Group Size in Physical Education: A Teachers' Perspective

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Abstract

The physical education context is fun, yet challenging. There is the potential to offer a multitude of activities and games for students. Thus, PE teachers should put the students in the best position to learn the content. One method PE teachers can use is putting students in small-sided groups during game and activities. The purpose of this study was to investigate K-12 physical education teachers’ perceptions of small-sided games/activities in their PE lessons. For this study 31 K-12 physical educators from five states participated in the study. The PE teachers were emailed a survey for them to fill out. The questions were structured to produce answers to the survey that were short answers. Analysis of the interview data revealed four themes concerning small-sided games/activities in physical education lessons. They were, 1) the importance of small-sided groups, 2) PE teachers observations of students in 2v2 and 3v3 activities, 3) how do PE teachers know small-sided groups are better than large-sided games, and 4) small-sided groups affect on student attitudes. The results from the data collected show that small-sided games/activities are helpful and important to students learning, students have more interaction with the equipment, and students feel more comfortable to participate in small-sided games/activities.
Educators in all content areas want to put their students in the best position to learn and be successful. One particular topic of interest that has received much attention has dealt with class size. It is believed that smaller class sizes will allow teachers to give students the needed attention to help students learn the content. For example, Rivkin, Hanushek and Kain (2005) studied class size in Texas schools. It was found that class size does seem to have a significant negative impact on student test scores in reading and math among students in grades 4 and 5, but not on students in 6th and 7th grades. The researchers continued to state that the impact of lower class size is quite small; a reduction in class size of 10 students would increase test scores by only about 0.1 standard deviations. With these results, the concept of small class size will continue to be debated. In regards to physical education, class size has been also debated.

Physical education (PE) lessons have the potential to provide a multitude of teaching–learning situations during the diverse activities and games planned for the students. As a result of the variety of activities to participate in, there are many methods used to engage students. For example, in a normal basketball game, participants compete in a 5v5 game. In many cases the five players that play the game would have equal opportunities to dribble, pass and shoot the basketball. In a physical education class, as a result of the dynamics of combining students in a 5v5 basketball game may not offer all participants an equal opportunity to dribble, pass and shoot the basketball. The reasons for this inequality could be as simple as the differing skills of a homogeneously grouped class of students, playing with a classmate that doesn’t pass the ball to teammates (a ball hog), or the student doesn’t enjoy playing basketball. Whatever the reason for not having equal opportunities with the basketball, the PE teacher can design the teaching–learning experience to necessitate students to be in a position to have plenty of interaction with a ball, tactical skill or piece of equipment. The pedagogical method the PE teacher can employ is
putting students on small-sided teams or groups which requires more involvement as a direct
result of fewer participants requires more involvement to make the game work. Unfortunately,
for reasons outside the control of the PE teacher, their classes could have as many as 60 students
at one time in their class. In elementary PE schools combine classes, creating classes of 50 or
more students (Pangrazi & Beighle, 2013). When this happens PE teachers may feel
overwhelmed having students participate in large sized group activities and games. For PE
teachers this is easier to put students in large group activities.

The national standards (#4) for k-12 PE touch upon group-size in PE. Standard four
states, “The physically literate individual exhibits responsible personal and social behaviors that
respect self and others.” The essence of the respect component contained in this national
standard is maximized by decreasing the group-size, requiring the smaller number of individuals
to work together. This allows “problem solving with a small group of classmates during
adventure activities, small-group initiatives, or game play (SHAPE America, 2014). This is one
equivalent from the national standards illustrating how small group-size activities in PE can teach
students how to constructively work together in a positive and meaningful way in an effort to
engage in practice that requires using the instructional component.

The literature regarding the aspect of group sizes in PE classes have investigated physical
conditioning and the number of touches a student has with the equipment or ball. Katis and
Kellis (2009) examined the movement actions in regards to heart rate during two different small-
sided games. For this study 34 junior high school-aged students in three groups participated in a
3v3 and 6v6 game of soccer. The researchers found that those students that played in the 3v3
sided games displayed higher exercise intensity compared to those students that played in the
6v6 games. The researchers concluded that the reason the students in the 3v3 game had higher
exercise intensity was because they had more interaction with the soccer ball. They were
dribbling and passing the ball more than the students that played in the 6v6 games. Bell,
Johnson, Shimon, and Bale (2013) studied the effects of participating in small (3v3), medium
(6v6), and large-sided (12v12) throwing and catching games on physical activity and actual ball
touches of 10-11-year-old elementary school children in physical education class. The results
from this study were that the students were more physically active in 3v3 games compared to
12v12 games. The researchers in the Bell et al. study also reported the students in the 3v3 games
had more touches with the ball. The researchers felt that these elementary-aged students had
more opportunities for technical improvement when playing 3v3 games. Using small-sided
teams is of great pedagogical advantage during practice to have students actively involved as a
participant, thus giving the student opportunities to learn through increased active-learning
involvement. Another study that looked at group-size in the PE setting, studied physical
education teacher education (PETE) major’s knowledge of appropriate instructional practices
(AIP) used in PE (Barney & Strand, 2006). The purpose of this study was to identify PETE
major’s knowledge of what commonly used PE practices are either appropriate or inappropriate
to use as they teach PE. There were two survey questions that were incorrectly answered. The
first was, “Teachers may organize full-sided or large-sided games (e.g., the class of 30 split into
2 groups of 15 that play against each other).” The other incorrectly identified survey question
was, “Teacher may use large groups in which student participation is based in individual
competitiveness.” For the first survey question 67% of the PETE students incorrectly answered
the survey question. For the second survey question 50% of the PETE students incorrectly
answered the question. The results from this study should give PETE faculties reason to pause
and think about their role in preparing future professional students to become PE teacher and
why it is so important. Pajares (1992) has stated, “They (students) have had experiences as (K-12) students that are carried with them into their teaching.” These PETE majors have spent many hours in school PE classes. They have been exposed to appropriate and inappropriate instructional practices in their many hours of being in PE classes, and in their mind, as a direct result of their success as well as enjoyment, this is how PE lessons and activities should be taught. As a result of this clear instructions need to expel the inappropriate practices, PETE faculty have a great responsibility to expose PETE majors of appropriate instructional practices in PE and teach these future-professionals that K-12 students are better served when appropriate instructional practices are used as a backdrop to all instructional settings.

Fully embracing such a significant responsibility, PETE faculty have in preparing future-professional physical education teachers to implement appropriate instructional practices when they become PE teachers, there is a resource that can assist in their preparations. This resource is the Appropriate Instructional Guidelines documents for teaching physical education. These guidelines were prepared by the National Association of Sport and Physical Education (NASPE). There are guidelines for Elementary (NASPE, 2009a), Middle School (NASPE, 2009b), and High School (NASPE, 2009c). The AIP documents have five separate sections, which include: 1) Learning Environment, 2) Instructional Strategies, 3) Curriculum, 4) Assessment, and 5) Professionalism. Within each section, while the list is not exhaustive, there are two very specific instructional practices presented. One practice being appropriate with an example of how the concept in applied and the other practice being inappropriate with an example of how the same concept might be wrongly applied. The purpose of these document is to give:

specific guidelines for recognizing and implementing developmentally appropriate physical education activities and practices… practices that are in the best interests of
children (appropriate) and those that are counterproductive or even harmful (inappropriate) need to be identified for the benefit of the students. (NASPE, 2009b, p. 7)

An example of an appropriate instructional practice regarding group size is, “Teachers create a mastery-learning environment that encourages students to compete against previous personal performance.” The example of the inappropriate instructional practice is, “Teachers focus on producing full-scale competition and limit skill instruction (e.g., playing 11v11 soccer instead of modifying the game to 3v3). The focus is on activities that produce winners and losers.”

Another example of an appropriate instructional practice from the document is, “The physical educator uses small-sided games (1v1, 2v2) or mini-activities to allow students ample opportunity to participate.” The inappropriate practice is, “The physical educator consistently uses only one ball for most ball-oriented activities (e.g., soccer, softball).” These brief statements from the AIP documents reinforce the concept to use small-sided games/activities in PE and how important they can be to student learning. Thus, the purpose of this study was to investigate k-12 physical education teachers’ perceptions of small-sided games/activities in their physical education lessons.

Methodology

Participants

Thirty-one physical education teachers (14 males & 17 females) from five states (California, Nevada, North Dakota, Oklahoma & Utah); representing 16 schools (3 elementary schools, 9 junior high schools & 4 high schools) participated in the study. Teaching experience ranged from 1 to 26 years. University Institutional Board (IRB) approved the study before implementation. Participants provided their informed consent for voluntary participation before study implementation.
Instrument

No instrument was identifiable in the literature that examined physical educator’s perceptions of group-size activities and their benefits to student in the literature. As such, the investigator constructed a survey instrument from the literature regarding group-size activities. The instrument was further strengthened as a result of pre-trials with follow-up conversations with K-12 physical educators. A 14-item survey was constructed of the following: 1) 11 open-ended questions and 2) three demographic questions (See Table 1).

Insert Table 1 Here

Content validity on constructed and readability of survey items was established with four experienced K-12 physical educators. The survey was pilot-tested with six experienced K-12 physical educators who did not participate in the study. The survey was sent electronically to the participants via Qualtrics Survey Company.

Data Analysis

Framework analysis methodology for participant responses, as outlined in Check and Schutt (2011), was used to correlate and review participants’ open-ended responses to generate preliminary coding categories. Framework analysis incorporated four stages: 1) familiarization, 2) thematic, 3) identification, and 4) charting and interpretation (Rabiee, 2004).

Group-Size Content Themes. The researcher read and re-read the interview transcripts identifying key themes and phrases. From all survey responses, the most frequent group-size themes were: 1) The importance of small groups, 2) PE teacher’s observations of students in
small-group sizes, 3) Small-sided or large-sided groups, and 4) Small-sided groups affecting student attitudes in PE.

Results

The Importance of Small-Sided Groups. A majority of the PE teacher felt that having students participate in small groups was important. One of the thoughts that came from this was the learning that takes place for the students. Sarah stated, “The more time the student’s practice and the more repetition they have, the faster their skill level will improve.” John said, “Vital, only way to have any hope of learning.” And Ann stated, “Crucial! If a teacher is going to assess learning they have to give students the opportunity to learn. Physical skills take repetitions in order for muscle memory and learning to take place. If a student does not have the equipment with which to try, fail, try again, practice, and learn is impossible!”

PE Teachers Observations of Students in 2v2 and 3v3 Activities. A second theme that emerged from the data reported PE teacher’s observations of their students in 2v2 and 3v3 activities. One thought from this theme was that the students have to work together. Seth stated, “I feel the students learn better social skills because they are in smaller groups and are forced to communicate with their peers on a more personal level.” Susan said, “Students learn to work more efficiently. They develop skills and friendships faster. Better collaborative skills and improve skill levels.” And Fred simply stated, “Students learn how to be a good teammate.” A second thought from this theme is that students have higher rates of participation in the activity. Frank stated, “These more intimate settings seem to be more comfortable for my students and they not only participate way more, but they also seem to enjoy it more as well.” Cindy said, “When games are 2v2 or 3v3 every player is crucial. When this is the case, not only do the ‘All-
Stars’ participate but so does everyone else. They have to!” John stated, “Students are engaged more in the activity and skill levels improve faster! Students have more fun.”

**How Do PE Teachers Know Small-Sided Groups are Better Than Large-Sided Groups?**

PE teacher observations of small-sided groups or large-sided groups are better for student learning. Frank stated, “I know this because I can actually see a student do the skill many more times and see improvement instead of only touching the ball or piece of equipment once in a long while.” Ann said, “I equate student learning in PE with highly active students. In small-sided games students are more active and therefore are learning more because their brains and bodies are more engaged in participation.” And Richard concluded by stating, “Through my experience as a PE teacher, I have had class sizes ranging from 12 to 68. In my early years, I have attempted larger size groups or whole class activities to try and include all students at once and I have noticed that the timid step aside and let the aggressive students take control of the activity. Too many students end up never touching the equipment when groups are too large. Thus, they are not learning.”

**Small-Sided Groups effect on Student Attitudes.** The final theme from this study addressed group size on student attitudes. Calvin stated, “I do think small-sided games affect student attitudes towards PE. I feel when they are more active and engaged that they feel more success because they are given more opportunity to try.” Julie said, “The more students enjoy the activities in PE and are engaged, the more they enjoy PE. Small groups tend to lead to more engaged students, more learning, and more enjoyable PE experience. I’ve had not only students, but parents tell me how they (or their child) have enjoyed the class.”

Cindy stated,
“I think it does affect student attitudes towards PE. I think the more competitive ones are able to learn how to cooperate with others at lower skill levels. And those with lower skills levels are able to have a safe environment where they are needed in the activities and can also have a fun time with other students.”

And Ann concluded by saying,

“I think students tend to have more fun in PE when they feel comfortable playing with a small group of peers they trust and don’t feel pressure to perform to a certain standard, or feel like they’re being judged by the whole group (all eyes on me perception). If students don’t feel that threat, I think they’re more willing to put forth a better effort and if they feel successful and they’re having fun, they definitely have a better attitude.”

**Discussion**

The purpose of this study was to investigate K-12 physical education teachers’ perceptions of small-sided games/activities in their physical education lessons. Four major themes arose from PE teacher’s perceptions of small-sided games/activities. The four themes were: 1) The importance of small-sided groups, 2) PE teacher’s observations of students in 2v2 and 3v3 activities, 3) How do PE teachers know small-sided groups are better than large-sided groups, and 4) small-sided groups effects on student attitudes.

Physical education teachers indicated that small-sided groups were important for the fact that students learn a skill better. For example, Frank stated, “I have observed students that have more touches with the ball, learn the skill better.” Darst and Pangrazi (2002) have suggested that student learning is more effective when learners are placed in small-sided groups. The authors feel that student learning takes place in small-sided groups as a direct result of the student having more opportunities to interact with the equipment. Bell, Johnson, Shimon and Bale (2013)
studied the effects group size games in elementary PE had on ball touches. The students participated in group games of 3v3, 6v6, and 12v12 games. The researchers concluded that when the students participated in 3v3 games they had significantly more opportunities for technical improvement. The student also accumulated higher numbers of passes, kicks, and shots on goal compared to playing in the larger-sided games. Participants from this study stated, “I’ve had more success with equipment touch activities”, “The more time with the equipment, the better the student feels about the task”, and “For PE skills and lifetime activity classes ball touches are vital for the development of skills.”

A second theme the PE teachers discussed dealt with what they observed from their students as they participated in small-sided games/activities. One of the thoughts from this theme was the benefits of the students interacting with each other. For example, a few of the PE teachers stated, “They (the students) learn to work together, they learn better strategy, they learn that they are valued and do matter, they also make better friends”, “Students learn to work more efficiently. The develop skills and friendships faster. Better collaborative skills”, and “They learn how to be a good teammate and work together. They also have to practice sportsmanship.”

These responses from the PE teachers strongly align with the fourth standard from the SHAPE America National Standards. The fourth standard states, “The physically literate individual exhibits responsible personal and social behaviors that respects self and others (SHAPE America, 2014). The National Standards from 2004 (NASPE, 2004), states that “The intent of this standard is achievement of self-initiated behaviors that promote personal and group success in activity settings. These include safe practices, adherence to rules and procedures, etiquette, cooperation and teamwork, ethical behavior, and positive social interaction” (pg.14).
A third theme PE teachers revealed to deal with small-sided or large-sided games/activities. PE teachers overwhelmingly felt that small-sided games/activities are better for student learning. Much of the literature has touched upon the idea that small-sided games are great for students being more physically active (Foster, et. al, 2010; Rampini, et. al, 2007; Arnet & Lutz, 2003; Katis & Kellis, 2009; & Bell, et. al, 2013). As previously discussed, students in small-sided games/activities have more ball touches (Bell et. al, 2013; McCormick et. al, 2012; & Prusak & Barney, 2014). The responses from the study weren’t the same from previous research. Yet, the responses from the PE teachers were favorable for small-sided games/activities then large-sided games. Some of the comments were, “Students grasp the skills much quicker in small-sided games and more enjoy and want to keep participating” and “As a PE teacher you are able to see when students are grasping the concepts of an activity. It is very easy to see the difference between one big game and more little games.”

And finally, the PE teachers discussed how small-sided games/activities affect student attitudes towards PE. From the interview data one PE teacher stated, “Yes, when a student can participate and have unlimited turns, they have a more positive attitude about the class, the game, and their own abilities.” Another PE teacher said, “I do feel small-sided games/activities affect student attitudes towards PE, as they keep students engaged in an activity rather than giving the students to feel like they aren’t given a chance to learn anything.”

Conclusions

The purpose of this study was to investigate k-12 physical education teachers’ perceptions of small-sided games/activities in their physical education lessons. Class size has been debated for many years. Many proponents of small class/group size feel that when students
are put in small classes or groups there is a better chance students will have success with what they are being taught. This same idea has been discussed in the physical education setting. From much of the literature the research has focused on physical activity, more specifically moderate to vigorous physical activity and the number of ball touches a student has in small-sided game/activities. The literature confirms that having small-sided games/activities are beneficial for students in the PE context. The results from this study are positive from a PE teacher’s perspective. In so doing, the results of this study help strengthen and add to the literature regarding small-sided games/activities.

The results from this study coincide with the literature in regards to putting students in a better situation to learn skills. Bell et. al, (2013) found that when students are in small-sided groups there are greater opportunities to learn, for the fact that the student is having more interaction with the equipment. Another result from this study was that when students are put into small-sided groups there is an environment of mastery learning. From the Appropriate Instructional Practices document (NASPE, 2014) this instructional practice is recommended to benefit students during PE lessons. It is the researchers hope that K-12 PE teachers and PETE faculty will promote, educate, and implement putting students in smaller-sized groups to benefit students.

**Study Limitations**

This study represents physical education teachers from five states as previously mentioned. Thus, the findings and conclusions are mostly germane to those environments. As a direct result of the impact on the instructional theme of classes as well as of the nature of the study, the findings have the potential to provide practical application to k-12 physical education teachers and physical education teacher education (PETE) programs.
References


As a physical educator, you have probably seen first-hand how group sized activities can affect your class and the activities they participate in. The following survey questions will ask you your opinions, experiences and perceptions of group size in PE class. For many of the questions you will be asked to briefly explain your thoughts and feelings regarding group size in PE classes. I would appreciate your help with this survey. Thank you.

1. In your opinion, do you feel students like participating in large groups or small groups? Please explain your answer.

2. How important is it for students to have ball (equipment) touches? Please explain your answer.

3. In what activities do you use small-sided games (e.g. basketball, soccer..)?

4. From your experience, why would you want students to have a piece of equipment (ball, hula hoop, bean bag, etc.) during class activities. Please explain your answer.

5. From your experience, as a PE teacher, what have you witnessed when there are two teams (15 v 15) and one ball for an activity. Please explain your answer.

6. From your experience, what have you noticed when students have to stand in line to take their turn at an activity? Please explain your answer.

7. From your experience, what happens when there is a 2v2 or 3v3 game for the students? Please explain your answer.

8. From your experience, what do students learn when they participate in a 2v2 or 3v3 game/activity? Please explain your answer.

9. Do you feel small-sided games keep or hold students’ interest in the game/activity? Please explain your answer.

10. How do you know small-sided games are better for student learning then large-sided games? Please explain your answer.

11. Do you feel small-sided games/activities affect student attitudes towards PE? Please explain your answer.

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