Inclusive Teaching Skills and Student Engagement in Physical Education

Karin Bertills[1]*, Mats Granlund[2] and Lilly Augustine[1]

[1] School of Education and Communication, CHILD, SIDR, Jönköping University, Jönköping, Sweden, [2] School of Health and Welfare, CHILD, SIDR, Jönköping University, Jönköping, Sweden

Including students with disabilities in school-based Physical Education (PE) is common practice. However, little is known about students' engagement and interaction in this environment and how it is related to PE teaching skills. Student engagement and interaction patterns were therefore observed. A multiple time-sampling method was used to perform observations of individual, contextual and environmental aspects of student engagement in school-based PE lessons. Three groups of students, aged 14 ($n = 94$), with: (1) Disabilities ($n = 23$), (2) Low grades ($n = 27$), and (3) High grades ($n = 44$) were compared. Students, independent of group, showed relatively high engagement in PE. The observed frequency of linking lesson content to PE syllabus in combination with using a vibrant affective tone when instructing was used as an indicator of high-/low-level teaching skills. Higher student engagement was observed in environments with high-level PE teaching skills, which included more whole group teaching, a higher frequency of student-teacher communicative proximity and more instructions. Students with disabilities and with low grades were more often observed in whole group activities, students with high grades in small group activities. The primary type of support provided to students with disabilities in PE seemed to consist of communicative proximity to the teacher. They were more often observed to be close to the teacher. Our results suggest that proximity to the teacher may serve as an indicator of inclusive teaching. In high-level teaching environments, teachers were more frequently in communicative proximity to all students, which facilitates learning. Lessons were also more focused (physically and academically) and technical devices and music were used for teaching purposes. More complex lesson content requires more instructions and our results show that, despite more instructions, all student groups were more on-task. Implied from our observations is that lesson complexity, the structuring of whole/small group formats, teacher proximity, and student engagement are aspects to consider when studying school-based PE. More instructions, closer communicative proximity and higher student engagement in high-level teaching provide students with more learning opportunities and facilitate feed-back and feed-forward, and individual support to students with disabilities.

Keywords: student engagement, teaching skills, physical education, disability, inclusion, participation, secondary school

INTRODUCTION

Students with disabilities experience restricted participation in extracurricular activities (King et al., 2009) and are six times less likely to report elevated self-efficacy in Physical Education (PE specific self-efficacy) compared to students with high grades in school-based Physical Education (PE) (Bertills et al., 2018b). Physical activity is fundamental to health and individual well-being (Kohl et al., 2012; World Health Organization [WHO], 2017). Participation in high quality PE therefore provides a good opportunity to benefit children's health (UNESCO, 2015). Life-style patterns are established during childhood, and behaviors established in adolescence may therefore impact future patterns of physical activity, health, and subjective well-being (Engström, 2008; Inchley, 2013). Mainstream schooling is beneficial to the educational outcomes of students in need of special support (Myklebust, 2006). However, mere access to equal opportunities to education does not guarantee feeling included for students with disabilities (King, 2013). Inclusive school development values diversity, supports every student's full participation, including the dimensions of attendance and engagement, and reduces exclusion of vulnerable learners (De Vroey et al., 2016). High quality teaching, which incorporates cognitive, creative and emotional prerequisites for positive functioning, is needed for these students to reach their potential (UNICEF, 2012). A shared goal of quality PE and the development of a physically active lifestyle, has directed the design of national content standards for PE (Rink, 2013). In accordance with guidelines outlined by UNESCO, the core aspects of inclusive Quality Physical Education (QPE) are inclusion, physical literacy, and child protection and safeguarding. Highly qualified teachers should provide students with sport values (respect, fair play, tolerance), support their skills, confidence, knowledge and understanding to make good decisions about physical activity throughout the lifespan, and contribute to personal well-being and student healthy and active lifestyle (UNESCO, 2015). The Physical Education and Health (PEH) syllabus in Sweden is criterion-referenced and health oriented. The purpose is to provide students with knowledge, skills and abilities to lead a healthy lifestyle. Achievement goals are stated and graded accordingly, for example, to set goals for, plan and organize training and evaluate effects of individual physical activity (The Swedish National Agency for Education, 2011). Participation issues are a matter of concern when adding an inclusive perspective to quality PE teaching. For students with disabilities to join in, feel included, and experience meaningful learning in PE, teachers need to create opportunities for students to control their own learning, and work in accordance with the UNESCO guidelines and national curricula. Individual goals e.g., in an Individual Education Plan (IEP) and special support may be needed for students with disabilities to participate in PE. Participation, as a measure of inclusion may therefore add valuable information to academic, social and emotional outcomes of students in need of special support (Maxwell et al., 2018). For full participation, individual and environmental aspects should be considered. Student engagement in school-based PE may provide key opportunities for students to gain knowledge and skills necessary for leading an active lifestyle in the future (Block and Obrusnikova, 2007). Knowledgeable instructors may create a meaningful learning environment that fosters autonomy (Shirazipour et al., 2018), with lessons structured into inclusive PE settings that may promote the physical, social, affective, and cognitive benefits claimed for PE (Bailey et al., 2009).

Engagement and Learning

Participation, defined as "involvement in life situations" (World Health Organization [WHO], 2007) includes not only attendance, but also engagement while being there (Imms et al., 2017). High engagement in school activities is linked to positive academic and life outcomes. Thus, student engagement may be considered as the "outward manifestation of motivation" (Skinner et al., 2009). Benefits from school engagement can be seen in relation to individual well-being, which positively correlates with future work quality (Pellegrino and Hilton, 2012). School engagement, or commitment to participate in learning activities, as opposed to attendance, is essential to student success and includes behavioral, emotional, and cognitive engagement (Fredricks et al., 2004). Higher student engagement is also a source of inspiration for teachers, whose energy can be invested in promoting learning rather than on managing off-task behaviors (Corso et al., 2013). Classrooms in which autonomy is fostered, i.e., where students are engaged in their learning, predict student engagement over time (Skinner et al., 2009). In classrooms with a positive climate, students engage more in learning (Furrer and Skinner, 2003). When the classroom climate is warm and respectful and emotional relationships are supported, students are more motivated to learn (Reyes et al., 2012).

Disabilities and long-term health conditions may limit meaningful participation in mainstream PE, unless proper support is provided (Block et al., 2007). Applying a non-disabled perspective such as using able-bodied or ableism to describe skills required in PE, may undermine and disrespect the value of disabled identity (Loja et al., 2013; Giese and Ruin, 2018). Approaches which foster the development of an inclusive educational environment, value diversity, attend to individual functioning and consider social and emotional states (Hart and Drummond, 2014). This inclusive approach requires adapted teaching strategies. One literature review shows that few studies report positive participatory gains from interventions, however individually tailored programs have been developed for students with disabilities (Adair et al., 2015). Modification of traditional sports and providing optional activities at appropriate skill levels are examples of an inclusive teaching style with possible participatory gains (Tant and Watelain, 2016).

Inclusive Teaching Skills

In a literature review on inclusion in PE (1975–2015), Tant and Watelain (2016) suggest that inclusive PE is shaped by professional training, collegial collaboration and a curriculum that can easily be adapted to physical activity and sports participation for people with disabilities. Learning activities that promote collaboration and reduce exclusionary competitive games are important for students to feel engaged and socially

successful in PE (Garn et al., 2011). Cooperative learning, referring to instructional methods where students work together in small groups to learn and help others learn (Dyson and Strachan, 2000), have successfully been implemented in inclusive PE classrooms (Grenier et al., 2005). Group goals (interaction and reflective dialogues), interpersonal and small group skills (shared decision making and listening, taking responsibility, giving feed-back, and encouraging each other), and individual accountability (to complete tasks) (Antil et al., 1998) are key elements for this model to be successful (Slavin, 1996). In a case study including a student with disabilities in regular PE, successful teaching strategies entailed avoiding competition and a shift toward motor learning, socializing, and using peer cooperation to progress in and control individually set goals (Grenier, 2006). A literature review concludes that positive outcomes of cooperative learning in PE include gains in physical performance, cognitive understanding (academic achievement), interactive skills and meaningful participation (social learning) as well as increased student concepts of self and their learning (affective learning). Although small-group methods may have potential for positive effects on student achievement, the degree of learning can also depend on tasks, group dynamics e.g., unequal group participation, or individuals' inability to seek help (Webb, 2008).

Supporting Students With Disabilities

Teacher proximity strategies are used to redirect problem behavior by making activity transitions smooth and increasing student on-task behaviors (Scherer, 2018). Studies of the proximity of paraeducators to students with disabilities suggest inconclusive outcomes (Broer et al., 2005). Academic engagement increased when paraeducators were less than three feet from students with substantial disabilities (Werts et al., 2001). One study determined that the on-task behaviors of students with autism increased, and disruptive behaviors decreased when the teacher was in proximity, in comparison to no teacher proximity (Conroy et al., 2004). While paraeducators can support student learning and positive peer interaction, excessive proximity of paraeducators may also have a negative impact. Students with disabilities may be, or feel, separated from classmates, with an increased risk of loss of personal control and social participation with peers (Giangreco et al., 1997). In fact, students with disabilities are often individually assisted by non-PE qualified teacher assistants, in activities separated from a regular school-based PE environment (Haycock and Smith, 2010). Since teacher proximity affects both student inappropriate and appropriate behaviors, it is an aspect which requires further investigation (Conroy et al., 2004). We are unaware of existing research concerning PE-teacher proximity to students with disabilities.

Conceptual Framework

Due to previous conceptual inconsistencies, an attempt to unify the concept of participation is posed in the family of Participation-Related Constructs model (fPRC) which was developed using a biopsychosocial approach (Imms et al., 2017). According to this model, participation consists of two dimensions, attendance and involvement. Attendance, or "being there," is a prerequisite for involvement, which in turn is the individual's experience of participation while attending, "being involved." The dimension of being involved (student engagement) was observed in the current study and compared with students' previously self-reported aptitude to participate in PE. Exemplified are high (see **Box 1**) vs. low engagement (see **Box 2**) in complex everyday activities that students with disabilities face in mainstream secondary school.

In line with the definition of participation stated in the International Classification of Functioning, Disability and Health for Children and Youth, ICF-CY (World Health Organization [WHO], 2007), high engagement is characterized by a student, paying full attention to the assigned or chosen activity. Participation-focused research dealing with student diversity is required to extend knowledge about levels of engagement in students with disabilities in various environmental, and individual interactions (Imms et al., 2017). Research on individual engagement also needs to consider environmental factors such as type of activity and inclusive teaching skills. Context specific functioning was observed in terms of how engagement was related to the way lessons were structured (small group, whole group or individual activities) and communicative proximity to the teacher. Teachers' level of instruction, from no learning-related instruction to dialogues with high inferential learning and teachers' affective tone when instructing was used as an indicator of observed (high-/low-level) inclusive teaching skills (Tskills).

Aim and Research Questions

The current observational study targeted students with disabilities and examined links between student engagement, type of activity and teaching skills. Participation patterns in different PE contexts were observed as well as how student engagement varied between students with (1) disabilities, (2) high grades (A–C) in PE and (3) low grades (D–F) in PE.

BOX 1 | High engagement in PE.

One girl pays full attention to the instructor in a dance lesson but does not make a move. Suddenly she starts doing star jumps, the current move to copy, and stops when the next move is demonstrated. The routine is repeated following the same pattern. There is no doubt this girl with developmental coordination disorder, DCD, is "being there" and fully involved practicing skills, when possible, in the intended learning context.

BOX 2 | Low engagement in PE.

Before assessment, one boy is given the instruction to practice the drills he needs, to improve certain gymnastics skills. There is a choice of various activities, and this boy half-heartedly paces the assigned context. Suddenly he starts kicking and pushing the equipment out of place. This boy with ADHD is "being there", a prerequisite for participation, but engaged in the wrong activity and consequently not involved in the intended learning context.

Research questions were:

a) How does student engagement in PE vary between the groups of students examined?
b) What characterizes contexts in which students are highly engaged?
c) What characterizes PE lessons with high-/low-level teaching skills?

METHODS

Individual, contextual, and environmental aspects of student participation were examined. The learning environment comprised of mainstream, school-based PE in which individual student engagement takes place in PE specific contexts. Time samples of 3 s observations were performed using the Child Observation in Physical Education (COPE) and Teacher Observation in Physical Education (TOPE) scales. A multiple groups time series design was used.

Participants

A total of 94 students, aged 14–15, were observed during PE lessons. Students with diagnosed disabilities (n = 23) were first recruited. They were indirectly identified via PE-teacher networks, head teachers, disability organizations, habilitation services, and personal contacts and subsequently contacted by researchers. Once consent to participate was obtained from each individual, their schools, classmates and PE-teachers were given the opportunity to participate. Consenting classmates of students with diagnosed disabilities were grouped based on their PE grade from the previous year. Students were divided into one group with high grades (A–C group) (n = 44), and one with low grades (D–F group) in PE (n = 27). The heterogeneous group of students with disabilities had a variety of diagnoses including physical, neurodevelopmental and intellectual impairments and disorders typically present in inclusive mainstream schools, e.g., severe vision impairment, developmental coordination disorder, attention deficit hyperactivity. For a complete description (see Bertills et al., 2018b). Observational data were also collected and analyzed from the recruited students' PE-teachers (n = 21), one teacher was responsible for two classes and one declined participation.

Data Collection Instruments

Structured observations of school-based PE in mainstream secondary education were performed. Participants were observed one at a time and results were logged in structured observation sheets (tablets). A sweep was concluded when all participants (students and teachers) had been observed and logged once. This was followed by a new sweep. The procedure was repeated throughout the entire lesson. During one observation a participant was momentarily "caught in action" over a 3 s interval. Contextual communication, action and interaction such as what the participant was doing, where and with whom was scored instantly. The observer repeatedly took "snapshots" of the targeted students' (COPE) or teacher's (TOPE) activity.

Observations were coded into different sets of variables, primarily constructed to be summed into counts of whether a phenomenon was observed or not.

Child Observation in PE (COPE)

Ten variables were coded in each sweep: verbal, to whom, scheduled activity, emotional state, proximity, interaction state, type of task, engagement in learning, materials, and lesson focus (see detailed coding alternatives in **Table 1**). A total of seven of these variables were used in this study (verbal, to whom and emotional state were excluded). **Table 2** shows the indexes that were created for further analyses from combinations of codes in each category, with frequency proportions and interrater reliability scores.

> *Engagement* was assessed on a scale ranging one to three (1 = low, 2 = medium, 3 = high engagement) and indexed into "high" (n = 58) and "lower" (n = 36) engagement with cut-off at mean (M = 2.35, SD = 0.370).
>
> *Type of task* describes student action in terms of doing what they are supposed to do by actively "practicing skills", or "not practicing skills" (doing wrong activity, nothing or being disruptive), "being social", or "other" (passive presence due to being instructed, queueing or else).
>
> *Proximity* An indicator of available support in terms of communicative distance to "teacher", "student", "self".
>
> *"Being there"* measuring student's interaction state. Social (parallel, associative, cooperative), and unsocial (unoccupied, alone, onlooker) play behavior in preschoolers (Farran and Son-Yarbrough, 2001) guided the composition of variables into being there "on-task", "off-task", "socializing" or "alone".
>
> *Format*, the scheduled activity and lesson structure indexed into "whole group", "centers" (small group or a choice of individual or group activity), "transitions", and "other" (e.g. drink pause or special arrangements due to not participating in planned activity).
>
> *Focus* describes the content in the variables "physical" (student focus set on certain physical activity), "academic" (cognitive skills challenged in e.g. collaborative problem solving), and "no focus".
>
> *Materials* were indexed into different types of equipment "team sports and dance" (balls and music), "play and obstacle runs" (standard gym equipment), "else" (electronic device), "no materials".

Teacher Observation in PE (TOPE)

TOPE contain nine variables: verbal, to whom, scheduled activity, proximity, type of task, level of instruction, material, tone/affect, and lesson focus. Findings from factor analyses to establish indicators of observed inclusive teaching skills were resolved in a one-factor solution (n = 197 observations), which explained 51% of the variance after excluding items with low factor loadings (<0.40). This factor (eigenvalue, 2.0, KMO = 0.623,) contained the items, level of instruction (some/high) and tone/affect (vibrant) when instructing. Correlations between some and high instructional level, and vibrant affective tone ranged from $r = 0.444–0.544$. Three variables were indexed

TABLE 1 | Instrument variables with coding alternatives, adaptations and indexes.

Variable	Coding alternatives	Adaptations in COPE	Index
			Format
Scheduled activity	**W**hole group (WG)	No	WG
	Small group (SG), centers (C), small group, and centers (SGC)	Small group activity, individual choice of activity, choice of group activities	Centers
	Transition	No	Transition
	Special, mealtime, playground, gym, nap	Special = teacher's aide, mealtime = drink pause, playground = walk, gym = rehab, nap = warm down	Other
			Proximity to
Proximity	**T**eacher, small group teacher (SGT), whole group teacher (WGT)	Communicative distance enabling teacher instruction/feed-back, originally 1 meter	Teacher
	Student, SG, WG	No	Student
	Self	No	Self
			"Being there"
Interaction state	**P**arallel, associative, cooperative	Individual, pairwise or group wise activity	On-task
	Non-academic, onlooker, unoccupied, time out	Onlooker is non-learning related, originally it is a learning activity. Time out was never scored.	Off-task
	Socializing	No	Socializing
	Alone	No	Alone
			Student action
Type of task	**S**equential	No	Practicing skills
	Non-sequential, none, disruptive	Indexed as not learning for current study	Not learning
	Social	No	Being social
	Passive instruction, queueing, fantasy driven, disruptiveEx, time out	Passive presence due to being instructed, queueing or else. DisruptiveEx and time out were never scored.	Other
			Engagement
Engagement	**L**ow, **M**edium, **H**igh	3-range scale (originally five)	Lower/High
			Materials used
Materials	**L**iteracy, math, science, social studies, toys etc.,	Balls, rackets, music for dance	Team sports/music
	Gross motor	Standard gym equipment	Play/obstacle runs
	Computer, TV	Projector, computer tablet, worksheet	Technical device
	None		No
			Focus
Focus	**L**anguage arts, reading, science, drama, gross motor	Team sports, games, aerobic training, dance, obstacle runs	Physical
	Math, social studies, other	Risks/injuries, teamwork challenges, communication with teacher	Academic
	None		No
Level of instruction*	**S**ome, **H**igh	Intended PE learning outcomes were targeted	**Inclusive teaching skills** when instructing
Tone/affect*	**V**ibrant	No	
Type of task*	**I**nstructing	No	

*Index names are bolded. Bolded first letter indicate which coding alternatives were combined into indexes. Data derives from COPE (students). *Data derives from TOPE (teachers), only relevant coding alternatives are displayed.*

into one scale (see **Table 1**) indicating observed PE teaching skills (Tskills).

Type of task. Data was extracted only from situations where teachers were instructing
Level of instruction. Considered the degree to which syllabus intentions were referred to or embedded into the instructions 1. no learning-related instruction, 2. one-way-communication, 3. some content deriving from syllabus e.g. reasoning with open-ended questions, and 4. high inferential learning e.g. content clearly connected to syllabus with reasoning and/or feed-back/-forward when students were practicing physical skills.
Tone/affect. Teachers tone when instructing students was scored as 1. extremely negative, 2. negative 3. flat, 4. harmonic, 5. vibrant.

TABLE 2 | Indexes used to capture different aspects of student participation, with proportion of observations where our different indexes were observed and interrater reliability scores.

Variable	Index	Aspect	%	Kappa value
Student*				
Engagement	**Engagement**	Individual		0.89
	Lower engagement		40	
	High engagement		60	
Type of Task	**Student action**	Individual		1.00
	Practicing skills		49	
	Not practicing skills		14	
	Being social		14	
	Being instructed or else		23	
Proximity	**Proximity to**	Contextual		0.70
	Teacher		34	
	Student/-s		53	
	Self		13	
Interaction state	**"Being there"**	Contextual		0.78
	On-task		46	
	Off-task		42	
	Socializing		11	
	Alone doing different		1	
Focus	**Focus**	Environmental		0.96
	Physical skills		63	
	Academic skills		15	
	No		22	
Scheduled activity	**Format**	Environmental		0.85
	Whole group		57	
	Centers		23	
	Transition		16	
	Other		4	
Materials	**Materials used**	Environmental		0.74
	No		50	
	Team sports/music		26	
	Play/obstacle runs		20	
	Technical device		4	
Teacher**	**Teaching skills**	Contextual		
Level of Instruction	Some		4	0.72
	High		2	
Tone/affect	Vibrant		7	0.86
Task Instruction	Teachers instructing		35	

*Data derives from COPE (students). **Data derives from TOPE (teachers).
Index names are bolded.

To differentiate levels of Tskills, the scale scores needed to be dichotomized. Instructional level was combined with affective tone when instructing ($n = 197$ observations) and summed into a scale ranging 1–8 (see **Table 2** for proportion of observations and interrater reliability). Each teacher received a mean frequency score and was assigned into either high- ($n = 10$) or low-level ($n = 11$) Tskills, with a cut-off at the mean ($M = 3.45$, SD $= 0.95$). In the current study, inclusive high-level Tskills was assigned teachers who more frequently vividly interacted with students,

incorporated the Swedish PE syllabus into drills or discussions, or gave feed-back/-forward when students were practicing skills.

When the PE lessons were finished the observers rated their overall impression; teacher engagement, variation, and student attention, on a scale ranging 1–5. Comparing these ratings with the dichotomized scale constructed for the analysis of results, teachers were similarly estimated into the same category of high-/low-level teaching skills in 18 of 21 (86%) cases.

Self-Report Questionnaires

Self-reported questionnaires had been collected from students, year 7, and their teachers, one and a half years prior to this observational study. Students reported their PE specific self-efficacy, i.e., perceived skills and abilities to participate and succeed in the syllabus-related components of movement, health and lifestyle, and outdoor life and activities. They also reported their aptitude to participate e.g., feeling secure, appropriate modifications, support provided. Teachers self-rated their teaching skills (self-rated Tskills) in terms of short- and long-term planning of lessons and grading skills according to a criterion-referenced grading system. For detailed description (see Bertills et al., 2018b).

Procedures

The observation instruments COPE and TOPE originate from observations in preschools (Farran et al., 2006; Bilbrey et al., 2007). Observers were initially trained by researchers experienced with the original version of the instruments. To fit a school-based PE setting scales were adapted and pilot-tested. Adaptations were made to reflect observation on students representing a different age group and setting, e.g., typical child routines and behaviors were adjusted to those of adolescents, in a gym setting. Notably, COPE/TOPE were initially intended to collect observations of preschool over the course of 1 full day, whereas the time-span for COPE/TOPE in this study was the duration of a PE lesson, 45–60 min. Feed-back and feed-forward have a powerful impact on the learning process (Hattie and Timperley, 2007) and was therefore added to the highest level of instruction in the current study. Adaptations (see **Table 1**) were discussed and after pilot-testing approved by developers of the preschool instruments.

Over a 4 week period involving indoor activities, a total of 40 lessons were observed (M = 20 students/class). Observations were performed with the same group at one to three occasions. The number of consenting participants in each class ranged from 1 to 12 individuals. Two observers simultaneously registered scores in classes with more than four participants while one observer was used when classes had less than four participants. The limited number of students with disabilities ($n = 23$) and the limited number of PE-teachers ($n = 21$), together with the notion they might not be present a second time, meant that the researchers aimed to record as many sweeps as possible on the first occasion. To ensure a satisfactory number of sweeps, students with disabilities and teachers were observed at more frequent intervals than the other participants. In total, 2,068 sweeps of students and 535 sweeps of teacher activities during

PE lessons were analyzed from individuals with at least 12 recorded sweeps (M = 21.99, SD = 4.47, min = 12, max = 37). Prior to data collection, the two observers performed trial observations and discussed situations in which they disagreed on scoring of specific situations. An interrater reliability analysis was performed using the Cohen's kappa statistic. Two observers coded 14 students in 54 sessions and three teachers in 29 sessions at three different time-points; beginning, middle, and end of the total observations. Kappa coefficients for COPE ranged from 0.70 to 1.0 (see **Table 2**). TOPE interrater reliability Kappa coefficients for the indexes level of instruction was 0.72 and for tone/affect 0.86.

Statistical Analysis

Analysis of variance, ANOVA (Bird, 2004) to index significant aspects of activity characteristics (proximity to teacher, scheduled activity, format, student interactions, student actions, lesson focus, and materials used) was used to investigate mean differences between average scores in the groups of students with disabilities, high grades (A–C) and low grades (D–F). Characteristics of contexts, in which students showed high/lower levels of engagement were calculated using an independent samples t-test (Field, 2013). Characteristics of PE lessons with high-level Tskills were examined using an independent samples t-test (Field, 2013). Finally, observational data was integrated with previously collected data from teacher and student questionnaires (Bertills et al., 2018b). Spearman's rho was used to examine associations between observed Tskills (mean score), and self-rated Tskills (sum score ranging 0–14). In addition, observed student level of engagement was compared to their self-reported general and PE specific self-efficacy (mean scores), aptitude to participate in PE and functional skills using an independent samples t-test (Field, 2013).

Ethics

All students actively consented to participate in the current study. Written informed consent was obtained from the participants and their parents. The study was approved by the Ethical Review Board, Linköping, Sweden (2013/508-31).

RESULTS

Group Variation of Student Participation in PE

Scheduled activity. "Being there," on-task or off-task varied between the disability group and the A–C group and between the A–C group and the D–F group (see **Table 3**). Students with disabilities and the D–F group were more off-task compared to the group with high grades. Despite large mean differences in socializing and alone, significance was not detected, due to large within-group differences. A trend (non-significant) showed that being off-task, students with disabilities tended to talk more with teachers and did activities alone, while their classmates socialized with each other. Additionally, students with disabilities were observed as being instructed or queueing more frequently and practicing skills less frequently than their peers.

Students with disabilities were more frequently observed in communicative proximity to teachers [$F_{(2,91)} = 6.59$, $p = 0.037$], compared to the A-C group, who were significantly closer to peers [$F_{(2,91)} = 7.42$, $p = 0.024$]. The D–F group were non-significantly closer to peers. Group differences were also observed when lessons had an academic focus. Compared to the A–C group, students with disabilities [$F_{(2,91)} = 7.38$, $p = 0.025$] and the D–F group [$F_{(1,91)} = 5.50$, $p = 0.019$] were significantly less often observed in such conditions.

In conditions of observed high-level teaching skills (Tskills), students were significantly more frequently observed in whole group activities, and less in centers activities (see **Table 5**). And student engagement was positively affected by whole group formats, negatively by centers formats (see **Table 4**). Comparing the groups, this was significant for students with disabilities. There was also a non-significant trend that students with disabilities were more often observed in situations with an academic focus (in high-level Tskills conditions). Students with disabilities and the A–C group were less and the D–F was more frequently observed in non-focused lesson situations. Materials were only used half of the time (see **Table 2**), with students showing lower engagement when no materials were used (see **Table 4**). Another group pattern was that when team sports

TABLE 3 | Group differences of "being there" in planned activity on-task, off-task, socializing, or alone.

Group	On-task		Off-task		Socializing		Alone	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Disability (n = 23)	39.05	(16.86)	48.84	(15.04)	9.36	(6.98)	2.76	(9.66)
A-C (n = 44)	52.27	(18.63)	35.14	(15.57)	12.37	(10.61)	0.23	(1.05)
D–F (n = 27)	41.36	(21.20)	46.35	(19.34)	12.02	(9.03)	0.28	(1.00)
ANOVA	**F = 4.739 ρ = 0.011**		**F = 6.608 (0.002)**		**F = 0.823 (0.442)**		**F = 2.346 (0.102)**	
Post-hoc	**df**	**χ^2**	**ρ-value**	**χ^2**	**ρ-value**			
Disability—A–C	2	9.12	0.010	12.93	0.002			
Disability—D–F	1	0.06	0.800	0.02	0.876			
A–C—D–F	1	5.50	0.019	7.82	0.005			

Total sample n = 94, disability n = 23, A–C n = 44, D–F n = 27.

materials and music for dancing were used, students with disabilities and the D–F group showed higher engagement.

Student Engagement in PE Contexts

Students, independent of group, show relatively high engagement and no significant differences between the three groups were found. A dichotomization of engagement into high ($n = 58$) vs. lower ($n = 36$) engagement for the total sample revealed that students displayed higher engagement when they were in communicative proximity to teachers, and in whole group PE formats. Students showing high engagement were more frequently on-task practicing skills. Significantly lower levels of engagement were found in centers formats, and when students were off-task or socializing (see **Table 4**).

Significant associations were found between observed student engagement and previously self-reported level of PE specific self-efficacy $t_{(90)} = 2.35$, $p = 0.021$, and aptitude to participate in PE $t_{(90)} = 2.62$, $p = 0.010$.

Teaching Skills in a PE Environment

Environments with observed high-level teaching skills (Tskills) were found in teachers who used syllabus content reasoning, gave feed-back and vividly interacted with students when instructing. Teachers with high-level Tskills were observed to be instructing significantly more frequently, students were more engaged, and teachers were more often in communicative proximity to their students (see **Table 5**). Students were more frequently observed practicing skills or being given instructions, whole group formats were used to a significantly greater extent, and technical device (e.g., music for dancing, computer tablets, and data projectors) were significantly more frequently used for teaching purposes, in conditions of high-level Tskills. Lessons had a physical focus most of the time in both high- and low-level Tskills, but in low-level Tskills, non-focused content occurred significantly more often. Additionally, students were observed to be alone to a significantly greater extent, not practicing skills, or being social, and observed to be more in centers formats when taught by teachers with low-level Tskills.

Observed Tskills (level of instruction and tone/affect when instructing) and previously self-rated teaching skills (short- and long-term planning of lessons and grading skills) showed moderate correlations (Spearman's rho) $r_{(15)} = 0.38$, $p = 0.165$.

DISCUSSION

Individual, Contextual, and Environmental Factors Influencing Student Engagement

Common for students with disabilities is loss of, or restricted, functional skills. Implied by earlier findings was a mutual relationship between socio-cognitive skills, aptitude to participate, and self-efficacy (Bertills et al., 2018b). Despite functional limitations, findings in this study indicate that all groups of students were equally engaged in PE. In addition, a strong relationship ($r = 0.76$) between PE specific self-efficacy and aptitude to participate was previously established (Bertills et al., 2018a). The significant associations found in the current study between student engagement and the self-reported questionnaires indicate that student perceived self-efficacy in PE

TABLE 4 | Observed student engagement in PE lessons and aspects of student participation in PE.

| Variable | Student engagement | | | | | | |
| | Lower ($n = 36$) | | High ($n = 58$) | | | | |
	Mean %	SD	Mean %	SD	df	t	p
Student action							
Practicing skills	31.9	13.17	59.2	13.83	92	−9.47	0.000
Not practicing skills	24.2	15.00	8.1	7.73	92	6.82	0.000
Being social	21.4	9.72	10.0	6.51	92	6.83	0.000
Being instructed or else	22.5	11.78	22.7	11.54	92	−0.07	0.940
Proximity to							
Teacher	28.8	14.44	37.5	22.50	92	−2.05	0.043
Student/-s	58.9	18.33	48.7	19.67	92	2.50	0.014
Self	12.3	11.01	13.8	17.12	92	−0.48	0.635
"Being there"							
On-task	28.4	12.60	56.8	15.03	92	−9.44	0.000
Off-task	53.6	13.80	34.3	15.59	92	6.08	0.000
Socializing	16.4	10.21	8.5	7.45	92	4.30	0.000
Alone doing different	1.6	7.76	0.4	1.31	92	1.18	0.243
Focus							
Physical skills	47.4	16.09	73.3	14.31	92	−8.12	0.000
Academic skills	14.3	10.40	15.1	12.50	92	−0.32	0.752
No	38.3	14.52	11.6	8.45	92	11.26	0.000
Format							
Whole group	47.3	23.74	62.7	17.81	92	−3.59	0.001
Centers	28.3	21.70	19.1	21.11	92	2.03	0.046
Transition	16.1	10.47	16.6	9.34	92	−0.28	0.782
Other	8.4	18.60	1.5	3.06	92	2.76	0.007
Materials used							
No	62.1	17.68	43.1	18.31	92	4.95	0.000
Team sports/music	16.2	20.82	32.6	24.72	92	−3.31	0.001
Play/obstacle runs	19.8	17.17	19.3	19.49	92	0.13	0.898
Technical device	1.9	3.90	5.0	14.93	92	−1.24	0.220

Observed frequency means in percent.

and aptitude to participate are also reflected in observed student engagement during PE lessons.

Students with disabilities tend to socialize less and seem to be more alone (non-significant) than their peers. This finding is consistent with peer interaction research on adolescents with ASD (Humphrey and Symes, 2011). Many students tend to chat in non-focused teaching situations, e.g., when teachers adjust equipment, but having a disability seem to exclude these students from partaking. Opportunities to do other things than intended are limited with high-level teaching, since lesson time is used more efficiently. Communicative proximity to the teacher in high-level teaching conditions appears to be a primary source of support for students with disabilities. This finding implies that when organizing lessons, especially in centers formats (assigned or chosen small group or individual activity), teacher communicative proximity needs to be taken into consideration to accommodate for the needs of students with disabilities.

Using a small group format is common practice in inclusive settings and encourages student learning (Webb, 2008). According to our results, this does not seem to apply to PE settings. Whole group activities were scored when more than 75% of the class were doing the same activity, or active in

TABLE 5 | Observed high-/low-level teaching skills and aspects of student participation in PE.

	Teaching skills						
Index	**Lower (*n* = 11)**		**High (*n* = 10)**				
	Mean %	*SD*	*Mean %*	*SD*	*df*	*t*	*p*
Student engagement	2.3	0.36	2.4	0.37	92	−2.00	0.049
Student action							
Practicing skills	44.8	19.74	52.6	17.53	92	−2.02	0.046
Not practicing skills	17.9	14.02	10.6	12.07	92	2.70	0.008
Being social	17.1	9.08	11.6	9.47	92	2.85	0.005
Being instructed or else	20.2	11.84	25.1	10.86	92	−2.11	0.038
Proximity to							
Teacher	27.5	16.78	40.8	21.20	92	−3.38	0.001
Student/-s	55.7	19.71	49.6	19.43	92	1.51	0.134
Self	16.8	18.57	9.6	9.22	92	2.39	0.019
"Being there"							
On-task	43.1	20.26	48.7	19.05	92	−1.36	0.176
Off-task	41.2	20.01	42.2	14.99	92	−0.29	0.774
Socializing	14.3	8.97	8.7	9.02	92	3.02	0.003
Alone doing different	1.3	6.83	0.4	1.25	92	0.97	0.336
Focus							
Physical skills	58.6	20.39	68.1	17.65	92	−2.42	0.017
Academic skills	14.1	11.98	15.4	11.48	92	−0.56	0.578
No	27.3	15.91	16.4	16.68	92	3.23	0.002
Format							
Whole group	51.0	22.99	62.6	18.44	92	−2.69	0.008
Centers	28.7	25.02	16.5	15.78	92	2.83	0.006
Transition	16.9	9.51	16.0	10.04	92	0.45	0.651
Other	3.4	9.65	4.9	14.25	92	−0.62	0.540
Materials used							
No	51.6	22.00	49.1	18.45	92	0.59	0.557
Team sports/music	23.8	23.82	28.8	25.23	92	−0.98	0.331
Play/obstacle runs	17.9	17.79	21.1	19.32	92	−0.84	0.403
Technical device	6.7	16.36	1.0	2.91	92	2.35	0.021
Teachers instructing*	28.6	13.83	50.1	13.05	19	−3.65	0.002

*In the observations with high-/low-level teaching skills, student engagement is an average of observed engagement. Other values indicate the mean percentage of observations (see **Table 2** for observed total frequency percentages). *The variable Teachers instructing derives from TOPE, all other data derive from COPE.*

two parallel activities. Likewise, centers were scored in either assigned or chosen pair- or group-wise activities. Autonomy support and structure predict student engagement (Jang et al., 2010). All activities e.g., warm-ups, and obstacle runs, can be structured into either whole group or centers formats with different focuses and intended learning outcomes. Small group formats may be preferred when targeting individuals' learning of more advanced exercises, e.g., motor skills or certain drills. Students with disabilities and those with low grades were observed more frequently as being more engaged in whole group activities while students with high grades were more frequently observed in centers activities. This finding is contradictive to findings in preschools (Powell et al., 2008), and indicate support limitations. PE-teachers work alone, with student assistants only present at four of 40 of the lessons observed. This is consistent with earlier findings (Morley et al., 2005; Block and Obrusnikova, 2007; Tant and Watelain, 2016). Organizing lessons

into parallel activities are commonly occurring, either as two or more optional activities, or as stations with different time-regulated activities that students attend, in a circuit mode. One reason as to why the student groups frequented small/whole group formats differently may be that when organizing small group activities, the students who manage to stay on-task might be those with high grades. For full engagement of all students, activities at appropriate skill levels should be provided (Tant and Watelain, 2016). Our results suggest that autonomy support in centers formats is not sufficient for student engagement and on-task behaviors of students other than those with high grades. This result is interesting since a recent quality report of PE in Sweden (The Swedish Schools Inspectorate, 2018) questions the organization of whole group activities. Due to the commonly occurring exclusionary competitive activities in such formats, often using balls in team sports and play, they argue that student physical capacity is exposed and that students do not experience equal opportunities to develop required skills. Contrasting this conclusion, the reason for using team sports and play might be that it is an organizational solution for PE-teachers' solitary work situation. PE-teachers may organize activities into one self-sustaining activity, e.g., team game, that does not require their attention, to allocate their assistance to more advanced small group activities. Learning support assistants would provide opportunities for more small group formats. However, lack of training has been reported to limit support effectiveness and collaboration between PE-teachers and learning support assistants (Vickerman and Blundell, 2012). Adding to the notion of complexity, our findings indicate higher student engagement in whole group activities for students with disabilities and those with low grades. Higher engagement was also indicated in these groups when materials for team sports and music for dancing were used (dancing never occurred in low-level teaching). We argue that organizing lessons into whole group formats may be an appropriate structure to use, unless proper assistance is provided. And that high-level teaching conditions support student learning by using balls and music. Balls and music may be used for different purposes, competitive/entertaining, or for reinforcing engagement that promotes learning.

In a majority of the observations (63 percent, see **Table 2**) students were active in activities with a physical focus, i.e., physically activated. This may be due to PE-teachers' inconsistent agreement on what is important to teach (Rink, 2013), physical, social, cognitive, or affective skills (Bailey et al., 2009). Our finding that students with disabilities were more engaged in academically focused activities in high-level teaching conditions, i.e., when cognitive skills were challenged, implicate that teaching intentions are more obvious and student engagement is encouraged when they can impact their learning. Student engagement in PE was generally high (M = 2.35, ranging 1–3) with little variation between the groups and irrespectively of focus. But in PE lessons with a physical focus the full participation of students with disabilities may be projected toward joining in and blending into the physical activities, whereas their peers can physically attend while also being socially, cognitively and affectively involved.

Our findings that students with disabilities were, compared to peers, more frequently observed in communicative proximity to the teacher, and in conditions of high-level teaching more in situations with an academic focus imply further notice to lesson complexity. When activities have an academic focus and if students with disabilities are properly supported, they participate more on equal terms with their classmates. Students were significantly more highly engaged in conditions of high- compared to low-level teaching. By using level of instruction and emotional tone when instructing or giving feed-back as indicators of high-/low-level teaching skills we found some characteristics that may be added when examining quality teaching as outlined in the UNESCO (2015) guidelines. High-level teaching provides students with more instructions and involves more whole group activities. Significant differences between high- and low-level teaching skills (see **Table 5**) show that students in conditions of high-level teaching spend 78% (low–level = 65%) of the PE lessons being instructed or practicing skills with physical or academic focus 84% (low–level = 73%) of the time. The fact that less time is spent on being social or not practicing skills 22% (low–level = 35%) and amount of non-focused lessons 16% (low–level = 27%) imply not only that high-level teaching is more efficient, but also that lessons are more complex. Examining teacher instructions, high-level teaching was represented by teachers, who incorporated syllabus content into their lessons and used vibrant verbal and non-verbal communication. Student engagement over time is predicted by student autonomy, i.e., students need to know teaching purposes in order to influence their learning (Skinner et al., 2009). Our results show for example that obstacle runs, and circuit training occur in 20% of the observations (see **Table 2**). Although student engagement in general is high in these activities, modifications such as targeting certain aims, offering challenges (choice of alternative pathways of difficulty) and giving instructions or feed-back along the route add quality to teaching. Our finding that students are being significantly more instructed in high-level teaching imply that more instruction is required when lesson content is more complex. Teaching may be differentiated by using technical devices e.g., tablets, which were more often used in high-level teaching. When lesson content is more complex, instructions are probably more individualized and refined. According to our leveling of instructions, the purpose of lesson content was communicated (partly or highly) in high-level teaching. When provided with high-level teaching, students became more engaged, practiced skills more actively, and the individualized instructions (feed-back and feed-forward) probably updated students on their current achievements. Thus, facilitating students' control of their own learning.

Our study suggests that teacher communicative proximity to students may function as a measure of individual learning support. Students with disabilities were closer to the teachers than their peers. Similar findings have been found in research concerning younger children in need of paraprofessional support (Giangreco et al., 2010). When structuring PE lessons, teachers need to consider their placement in terms of safeguarding, individualized instructions, feed-back for encouragement, and feed-forward for motor skills development. Although teachers' closer proximity to students in need of special support may intervene with peer to peer interaction (Malmgren and Causton-Theoharis, 2006; Luttropp and Granlund, 2010), research also shows that teacher proximity may facilitate inclusion (Werts et al., 2001). Earlier findings show that the teacher is one vital factor to the inclusive classroom climate, since teacher-students relationships affect student-student relationships (Falkmer, 2013) and a positive classroom climate fosters student engagement (Furrer and Skinner, 2003). It has also been suggested that PE-teachers' ratings of the classroom climate, serve as a social indicator of how students experience their learning environment and is most beneficial to students with disabilities, compared to peers with typical function (Bertills et al., 2018a). By positioning themselves in communicative proximity to their students, teachers may increase opportunities for individualized instructions, feed-back and feed-forward, but also affect the classroom climate positively by supplying support to those in need to overcome barriers and balance functional restrictions (Giangreco et al., 1997).

Methodological Considerations of the TOPE/COPE Instruments

Instruments used for structured observations were adapted and used for the first time in a PE environment. The TOPE instrument was indexed into a measurement of high-/low-level teaching and the COPE instruments to capture student engagement during PE lessons. The instruments amount to a detailed and fruitful description of individuals preoccupations in on-going activities. The instruments need further modification and testing but may serve well in large scale research studies or state of the art inspections. Also, multiple 3 s snapshots of students' preoccupations during PE showed significant links between observed student engagement and previously self-reported student perceived self-efficacy. We suggest COPE to be a time-saving method that could be used to direct the focus of further in-depth qualitative research on individual learning processes in specified contextual or environmental learning situations.

The tendency that students with disabilities socialize less and seem to be more alone during PE lessons need to be further examined. The dimension of "being there" in lesson activities (Imms et al., 2017) is fulfilled, whereas the dimension of "being involved" appears to be different for students with disabilities compared to their peers. This finding implies that students with disabilities do not feel included, or that their full attention is required to be directed toward the physical activity and thereby leaving no space for the social aspects of participation. Considering our results that students with disabilities and students with low grades were more engaged in whole group than in centers activities, detailing the variable scheduled activity would be of interest in future examination of learning contexts. For example, an addition of intentional or unintentional to the variable transition would add valuable information to teaching quality. Aerobic training includes intentional pauses for recovery. In current study no attention was paid to whether the transitions were such or caused by lack of teacher organizational skills. Observers need training for accurate scoring and inter-rater agreement. In this study agreement was tested at three time-points, at the beginning, middle and the end of data collection.

Experience improved rating speed and interrater agreement, especially in the indexes with lowest kappa values. Observers need to discuss and synchronize their ratings of situations that arise in a PE environment.

CONCLUSION

Using the multiple time-sampling observational instruments COPE and TOPE enabled examination of individual, contextual, and environmental aspects of student engagement rarely studied before. Students with disabilities are in closer communicative proximity to teachers and are more often in whole group formats in high-level teaching conditions, which also contain more instructions. Student engagement is linked to teaching skills and students with disabilities show similarly high engagement in PE lessons as their peers. Communicating intended learning outcome, reasoning about lesson content relevant to the syllabus, feed-back/feed-forward during learning exercises/drills, and using a vibrant affective tone when instructing was used as indicators of high-level teaching. Including more academically focused learning situations into high-level teaching or using more intricate physical activities require more instructions. Despite extended instructional time, we found that students show higher engagement. Additionally, time is used more efficiently, with fewer managerial interruptions and leaving less time for socializing. And PE lesson time is used for practicing and learning skills, students were more on-task. Together with the notion that students are more often in communicative proximity to teachers in whole group and centers formats in high-level teaching, our results show that these are individual and contextual factors that influence student engagement.

Differences in group patterns suggest that the factors instructional level, affective tone, proximity, and whole group/centers formats may serve as indicators of *inclusive* PE teaching skills. In high-level teaching conditions, teachers used more whole group activities, which is contradictive to research concerning inclusive teaching emphasizing learning gains when using a small group format (Webb, 2008). Support in PE for students with disabilities is primarily provided by the teacher. In high-level teaching, the teachers seem to compensate for the lack of assistance needed for students to effectively work in centers, by structuring lessons to fit whole group formats. It is reasonable to suggest that centers formats are used for more advanced drills. The teacher may thereby differentiate levels of challenges and provide individualized support and feed-back/feed-forward in small groups, while optional physically focused whole-group self-sustaining activities (e.g., team games) are offered to their peers. In summary, our results suggest that intended learning outcomes in the PE-syllabus are promoted in high-level teaching since time-saving PE lesson structures increase students' learning opportunities and enable more individualized instructions (feed-back and feed-forward), with higher levels of student engagement as a result.

LIMITATIONS

Studying students with disabilities encompass ethical concerns and time-consuming procedures. The sample size is conditioned by the number of students with disabilities recruited. Once they consented to participate, their classmates and PE-teachers were invited to agree to participation. The limited number of participants in each group in this study mean that group patterns rather than significant values are reported.

In our approach with teaching skills (high-level, low-level) we attempted to observe teachers structuring their lesson toward a conscientious alignment of curriculum, instruction and assessment in an inclusive mainstream school system. The observers were experienced PE-teachers, the overall subjective ratings of the 10 teachers (teacher engagement, variation, and student attention) observed by both had full agreement. One reflection from the observations was that PE-teachers in general are good organizers, lessons run smoothly, and safety issues are considered. One common feature between the teachers seemed to be the intention to maximize physical activity. Observed differences, according to the observers, lay in the purpose of the activity, the extent to which curricular intentions were mirrored. Most PE-teachers in this study were experienced and the lessons generally held high standards, especially when knowing they were being observed. Due to the limited number of teachers participating, significance could not be established, but an $r = 0.38$ indicate concurrence between self-rated and observed teaching skills. Teaching is multifaceted and cannot easily be measured. Previous studies using the original versions of TOPE and COPE show positive effects of instructional quality (Fuhs et al., 2013), teachers' affective tone (Spivak and Farran, 2016), and clear learning goals (Cameron and Morrison, 2011) on preschoolers' engagement. This guided the factor analyses performed. To differentiate observed learning environments, we indexed these aspects into a dichotomized scale, based on mean scores. Depending on the extent to which the curriculum was observable our dichotomization is an attempt to discern differences in student engagement and autonomous behaviors, not to be confused with good/bad teaching. We have chosen to call this high- and low-level inclusive teaching skills. The observation instruments adapted to secondary school students in a PE setting need further refinements for future use.

DATA AVAILABILITY

The datasets for this manuscript are not publicly available. Requests to access the datasets should be directed to Karin.bertills@ju.se.

ETHICS STATEMENT

This study was approved by the Ethical Review Board, Linköping, Sweden (2013/508-31). Students with disabilities, their classmates

who agreed to participate, and their parents actively consented to participate in the current study.

AUTHOR CONTRIBUTIONS

KB adapted the instruments, conducted observations and data analyses, and wrote the first draft. All authors interpreted results and contributed to the writing and revising process.

REFERENCES

Adair, B., Ullenhag, A., Keen, D., Granlund, M., and Imms, C. (2015). The effect of interventions aimed at improving participation outcomes for children with disabilities: a systematic review. *Dev. Med. Child Neurol.* 57, 1093–1104. doi: 10.1111/dmcn.12809

Antil, L. R., Jenkins, J. R., Wayne, S. K., and Vadasy, P. F. (1998). Cooperative learning: prevalence, conceptualizations, and the relation between research and practice. *Am. Educ. Res. J.* 35, 419–454. doi: 10.3102/00028312035003419

Bailey, R., Armour, K., Kirk, D., Jess, M., Pickup, I., and Sandford, R. (2009). The educational benefits claimed for physical education and school sport: an academic review. *Res. Papers Educ.* 24, 1–27. doi: 10.1080/02671520701809817

Bertills, K., Granlund, M., and Augustine, L. (2018a). Measuring self-efficacy, aptitude to participate and functioning in students with and without impairments. *Eur. J. Special Needs Educ.* 33, 572–583. doi: 10.1080/08856257.2017.1386316

Bertills, K., Granlund, M., Dahlström, Ö., and Augustine, L. (2018b). Relationships between physical education (PE) teaching and student self-efficacy, aptitude to participate in PE and functional skills: with a special focus on students with disabilities. *Phys. Educ. Sport Pedag.* 23, 387–401. doi: 10.1080/17408989.2018.1441394

Bilbrey, C., Vorhaus, E., and Farran, D. (2007). *Teacher Observation in Preschools*. Nashville, TN: Vanderbuilt University, Peabody Research Institute.

Bird, K. D. (2004). *Analysis of Variance via Confidence Intervals*. London; Thousand Oaks, CA: SAGE Publications.

Block, M. E., Klavina, A., and Flint, W. (2007). Including students with severe, multiple disabilities in general physical education. *J. Phys. Educ. Recreat. Dance* 78, 29–32. doi: 10.1080/07303084.2007.10597986

Block, M. E., and Obrusnikova, I. (2007). Inclusion in physical education: a review of the literature from 1995-2005. *Adapt. Phys. Activity Q.* 24, 103–124. doi: 10.1123/apaq.24.2.103

Broer, S., Doyle, M., and Giangreco, M. (2005). Perspectives of students with intellectual disabilities about their experiences with paraprofessional support. *Except. Child.* 71, 415–430.

Cameron, C. E., and Morrison, F. J. (2011). Teacher activity orienting predicts preschoolers' academic and self-regulatory skills. *Early Educ. Dev.* 22, 620–648. doi: 10.1080/10409280903544405

Conroy, M. A., Asmus, J. M., Ladwig, C. N., Sellers, J. A., and Valcante, G. (2004). The effects of proximity on the classroom behaviors of students with autism in general education strategies. *Behav. Disord.* 29, 119–129. doi: 10.1177/019874290402900201

Corso, M., Bundick, M., Quaglia, R., and Haywood, D. (2013). Where student, teacher, and content meet: student engagement in the secondary school classroom. *Am. Sec. Educ.* 41, 50–61. Available online at: http://www.jstor.org/stable/43694167

De Vroey, A., Struyf, E., and Petry, K. (2016). Secondary schools included: a literature review. *Int. J. Inclusive Educ.* 20, 109–135. doi: 10.1080/13603116.2015.1075609

Dyson, B., and Strachan, K. (2000). Co-operative learning in a high school physical education programm. *Waikato J. Educ.* 6, 19–37. doi: 10.15663/wje.v6i1.453

Engström, L.-M. (2008). Who is physically active? Cultural capital and sports participation from adolescence to middle age-a 38-year follow-up study. *Phys. Educ. Sport Pedagogy* 13, 319–343. doi: 10.1080/17408980802400510

Falkmer, M. (2013). *From Eye to Us: Prerequisites for and Levels of Participation in Mainstream School Of Persons With Autism Spectrum Conditions*. Jönköping: School of education and communication, Jönköping University.

Farran, D. C., Plummer, C., Kang, S., Bilbrey, C., and Shufelt, S. (2006). *Child Observation in Preschool Manual.*. Nashville, TN: Vanderbilt University.

Farran, D. C., and Son-Yarbrough, W. (2001). Title I funded preschools as a developmental context for children's play and verbal behaviors. *Early Childh. Res. Q.* 16, 245–262. doi: 10.1016/S0885-2006(01)00100-4

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics,* 4 Edn. Los Angeles, CA; London: Sage.

Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Rev. Educ. Res.* 74, 59–109. doi: 10.3102/00346543074001059

Fuhs, M. W., Farran, D. C., and Nesbitt, K. T. (2013). Preschool classroom processes as predictors of children's cognitive self-regulation skills development. *Sch. Psychol. Q.* 28, 347–359. doi: 10.1037/spq0000031

Furrer, C., and Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *J. Educ. Psychol.* 95, 148–162. doi: 10.1037/0022-0663.95.1.148

Garn, A. C., Ware, D. R., and Solmon, M. A. (2011). Student engagement in high school physical education: do social motivation orientations matter? *J. Teach. Phys. Educ.* 30, 84–98. doi: 10.1123/jtpe.30.1.84

Giangreco, M. F., Edelman, S. W., Luiselli, T. E., and MacFarland, S. Z. C. (1997). Helping or hovering? Effects of instructional assistant proximity on students with disabilities. *Except. Child.* 64, 7–18. doi: 10.1177/001440299706400101

Giangreco, M. F., Suter, J. C., and Doyle, M. B. (2010). Paraprofessionals in inclusive schools: a review of recent research. *J. Educ. Psychol. Consult.* 20, 41–57. doi: 10.1080/10474410903535356

Giese, M., and Ruin, S. (2018). Forgotten bodies - an examination of physical education from the perspective of ableism. *Sport Soc.* 21, 152–165. doi: 10.1080/17430437.2016.1225857

Grenier, M. (2006). A social constructionist perspective of teaching and learning in inclusive physical education. *Adapt. Phys. Activity Q.* 23, 245–260. doi: 10.1123/apaq.23.3.245

Grenier, M., Dyson, B., and Yeaton, P. (2005). Cooperative learning that includes students with disabilities. *J. Phys. Educ. Recreat. Dance* 76, 29–35. doi: 10.1080/07303084.2005.10608264

Hart, S. J., and Drummond, M. J. (2014). "Learning without limits: constructing a pedagogy free from determinist beliefs about ability," in *The SAGE Handbook of Special Education: Two Volume Set, Second Edition* (Thousand Oaks, CA: SAGE Publications, Inc), 439–458.

Hattie, J., and Timperley, H. (2007). The power of feedback. *Rev. Educ. Res.* 77, 81–112. doi: 10.3102/003465430298487

Haycock, D., and Smith, A. (2010). Inclusive physical education? A study of the management of national curriculum physical education and unplanned outcomes in England. *Br. J. Sociol. Educ.* 31, 291–305. doi: 10.1080/01425691003700532

Humphrey, N., and Symes, W. (2011). Peer interaction patterns among adolescents with autistic spectrum disorders (ASDs) in mainstream school settings. *Autism* 15, 397–419. doi: 10.1177/1362361310387804

Imms, C., Granlund, M., Wilson, P. H., Steenbergen, B., Rosenbaum, P. L., and Gordon, A. M. (2017). Participation, both a means and an end: a conceptual

analysis of processes and outcomes in childhood disability. *Dev. Med. Child Neurol.* 59, 16–25. doi: 10.1111/dmcn.13237

Inchley, J. (2013). Let's get physical: a public health priority. *Perspect. Public Health* 133, 92–93. doi: 10.1177/1757913913475755

Jang, H., Reeve, J., and Deci, E. L. (2010). Engaging students in learning activities: it is not autonomy support or structure but autonomy support and structure. *J. Educ. Psychol.* 102, 588–600. doi: 10.1037/a0019682

King, G. (2013). Perspectives on measuring participation: going forward. *Child Care Health Dev.* 39, 466–469. doi: 10.1111/cch.12083

King, G., Petrenchik, T., Law, M., and Hurley, P. (2009). The enjoyment of formal and informal recreation and leisure activities: a comparison of school-aged children with and without physical disabilities. *Int. J. Disabil. Dev. Educ.* 56, 109–130. doi: 10.1080/10349120902868558

Kohl, H. W., Craig, C. L., Lambert, E. V., Inoue, S., Alkandari, J. R., Leetongin, G., et al. (2012). The pandemic of physical inactivity: global action for public health. *Lancet* 380, 294–305. doi: 10.1016/S0140-6736(12)60898-8

Loja, E., Costa, M. E., Hughes, B., and Menezes, I. (2013). Disability, embodiment and ableism: stories of resistance. *Disabil. Soc.* 28, 190–203. doi: 10.1080/09687599.2012.705057

Luttropp, A., and Granlund, M. (2010). Interaction - it depends - a comparative study of interaction in preschools between children with intellectual disability and children with typical development. *Scand. J. Disabil. Res.* 12, 151–164. doi: 10.1080/15017410903175677

Malmgren, K. W., and Causton-Theoharis, J. N. (2006). Boy in the bubble: effects of paraprofessional proximity and other pedagogical decisions on the interactions of a student with behavioral disorders. *J. Res. Childh. Educ.* 20, 301–312. doi: 10.1080/02568540609594569

Maxwell, G., Granlund, M., and Augustine, L. (2018). Inclusion through participation: understanding participation in the international classification of functioning, disability, and health as a methodological research tool for investigating inclusion. *Front. Educ.* 3:e00041. doi: 10.3389/feduc.2018.00041

Morley, D., Bailey, R., Tan, J., and Cooke, B. (2005). Inclusive physical education: teachers' views of including pupils with special educational needs and/or disabilities in physical education. *Eur. Phys. Educ. Rev.* 11, 84–107. doi: 10.1177/1356336X05049826

Myklebust, J. O. (2006). Class placement and competence attainment among students with special educational needs. *Br. J. Spec. Educ.* 33, 76–81. doi: 10.1111/j.1467-8578.2006.00418.x

Pellegrino, J. W., and Hilton, M. L. (2012). *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. Washington, DC: National Academies Press.

Powell, D. R., Burchinal, M. R., File, N., and Kontos, S. (2008). An eco-behavioral analysis of children's engagement in urban public school preschool classrooms. *Early Child. Res. Q.* 23, 108–123. doi: 10.1016/j.ecresq.2007.04.001

Reyes, M. R., Brackett, M. A., Rivers, S. E., White, M., and Salovey, P. (2012). Classroom emotional climate, student engagement, and academic achievement. *J. Educ. Psychol.* 104, 700–712. doi: 10.1037/a0027268

Rink, J. E. (2013). Measuring teacher effectiveness in physical education. *Res. Q. Exerc. Sport* 84, 407–418. doi: 10.1080/02701367.2013.844018

Scherer, P. (2018). *Using Proximity Control in Unstructured Settings*. University of Nebraska at Omaha.

Shirazipour, C. H., Evans, M. B., Leo, J., Lithopoulos, A., Martin Ginis, K. A., and Latimer-Cheung, A. E. (2018). Program conditions that foster quality physical activity participation experiences for people

with a physical disability: a systematic review. *Disabil. Rehabil.* 40, 1-9. doi: 10.1080/09638288.2018.1494215

Skinner, E. A., Kindermann, T. A., and Furrer, C. J. (2009). A motivational perspective on engagement and disaffection: conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educ. Psychol. Meas.* 69, 493–525. doi: 10.1177/0013164408323233

Slavin, R. E. (1996). Research on cooperative learning and achievement: what we know, what we need to know. *Contemp. Educ. Psychol.* 21, 43–69. doi: 10.1006/ceps.1996.0004

Spivak, A. L., and Farran, D. C. (2016). Predicting first graders' social competence from their preschool classroom interpersonal context. *Early Educ. Dev.* 27, 735–750. doi: 10.1080/10409289.2016.1138825

Tant, M., and Watelain, E. (2016). Forty years later, a systematic literature review on inclusion in physical education (1975-2015): a teacher perspective. *Educ. Res. Rev.* 19, 1–17. doi: 10.1016/j.edurev.2016.04.002

The Swedish National Agency for Education, S. (2011). *Syllabus of Physical Education and Health,* 50–58. Retrieved from: http://www.skolverket.se/publikationer?id=2687

The Swedish Schools Inspectorate, S. (2018). *Physical Education Quality Report in Years,* 7–9, [Kvalitetsgranskning av ämnet idrott och hälsa i årskurs 7-9]. Retrieved from Stockholm: https://www.skolinspektionen.se/idrott-och-halsa

UNESCO (2015). *Quality Physical Education*. Retrieved from: http://unesdoc.unesco.org/images/0023/002311/231101E.pdf

UNICEF (2012). *The Right of Children With Disabilities to Education: A Rights-Based Approach to Inclusive Education*. Retrieved from: https://www.unicef.org/disabilities/files/UNICEF_Right_to_Education_Children_Disabilities_En_Web.pdf

Vickerman, P., and Blundell, M. (2012). English learning support assistants' experiences of including children with special educational needs in physical education. *Eur. J. Spec. Needs Educ.* 27, 143–156. doi: 10.1080/08856257.2011.645585

Webb, N. (2008). "Learning in small groups," in *21st Century Education: A Reference Handbook, Vol. 2*, ed T. L. Good (Thousand Oaks, CA: SAGE Publications, Inc), I-203–I-211. doi: 10.4135/9781412964012.n22

Werts, M., Zigmond, N., and Leeper, D. (2001). Paraprofessional proximity and academic engagement: students with disabilities in primary aged classrooms. *Educ. Train. Mental Retard. Dev. Disab.* 36, 424–440. Retrieved from: http://www.jstor.org/stable/23879903

World Health Organization [WHO] (2007). *International Classification of Functioning, Disability and Health: Children and Youth Version: ICF-CY*. Geneva: World Health Organization.

World Health Organization [WHO] (2017). *Health Literacy. The Solid Facts*. Geneva: World Health Organization [WHO].