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2018-03-28

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.

24 Educators in all content areas want to put their students in the best position to learn and
25 be successful. One particular topic of interest that has received much attention has dealt with
26 class size. It is believed that smaller class sizes will allow teachers to give students the needed
27 attention to help students learn the content. For example, Rivkin, Hanushek and Kain (2005)
28 studied class size in Texas schools. It was found that class size does seem to have a significant
29 negative impact on student test scores in reading and math among students in grades 4 and 5, but
30 not on students in 6th and 7th grades. The researchers continued to state that the impact of lower
31 class size is quite small; a reduction in class size of 10 students would increase test scores by
32 only about 0.1 standard deviations. With these results, the concept of small class size will
33 continue to be debated. In regards to physical education, class size has been also debated.

34 Physical education (PE) lessons have the potential to provide a multitude of teaching –
35 learning situations during the diverse activities and games planned for the students. As a result
36 of the variety of activities to participate in, there are many methods used to engage students. For
37 example, in a normal basketball game, participants compete in a 5v5 game. In many cases the
38 five players that play the game would have equal opportunities to dribble, pass and shoot the
39 basketball. In a physical education class, as a result of the dynamics of combining students in a
40 5v5 basketball game may not offer all participants an equal opportunity to dribble, pass and
41 shoot the basketball. The reasons for this inequality could be as simple as the differing skills of a
42 homogeneously grouped class of students, playing with a classmate that doesn't pass the ball to
43 teammates (a ball hog), or the student doesn't enjoy playing basketball. Whatever the reason for
44 not having equal opportunities with the basketball, the PE teacher can design the teaching-
45 learning experience to necessitate students to be in a position to have plenty of interaction with a
46 ball, tactical skill or piece of equipment. The pedagogical method the PE teacher can employ is

47 putting students on small-sided teams or groups which requires more involvement as a direct
48 result of fewer participants requires more involvement to make the game work. Unfortunately,
49 for reasons outside the control of the PE teacher, their classes could have as many as 60 students
50 at one time in their class. In elementary PE schools combine classes, creating classes of 50 or
51 more students (Pangrazi & Beighle, 2013). When this happens PE teachers may feel
52 overwhelmed having students participate in large sized group activities and games. For PE
53 teachers this is easier to put students in large group activities.

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

63 The literature regarding the aspect of group sizes in PE classes have investigated physical
64 conditioning and the number of touches a student has with the equipment or ball. Katis and
65 Kellis (2009) examined the movement actions in regards to heart rate during two different small-
66 sided games. For this study 34 junior high school-aged students in three groups participated in a
67 3v3 and 6v6 game of soccer. The researchers found that those students that played in the 3v3
68 sided games displayed higher exercise intensity compared to those students that played in the
69 6v6 games. The researchers concluded that the reason the students in the 3v3 game had higher

70 exercise intensity was because they had more interaction with the soccer ball. They were
71 dribbling and passing the ball more than the students that played in the 6v6 games. Bell,
72 Johnson, Shimon, and Bale (2013) studied the effects of participating in small (3v3), medium
73 (6v6), and large-sided (12v12) throwing and catching games on physical activity and actual ball
74 touches of 10-11-year-old elementary school children in physical education class. The results
75 from this study were that the students were more physically active in 3v3 games compared to
76 12v12 games. The researchers in the Bell et al. study also reported the students in the 3v3 games
77 had more touches with the ball. The researchers felt that these elementary-aged students had
78 more opportunities for technical improvement when playing 3v3 games. Using small-sided
79 teams is of great pedagogical advantage during practice to have students actively involved as a
80 participant, thus giving the student opportunities to learn through increased active-learning
81 involvement. Another study that looked at group-size in the PE setting, studied physical
82 education teacher education (PETE) major's knowledge of appropriate instructional practices
83 (AIP) used in PE (Barney & Strand, 2006). The purpose of this study was to identify PETE
84 major's knowledge of what commonly used PE practices are either appropriate or inappropriate
85 to use as they teach PE. There were two survey questions that were incorrectly answered. The
86 first was, "Teachers may organize full-sided or large-sided games (e.g., the class of 30 split into
87 2 groups of 15 that play against each other)." The other incorrectly identified survey question
88 was, "Teacher may use large groups in which student participation is based in individual
89 competitiveness." For the first survey question 67% of the PETE students incorrectly answered
90 the survey question. For the second survey question 50% of the PETE students incorrectly
91 answered the question. The results from this study should give PETE faculties reason to pause
92 and think about their role in preparing future professional students to become PE teacher and

93 why it is so important. Pajares (1992) has stated, “They (students) have had experiences as (K-
94 12) students that are carried with them into their teaching.” These PETE majors have spent
95 many hours in school PE classes. They have been exposed to appropriate and inappropriate
96 instructional practices in their many hours of being in PE classes, and in their mind, as a direct
97 result of their success as well as enjoyment, this is how PE lessons and activities should be
98 taught. As a result of this clear instructions need to expel the inappropriate practices, PETE
99 faculty have a great responsibility to expose PETE majors of appropriate instructional practices
100 in PE and teach these future-professionals that K-12 students are better served when appropriate
101 instructional practices are used as a backdrop to all instructional settings.

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

114 specific guidelines for recognizing and implementing developmentally appropriate
115 physical education activities and practices... practices that are in the best interests of

116 children (appropriate) and those that are counterproductive or even harmful
117 (inappropriate) need to be identified for the benefit of the students. (NASPE, 2009b, p. 7)
118 An example of an appropriate instructional practice regarding group size is, “Teachers create a
119 mastery-learning environment that encourages students to compete against previous personal
120 performance.” The example of the inappropriate instructional practice is, “Teachers focus on
121 producing full-scale competition and limit skill instruction (e.g., playing 11v11 soccer instead of
122 modifying the game to 3v3). The focus is on activities that produce winners and losers.”
123 Another example of an appropriate instructional practice from the document is, “The physical
124 educator uses small-sided games (1v1, 2v2) or mini-activities to allow students ample
125 opportunity to participate.” The inappropriate practice is, “The physical educator consistently
126 uses only one ball for most ball-oriented activities (e.g., soccer, softball).” These brief
127 statements from the AIP documents reinforce the concept to use small-sided games/activities in
128 PE and how important they can be to student learning. Thus, the purpose of this study was to
129 investigate k-12 physical education teachers’ perceptions of small-sided games/activities in their
130 physical education lessons.

131 **Methodology**

132 **Participants**

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

139 **Instrument**

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

146

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Insert Table 1 Here

148

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

153 **Data Analysis**

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

158 **Group-Size Content Themes.** The researcher read and re-read the interview transcripts
159 identifying key themes and phrases. From all survey responses, the most frequent group-size
160 themes were: 1) The importance of small groups, 2) PE teacher's observations of students in

161 small-group sizes, 3) Small-sided or large-sided groups, and 4) Small-sided groups affecting
162 student attitudes in PE.

163 **Results**

164 **The Importance of Small-Sided Groups.** A majority of the PE teacher felt that having students
165 participate in small groups was important. One of the thoughts that came from this was the
166 learning that takes place for the students. Sarah stated, “The more time the student’s practice and
167 the more repetition they have, the faster their skill level will improve.” John said, “Vital, only
168 way to have any hope of learning.” And Ann stated,

169 “Crucial! If a teacher is going to assess learning they have to give students the
170 opportunity to learn. Physical skills take repetitions in order for muscle memory and
171 learning to take place. If a student does not have the equipment with which to try, fail,
172 try again, practice, and learn is impossible!”

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

184 Stars' participate but so does everyone else. They have to!" John stated, "Students are engaged
185 more in the activity and skill levels improve faster! Students have more fun."

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

187 PE teacher observations of small-sided groups or large-sided groups are better for student
188 learning. Frank stated, "I know this because I can actually see a student do the skill many more
189 times and see improvement instead of only touching the ball or piece of equipment once in a
190 long while." Ann said, "I equate student learning in PE with highly active students. In small-
191 sided games students are more active and therefore are learning more because their brains and
192 bodies are more engaged in participation." And Richard concluded by stating,

193 "Through my experience as a PE teacher, I have had class sizes ranging from 12 to 68. In
194 my early years, I have attempted larger size groups or whole class activities to try and
195 include all students at once and I have noticed that the timid step aside and let the
196 aggressive students take control of the activity. Too many students end up never
197 touching the equipment when groups are too large. Thus, they are not learning."

198 **Small-Sided Groups effect on Student Attitudes.** The final theme from this study addressed
199 group size on student attitudes. Calvin stated, "I do think small-sided games affect student
200 attitudes towards PE. I feel when they are more active and engaged that they feel more success
201 because they are given more opportunity to try." Julie said,

202 "The more students enjoy the activities in PE and are engaged, the more they enjoy PE.
203 Small groups tend to lead to more engaged students, more learning, and more enjoyable
204 PE experience. I've had not only students, but parents tell me how they (or their child)
205 have enjoyed the class."

206 Cindy stated,

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

211 And Ann concluded by saying,

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

217 **Discussion**

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

224 Physical education teachers indicated that small-sided groups were important for the fact
225 that students learn a skill better. For example, Frank stated, “I have observed students that have
226 more touches with the ball, learn the skill better.” Darst and Pangrazi (2002) have suggested that
227 student learning is more effective when learners are placed in small-sided groups. The authors
228 feel that student learning takes place in small-sided groups as a direct result of the student having
229 more opportunities to interact with the equipment. Bell, Johnson, Shimon and Bale (2013)

230 studied the effects group size games in elementary PE had on ball touches. The students
231 participated in group games of 3v3, 6v6, and 12v12 games. The researchers concluded that
232 when the students participated in 3v3 games they had significantly more opportunities for
233 technical improvement. The student also accumulated higher numbers of passes, kicks, and
234 shots on goal compared to playing in the larger-sided games. Participants from this study stated,
235 “I’ve had more success with equipment touch activities”, “The more time with the equipment,
236 the better the student feels about the task”, and “For PE skills and lifetime activity classes ball
237 touches are vital for the development of skills.”

238 A second theme the PE teachers discussed dealt with what they observed from their
239 students as they participated in small-sided games/activities. One of the thoughts from this
240 theme was the benefits of the students interacting with each other. For example, a few of the PE
241 teachers stated, “They (the students) learn to work together, they learn better strategy, they learn
242 that they are valued and do matter, they also make better friends”, “Students learn to work more
243 efficiently. They develop skills and friendships faster. Better collaborative skills”, and “They
244 learn how to be a good teammate and work together. They also have to practice sportsmanship.”
245 These responses from the PE teachers strongly align with the fourth standard from the SHAPE
246 America National Standards. The fourth standard states, “The physically literate individual
247 exhibits responsible personal and social behaviors that respects self and others (SHAPE
248 America, 2014). The National Standards from 2004 (NASPE, 2004), states that “The intent of
249 this standard is achievement of self-initiated behaviors that promote personal and group success
250 in activity settings. These include safe practices, adherence to rules and procedures, etiquette,
251 cooperation and teamwork, ethical behavior, and positive social interaction” (pg.14).

252 A third theme PE teachers revealed to dealt with small-sided or large-sided
253 games/activities. PE teachers overwhelmingly felt that small-sided games/activities are better for
254 student learning. Much of the literature has touched upon the idea that small-sided games are
255 great for students being more physically active (Foster, et. al, 2010; Rampini, et. al,2007; Arnet
256 & Lutz, 2003; Katis & Kellis, 2009; & Bell, et. al, 2013). As previously discussed, students in
257 small-sided games/activities have more ball touches (Bell et. al, 2013; McCormick et. al, 2012;
258 & Prusak & Barney, 2014). The responses from the study weren't the same from previous
259 research. Yet, the responses from the PE teachers were favorable for small-sided
260 games/activities then large-sided games. Some of the comments were, "Students grasp the skills
261 much quicker in small-sided games and more enjoy and want to keep participating" and "As a
262 PE teacher you are able to see when students are grasping the concepts of an activity. It is very
263 easy to see the difference between one big game and more little games."

264 And finally, the PE teachers discussed how small-sided games/activities affect student
265 attitudes towards PE. From the interview data one PE teacher stated, "Yes, when a student can
266 participate and have unlimited turns, they have a more positive attitude about the class, the game,
267 and their own abilities." Another PE teacher said,

268 "I do feel small-sided games/activities affect student attitudes towards PE, as they keep
269 students engaged in an activity rather than giving the students to feel like they aren't
270 given a chance to learn anything."

271 **Conclusions**

272 The purpose of this study was to investigate k-12 physical education teachers'
273 perceptions of small-sided games/activities in their physical education lessons. Class size has
274 been debated for many years. Many proponents of small class/group size feel that when students

275 are put in small classes or groups there is a better chance students will have success with what
276 they are being taught. This same idea has been discussed in the physical education setting.
277 From much of the literature the research has focused on physical activity, more specifically
278 moderate to vigorous physical activity and the number of ball touches a student has in small-
279 sided game/activities. The literature confirms that having small-sided games/activities are
280 beneficial for students in the PE context. The results from this study are positive from a PE
281 teacher's perspective. In so doing, the results of this study help strengthen and add to the
282 literature regarding small-sided games/activities.

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

292 **Study Limitations**

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

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367 Table 1
368 PE Teachers Perceptions of Small-Sided Games/Activities Survey

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

- 375
- 376 1. In your opinion, do you feel students like participating in large groups or small groups?
377 Please explain your answer.
 - 378
 - 379 2. How important is it for students to have ball (equipment) touches? Please explain your
380 answer.
 - 381
 - 382 3. In what activities do you use small-sided games (e.g. basketball, soccer,..)?
383
 - 384 4. From your experience, why would you want students to have a piece of equipment (ball,
385 hula hoop, bean bag, etc.) during class activities. Please explain your answer.
 - 386
 - 387 5. From your experience, as a PE teacher, what have you witnessed when there are two
388 teams (15 v 15) and one ball for an activity. Please explain your answer.
 - 389
 - 390 6. From your experience, what have you noticed when students have to stand in line to take
391 their turn at an activity? Please explain your answer.
 - 392
 - 393 7. From your experience, what happens when there is a 2v2 or 3v3 game for the students?
394 Please explain your answer.
 - 395
 - 396 8. From your experience, what do students learn when they participate in a 2v2 or 3v3
397 game/activity? Please explain your answer.
 - 398
 - 399 9. Do you feel small-sided games keep or hold students' interest in the game/activity?
400 Please explain your answer.
 - 401
 - 402 10. How do you know small-sided games are better for student learning then large-sided
403 games? Please explain your answer.
 - 404
 - 405 11. Do you feel small-sided games/activities affect student attitudes towards PE? Please
406 explain your answer.
-

408

409 Gender	Male _____	Female _____			
410 Years Teaching:	1-5 _____	6-10 _____	11-15 _____	15-20 _____	20+ _____
411 Grades you Teach:	k-6 _____	7-9 _____	10-12 _____		

412

