

Full Length Research Paper

Do small rural high schools differ from larger schools in relation to absentee rates in physical education?

Pål Lagestad^{1*}, Vebjørn Rånes² and Boye Welde¹

¹North-Troendelag University College, Department of Sport & Physical Education, Roestad, N-7600 Levanger, Norway.

²University of Nordland, N-8049 Bodø, Norway.

Received 22 January, 2015, Accepted 8 June, 2015

The aims of the study were twofold: (a) to investigate how school size affects absentee rates in physical education (PE) and (b) to examine the experiences of students and teachers at a small rural high school in relation to attendance in PE at their school. The absentee rates in PE among all students (N = 6928 students) in a county in Norway were collected, and interviews with 15 students and two teachers at a small rural high school in the county were conducted. The results showed that the absentee rates in PE were significantly lower in small high schools (<200 students) located in rural areas, compared with larger-sized schools located in communities with more people. Small high schools also produced a lower percentage of students with an absentee rate above 10%. Furthermore, in contrast to small high schools, the absentee rate among girls was significantly higher than among boys in large high schools. Finally, the follow-up study showed that both students and teachers in a small rural high school reported a high level of relatedness, and both teachers and students claimed that this relatedness deterred absenteeism in PE. This finding may help explain the low absentee rates among students at small high schools.

Key words: Absentee rate, physical education, high school size, small schools, large schools, relatedness.

INTRODUCTION

Physical activity is considered a vital aspect of student life in Norwegian schools (White paper 31, 2008). Physical education (PE) is an important subject in school and represents an opportunity for students to engage in physical activity (Fairclough and Stratton, 2005; Morrow et al., 1999). Azzarito and Solomon (2005) claimed that the responsibility of educating children to adopt and maintain a physically active lifestyle is a major concern for schools, particularly with regard to those students who are less physically active in their leisure time. However, it is difficult to promote this type of lifestyle when absentee

rates in PE are high. If schools assume responsibility for educating children to adopt and maintain a physically active lifestyle, it is important that absenteeism in PE be low. Dahl and Kjørmo (1982) reported the average absentee rate in PE among Norwegian high school students to be 10%. They also showed that students with high absentee rates in PE did not participate as much as other youths in sports in their leisure time, a finding supported by Fairclough and Stratton (2005).

Hernes (2010) suggested that more in-depth knowledge is needed about absentee rates in high

E-mail: Pal.lagestad@hint. Tel: +4795086305.

Author agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](http://creativecommons.org/licenses/by/4.0/)

schools. In Norwegian high schools, a high absentee rate may lead to a grade of “no mark” in a subject, and PE is the subject with the highest no-mark rate in high schools in Norway (Rånes, 2011). Students typically start high school at age 16 years, which coincides with the point in their lives when they begin disengaging from physical activity (Seippel, 2005). A recent study by Kolle et al. (2012) found that 43 and 58% of 15-year-old boys and girls, respectively, in upper secondary school did not reach the daily recommended goal of 60 minutes or more of engaging in moderate or vigorous physical activity. Student participation in 90 minutes of mandatory physical activity per week in Norwegian high schools may contribute to increasing the percentage of students who meet the daily recommendation for physical activity.

Several small high schools in rural areas have been closed down and replaced with fewer and larger high schools in areas with more people (cities), presumably as a cost-savings measure because the cost per student increases as school size decreases (Newman et al., 2006; Stiefel et al., 2000). In his meta-analyses, Hattie (2009) identified school size as having a medium-level effect on school achievement. Some studies have pointed out that the attendance rates of students in small schools are higher than those of students at larger schools (Barker and Gump, 1964; Lindsay, 1982). Research has also showed that more students complete high school at small schools than at large schools and that fewer students drop out of small schools (Barker and Gump, 1964; Fowler and Walberg, 1991; Gardner et al., 2000; Pittman and Haughwout, 1987; Werblow and Duesbery, 2009). Barker and Gump (1964), Lindsay (1982), and Coladarci and Cobb (1996) showed that students are more involved in extracurricular activities at small schools compared with students at larger schools. Furthermore, there is greater involvement from parents of students in small schools (Dee et al., 2007; Walsh, 2010), and there exists more supportive leadership and better communication between teachers and students in small schools (Brown et al., 2012; Farmer-Hinton and Holland, 2008). Research has also found that fewer problems exist in connection to violence and discipline in small schools (Barker and Gump, 1964) and that students have greater satisfaction (Lindsay, 1982; Noguera, 2002) and a more positive attitude toward the school environment in small schools (Newman et al., 2006). In addition, studies have shown that social relations are better in small schools (Barker and Gump, 1964; Ready et al., 2004) and that students have more social capital in small schools than in larger schools (Dee et al., 2007). Student engagement is also greater in small schools than in larger schools (Weiss et al., 2010). Howley and Bickel (1999) found that for minority students, small schools were especially positive learning environments.

Some studies have found student achievement to be

better in small schools than in larger schools (Eddy, 2004; Flores and Chu, 2011; Noguera, 2002), whereas other studies have not found small schools to be superior with regard to student achievement (Bradley and Taylor, 1998; Coladarci and Cobb, 1996; Lee and Smith, 1997; Lindahl and Cain, 2012; Ready et al., 2004; Schneider et al., 2007; Weiss et al., 2010; Wyse et al., 2008), suggesting instead that medium-sized schools are superior to small schools and large schools with regard to student achievement. Both Lee and Smith (1997) and Ready et al. (2004) found that performance in mathematics was the best among students in medium-sized schools with 600 to 900 students. However, when the analysis was adjusted for students' socioeconomic status, Lee and Smith found small schools to be the best. Although the studies by Bradley and Taylor (1998), Schneider et al. (2007), and Lindahl and Cain (2012) did not provide any clear evidence showing that small schools produce better learning conditions than other schools, a closer examination points to several methodological weaknesses in these studies.

It is somewhat problematic that the definition of the cutoff point for what constitutes a small school varied a great deal in the studies mentioned previously, ranging from 100 (Lindsay, 1982) to 800 students (Dee et al., 2007). However, schools with fewer than 600 students were typically defined as small schools. In Norway, data about the number of pupils for different school sizes are available for primary school (Statistisk sentralbyrå [SSB], (2000) but these data may be inappropriate for defining cutoff points in Norwegian high schools. In his 2002 study, Noguera (2002) conducted research on the criteria for successful high schools, where students performed independently of their social group or social status. Based on his investigation of several schools in the United States, Noguera (2000) found that the schools meeting these requirements all had one thing in common: the number of students enrolled in these schools was fewer than 200 students. He claimed that these small schools produced social relations and support that were seldom present in high schools in the United States. The students in these small schools enjoyed being there to a greater degree, and the students trusted the staff in these schools much more than did students in other high schools.

Despite a huge number of research articles about school size, studies about absentee rate and school size are lacking overall. Furthermore, recent studies about the importance of school size in Norway are completely nonexistent. Some studies on Norwegian schools were conducted in the late 1960s and at the beginning of the 1970s (Norwegian Council for Research in Schools, 1968; Rasborg, 1974; Sandven, 1968; Utbildnings departementet, 1978, p. 4). For example, a 1968 study by the Norwegian Council for Research in Schools pointed

out that the establishment of lower secondary schools in urban communities in Norway in the 1950s led to a discussion about the quality of school with regard to school size in Norway. Another example is a study by Sandven (1968) on 3,600 students attending lower secondary schools in Bergen, Skien, and Akershus, which found that a higher percentage of students in small schools graduated in difficult subjects than did students in large schools. Sandven argued that this finding might be explained by a better learning environment and atmosphere, better social relationships between teachers and students, and enhanced work effort in small schools. Furthermore, Sandven pointed out that teachers employed in small lower secondary schools were more optimistic in relation to their students' ability to graduate from high school. However, Sandven also concluded that school size had no effect on students' performance levels, motives for learning at school, feeling of safety, and ability to solve problems. In addition, Jørgensen et al. (1975) did not find any relationships between school size and well-being among students in lower secondary school. Jørgensen (1976) also did not find any correlations between school size and disciplinary problems, except that the rate of more serious discipline problems increased with increasing school size. A study on students in Denmark pointed out the advantages of small schools with regard to transparency and communication between teachers and students and between teachers and parents (Koed and Bundsgaard, 1979).

Of the few Nordic studies on school size that have been conducted, these studies favored small schools in some aspects. However, these studies are old and may be outdated. Whether absentee rates in PE differ between small schools located in rural communities and larger schools located in larger communities is one topic that has been unexplored.

Another unexplored topic is whether absentee rates in PE differ among girls and boys in small, medium-sized, and large schools, owing to an interaction effect. Studies have indicated that Norwegian girls seem to experience PE as more problematic and that they are less active than boys in PE (Anderssen, 1995; Holstad, 2012), which in turn may affect absentee rates in PE for girls. According to Azzarito and Solomon (2005), gender differences in PE neither have been highlighted nor have received much attention.

This study has two main aims. The first main aim is to determine whether absentee rates in PE vary among small, medium-sized, and large schools, as well as between girls and boys, and whether absentee rates above 10% are associated with school size. The second main aim is to examine the experiences of students and teachers at a small rural high school in relation to attendance in PE at their school.

METHODS

Sample

The Department of Education in Nordland County, Norway (Utdanningsavdelingen, Nordland fylkeskommune) maintains a database of high school students. Accessing this database made it possible to examine student absentee rates based on school size and gender for all high schools in Nordland County during the school year of 2010–2011 ($n = 6,928$ students). In a follow-up study, we selected the high school with the lowest absentee rate in PE among all the high schools in Nordland. This high school was a small one with a low number of students ($n = 122$ students) and was located in THE rural area with the lowest population ($n = 498$ inhabitants). We selected this particular school for our follow-up study because we were interested in exploring the potential mechanisms between being a small school and having a low absentee rate. The subjects included two PE teachers and all 15 students in the third year of high school; all subjects were interviewed and observed.

Procedure

Small high schools were categorized as those with fewer than 200 students, medium-sized schools as those with 200 to 600 students, and large schools as those with more than 600 students. The dependent variable was the absentee rate in PE (range: 0%–100%). Two independent variables were included in the quantitative study: (a) high school size: small schools (fewer than 200 students, $n = 630$ students from five schools), medium-sized schools (between 200 and 600 students, $n = 2,451$ students from seven schools), and large schools (more than 600 students, $n = 3,847$ students from five schools); and (b) gender (boys = 3,476, girls = 3,452). The small high schools were located in rural areas (population = 2,602 inhabitants, $SD = 1661$), several miles from urbanized areas. The medium-sized schools were located in small towns (population = 4,772 inhabitants, $SD = 1,010$), and the large schools were located in medium-sized towns (population = 24,013 inhabitants, $SD = 13,999$), according to Norwegian standards.

A qualitative design was used in the follow-up study so as to obtain a deeper understanding of how PE was organized and how students experienced PE at the chosen high school. The two PE teachers were interviewed separately, and the 15 students were interviewed in three focus groups, with 5 students in each group. Two groups comprised only boys, and one group comprised only girls. The observations took place during a 3-day fieldwork session among the PE teachers. Several informal interviews were also carried out during the fieldwork. Finally, observations of two 90-minute classes in PE were carried out to examine whether a connection existed between what the teachers and students said and what was actually done.

With regard to the follow-up study, two interview guides with open-ended questions were developed to answer the research question on the experiences of teachers and students in relation to attendance of PE classes. This type of approach was preferred because it provided an opportunity to explore a topic that has not been researched a great deal. The semi-structured interview guide included the following key questions: How is PE organized at the school? What do you think are the key factors that promote students' enjoyment of PE at the school? What are the advantages and disadvantages in relation to PE at the school? How does the size of the school affect students' attendance at the school? Finally, the teachers were informed about the low absentee rates at their school and were asked to identify which factors may explain these

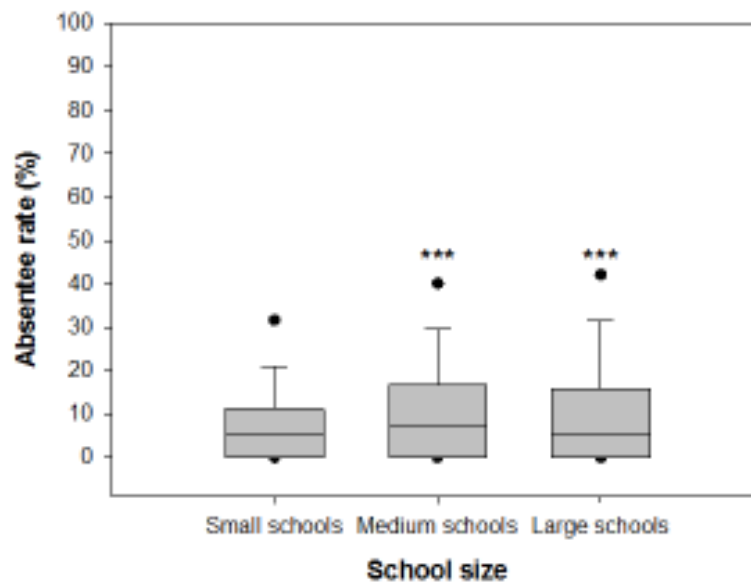


Figure 1. Box and whiskers plot for school size and absentee rate with the 5th and 95th percentiles (N = 6843 students). *** = Significantly higher absentee rates at medium-sized and large schools compared with small schools at $p < .001$.

rates. The students were also asked to answer the same questions, but from a student perspective. The interviews and the field notes from the informal conversations and observations were transcribed and analyzed within the tradition of grounded theory (Charmaz, 2006). Thus, interpretations of the text determine the categories. In accordance with grounded theory, the meaning of the subjects' statements and the interpretations of the subjects' actions were categorized into main findings. All the qualitative data were organized based on these findings during the reading, and the main findings were also reorganized during the process to create the meaning condensation. This approach is used to provide a thorough description and understanding of the phenomenon (Johannessen et al., 2006).

Statistics

The distribution of school absenteeism was leptokurtic ($Z_{\text{kurt}} = +84.6$) and positively skewed ($Z_{\text{skew}} = +66.7$) with a long tail of high values; hence, the Kolmogorov–Smirnov test showed that the assumption of normality was not met ($p < 0.001$). Data are therefore analyzed by nonparametric techniques, presented as median scores, and depicted in box and whiskers plots, as well as simple bar charts showing percentages. In addition, absentee rates are given as mean differences ($M_{\text{Diff.}}$) and standard error of the differences ($SE_{\text{Diff.}}$) between schools and genders in the Results section. In total, 85 students were excluded from the statistical analyses owing to missing values. The missing values were equally distributed across the different school sizes. The Kruskal–Wallis test was used to check for differences in absentee rates among the three school sizes. The Mann–Whitney U test was performed in follow-up tests to identify the pairwise differences between the school sizes, as well as for differences between genders. We also calculated a new cutoff value at a 10% absentee rate to emphasize

that some absences in PE are unavoidable owing to sickness or other external factors that are beyond students' control. This dichotomous variable was used in chi-square tests to check for differences between school sizes and genders with respect to an absentee rate that is above or below 10%. The post hoc test for the chi-square test was performed, revealing an association between categorical variables measured at more than two levels (i.e., school size), according to O'Donoghue (2012). The Fisher's exact test was reported when the chi-square was applied to a 2×2 cross-tabulation (i.e., gender vs. an absentee rate that is above or below 10%). The level of significance was set at an alpha level of $\leq .05$. All statistical tests were processed using Statistical Product and Service Solutions (SPSS) software, version 21.0.0.1, for Windows (IBM SPSS, Armonk, NY).

Ethical considerations

The subjects were fully informed about the protocol before participating in this study. Approval to use the data and conduct the study at the high school was given by both the Department of Education in Nordland County and the Norwegian Social Science Data Services (NSD).

RESULTS

The effect of school size on absentee rate was found to be significant, as evidenced by the Kruskal–Wallis test ($\chi^2_2 = 30.37$, $p < .001$, Figure 1). Post hoc pairwise comparisons with the Mann–Whitney U test showed that small schools had a significantly lower absentee rate than medium-sized schools ($Z = -5.25$, $p < .001$; $M_{\text{Diff.}} = 3.4\%$,

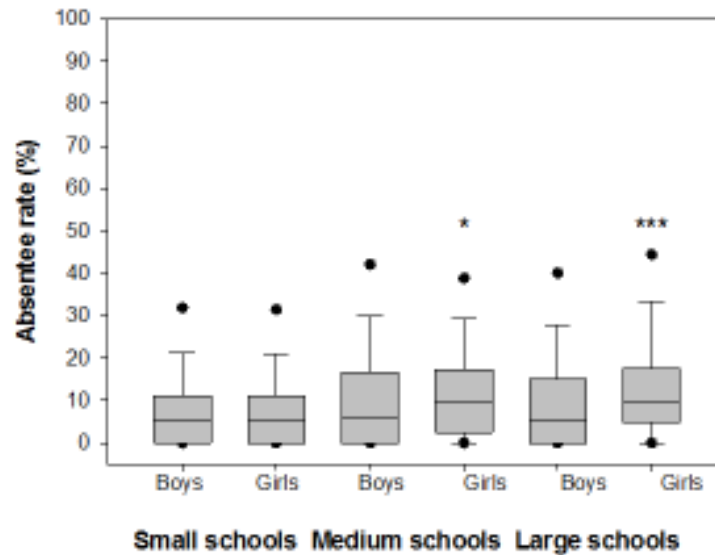


Figure 2. Box and whiskers plot for gender and absentee rate for different school sizes with the 5th and 95th percentiles (N = 6843 students). * = Significantly higher within-school absentee rates for girls compared with boys at $p < .05$; *** $p < .001$.

$SE_{Diff.} = 0.59$) and large schools ($Z = -5.30, p < .001$; $M_{Diff.} = 3.4\%$, $SE_{Diff.} = 0.59$). This constitutes a 29% difference in absentee rates between small schools and medium-sized and large schools. Regardless of school size, girls also had a significantly higher absentee rate than boys ($Z = -6.15, p < .001$; $M_{Diff.} = 1.4\%$, $SE_{Diff.} = 0.33$). Pairwise comparisons between gender and school size are given in Figure 2. No differences were detected between genders in small schools ($Z = -1.07, p = .28$); however, girls had significantly higher absentee rates than those of boys in medium-sized schools ($Z = -1.97, p = .05$) and in large schools ($Z = -6.07, p < .001$). The absentee rate of girls in large schools was nearly 3% higher than that of boys in large schools. This constitutes a 21% difference in absentee rates between girls and boys in large schools.

An absentee rate above 10% was significantly associated with school size ($\chi^2_2 = 16.76, p < .001$; Figure 3). Post hoc tests showed that the percentage of students with absentee rates above 10% in small schools was significantly lower than the percentage of students with absentee rates above 10% in medium-sized and large schools. The results showed that 37% of students in small schools had absentee rates above 10% and that 45% of students in medium-sized and large schools had absentee rates above 10% ($p < .001$). These results constitute a 19% difference in absentee rates between small schools and medium-sized schools and an 18% difference in absentee rates between small schools and large schools. Furthermore, Figure 4 shows that the

percentage of girls with absentee rates above 10% was significantly higher than the percentage of boys with absentee rates above 10%, regardless of school size (48% of girls with absentee rates above 10% vs. 41% of boys with absentee rates above 10%; $p < .001$). Pairwise comparisons between gender and school size (Figure 4) showed no difference in absentee rates above 10% between girls and boys in small schools (39% of girls vs. 35% of boys; $p = .18$). However, the percentages of girls with absentee rates above 10% were significantly higher than those of boys in medium-sized schools (48% of girls vs. 43% of boys; $p = .01$) and in large schools (50% of girls vs. 41% of boys; $p < .001$).

The analyses of the data from the interviews and informal conversations conducted with students and teachers in the high school and from observations of these students and teachers showed that students and teachers were consistent in their answers. One main finding was that both teachers and students reported a high level of relatedness among the students and between the students and the PE teachers, and they all claimed that this relatedness deterred absenteeism in PE. The observations supported this finding. The teachers highlighted that they knew each student well and that this knowledge was essential in relation to providing good teaching in PE. They could follow the same students through all three years of high school, and they knew of their students' parents in most cases. This familiarity made it easier for the teachers to create good conditions for learning because they "knew what to do

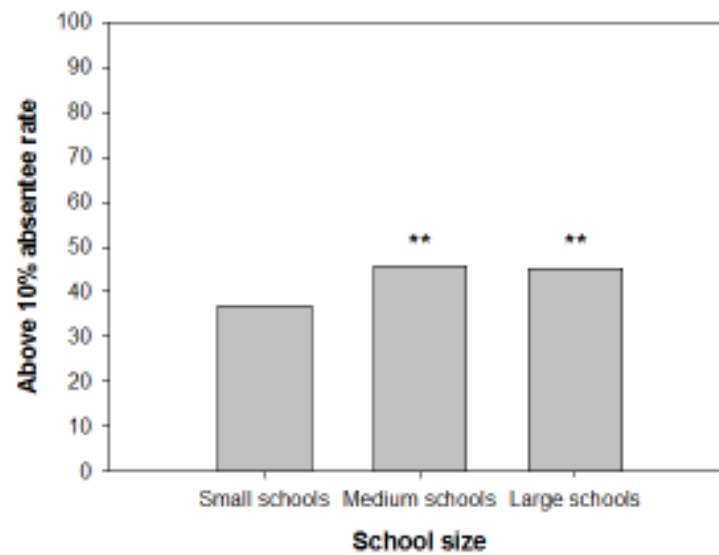


Figure 3. Absentee rate above 10% and school size (N = 6843 students). ** = Significantly higher absentee rates above 10% at medium-sized and large schools compared with small schools at $p < .01$.

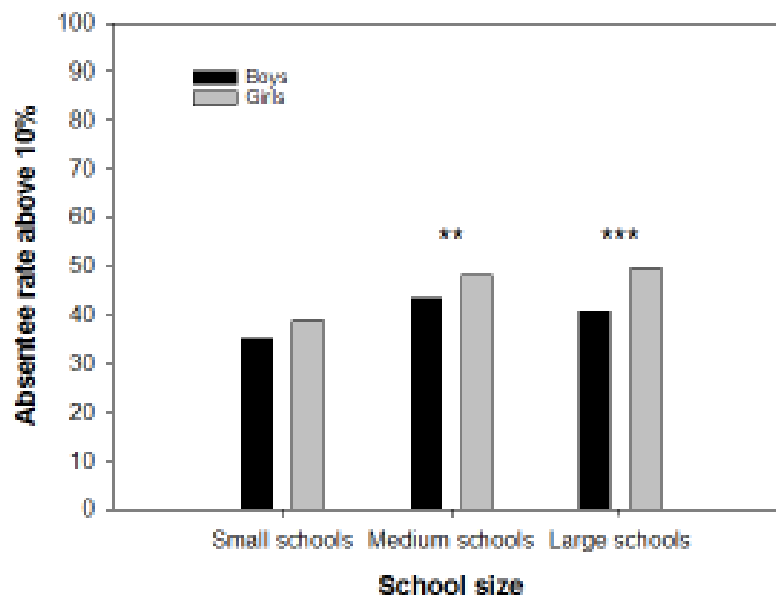


Figure 4. Absentee rate above 10%, gender, and school size (N = 6843 students). ** = Significantly higher absentee rates above 10% for girls in medium-sized and large schools compared with small schools at $p < .01$; *** $p < .001$.

and how to do it” with regard to engaging the students. The teachers reported that they usually had a low number of students in each class because class sizes in a small school in a rural community are generally small

owing to the low number of potential students. However, the teachers felt that the conditions for following up students in classes with 15 to 20 students were much better than in classes with more students. The teachers

claimed that the small class sizes allowed them to spend more time with each student and gave them a better opportunity to make the students feel that they are being taken care of and that they can receive attention from their teachers. In addition, the teachers stated that small class sizes made it easier to adapt the activities to each student, individualize the instruction, and instill competency and a sense of success in students. The students corroborated these statements. Furthermore, the teachers found it advantageous to know the students' names and histories so that they could follow them up sufficiently. One teacher further explained the advantages of a small school, stating:

"It is a huge advantage that we are a small school. The students are closely followed up, and they know they are being closely followed up. Sneaking away from PE is not an option. If anyone is uncomfortable, I see it right away. I talk with them, and they can decide what to do. On the other hand, if I tell them they all have to play basketball today, we lose them. You have to create a relationship with the student and listen to which activities they are motivated to do. They have to do something, but they can decide what to do. It really works."

The analysis of the students' responses to the interview questions revealed agreement with the teachers' statements. The students stated that attending a small high school in a rural area gave them several advantages. One advantage was that all the students knew each other and that they had confidence in each other. This advantage is explained in the following statement by a student:

"Here everybody knows each other, so nothing is embarrassing. You can be yourself. You know what the other students can do and what they cannot do, so it is not embarrassing to be bad in soccer when the others know you are good in other sports. . . . You feel more confident and dare to participate in PE."

The students also maintained that they had close relationships with their teachers and that it was easier to forge close relationships in a small high school. The closeness of their relationships with the teachers and the other students made them feel more committed to attend PE classes. One student stated, "If you have a personal relationship with the teacher, you will feel more obligated to attend school. It is easier to sleep through the morning [classes] when you do not know the teacher very well. In a way, you feel you have an agreement with the teacher, and you do not screw it up." This mindset is elaborated on by another student in the following interview response:

"The personal relationships you create with the

teachers and [those that] the teachers create with you here are important because you feel you have an attendance agreement that you break if you do not show up. It is actually personal. You feel you have to go, but you also want to go. It is acknowledged that everyone shall attend PE. No one talks trash about PE because the teaching is good."

The students also claimed that the existence of close relationships among the students led to a general expectation about attending PE classes (i.e., a positive form of peer pressure). One student offered the following explanation: "The other students see that you are missing, and then they ask you, 'Where the hell were you?' So you feel some pressure to attend, but it I think it is okay." Furthermore, because they attended a small high school in a rural area, the students frequently met their teachers at the local shops and other places in the community. The students pointed out that this lack of anonymity in a rural area deterred student absenteeism. The teachers also reported that it was easy to collaborate in a school located in a place where teachers and students knew each other well and where the student-to-teacher ratio was low.

DISCUSSION

The aim of this study was to examine the effects of school size and gender on absentee rates in PE among high school students. Our findings show that of small, medium-sized, and large schools, small schools had the lowest overall absentee rate in PE and the lowest absentee rate in PE above 10%. Furthermore, girls had significantly higher overall absentee rates and 10% absentee rates than boys in medium-sized and large schools. No gender differences in absentee rates were detected in small schools. The findings of a follow-up study among students and teachers in a small high school located in a rural area show that students and teachers reported a high level of relatedness among the students and between the students and the teachers.

Differences in absentee rates based on school size

We found that compared with small schools, the absentee rate in PE was 29% higher in medium-sized and large schools. Some reasons for absenteeism—sickness and other external factors—are, of course, beyond the control of students. However, an absentee rate above 10% can be categorized as problematic.

Therefore, we also calculated the percentage of students with an absentee rate of more than 10% in small, medium-sized, and large schools. Of the three types of

schools based on size, the percentage of students with an absentee rate above 10% was the lowest in small schools. Compared with small schools, medium-sized schools had 19% more students with an absentee rate of more than 10% in PE, and large schools had 18% more students with an absentee rate of more than 10% in PE. These findings support previous research suggesting that schools with a small student population are preferable to schools with a large student population (Barker and Gump, 1964; Brown et al., 2012; Dee et al., 2007; Eddy, 2004; Farmer-Hinton and Holland, 2008; Flores and Chu, 2011; Fowler and Walberg, 1991; Gardner et al., 2000; Lindsay, 1982; Morrow et al., 1999; Newman et al., 2006; Noguera, 2002; Pittman and Haughwout, 1987; Ready et al., 2004; Walsh, 2010; Weiss et al., 2010; Werblow and Duesbery, 2009).

However, Darling-Hammond et al. (2006) emphasized that many challenges exist in interpreting current research on school size because studies do not conduct randomized trials. They argued that strong causal claims are thus difficult to make. They also pointed to the challenge of defining the cutoff points of different school sizes. Larger schools may be located in more urban areas, which may affect the validity of the findings. In addition, Coladarci (2007) highlighted the importance of describing the context of the investigation. Haller and Virkler's (1993) findings revealed the importance of controlling socioeconomic status when studying rural and nonrural high school students. Research indicates that students attending small schools located in rural areas come from families with a lower socioeconomic status than students attending larger schools in more urban communities (Breivik and Rafoss, 2012). Research has also revealed that Norwegians with a low socioeconomic status are less physically active than Norwegians with a high socioeconomic status (Breivik and Rafoss, 2012). In addition, research has found that students who come from families with a low socioeconomic status are less physically active than students who come from families with a high socioeconomic status (Kolle et al., 2012). Furthermore, Breivik and Rafoss (2012) showed that Norwegians living in rural areas in Norway are less physically active than those living in larger communities. Despite the fact that students from rural communities are less physically active, we found that they have a lower absentee rate in PE.

Because previous studies on school size used different cutoff points with regard to what constitutes a small school and a large school in terms of population, these differences make comparisons difficult. Furthermore, comparing research on school size from different cultural settings (e.g., Norway vs. the United States) may be problematic. There is no single definition of a rural place in Norway. According to Coladarci (2007), there is no single definition of a rural place in the United States

either, but the populations do not vary much from the criteria of rural places identified by the Office of Management and Budget (2000) in the United States. As previously mentioned, defining the cutoff points for different school sizes is also somewhat problematic. The definition of a small school used in the present study is the same one put forth in a study by Noguera (2002) suggesting that small schools be categorized as those having fewer than 200 students. Using such a definition made it possible to categorize the schools into one of three groups, with approximately an equal number of schools in each group. Furthermore, such a definition seems to be an appropriate reflection of Norwegian school structure and society. In the United States, large high schools exceed 2,000 students (Schneider et al., 2007), but the largest schools in Norway rarely exceed 1,000 students. Hence, one could argue that Norwegian schools with more than 600 students fall under the category of large schools. Although some research has concluded that small schools are best suited to foster achievement among students, Wainer and Zwerling (2006) pointed out that this was a somewhat hurried conclusion. They argued that although many small schools had better student achievement levels than larger schools, there were also large schools where student achievement levels were superior to those of small schools. Kahneman (2011) supported this argument and criticized the use of statistics in research on the benefits of small schools. He identified several weaknesses in this type of research, such as the inclusion of a small number of subjects in a study and the use of different sizes between groups when conducting an analysis. In addition, Kahneman (2011) emphasized that it is easier to find differences among groups with small numbers of subjects than groups with larger numbers of subjects. One could argue that this criticism may be applied to the present study in which the small-school group had the smallest number of students ($n = 630$ students) compared with the medium-sized-school group ($n = 2,451$ students) and the large-school group ($n = 3,847$ students). However, Figures 1 through 4 clearly depict the difference between small schools and the other schools, and the statistical analyses show that the difference is significant (and not "borderline" significant). Furthermore, one could argue that even though the number of students comprising the three types of schools based on size is the lowest in small schools, 620 students constitute a relatively large group of students and a representative group. Both Wainer and Zwerling (2006) and Kahneman (2011) have critiqued studies on small schools and student achievement, and as we have previously mentioned in the Introduction, studies on student achievement and school size have produced contradictory findings. However, it is important to highlight that school outcomes include other aspects in

addition to achievement.

Previous studies have identified several advantages with regard to attending small schools that may explain their findings. Some studies have pointed out that student attendance is generally higher in small schools than in larger schools (Barker and Gump, 1964; Fowler and Walberg, 1991; Gardner et al., 2000; Lindsay, 1982; Pittman and Haughwout, 1987; Werblow and Duesbery, 2009). Several studies have also found more involvement in small schools (Barker and Gump, 1964; Coladarci and Cobb, 1996; Lindsay, 1982), a factor that may lead to lower absentee rates in PE. For example, some studies have shown parental involvement to be greater in small schools than in larger schools (Dee et al., 2007; Walsh, 2010). This increased parental involvement means that parents are more likely to have knowledge about their children's attendance at school, which may in turn help reduce absenteeism in PE. Other factors that may influence student absenteeism are student satisfaction and school environment. If students are more satisfied in small schools than in larger schools (Lindsay, 1982; Noguera, 2002) and are more positive toward the school environment in small schools than in larger schools (Newman et al., 2006), these factors may also reduce student absenteeism.

Finally, if students are more engaged in their learning (student engagement) in small schools, as Weiss et al. (2010) suggested, and students also experience a more supportive leadership and better communication with their teachers and the other students in small schools (Brown et al., 2012; Farmer-Hinton and Holland, 2008), these factors may contribute to reducing absenteeism among students. Shear et al. (2008) highlighted support and social relations as two important predictors for student success. Research has indicated that teacher support in high school may play an important role in motivating high school students (Hardré et al., 2009). The findings in the present study are partly supported by the few studies that were conducted several decades ago about school size in Norwegian schools (Norwegian Council for Research in Schools, 1968; Jørgensen et al., 1975; Sandven, 1968). One of these studies reported that tremendous challenges were associated with creating proximity, establishing human contact, and cultivating good social relationships among students and teachers in large schools (Norwegian Council for Research in Schools, 1968). Furthermore, if higher levels of social relationships and social capital exist in small schools, as studies have shown (Barker and Gump, 1964; Ready et al., 2004), these factors may deter high absentee rates among students. The results from the follow-up study support such an argument.

Recent school reforms in the United States reflect school research findings and the importance of replacing large schools with small schools (Carolan, 2012;

Goodlad, 1984; Horyna and Bonds-Raacke, 2012; Johnson, 2002; Kafka, 2008; Levine, 2010, 2011; Stiefel et al., 2009; Weiss et al., 2010). As a result of these reforms, many large high schools in the United States have been replaced with smaller schools (Ancess and Allen, 2006). It is striking that the opposite process is taking place in Norway, where small high schools located in rural areas are being closed and replaced with fewer and larger high schools in larger communities. The expected economic benefits seem to be an essential motivation for the closure of small schools. However, Stiefel et al. (2000) found that small schools spent less money per student who graduated than did larger schools, thus challenging the assumption about the economic benefits of reducing the number of small schools and sending students to larger schools that are located far away from home. Hence, the results of the present study could be of relevance to the political discussion about school size and the establishment and the closure of small high schools in rural areas all over the world. Following data collection for the present study, the high school with the second lowest absentee rate and the second lowest number of students in our sample shut down, and the students were transferred to a larger high school located in a larger community, a 60-minute drive away.

Relatedness among teachers and students at a small high school in a rural area

One main finding from the interviews and the fieldwork analysis among teachers and students was that both teachers and students reported a high level of relatedness among students and between the students and the teachers. Deci and Ryan (2000) pointed out three basic needs in all humans: autonomy, relatedness, and competence. These factors are essential for optimal motivation, integration, wellness, and well-being, which in turn lead to intrinsic motivation. Intrinsic motivation is about doing an activity because it is interesting and provides its own reward by satisfying one's basic needs for autonomy, competence, and relatedness (Ryan and Deci, 2000). It is the prototype of self-determination in their self-determination theory. A teacher can encourage or restrain students' intrinsic motivation. Self-determination theory emphasizes the importance of the social environment of students for personal growth. Relatedness is about feeling cared for and connected to someone (Deci and Ryan, 2000). Deci (1995) claimed that students need to feel connected with others—that is, to care and be cared for (the need for relatedness). In addition, Deci (1995) maintained that human behavior and experience are viewed in terms of the dialectic between the person and the environment. The interaction

between the active organism striving for autonomy and the social context can be either nurturing of or antagonistic toward the person's tendencies. Jang et al. (2010) emphasized the importance of creating trust and good relationships between teachers and students and of fostering a sense of belonging. The resulting relatedness may deter absenteeism in school. Chance and Segura (2009) pointed to collaboration as the heart of the school improvement process in rural high schools. The high school teachers interviewed for the present study reported that it was easy to collaborate in a rural school located in a community where teachers and students knew each other well.

Coladarci (2007) highlighted the importance of making the rural argument. A question of great relevance is if it is the size itself or the rural location that contributes to the superiority of small schools. The results from the follow-up study indicate that the rural location offered several advantages such as high levels of relatedness and collaboration, which may explain the findings. A previous study identified the individualization of instructions and the existence of supportive relationships with their community as important factors in rural school success (Barley and Beesley, 2007). The individualization of instructions and the existence of supportive relationships were two main findings of the follow-up study.

Differences in absentee rates between girls and boys based on school size

No gender differences in absentee rates in small schools were found. However, girls had significantly higher absentee rates than those of boys in medium-sized and large schools. Furthermore, no differences in the percentages of girls and boys with absentee rates above 10% in small schools were found. In both medium-sized and large schools, higher percentages of girls than boys had absentee rates above 10%. The results clearly show that the differences between the percentages of girls and boys with absentee rates above 10% decreased when school size decreased.

Our results support earlier studies on Norwegian students suggesting that girls in general find PE to be more problematic than do boys and that girls do not enjoy PE as much as boys do (Flagestad, 1996; Flagestad and Skisland, 2002; Holm, 2005; Johansen, 2002; Wabakken, 2010). Wabakken (2010) found a positive correlation between enjoyment and attendance in PE, thereby providing support for the idea that enjoyment in PE may help decrease absenteeism. Research has also shown that students in small schools are more satisfied than those in than larger schools (Lindsay, 1982; Noguera, 2002), which may explain the interaction effect. Holstad (2012) found that girls emphasize the importance of a

supportive leadership in high school PE. The presence of a supportive leadership in PE is especially important for girls who are more dissatisfied with their own bodies, she argued. In addition, studies have identified small schools as being the best suited for creating such a learning environment (Brown et al., 2012; Farmer-Hinton and Holland, 2008). With regard to earlier research, one could argue that small schools produce better social relationships (Barker and Gump, 1964; Dee et al., 2007; Ready et al., 2004)—relationships that may help reduce absenteeism among girls. Our findings also support other research showing that small schools create learning environments that are especially positive for marginalized groups in school (Howley and Bickel, 1999). In addition, our findings support the research of Noguera (2002) and Lindsay (1982), who also pointed out that in contrast to large schools, small schools (with fewer than 200 students and 100 students, respectively) all shared the following characteristic: The performance levels of students in small schools were independent of their social group or social status.

Conclusion

The study showed that the absentee rates in PE were significantly lower in small high schools with fewer than 200 students than in medium-sized schools and large schools with more students. Of these three types of schools based on size, small high schools also had the lowest percentage of students with an absentee rate of above 10% in PE.

Furthermore, the findings showed an interaction effect of gender, in that absentee rates among girls were significantly higher than those among boys in medium-sized and large high schools. The interaction effect was not found in small schools. The follow-up study showed a high level of relatedness among students and among the students and the PE teachers, and both teachers and students claimed that this relatedness deterred absenteeism in PE. The findings present new knowledge about absentee rates in PE in relation to the benefits of small high schools in rural areas, and this new knowledge may be relevant from an international perspective. Finally, further studies about how and why small high schools manage to maintain low absentee rates in PE are needed.

Conflict of Interests

The author(s) have not declared any conflict of interests.

REFERENCES

Ancess J, Allen D (2006). Implementing small theme high schools in

- New York City: Great intentions and great tensions. *Harvard Educ. Rev.* 76(3):401-416.
- Anderssen N (1995). *Physical activity of young people in a public health perspective*. Stability, change and social influences. Research Center for Health Promotion, Faculty of Psychology, University of Bergen.
- Azzarito L, Solomon MA (2005). A reconceptualization of physical education: The intersection of gender/race/social class. *Sport Educ. Soc.* 10(1):25-47. doi:10.1080/135733205200028794
- Barker RG & Gump PV (1964). *Big school, small school: High school size and student behavior*. Stanford, CA: Stanford University Press.
- Barley ZA, Beesley AD (2007). Rural school success: What can we learn? *J. Res. Rural Educ.* 22(1). Retrieved 10.10.2014 from <http://jrre.psu.edu/articles/22-1.pdf>
- Bradley S, Taylor J (1998). The effect of school size on exam performance in secondary schools. *Oxford B. Econ. Stat.* 60(3):291-324. doi:10.1111/1468-0084.00102
- Breivik G, Rafoss K (2012). *Fysisk aktivitet; omfang, tilrettelegging og sosial ulikhet – en oppdatering og revisjon* [Physical activity; scope, organization and social inequality – an update and revision]. Norwegian School of Sport Sciences, Oslo, Norway.
- Brown PD, Finch KS, MacGregor C (2012). A comparison of learning cultures in different sizes and types. *US-China Educ. Rev.* 2:206-222.
- Carolan BV (2012). An examination of the relationship among high school size, social capital, and adolescents' mathematics achievement. *J. Res. Adolescence* 22(3):583-595. doi:10.1111/j.1532-7795.2012.00779.x
- Chance PL, Segura SN (2009). A rural high school's collaborative approach to school improvement. *J. Res. Rural Educ.* 24(5). <http://jrre.psu.edu/articles/24-5.pdf>
- Charmaz K (2006). *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. Los Angeles: Sage.
- Coladarci T (2007). Improving the yield of rural education research: An editor's swan song. *J. Res. Rural Educ.* 22(3). <http://jrre.psu.edu/articles/22-3.pdf>
- Coladarci T, Cobb CD (1996). Extracurricular participation, school size, and achievement and self-esteem among high school students: A national look. *J. Res. Rural Educ.* 12(2):92-103.
- Dahl HA, Kjermo O (1982). *Illegitimt fravær fra kroppsøvningsundervisning ved Sogn Videregående Skole i Oslo* [Invalid absence in physical education at Sogn high school in Oslo]. (Vol. 41). Oslo, Norway: Norges Idrettshøgskole.
- Darling-Hammond L, Ross P, Milliken M (2006). High school size, organization, and content: What matters for student success? *Brookings Papers on Education Policy 2006/2007*:163-203.
- Deci EL, Flaste R (1995). *Why we do what we do. The dynamics of personal autonomy*. New York: Putnam's Sons.
- Deci EL, Ryan RM (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychol. Inq.* 11(4): 227-268. doi:10.1207/S15327965PLI1104_01
- Dee TS, Wei H, Jacob BA (2007). The effects of school size on parental involvement and social capital: Evidence from ELS: 2002. *Brookings Papers on Education Policy 2006/2007*: 77-97.
- Eddy RM (2004). Effects of school size on student achievement (Doctoral dissertation, Claremont Graduate University, 2004). *Dissertation Abstracts International*, 64 (9-A): 3188.
- Fairclough S, Stratton G (2005). Improving health-enhancing physical activity in girls' physical education. *Health Educ. Res.* 20(4):448-457. doi:10.1093/her/cyg137
- Farmer-Hinton RL, Holland NE (2008). The influence of high school size on access to postsecondary information, conversations, and activities. *Am. Second. Educ.* 37(1): 41-61.
- Flagestad L (1996). *Trivsel i kroppsøvningsfaget: En undersøkelse av trivselen i kroppsøvningsfaget blant 7. og 9. klassinger i Kristiansand kommune* [Well-being in physical education]. Unpublished master's thesis, Norwegian School of Sport Sciences, Oslo, Norway.
- Flagestad L, Skisland JO (2002). Årsaker til mistrivsel i kroppsøving [Reasons for unhappiness in physical education]. *Kroppsøving* 52(4)
- Flores N, Chu H (2011). How does size matter? The impact of the rise of small schools on Latinos and emergent bilinguals in New York City. *Int. J. Biling. Educ. Biling.* 14(2):155-170. doi:10.1080/13670050.2010.539671
- Fowler W Jr, Walberg HJ (1991). School size, characteristics, and outcomes. *Educ. Eval. Policy An.* 13(2), 189-202. doi:10.3102/01623737013002189
- Gardner PW, Ritblatt SN, Beatty JR (2000). Academic achievement and parental school involvement as a function of high school size. *High Sch. J.* 83(2):21-27.
- Goodlad JI (1984). *A place called school: Prospects for the future*. New York: McGraw-Hill.
- Haller EJ, Virkler SJ (1993). Another look at rural-nonrural differences in students' educational aspirations. *J. Res. Rural Educ.* 9(3):170-178.
- Hardré PL, Sullivan DW, Crowson HM (2009). Student characteristics and motivation in rural high schools. *J. Res. Rural Educ.* 24(16). <http://jrre.psu.edu/articles/24-16.pdf>
- Hattie JAC (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.
- Hernes G (2010). *Gull av gråstein. Tiltak for å redusere frafall i videregående opplæring* [Gold out of stone. Effort to reduce absenteeism in high school] (Fafo report 2010:03). Oslo, Norway: Fafo.
- Holm E (2005). *Fysisk skole- aktiv læring* [Physical school- active learning]. Jessheim, Norway: Kommunalt foreldreutvalg i Ullensaker (KFU).
- Holstad H (2012). *Fråfall i kroppsøving, motivasjon og motivasjonelt klima* [Drop out in physical education, motivation and motivation climate]. Ei kvalitativ undersøkelse om ei gruppe elever sitt fråfall i kroppsøvningsfaget. Unpublished master's thesis, Nord-Trøndelag University College, avdeling for lærerutdanning, Levanger, Norway.
- Horyna B, Bonds-Raacke JM (2012). Differences in students' motivation to attend college: Large versus small high schools. *Education* 132(4):708-724.
- Howley CB, Bickel R (1999). *The Matthew Project: National report*. Columbus: Ohio State University.
- Jang H, Reeve JB, Deci EL (2010). Engaging students in learning activities: It is not autonomy support or structure, but autonomy support and structure. *Journal of Educational Psychology*, 102: 588-600.
- Johannessen A, Tufte PA, Kristoffersen L (2006). Introduksjon til samfunnsvitenskapelig metode [Introduction to methods in social science]. Oslo: Abstract forlag.
- Johansen V (2002). "Gym er det faget jeg hater mest." [Physical education is the subject I hate most]. En kvalitativ undersøkelse om hvorfor noen jenter utvikler en negativ innstilling til kroppsøvningsfaget. Hovedfagsoppgave, helsefag, HEMIL-senteret, University of Bergen, Bergen, Norway.
- Johnson J (2002). A public agenda survey: Do communities want smaller schools? *Educ. Leadership* 59(5): 42-45.
- Jørgensen H (1976). *Disiplin, skolestørrelse, klassestørrelse og sentralisering. En undersøkelse på 7.klassestrinn* [Discipline, school size, class size and centralisation. An investigation at the seventh class]. Oslo, Norway: Musikkhøgskolen.
- Jørgensen H, Lunde O, Øygarden, S (1975). *Trivsel, skolestørrelse, klassestørrelse og sentralisering* [Well-being, school size, class size and centralisation]. En undersøkelse på 7. klassestrinn. Rapport fra Grisgrendtprosjektet. Pedagogisk seminar in Oslo, Norway.
- Kafka J (2008). Thinking big about getting small: An ideological genealogy of small-school reform. *Teach. Coll. Rec.* 110(9):1802-1836.
- Kahneman D (2011). *Thinking, fast and slow*. New York: Farrar, Straus and Giroux.
- Koed I, Bوندsgaard J (1979). *Valg af skolestørrelse* [The selection of school size]. Vol. II. Pedagogiske forhold og driftsutgifter. Rapport fra skolestrukturprosjektet. Copenhagen, Denmark: AKF.
- Kolle E, Stokke JS, Hansen BH, Anderssen S (2012). *Fysisk aktivitet blant 6-, 9- og 15-åringer i Norge*. Resultater fra en kartlegging i 2011. Oslo, Norway: Helsedirektoratet.

- Lee VE, Smith JB (1997). High school size: Which works best and for whom? *Educ. Eval. Policy An.* 19(3):205-227. doi:10.3102/01623737019003205
- Levine TH (2010). What research tells us about the impact and challenges of smaller learning communities. *Peabody J. Educ.* 85(3):276-289. doi:10.1080/0161956X.2010.491431
- Levine TH (2011). Comparing approaches to converting large high schools into smaller units. *Improving Schools* 14(2), 172-186. doi:10.1177/1365480211409898
- Lindahl RA, Cain PM Sr (2012). A study of school size among Alabama's public high schools. *Int. J. Educ. Policy Leadersh.* 7(1): 1-27.
- Lindsay P (1982). The effect of high school size on student participation, satisfaction, and attendance. *Educ. Eval. Policy An.* 4(1): 57-65. doi:10.3102/01623737004001057
- Morrow JR Jr, Jackson AW, Payne VG (1999). Physical activity promotion and school physical education. *Pres. Counc. Phys. Fit. Sports Res. Dig.* 3:1-8.
- Newman M, Garrett Z, Elbourne D, Bradley S, Noden P, Taylor J, West A (2006). Does secondary school size make a difference? A systematic review. *Educational Research Review* 1(1), 41-60. doi:10.1016/j.edurev.2006.03.001
- Noguera PA (2002). Beyond size: The challenge of high school reform. *Educ. Leadership* 59(5):60-63.
- Norwegian Council for Research in Schools [Forsøksrådet for skoleverket] (1968). *Små og store ungdomsskoler* [Small and large lower secondary schools]. Oslo, Norway: Universitetsforlaget.
- Office of Management and Budget (2000). *Standards for defining metropolitan and micropolitan statistical areas; notice* (OMB Publication No. 0032997). Retrieved from Federal Register, 65(249).
- O'Donoghue P (2012). *Statistics for sport and exercise studies*. New York: Routledge.
- Pittman RB, Haughwout P (1987). Influence of high school size on dropout rate. *Educ. Eval. Policy An.* 9(4):337-343. doi:10.3102/01623737009004337
- Rasborg F (1974). *Skolestørrelse, skoledeling og skoleledelse* [School size and school leadership]. Danmarks pædagogiske Institut. Copenhagen, Denmark: Afdelingen for didaktiske undersøgelser.
- Rånes V (2011). Jeg er ikke fornøyd med karakteren min [I am not happy with my mark]. En gjennomgang av klagesaker på standpunkt karakteren i i kroppsøving. Report. University of Nordland.
- Ready DD, Lee VE, Welner KG (2004). Educational equity and school structure: School size, overcrowding, and schools-within-schools. *Teach. Coll. Rec.* 106(10):1989-2014. doi:10.1111/j.1467-9620.2004.00424.x
- Ryan RM, Deci EL (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemp. Educ. Psychol.* 25(1):54-67. doi:10.1006/ceps.1999.1020
- Sandven J (1968). *Har skolestørrelsen noen betydning for elevenes fremgang og holdning*. Oslo, Norway: Universitetet i Oslo, Pedagogisk forskningsinstitutt.
- Schneider B, Wyse AE, Keesler V (2007). Is small really better? Testing some assumptions about high school size. *Brookings Papers on Education Policy* 2006/2007(9):15-47.
- Seippel Ø (2005). *Orker ikke, gidder ikke, passer ikke? Om frafallet i norsk idrett* [I am not able to, I do not bother, it does not fit me? Dropping out from sport]. http://www.virke.no/bransjer/Documents/ISF_Rapport_2005_3_Orkerikke.pdf
- Shear L, Means B, Mitchell K, House A, Gorges T, Joshi A, Smerdon B, Shkolnik J (2008). Contrasting paths to small-school reform: Results of a 5-year evaluation of the Bill & Melinda Gates Foundation's National High Schools Initiative. *Teach. Coll. Rec.* 110(9):1986-2039.
- Statistisk sentralbyrå [SSB] (2000). Downloaded from <http://www.ssb.no/a/histstat/au/9903/T-2.5.html>
- Stiefel L, Berne R, Iatarola P, Fruchter N (2000). High school size: Effects on budgets and performance in New York City. *Educ. Eval. Policy An.* 22(1):27-39. doi:10.3102/01623737022001027
- Stiefel L, Schwartz AE, Iatarola P, Chellman CC (2009). Mission matters: The cost of small high schools revisited. *Econ. Educ. Rev.* 28(5):585-599. doi:10.1016/j.econedurev.2009.01.005.
- Utbildningsdepartementet (1978). *Skolplanering og skolstorlek. Faktaredovising och bedömningsunderlag* [School planning and school size. Facts and evaluation]. Betänkande av Utredningen om skolens inre arbete (SIA). Statens offentliga utredningar. Stockholm: Utbildningsdepartementet.
- Wabakken TV (2010). *Et følelsesladet valg. Om prosesser og mekanismer bak ikke deltakelse i kroppsøving, dusj og garderobeaktiviteter* [Emotionally charged decisions. Processes and mechanism behind not participating in physical education, showering and dressing activities]. Unpublished master's thesis, Telemark University College, Porsgrunn, Norway.
- Wainer H, Zwerling HL (2006). Evidence that smaller schools do not improve student achievement. *Phi Delta Kappan* 88(4):300-303. doi:10.1177/003172170608800411
- Walsh P (2010). Is parental involvement lower at larger schools? *Econ. Educ. Rev.* 29(6): 959-970. doi:10.1016/j.econedurev.2010.04.003
- Weiss CC, Carolan BV, Baker-Smith EC (2010). Big school, small school: (Re)testing assumptions about high school size, school engagement and mathematics achievement. *J. Youth Adoles.* 39(2):163-176. doi:10.1007/s10964-009-9402-3
- Werblow J, Duesbery L (2009). The impact of high school size on math achievement and dropout rate. *High Sch. J.* 92(3):14-23.
- White paper 31 (2008). *Kvalitet i skolen* [Quality in school]. Kunnskapsdepartementet. <http://www.regjeringen.no/nb/dep/kd/dok/regpubl/stmeld/2007-2008/stmeld-nr-31-2007-2008-.html?id=516853>
- Wyse AE, Keesler V, Schneider B (2008). Assessing the effects of small school size on mathematics achievement: A propensity score-matching approach. *Teach. Coll. Rec.* 110(9):1879-1900.