm. 1: Kan du sige lidt om, hvad jeres tilgang til bevægelse (sport, motion) er her på skolen?

Spm. 2: Kan du sige lidt om, hvordan du anvender bevægelse i din undervisning?

1. Hvilke (fagdidaktiske) overvejelser gør du dig, inden du anvender bevægelse i undervisningen?
2. Er der forskel på, hvordan du anvender bevægelse i de fag, du underviser i?
  - a. Hvis ja – hvordan kommer det til udtryk og hvorfor?
  - b. Hvis nej – hvorfor tror du, det er sådan?
  - c. Er der nogle fag, hvor det er nemmere at anvende bevægelse – hvis ja, hvorfor?
3. Hvad synes du om at anvende bevægelse i undervisningen?
  - a. Hvad skal der til for at du kan blive mere motiveret til at anvende bevægelse?
4. Kan du kort komme med et eksempel på, hvornår du sidst anvende bevægelse i undervisningen?
5. Hvordan er I organiseret omkring undervisning – fagteams/klasse teams?
  - a. Arbejder I med bevægelse i de teams – hvis ja, hvordan?

Før spm. 3: Her kunne evt. bruges følgende beskrivelse af bevægelse i undervisningen:  
*Bevægelse integreret i den faglige undervisning: bevægelse integreres i det enkelte læringsforløb og understøtter det faglige indhold og læring. Kortere bevægelsesaktiviteter: korte sekvenser af bevægelse hvor aktiviteten giver en pause mellem læringsforløb.*

Spm. 3: Kobles bevægelse til det faglige indhold i undervisningen?

1. Hvis ja – hvordan og oplever du, at det giver mening?
2. Hvis nej – hvorfor ikke? Hvilke barrierer støder du på?

**DEL 3: Forståelse af læreres motivation for at anvende bevægelse i undervisningen. Kan også udtrykkes som "faglige bevæggrunde".**

Spm. 1: Hvad synes du om, at der er kommet et krav om 45. minutters bevægelse om dagen?

1. Tænker du, at det har ændret noget ved din profession? Hvis ja – på hvilken måde?
  - a. Kan du give et eksempel på det?

Spm. 2: Kan du prøve at beskrive, hvad der giver dig lyst til at anvende bevægelse i undervisningen eller omvendt - ikke giver dig lyst?

1. Hvad gør det svært? Hvad er vigtigt for dig?
2. Hænger det sammen med din generelle jobtilfredshed?

Spm. 3: I projektet arbejder jeg med tre begreber - medbestemmelse, fælleskab og kompetencer. Jeg ønsker blandt andet at undersøge, hvilken rolle de har ift. læreres motivation. Jeg starter med en kort beskrivelse af begrebet og spørger herefter ind til din oplevelse.

1. Medbestemmelse: Handler om, at man føler en grad af autonomi og medbestemmelse over det, man laver. En form for "Jeg har selv valgt det".
  - a. Er det noget du oplever, og kan du beskrive, hvordan det kommer til udtryk?

- b. Bestemmer du selv hvornår og hvilke bevægelsesaktiviteter, du anvender?
2. Fællesskab: Handler om, at man føler sig som en del af et fællesskab. En form for "Jeg er sammen med nogle om det".
  - a. Er det noget du oplever og kan du beskrive, hvordan det kommer til udtryk?
  - b. Ville det give mening for dig at have et fællesskab omkring bevægelse, og hvordan kunne det evt. se ud?
  - c. Gør skolen noget særligt ift. fællesskab omkring bevægelse?
3. Kompetence: Handler om, at man føler sig kompetent ift. den opgave/aktivitet, man står over for. En form for "Jeg kan det her".
  - a. Er det noget du oplever, kan du beskrive, hvordan det kommer til udtryk?
  - b. Hvordan har du det med at blive udfordret på din viden og kompetencer?
  - c. Kan du finde hjælp på skolen ift. bevægelsesaktiviteter?
    - i. Hvis ja – hvor henne og af hvem?
    - ii. Hvis nej - kunne du have et behov for det?

#### **DEL 4: Afdækning af nuværende stilladseringsniveauer og behov for stilladsering**

*En nylig rapport fra KORA, konkluderer, at lærere og pædagoger efterspørger og har brug for mere viden om bevægelse og støtte til at få det integreret i undervisningen.*

Spm 1: Jeg kan starte med at spørge, om du er enig i den konklusion?

1. Hvorfor enig eller uenig?

Spm. 2: Hvis du nu selv skulle beskrive den ideelle støtte eller vejledning for dig i forbindelse med at anvende bevægelse i undervisningen – hvad kunne det så være?

1. Hvilken rolle får din leder, fagteam/klasseteam, andre i det?
2. Eller ser du, at hjælpen skal komme udefra?
3. Oplever du, at i har en "kultur" på skolen i relation til at støtte og vejlede hinanden?
4. Kunne det have en betydning for din lyst til at anvende bevægelse?
  - a. Hvis ja, på hvilken måde?
5. Eller: Hvad skulle få dig til at anvende endnu mere bevægelse i undervisningen, end du gør i forvejen?

#### **Mulige punkter til opfølgning – med afsæt i stilladsering:**

Rekruttering: Her bliver du introduceret for den foreliggende "opgave" – altså selve bevægelselementet. Det kan helt konkret være et introduktionsmøde på skolen, hvor bevægelse er blevet præsenteret – måske I har nedsat nogle grupper eller andet.

1. Har du oplevet at blive "rekrutteret" til at anvende bevægelse – og hvordan kom det til udtryk?

2. Er det noget du kunne have et behov for?

Reduktion af frihedsgrader: Her forenkles eller simplificeres ”opgaven” yderligere. Det kan fx være, at nogle har instrueret og vejledt dig i, hvordan bevægelse kan anvendes i undervisningen? Det kan fx være et kursus eller workshop.

1. Er det noget du har oplevet – og hvordan kom det til udtryk?
2. Er det noget du kunne have et behov for?

Retningsfastholdelse: Løbende vejledning i, hvordan du kan anvende bevægelse i undervisningen? Det kan også være i form af feedback fra fx en kollega.

1. Er det noget du har oplevet – og hvordan kom det til udtryk?
2. Er det noget du kunne have et behov for?

Markering af kritiske træk: Formålet med dette niveau er også at vejlede undervejs og markere evt. uoverensstemmelser og samtidig sørge for at holde dig på rette ”spor”. Det kan fx være at nogle har påpeget, hvad du gør godt eller mindre godt.

1. Er det noget du har oplevet – og hvordan kom det til udtryk?
2. Er det noget du kunne have et behov for?

Frustrationskontrol: Handler om at få hjælp til at reducere stress og frustration i forbindelse med opgaven. Det kan fx være at du taler med en kollega eller leder omkring dine frustrationer – at de bliver italesat, og du bliver hjulpet videre.

1. Er det noget du har oplevet – og hvordan kom det til udtryk?
2. Er det noget du kunne have et behov for?

Demonstration: Handler helt grundlæggende om, om du har set eksempler på, hvordan bevægelse kan integreres i undervisningen?

1. Er det noget du har oplevet – og hvordan kom det til udtryk?
2. Og følte du dig efterfølgende inspireret til at gå videre på egen hånd og finde egne måder at anvende bevægelse på?
3. Er det noget du kunne have et behov for?

**DEL 5: Opsamling og afslutning. Vi er nu nået til afslutningen på interviewet, og jeg vil kort samle op på vores samtale.**

1. Del 1. Afdækning af din forståelse af bevægelse
2. Del 2. Afdækning af din anvendelse af bevægelse
3. Del 3. Forståelse for din motivation
4. Del 4. Afdækning af forskellige former for støtte/stilladsering

Hvis vi nu kigger lidt væk fra hele bevægelselementet, som jeg har fokus på i mit projekt, og i stedet kigger på reformen som helhed. Hvad er så den "brændende platform" for dig – og evt. for hele skolen?

1. Hvad har reformen betydet for dig?
2. Og passer den til den virkelighed, du kender?

#### **DEL 6: Demografiske spørgsmål**

Alder:

Køn:

Skole:

Erfaring:

Klassetrin:

Fag:

## Appendix 3 – Danish version of the interview consent form

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### Erklæring om samtykke

Jeg erklærer hermed, at jeg giver mit samtykke til at deltage i et interview i forbindelse med Louise Stjerne Knudsens projekt omkring læreres motivation for at anvende bevægelse i undervisningen.

Jeg er informeret og indforstået med at:

1. Min deltagelse er frivillig.
2. Jeg til enhver tid kan trække mit samtykke tilbage og udgå af undersøgelsen.
3. Interviewet er anonymt, hvilket betyder, at jeg (navne på kollegaer, skolen og andre stednavne) ikke nævnes ved navn eller på anden måde kan genkendes i det materiale, der udgår fra projektet.
4. Mine udsagn kommer til at fremgå og have betydning for analysens udfald.
5. Datamaterialet kun vil blive afspillet og behandlet i forbindelse med forskning.
6. Alt materiale, noter, transskriptioner mv. opbevares og behandles fortroligt jf. Persondataloven.

Jeg har modtaget både skriftlig og mundtlig information om undersøgelsen.

Dato: \_\_\_\_\_

Informantens underskrift: \_\_\_\_\_

Interviewerens underskrift: \_\_\_\_\_

## **Paper I-III**

## Paper I

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**Knudsen LS, Skovgaard T, & Bredahl T.** Understanding and scaffolding Danish schoolteachers' motivation for using classroom-based physical activity: study protocol for a mixed methods study. *BMJ Open* 2018;8:e019857 (status: published).

# BMJ Open Understanding and scaffolding Danish schoolteachers' motivation for using classroom-based physical activity: study protocol for a mixed methods study

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## ABSTRACT

**Introduction** The benefits of physical activity for children's health, both mental and physical, and its positive effects on academic achievement are well established. Research also emphasises that schools could provide a natural setting for regular physical activity. There is, however, a limited amount of knowledge about teachers' views when it comes to integrating physical activity as part of teaching. The aim of this study is to understand teachers' motivation for integrating physical activity as part of teaching and to assess their need for guidance and support.

**Methods and analysis** The study uses an explanatory sequential mixed-methods design. Schools from across Denmark are included in the sample. The design comprises two separated phases—a quantitative and qualitative phase. The quantitative phase is guided by the self-determination theory where teachers' motivation will be measured using the Work Task Motivation Scale for Teachers. The theory of scaffolding guides the qualitative phase, which consists of in-depth interviews with participants selected from the quantitative phase based on levels of motivation and on demographic information. In accordance with the study aims, the analysis of data will identify teachers' internal and external levels of motivation. The purpose of the qualitative phase is to enhance understanding of teachers' motivation and of their need for support in the use of physical activity in teaching.

**Ethics and dissemination** All relevant ethics approvals have been acquired. All participants in this study will provide written informed consent prior to data collection. All data emerging from the quantitative and qualitative phase will be anonymised for analysis. Ethics approval was requested from the Regional Committee on Health Research Ethics for Southern Denmark approval ID S-20162000–40 and the Danish Data Protection Agency approval ID 16/15491). The study was deemed not notifiable by both authorities.

**Trial registration number** NCT02894346; Pre-results.

## BACKGROUND AND INTRODUCTION

The benefits of physical activity (PA) for mental and physical health, cognitive function and academic achievement are well established, particularly for children and young people.<sup>1–6</sup> Children and adolescents

## Strengths and limitations of this study

- The mixed methods approach provides a nuanced and detailed understanding of teachers' motivation and need of scaffolding.
- The study involves a broad selection of Danish schoolteachers across age, gender, experience and school type.
- The study uses a systematic recruiting strategy making sure that different levels of motivation are represented.
- The study has the potential to address key factors of future school-based interventions that seek to increase students' levels of physical activity during the school day.
- The study covers a wide range of areas of Denmark but will not be representative for all teachers in Denmark.

spend a large part of the day at school, and even though they are required to sit still for the majority of the day, research emphasises that school is an ideal setting for promoting PA.<sup>7,8</sup> In Denmark, daily PA has been mandatory in all Danish state schools (primary and lower secondary education) since 2014 and must be integrated throughout the school day. Physical education has been an integrated part of the curriculum in Danish state schools for many years; however, daily PA is part of a comprehensive public school state reform launched in August 2014. The purpose is to ensure that all students engage in sport, exercise and PA everyday with the purpose of securing their health and well-being and at the same time supporting motivation and learning in all subjects. In this study, PA is used in accordance with the terms in the reform text, which is exercise, sport and movement and offers a broad understanding of movement activities. All students must engage in, on average, 45 min of PA during the school day. PA has to be part of subject-divided teaching (eg, mathematics,



science, language subjects, history, geography, physical education, etc) and of assisted learning. This means that all subject teachers across the curriculum are responsible for using PA. Assisted learning supplements and supports subject-divided teaching and is typically placed at the end of the school day.<sup>9</sup> In this study, 'teacher' is an overall label for both teachers and assistant teachers. Assistant teachers are often part of both subject-divided teaching and assisted learning with the purpose of supporting the main teacher and also carry out assisted learning alone. School management has to ensure that the physically active school day is, in fact, implemented. However, there are no recognised guidelines from the Danish Ministry of Education in this area nor are there any consequences if the school does not adhere to the PA policy. Danish schoolteachers do not, in general, receive training in facilitating physical activities in the classroom during their formal teacher education. However, teachers who choose physical education as main subject during their education, receive training in developing, for instance, PAs. At the moment, selected national school-sport organisations offer professional development for teachers focusing on the PA policy. However, these training courses are not mandatory.

A few preliminary Danish reports on the implementation of the state school reform have been conducted.<sup>10 11</sup> These state that a considerable number of schools and teachers find it difficult to integrate PA into the school day. The reports note that PA has a positive effect on students' well-being and academic performance, but that barriers to integrating PA during the school day remain and that only a limited number of schools have successfully implemented PA.<sup>10 11</sup> There is an implication that teachers need more guidance and support in integrating PA in a meaningful manner, especially as part of their teaching practice.<sup>10 11</sup> However, there are no suggestions as to what kind of support or who should provide it. As a result, we know very little of the effect of the reform and teachers' qualifications and motivation for integrating PA.

As far as we can see, there is a shortage of knowledge about teachers' motivation for integrating PA into the classroom. In this sense, 'integration' means incorporating PA into the academic material of any given subject. Looking at the literature, we find suggestions of the perceived barriers to integrating PA into the classroom,<sup>1 12-14</sup> and these are typically time consumption, other curriculum pressures, lack of resources, lack of space and lack of competence. Additionally, a number of studies address the issue of teachers' perspectives on PA<sup>13 15-18</sup> and willingness to integrate PA into the classroom.<sup>19 20</sup> However, knowledge about the factors that may influence teachers' motivation or view on classroom-based PA is limited. A study by Parks *et al*<sup>19</sup> found that teachers generally recognise the importance of PA for children's physical and mental health and possibly for their academic progress. The study focused on elementary schoolteachers and school principals recruited from

both public and private schools in the USA. Elementary school in the USA corresponds to preschool class to fifth grade in Denmark (6-11 years of age). The findings of the study also indicates that teachers would be willing to integrate PA into the classroom but that their preparedness for designing and implementing PA is limited. It finds that they would need support to do so successfully. The Parks *et al* study raises important concerns about teachers' motivation for integrating PA into the classroom and about the factors that may hinder or facilitate that integration. The study also supports the notion that integrating something 'new', such as school-based PA interventions or a state school reform such as the one seen in Denmark, puts extra pressure on teachers that affects their involvement in the particular new task and in their overall job satisfaction.<sup>21 22</sup> Furthermore, since teachers' motivation has received little attention compared with students' motivation,<sup>23-27</sup> it is very relevant to understand their motivation in an educational setting. The reform introduced in Denmark is rather unique, in the way that it is mandatory as opposed to guided by broadly based recommendations about PA in schools (eg, the United States: Comprehensive School Physical Activity Program). All state schools in Denmark are obligated to integrate 45 min of PA during the school day across year groups and subjects. Teachers therefore play an important role in integrating PA into the classroom and in increasing levels of PA among students.<sup>28 29</sup> In the light of the reform, it is therefore even more necessary to understand teachers' motivation for the new PA task, as well as their need for support in integrating PA into the classroom.<sup>17</sup> This study investigates teachers' motivation and need for support across subjects and year groups using two underpinning theories as a guide.

### Self-determination theory

In this project, the self-determination theory (SDT)<sup>30 31</sup> is applied and motivation assessed using the Work Task Motivation Scale for Teachers (WTMST).<sup>32</sup> SDT is a useful theoretical framework for understanding the nature of teachers' motivation. SDT makes important distinctions between different types of motivation that make human beings act in different domains. Using SDT will make it possible to establish whether teachers have the motivation to use PA as part of their teaching on a daily basis. Furthermore, by applying the SDT perspective, this study will look further into possibilities of maintaining PA in both subject-divided teaching and assisted learning.

At the core of SDT are three basic psychological needs that, according to Deci and Ryan, are inherent in all human life and essential for optimal human functioning and development. The three innate needs are competence, relatedness and autonomy. Competence can be described as a feeling of being able to achieve a possible and/or desired outcome. Relatedness is the feeling of connectedness with others and having a sense of belonging. Autonomy refers to the feeling of self-determination.<sup>30 31 33 34</sup> Deci and Ryan distinguish between



intrinsic motivation, external regulation (external, introjected, identified and integrated) and amotivation. For example, intrinsic motivation occurs when people engage in their job for the pleasure and satisfaction they gain from it. External regulation occurs when the underlying motives are more instrumental and when reward is seen as originating in a benefit or pressure from without.<sup>31 35</sup> There are four kinds of external regulation according to Deci and Ryan. External regulation is a classical type of extrinsic motivation. It occurs when a task is performed on the basis of rewards or to avoid punishment. Introjected regulation occurs when the work tasks are performed to avoid feelings of guilt or to increase self-worth. Identified regulation occurs when work tasks are performed based on personal beliefs, importance or personal values. According to Deci and Ryan this is the process where people recognise and accept the underlying value of a behaviour or task.<sup>30 35</sup> Integration occurs when people identify with the importance of the task and integrate the identification with other aspects of the self.<sup>30</sup> In this study, these different types of motivation and regulations will be assessed at a task level by applying the WTMST.<sup>32</sup> For example, to what extent do teachers feel regulated by external pressure or to what extent are they intrinsically motivated when it comes to integrating PA?

### Scaffolding

According to Deci and Ryan all human motivation needs supportive conditions to thrive. Negative conditions can, on the contrary, diminish motivation. The mentioned authors see the environment as a key predictor in the maintenance and support of motivation.<sup>30 31</sup> To understand how teachers and their motivation can be supported in the process of integrating PA in teaching, scaffolding will be used as a theoretical framework. In this study, the environment will be understood as the school context, consisting of both social, cultural and physical elements.<sup>36 37</sup>

Scaffolding is originally a teaching strategy and originated as the principle of an expert (eg, teacher) that guides a learner (eg, student) in a one-to-one interaction. Building on Lev Vygotsky's zone of proximal development, the basic feature of scaffolding is to guide and support children or students to solve problems not by telling them what to do but by using six types of scaffolding, which, applied appropriately, help the learner in the development process until they are able to solve the task themselves.<sup>38</sup> The zone of proximal development is characterised as the distance between a child's actual development level and the level of potential development.<sup>36 39</sup>

In this study, scaffolding will not be used as a teaching strategy in its original form. Instead it will be used as a way of describing and identifying the kind of supportive conditions that exist in a school environment. Scaffolding is therefore used synonymously with support,<sup>37</sup> and will be used to understand what kind of support and scaffolding 'tools' teachers need to carry out PA. It will for example

be possible to identify, through the six levels of scaffolding (recruitment, reduction of degrees of freedom, direction maintenance, marking critical features, frustration control and demonstration), what kind of scaffolding strategy is needed.<sup>38</sup> Additionally, through the six levels of scaffolding means (feeding back, hints, instructing, explaining, modelling and questioning), it will be possible to further elaborate this strategy and understand what kind of assistance and support teachers specifically need.<sup>40</sup>

### Study aims

This study aims to:

1. Understand teachers' motivation for using PA in teaching using SDT as a theoretical framework;
2. Understand how teachers and their motivation can be maintained and supported by using the theory of scaffolding.

### METHODS AND ANALYSIS

To understand teachers' motivation, this study uses an explanatory sequential mixed methods design.<sup>41-43</sup> The purpose is to explore preliminary quantitative data in a subsequent supplementary qualitative phase.<sup>44</sup> The combination of quantitative and qualitative methods will provide a rich and detailed understanding of the study aims. The study started January 2016 and will end December 2018.

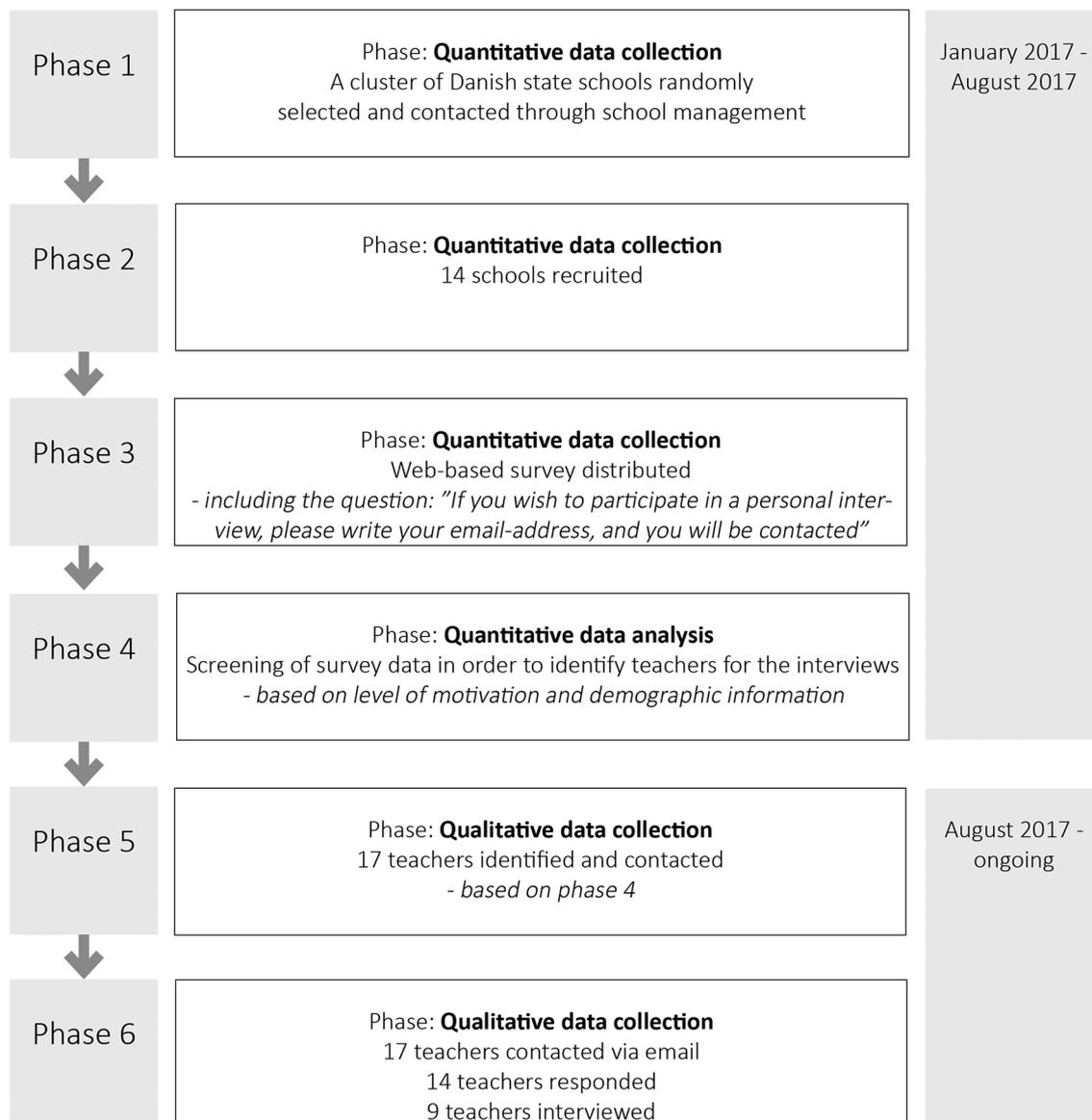
#### The quantitative phase

##### Selection of sample

The target population in this study are teachers employed at Danish state schools. Inclusion criteria are (1) employment at a Danish state school and (2) teaching responsibilities (both subject-divided teaching and assisted learning). A pilot study was conducted as part of the quantitative data collection phase. During the pilot study, it became clear that teaching assistants with special teaching tasks also carry out PA activities in assisted learning. As a result, teaching assistants were included in the sample. For the quantitative phase, a basic probability sampling technique was used.<sup>45</sup> In the first stage of sampling, a cluster of schools was randomly selected. To secure maximum variation and diversity in the sample, schools were chosen on the basis of their regional and municipal location to reach a variety of schools to make sure that both countryside, suburban and city schools were included. By using this type of sampling technique, it was also possible to include schools that show different usage levels of PA. The final step of the sampling process was identifying the teachers at the sampled schools.

#### Recruitment

Participants were recruited through school management. Each school manager received a recruitment email consisting of a detailed description of the study, its purpose, time consumption and possible workload. After approval of the study at management level, teachers at



**Figure 1** Overview of recruitment procedures in the quantitative and qualitative data collection phases.

each sampled school received a message through the internal school message system. The message entailed a link to the questionnaire and provided schools and participants with knowledge of handling of data, data security, participation rights and anonymity (figure 1).

#### Questionnaire translation and pilot study

A systematic adaptation, pilot testing and back-translation process of WTMST were conducted.<sup>46–48</sup> The scale was translated from English to Danish using a bilingual translator. Next, it was culturally adapted, making sure the questionnaire was understandable and meaningful to the sample. The scale was pilot tested on teachers employed at a state school representative of the sample. After the pilot test, the scale was analysed and evaluated by a qualified and appropriate reference group. The reference group consisted of researchers in the field of physical activity, well-being and learning within school contexts. On the basis of the feedback from the reference

group, further adaptations were made. The questionnaire was then back-translated into English. An expert committee consisting of one native English speaker as well as researchers with specific knowledge of teaching and the Danish school system evaluated the back-translated questionnaire. Meaning variations were discussed. No significant differences in meaning between the two English versions were identified. An original English version of WTMST can be found in online supplementary appendix 1.

#### Quantitative data collection

The target group answered a questionnaire based on WTMST. The scale is designed to measure motivation towards six tasks: class preparation, teaching, evaluation of studies, classroom management, administrative tasks and complementary tasks.<sup>32 35</sup> At the core of the questionnaire are 15 items specifically designed to measure both internal and external types of motivation, such as:



intrinsic, identified, introjected and external regulations and amotivation. Each motivational type contains three items addressing possible reasons for engaging in a particular task. In this study, questions fall into various types, such as: 'Because I find movement activities interesting to use' (intrinsic); 'Because I feel guilty if I don't use movement activities' (introjected); 'Because I'm paid to use movement activities' (external) and 'Because it is important for me to use movement activities' (identified). The 15 items are scored on a 7-point Likert scale. WTMST will be used to measure teachers' motivation for using PA as part of their teaching task (both subject divided and assisted learning) on a task level. In addition, the questionnaire consists of questions that measure factors that either hinder or facilitate the integration of PA in a school setting. These factors are based on findings from a review in which Naylor and colleagues<sup>1</sup> identified several perceived barriers that may influence the implementation of school-based PA interventions. Five factors were chosen for this questionnaire: time, support, resources, own competence and relevance. Participants were asked to prioritise the five factors from 1 to 5 five in two categories: (1) seen as important for carrying out PA and (2) acting as a barrier for carrying out PA. In addition, the participants answered sociodemographic questions concerning gender, age, employment status, subject(s), year(s), school and experience.

#### Data analysis

All data from the questionnaire will be analysed using SPSS statistical software V.24. Data from the questionnaire will be organised and summarised in a descriptive analysis for the purpose of enhancing understanding of teachers' level of motivation.<sup>49</sup> In the descriptive analysis questionnaire, information on levels of motivation will be analysed alongside demographic information using frequency counts and cross-tabulations. This type of analysis will provide the information needed for the qualitative phase of the study.

#### The qualitative phase

##### Sampling and case selection

Participants for the qualitative phase will be selected based on the following variables: (1) their level of motivation measured by WTMST—ensuring that both intrinsic and extrinsic levels are represented—and (2) sociodemographic factors such as age, gender, subject and length of employment. The number of participants for the interviews is based on data saturation and will be ongoing until reaching the point where the data are rich and detailed and no new information arises. Recruitment of participants is an integrated part of the survey process, where respondents are asked to write their email address if they are interested in participating in a subsequent in-depth interview.

##### Data collection

Against the background of the preliminary quantitative findings, the aim of the qualitative phase is to elaborate

on and enhance the understanding of teachers' motivation and of their need for support.<sup>44</sup> Where the quantitative data will provide a general picture of trends based on the sample of teachers measured by the WTMST, the qualitative phase will deepen the understanding of their motivational levels based on the three psychological needs highlighted in SDT (competence, relatedness and autonomy). The qualitative phase will also explore teachers' need for support.<sup>41 50</sup> Data will be collected through individual in-depth interviews,<sup>51</sup> and interviews will be carried out in the participants natural setting (schools).<sup>50</sup> A semistructured interview guide will form the basis for the interviews, which will be conducted face to face.<sup>51</sup> In the qualitative data collection period, we will consider teachers' teaching responsibilities and workload, thus staying clear of, for instance, examination periods. Interviews are expected to last approximately 1 hour.

The semistructured interview guide is primarily informed by the SDT and the theory of scaffolding. Participants will first be asked to identify motivational levels in accordance to the three basic needs from SDT (competence, relatedness and autonomy). Second, participants will be asked to identify the types of scaffolding levels they currently meet at a school level. Third, participants will be asked to identify what kind of support they need to carry out PA in teaching. Lastly, participants will be asked to identify the factors that may hinder or facilitate their motivation for integrating PA. Before starting data collection, the interview protocol will be pilot tested on one or two participants selected from the list of participants, whereupon it will be revised and adjusted as needed.

#### Data analysis

The interviews will be transcribed verbatim. Data will then be analysed through thematic coding using Nvivo software V.11.<sup>52</sup> The first step in the data analysis is to conduct a preliminary exploration of the data by reading through the transcripts and any notes taken during the interview sessions. The second step is to code the data. This will allow for a thematic analysis on the basis of SDT, while the theory of scaffolding will be used for identifying, analysing and reporting on possible patterns concerning need for support and guidance—both at a case level and across cases.<sup>41 53</sup> As an overall guide, the qualitative data analysis follows the six steps of thematic analysis.<sup>52</sup> A systematic double-coding process with a second analyst will be conducted in Nvivo to secure trustworthiness and test for reliability.

#### Discussion of possible outcomes

This study will provide a detailed understanding of teachers' motivation for using PA as part of their teaching practice. The mixed methods design makes it possible to achieve a theory-driven perspective on teachers' motivation based on SDT<sup>31</sup> measured by the WTMST. Moreover, using the theory of scaffolding,<sup>38</sup> the study provides information of how teachers can be supported in their work with integrating PA and what factors may affect

their willingness to do so. The outcomes of this study may inform training programmes aiming to improve the skills of current and future teachers as regards implementation of PA into the classroom. The study also has the potential to address key factors of importance for designing future school-based interventions aiming to increase students' level of PA by providing knowledge of how to foster teachers' motivation. Finally, this study may be used to inform stakeholders, such as school management, board of governors and subject advisors on how to foster teachers' motivation for integrating PA into the classroom.

## ETHICS AND DISSEMINATION

All participants in this study will receive information regarding their participation. This information will outline the study, their voluntary participation and the handling of data. Furthermore, participants have the right to withdraw from the study at any time. Prior to the quantitative phase, school management will provide written informed consent. Prior to the qualitative data collection, each participant will provide written informed consent. Participants will be anonymous in all publications. All data will be organised and handled with confidence and only the research team will have access to the data. Data will be stored according to the rules of The Danish Protection Agency.

Results will be disseminated continuously in the field of public health, for example, conference presentations, scientific articles and other platforms deemed relevant for the dissemination of this study.

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**Competing interests** None declared.

**Patient consent** Not required.

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# Understanding and scaffolding Danish schoolteachers' motivation for using classroom-based physical activity: study protocol for a mixed methods study

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**Knudsen LS, Skovgaard T, & Bredahl TVG.** Knudsen LS, Skovgaard T, & Bredahl TVG. "I like it": Exploring teachers' motivation for using classroom-based physical activity in Danish public-schools from a Self-Determination perspective. Results from a mixed methods study.

## Paper III

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**Knudsen LS, Bredahl, TVG, Skovgaard T, & Elf, NF.** Identification of Usable Ways to Support and 'Scaffold' Danish Schoolteachers in the Integration of Classroom-Based Physical Activity: Results from a Qualitative Study. *Scandinavian Journal of Educational Research*, (status: accepted for publication).





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