

PHYSICAL ACTIVITY

Physical Activity Contributions of Dancing Classrooms Program on Middle School Students

Colin G. Pennington and Larry P. Nelson

Abstract

This study measured the physical activity contributions of Dancing Classrooms on middle school students. Data were collected on 77 students from two large urban middle schools who wore Actigraph wGT3X+ accelerometers for 2 weeks during the program. Physical activity profiles were created to show participant heart rates and step counts. Focus groups further explained motivations for and limitations of exercising in the program. Participants averaged 30.23 min of class time participating in beneficial physical activity, including a mean heart rate of 122 bpm and 1,863 steps/class period. Swing dance recorded the highest exercise outputs as well as highest enjoyment by students. Girls recorded significantly higher exercise intensity levels than boys. The majority of dances in the Dancing Classrooms curriculum produce light to vigorous physical activity with Swing dance and some Sugar dances producing a moderate to vigorous physical activity response. Higher physical activity outputs were also attributed to up-tempo music modifications and styles of dance instruction that focus on time-on-task awareness.

Due to evidence of increasingly high levels of adult and childhood obesity in the United States, a renewed effort has been undertaken to identify the etiology of this epidemic. While poor nutrition has emerged as one contributing cause, the increasing prevalence of a

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sedentary lifestyle is also a major factor. Regular physical activity has been shown to reduce a person's likelihood of becoming obese. Research has shown, however, that 1 in 5 adults meets physical activity guidelines, less than 3 in 10 high school students get at least 60 min of physical activity every day, and by the completion of elementary school, only 70% of children are participating in health-enhancing physical activity on a regular basis (this number falls to 42% for boys and 30% for girls by age 21; Institute of Medicine, 2013). Furthermore, only 16% of Hispanic adults meet physical activity guidelines and women are 8% less likely to meet physical activity guidelines than men (Centers for Disease Control and Prevention, 2014). Thus, it is important to develop habit-forming physical activity in children to help improve these outcomes (Gao, Chen, Huang, Stodden, & Xiang, 2017; Hulteen, Morgan, Barnett, Stodden, & Lubans, 2018).

Physical education can play a critical role in helping children establish a foundation for an active lifestyle (Pennington, 2019). Unfortunately, traditional practices of physical education have been called into question in regard to the amount of beneficial physical activity the class provides. Therefore, it is possible that traditional physical education exposure and curricula are deficient in providing the kinds of robust physical activity needed to combat these sedentary behavior-related trends. In this light, researchers and professional organizations have called for structured, well-designed, and innovative daily physical education activities that can help children to achieve health-enhancing fitness (Institute of Medicine, 2013).

In a well-cited longitudinal study by Nader, Bradley, Houts, McRitchie, and O'Brien (2008), physical activity among youth decreased significantly between the ages of 9 and 15 years. It is at age 13 for girls and 13–14 for boys that adolescents drop below the recommended physical activity threshold for maintaining health-enhancing exercise (e.g., 60 min/day at a moderate to vigorous physical activity level; Institute of Medicine, 2013). Coincidentally, this also happens to be the same time frame in which many middle school physical education programs have been criticized for not delivering activities that are well structured and liked by students (Lee, Burgeson, Fulton, & Spain, 2007). Therefore, one place to focus attention is the middle school level where having access and opportunity to high-quality and culturally-relevant physical activity programs can affect sedentary

forms of behavior. The goal should be to bring the community together and look for new ways to increase physical activity output and engage students in programs that inspire health-enhancing physical activity, positive role-modeling, parental engagement, and a greater appreciation for school (Pennington, 2017, 2018).

Research has also shown that enjoyment is a major factor for exercise motivation and maintaining a productive engagement in physical activity (Prochaska, Sallis, Slymen, & McKenzie, 2003; Wallhead & Ntoumanis, 2004; Yli-Piipari, Watt, Jaakkola, Liukkonen, & Nurmi, 2009). Positive feelings during an exercise-related episode have shown improvements with self-efficacy (Gentile et al., 2009; Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari, 2012) and predict the likelihood of a person continuing those activities on their own and into the future (Guinn et al., 2006). Research has also shown that girls have a greater tendency to feel less optimistic about achieving health and participating in physical activities than do boys (Burnett, Sabiston, Dorsch, & McCreary, 2010; Puskar et al., 2010; Shen, Chen, Tolley, & Scrabis, 2003). Thus, providing less aggressive activities in middle school physical education may correct this imbalance and improve fitness-related outcomes (Barr-Anderson et al., 2008; Mansfield, Caudwell, Wheaton, & Watson, 2018; Webber et al., 2008). Dancing Classrooms may be an innovative and promising program approach to addressing some of these challenges.

Dancing Classrooms is an in-school residency that has spread rapidly into new cities and schools over the past decade. Featured in the award-winning 2005 documentary *Mad Hot Ballroom*, Dancing Classrooms (<http://www.dancingclassrooms.org/>) was created in 1994 and introduced in the New York City public schools by ballroom dance champion Pierre Dulaine. The primary mission of the program was to address fundamental social development characteristics (e.g., respect for differences, self-confidence, and cooperation) that cultivate essential life skills in fifth-grade children through the mechanism of social dance. These objectives are constructed through group dance circles that utilize sequential rhythmical skills while working with a multitude of partners in a “dance frame.” Participants of the program learn basic American-Style Merengue, Foxtrot, Rumba, Tango, Swing, and Waltz. In addition, the students learn up to four “Sugar” dances that do not require a partner

such as the Stomp, Electric Slide, and Cha Cha Slide. During the 2013–2014 school year, Dancing Classrooms served 44,348 students at 549 schools in 29 major cities across the United States (Dancing Classrooms, 2020).

The Dancing Classrooms program is taught by guest teaching artists from the community who receive training on the Dulaine Method of dance pedagogy. This method embodies Respect and Compassion, Being Present, Creating a Safe Space, Command and Control, Body and Verbal Language, and Humor and Joy. Qualifications of teaching artists include stage presence, vocal command, and prior work experience with children. While previous dance training is preferred, it is not mandatory. The curriculum is made up of 20 uniform lessons that all students at the participating schools receive twice per week via physical education classes. Each class in the series introduces new steps, reinforcing those previously learned through practice and repetition. The highlight of the Dancing Classrooms program is a “Culminating Event” in which all students collectively demonstrate the accomplishments of their 10-week journey while performing the dances of the program for parents, teachers, and administrators at school. Additionally, schools may elect to send a team of 12 students to perform the dances and compete against other local schools at a “Colors of the Rainbow Team Match,” which is performed regionally.

Although there is little research on Dancing Classrooms in the literature, two studies have exhibited some of its benefits. The first study examined some of the developmental assets characteristic of the program such as personal efficacy, social support, and school climate. Findings showed that Dancing Classrooms had a beneficial social support structure in which African American and Caucasian students, in particular, showed significant gains in the way they felt accepted by peers of different ethnic backgrounds (Nelson, Wilson, & Guess, 2011). Additionally, Nelson, Evans, et al., (2011) profiled the heart rates of fifth graders in Dancing Classrooms, in which students averaged 124 bpm and were physically active 37 min of class time (17.39 min were spent above a 60% maximal heart rate level). This study also showed girls recorded significantly higher heart rates than boys during the program.

With the successes Dancing Classrooms has had with elementary students over the years, many parents and school officials have

asked the program to expand into the secondary school setting. Therefore, a new version of the Dancing Classrooms program was devised for a pilot. The purpose of this study was to measure how much physical activity middle school students received in the pilot and to explore how students at this level responded to the dance program. Efforts to increase physical activity output for participants' adjustments to the program included a new music soundtrack (with more upbeat tempos for each dance), higher intensity warm-ups at the beginning of lessons, and replacing the Waltz dance with the Salsa dance. With such changes, the following research questions were asked: How much physical activity did Dancing Classrooms provide middle school students? Which components of the Dancing Classrooms program provided the most and least desired physical activity response? What did students think about the program in terms of enjoyment and willingness to participate enthusiastically?

Method

Participants

Participants in the study ($N = 77$) were eighth graders from two middle schools located in a large urban southwest school district ($n_{\text{boys}} = 39$; $n_{\text{girls}} = 38$). Participants were 12 to 13 years old (average 13 years). The two middle schools receiving the Dancing Classrooms pilot were eager to bring dance to their physical education curriculum and were selected by school district officials. Demographic makeup of the school district was 62.7% Hispanic, 22.9% African American, and 10.9% Caucasian. Seventy-four percent of students were economically disadvantaged and 31.4% were limited English proficiency. According to the FitnessGram PACER test, data showed 75% of students at School 1 ($N = 45$) and 74% of students at School 2 ($N = 32$) recorded "healthy fitness zone" levels. School 1 had 30% of its student body considered to be at "some risk" and 15% at "high risk" for obesity, and School 2 exhibited 34% of students to be at "some risk" and 13% at "high risk" for obesity. School 1 operated on a 50-min class period, while School 2 operated on an 80-min class period. Attendance rates at both schools were similar. Assent was obtained from all participants and informed consent was obtained from parents. Protocols for the study were approved by an internal review board for research.

Procedures

Two teaching artists (TAs) with many years of experience were selected to teach the program. The selection of TAs was based on teaching evaluations, overall leadership in the classroom and instructor trainings, and program seniority. Both TAs were trained on new curriculum additions (i.e., Salsa dance), music soundtrack modifications, and other lesson plan progressions (see Appendix for an example modified lesson plan).

Data Collection and Analysis

Actigraph wGT3X+ triaxial accelerometers were used to measure physical activity contributions of students. These are widely used in a variety of research settings and have been proven a reliable and valid assessment tool for measuring free living physical activity (Rothney, Schaefer, Neumann, Choi, & Chen, 2008). In addition to collecting heart rate data, the wGT3X+ accelerometers have multiple sensors that measure motion along an axis plane (i.e., horizontal, vertical, and perpendicular) and convert those movements into electrical signals over time (epoch). In terms of wearing the accelerometers, students were instructed to wear the unit all day while awake. The only time students were to remove the unit was to sleep or shower. Devices were collected after 2 weeks of wear time and data were downloaded into software for analysis. Heart rate and step count data were independently matched up by program time frames and plotted at 10-s epochs to show a representative physical activity profile. Analysis of variance computations were also used to show differences between the dependent variables (heart rate and step counts) and independent variables (gender and the two schools used for data collection).

Pulsford et al. (2011) cut-point classifications were used for categorizing physical activity intensity levels (i.e., sedentary, light, moderate, and vigorous). For heart rate classification, this study followed the Healthy People 2020 report (Office of Disease Prevention and Health Promotion, 2008), which noted, vigorous physical activities are rhythmic, repetitive physical activities that use large muscle groups at 60% or more of maximum heart rate for age. An exercise rate of 60% of maximum heart rate for age is about 50% of maximal

cardiorespiratory capacity and is sufficient for cardiorespiratory conditioning.

Therefore, using Tanaka, Monahan, and Seal's (2001) regression equation ($208 - 0.7 \times \text{Age}$) for maximum heart rate prediction, the study calculated an average maximum heart rate of 199 for the participants (using the average and mode age of 13 years old). Thus, if students had a heart rate of 119 bpm (60% of maximal heart rate) or higher for more than 50% of class activity time, the Dancing Classrooms program was considered to be successful at meeting exercise guidelines.

This study also utilized a naturalistic approach (Lincoln & Guba, 1985) in the form of a questionnaire and focus group interviews. Two focus groups were selected in consult with the resident physical education teacher and consisted of a male group ($N = 12$) and a female group ($N = 14$). The questionnaire was administered by the principal investigator at the beginning of the focus group and asked simple and direct questions about which dances students enjoyed most in the program and which dances did they thought stimulated the most physical activity. The students were then asked follow-up interview questions about the specifics of how actively engaged they were in the learning process. Follow-up questions were also directed toward identifying the perceived benefits of participating in dance activities. This process took about 20 min for each group. For enhanced trustworthiness, the content of the interviews was voice recorded, transcribed, and analyzed, to find salient and recurring units of meaning (Goetz & LeCompte, 1981). These themes were used to structure and clarify the important issues arising from the study.

Results

General physical activity findings showed middle school students were sedentary 68.65% of the day. Students were engaged in moderate to vigorous physical activity (MVPA) 3.16% of each day or 17.45 min. Overall, boys spent more time being physically active than girls (Table 1). Dancing Classrooms data showed students spent 61.56% of class time (32.53 min) engaged in light to vigorous

physical activity (LVPA) and 3.08% (1.55 min) in MVPA (Table 2). Dancing Classrooms accounted for 18.79% of total daily LVPA and 8.89% of MVPA. Although there were little differences between genders, there were large differences in the amount of physical activity being recorded between the two schools (Table 2).

Heart rate measures showed Dancing Classrooms exceeded the 60% maximum heart rate threshold for 54% of class time (Table 2) with a mean heart rate of 122 bpm (Table 3). Overall, girls achieved significantly higher heart rates than did boys, $F(1, 3220) = 195.14$, $p = .000$. Girls also achieved the desired heart rate across each of the seven dances in the program, whereas boys did not reach desired heart rate levels in Foxtrot, Rumba, Salsa, and Tango (Figure 1). Table 4 shows that School 1 achieved significantly higher heart rates than School 2, $F(1, 3220) = 72.71$, $p = .000$. Of total physical activity time per lesson, 61% (or 25 min out of a 50-min class period) was spent above the 60% maximal heart rate threshold for School 1, whereas 48% (or 28 min out of an 80-min class period) was spent above the heart rate threshold for School 2. School 1 recorded higher heart rates for each dance independently except with Merengue dance, for which both schools recorded 122 bpm average (Figure 2).

Table 1

Physical Activity Profile of Middle School Students Overall

Physical activity level	Overall	Girls	Boys
Time in Sedentary (%)	68.65	75.17	60.60
Time in Light Physical Activity (%)	28.20	22.98	34.62
Time in Moderate Physical Activity (%)	2.31	1.48	3.33
Time in Vigorous Physical Activity (%)	0.85	0.36	1.45
Average MVPA Per Day (min)	17.45	11.23	23.47
Average LVPA Per Day (min)	173.17	151.48	193.81
Average Steps Per Minute	7.5	5.8	9.5
Steps Max Counts Per Minute	179	178	179

Note. Data use Pulsford et al.'s 2011 cut points for children and exclude non-wear times. LVPA = Low to Vigorous Physical Activity; MVPA = Moderate to Vigorous Physical Activity.

Table 2*Physical Activity Profile of Middle School Students During Dancing Classrooms*

Physical activity level	Overall	Girls	Boys	School 1	School 2
Time in Sedentary (%)	35.35	36.01	34.71	5.01	53.08
Time in Light Physical Activity (%)	61.56	60.64	62.48	89.04	45.51
Time in Moderate Physical Activity (%)	2.64	2.91	2.37	5.05	1.23
Time in Vigorous Physical Activity (%)	0.44	0.44	0.45	.90	.18
Average MVPA Per Class (min)	1.55	1.65	1.46	2.53	.78
Average LVPA Per Class (min)	32.53	31.52	33.35	40.39	25.96
DC Contribution to Daily MVPA (%)	8.89	14.69	6.22	12.46	5.06
DC Contribution to Daily LVPA (%)	18.79	20.81	17.21	20.26	16.79
Average Steps Per Minute	18.5	19.8	17.1	31.4	10.9
Steps Max Counts Per Minute	148	148	143	148	119
Classtime Above 60% Max HR (%)	54	64	43	61	48

Note. Data use Pulsford et al's 2011 cut points for children and exclude non-wear times. DC = Dancing Classrooms Program; LVPA = Low to Vigorous Physical Activity; MVPA = Moderate to Vigorous Physical Activity; HR = Heart Rate.

Table 3*Dancing Classrooms Physical Activity Measures by Gender and School*

Measure	Gender	Condition	<i>M</i>	<i>SD</i>	<i>N</i>
Heart Rate (bpm)	Boys	School 1	121.02	15.93	495
		School 2	114.30	17.90	1070
		Total	116.42	17.58	1565
	Girls	School 1	129.38	18.37	850
		School 2	124.67	19.99	805
		Total	127.09	19.31	1655
	Total	School 1	126.31	17.97	1345
		School 2	118.75	19.41	1875
		Total	121.90	19.24	3220

Table 3 (cont.)

Measure	Gender	Condition	<i>M</i>	<i>SD</i>	<i>N</i>
Step Counts (per Minute)	Boys	School 1	32.34	21.78	495
		School 2	23.24	18.43	1070
		Total	26.12	20.00	1565
	Girls	School 1	33.45	22.43	850
		School 2	21.25	19.42	805
		Total	27.52	21.88	1655
	Total	School 1	33.04	22.19	1345
		School 2	22.39	18.89	1875
		Total	26.84	21.00	3220
Vector Magnitude (in Feet)	Boys	School 1	2259.46	1030.91	495
		School 2	2003.18	1092.92	1070
		Total	2084.24	1079.97	1565
	Girls	School 1	2616.60	1247.23	850
		School 2	2181.57	1275.20	805
		Total	2405.00	1279.16	1655
	Total	School 1	2485.16	1184.47	1345
		School 2	2079.77	1177.64	1875
		Total	2249.10	1197.13	3220

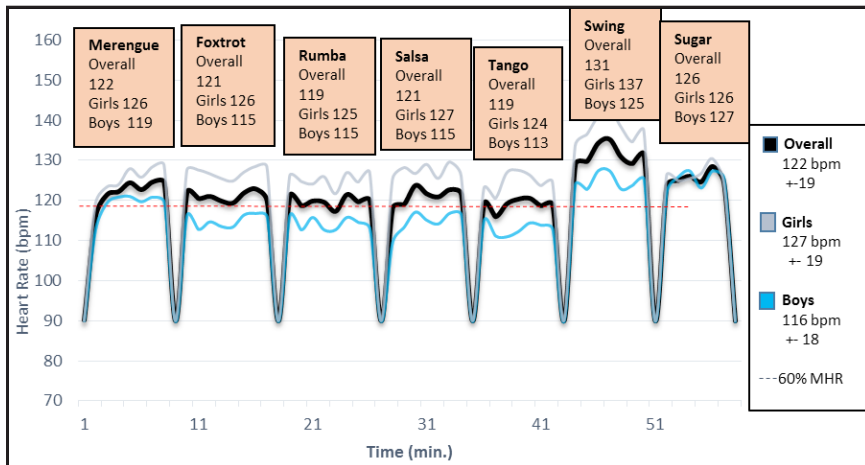
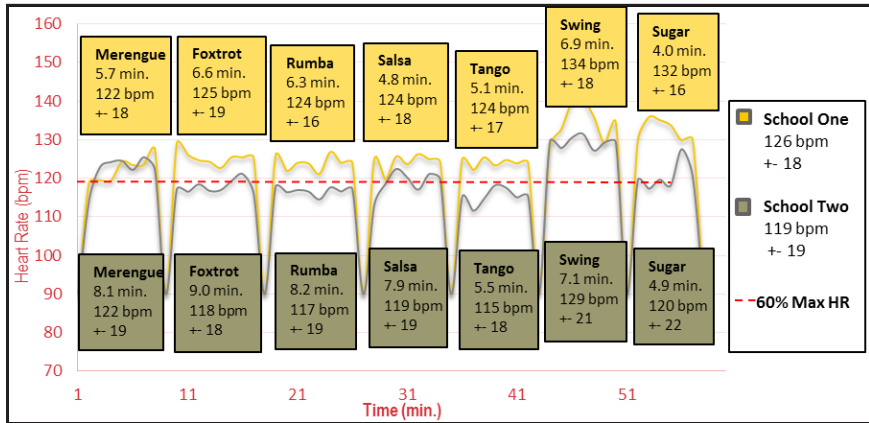


Figure 1. Heart rates of Dancing Classrooms middle school program. MHR = max heart rate.

Table 4*Dancing Classrooms Tests of Between-Subjects Effects for Gender and School*

Source	Measure	Type III sum of squares	df	F
Gender	Heart Rate	65275.92	1	195.14*
	Steps	142.57	1	.345
School 1 * School 2	Heart Rate	24322.78	1	72.71*
	Steps	84340.84	1	204.25*
Gender * School	Heart Rate	754.62	1	2.26
	Steps	1795.04	1	4.35

* $p < .05$.**Figure 2.** Heart rates of Dancing Classrooms program (School 1 vs. School 2). HR = heart rate.

Dancing Classrooms provided students with an average of 18.5 steps/min during class time (Table 2). School 1 (33 steps/min) recorded much higher average step count totals than School 2 (22 steps/min). No significant gender differences were found with overall step counts, $F(1, 3220) = .345$, $p = .557$. There were visible differences between gender at the beginning of some dances (i.e., Merengue, Foxtrot, and Swing) where girls outperformed boys (Figure 3). Boys showed higher step counts at the beginning of Tango

and latter part of Sugar dances. School 1 recorded significantly higher step count totals than School 2, $F(1, 3220) = 204.25, p = .000$, with the largest differences found in Merengue, Rumba, Tango, and Sugar dances (Figure 4). Step counts started out stronger in School 1 across every dance except Salsa.

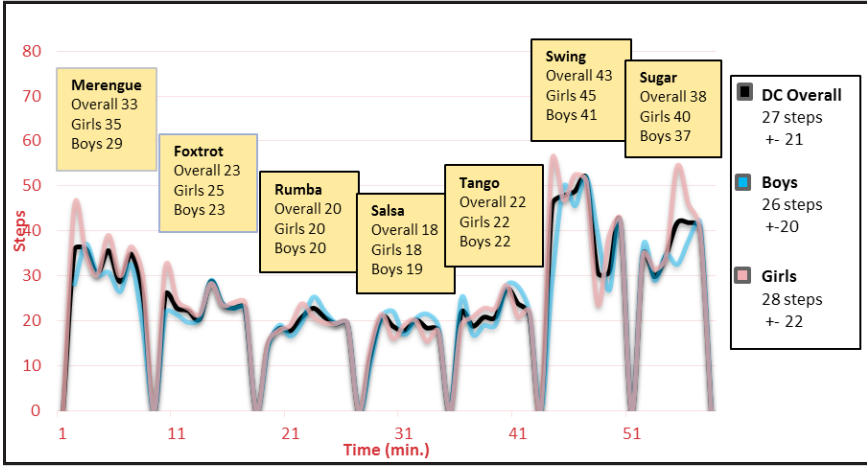


Figure 3. Step counts of Dancing Classrooms middle school program. DC = Dancing Classrooms.

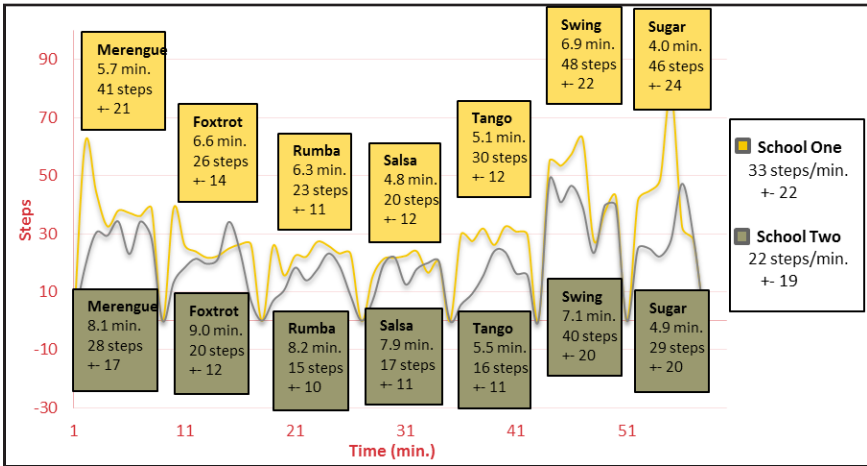


Figure 4. Step counts of Dancing Classrooms program (School 1 vs. School 2).

A vector is a quantity having direction as well as magnitude (i.e., length), as determining the position of one point in space relative to another. So the vector magnitude of a particular dance represents the distance traveled during the dance in feet. In addition to collecting heart rate data, the wGT3X+ accelerometers have multiple sensors that measure motion along an axis plane (i.e., horizontal, vertical, and perpendicular) and convert those movements into electrical signals over time (epoch). Multiple planes of these axis movements can be bundled together to show more comprehensive physical activity estimates (e.g., vector magnitude). The vector magnitude of movement counts (Table 4 and Figure 5) showed girls (2405.00) accumulated statistically significantly higher amounts than boys (2084.24). Additionally, vector magnitude was the only metric that showed girls at School 1 performed greater dance/exercise movements than boys at School 1 significantly more than did the girls at School 2 over the boys at School 2. Tables 3 and 4 also show School 1 (2485.16) accumulated significantly higher vector magnitude counts than School 2 overall (2079.77), especially within Foxtrot, Rumba, Tango, and Sugar dances (Figure 6). The largest vector magnitude of movement difference was found in Rumba where School 1 recorded 895 counts higher than School 2.

Questionnaire results showed middle school students thought Swing (68.57%) elicited the most fitness response of any dance. Additionally, Swing (62.86%) was enjoyed by students most. The dance viewed to be least enjoyable was Rumba (2.86%). The only significant difference found between gender across questionnaire reporting was with the question, “How much exercise do you feel you got in the Dancing Classrooms program?” where girls reported significantly higher means, $F(1, 33) = 4.202, p = .048$, than the boys.

Discussion

The Physical Activity Response of Dancing Classrooms on Middle School Students

Findings of this study suggest Dancing Classrooms is eliciting a generous amount of light to moderate physical activity with middle school students and is accounting for a substantial amount of total daily physical activity contribution. Based on middle school physical education activities measured by Brusseau and Burns (2015),

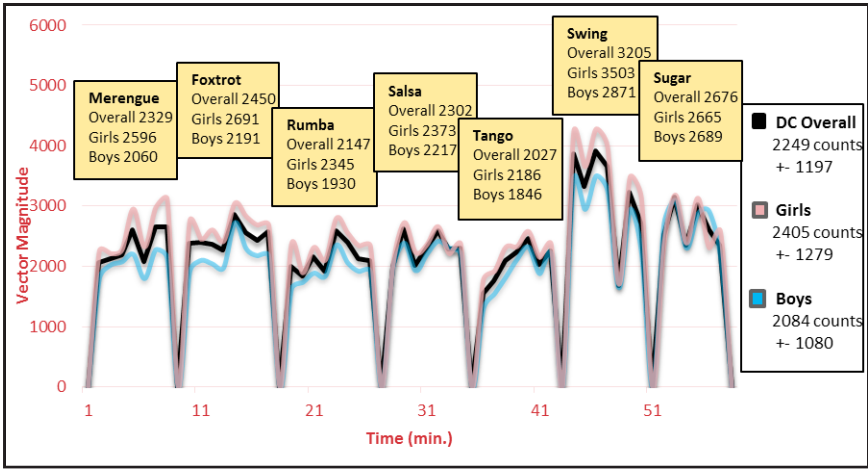


Figure 5. Vector magnitude counts of Dancing Classrooms middle school program. DC = Dancing Classrooms.

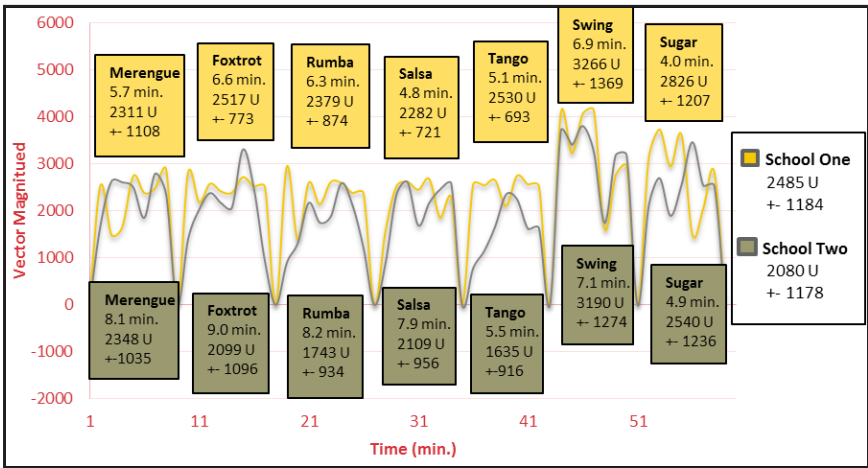


Figure 6. Vector magnitude counts of Dancing Classrooms (School 1 vs. School 2).

Dancing Classrooms total step count measures (1,863) compare similarly with Floor Hockey (1,863), Tchouckball (1,866), Hip Hop Dancing (1,766), Fitness Relays (1,705), and Cross Training (1,759). Compared to findings by Laurson, Brown, Cullen, and Dennis (2008), the recorded heart rates of Dancing Classrooms (119 bpm) measured most closely with high school physical education activities such as Pickleball (115 bpm) and Dance (124 bpm).

Boys are participating in more physical activity overall, although girls are exhibiting a greater physiological response during the Dancing Classrooms program. This lends further support to the gender findings of Nelson et al. (2011), who found girls (127.3 bpm) attained higher heart rates than the boys (121.1 bpm). Why girls are responding to the Dancing Classrooms program differently may be partly explained by the psychosocial and cultural factors associated with dance that influence girls more than boys (Puskar, et al. 2010). As Ginsburg-Block, Rohrbeck, and Fantuzzo (2006) reported, girls are likely to do better when presented activities that are more interactive and cooperative in nature. While many middle school physical education curricula are dominated by competitive activities, which are typically more appealing to boys (e.g., team sports), Dancing Classrooms may be viewed as a curriculum that can help motivate girls to participate more fully in middle school physical education.

The only measure from the study that did not show girls expending significantly more physical activity than boys was step counts (Boys, 26.12; Girls, 27.52). An explanation for this may have to do with the uniform and synchronized structure of the program. Because all participants dance in circular progressions with multiple partners at the same time, everyone is performing typically identical leg and step movements. For step count measures, the accelerometers are only taking vertical axis measurements of movement into consideration, which tend to be very similar between dance partners in the program.

Differences Between Activities in the Dancing Classrooms Program

Individual dances within the Dancing Classrooms program showed some variation. Heart rates, step counts, and vector magnitude of movement data showed much higher physical activity outputs within the Swing dance over all other dances in the program. The Swing is danced to vigorous music with an upbeat tempo and requires large and fast body movements (e.g., bouncing quickly on the balls of the feet and pushing and pulling a dance partner with speed and force). What makes the Swing dance even more appealing is that middle school students enjoyed this dance most. Additionally, there was a strong positive correlation ($r = .90$, $n = 36$, $p = .000$) between which dance activity in the program students thought would result

in the most fitness (i.e., Swing) and which activity they enjoyed most in the program (i.e., Swing). Furthermore, many students recorded on the questionnaire that Swing was the dance practiced most at home and taught to family members and friends. Clearly, the Swing dance is most likely to be rehearsed and remembered into the future by students.

One goal the researchers and program administrators had for this pilot was to find another dance (i.e., Salsa) that would elicit a high physical activity response with middle school students. This study shows that Salsa does not meet these expectations. Salsa led to the least amount of step counts of any dance in the program and did not elicit any more physical activity. Furthermore, Salsa (121 bpm) did not improve heart rate much more than the dance it replaced (i.e., Waltz at 118 bpm) reported by Nelson et al. (2011).

Why Did School 1 Show More Physical Activity Contributions Than School 2?

Although we did not see a large difference in the amount of MVPA time between schools, we did find a large difference in the amount of LVPA time. The average time students were physically active during the Dancing Classrooms program was 39 minutes (School 1) and 24 minutes (School 2). Ironically, School 1 operated on a 50-minute class period, whereas School 2 operated on a “block schedule” that embodied 80-minute class periods. We think there may be two contributing reasons that help explain this difference between schools. First, after careful observations, the environment (and the students familiar with the existing environment) at School 1 was generally better managed by existing physical education faculty before, during, and after the Dancing Classrooms program. Second, the style of instruction from the TA at School 1 was generally more cognizant and focused on the fitness aspect of dance than the style of instruction from the TA at School 2. In other words, the instructor at School 1 was more focused and efficient with instruction, transitions, and minimizing downtime to get the students moving and completing the lesson on time. Because the duration of class length differs between and across schools delivering the Dancing Classroom curriculum, we recommend that future lesson plans be tailor-made for participating schools based on time allocated to physical education classes. We also support the effort of instructors employing efficient

transitions and management techniques to enhance the time on task of each lesson, thus increasing the likelihood of students staying in optimal physical activity ranges.

Results did show School 2 outperforming School 1 in the latter part of the Foxtrot dance in step count and vector magnitude. However, this was the only time in the program that School 2 showed more physical activity contributions than School 1. Excluding step count measures, Merengue was the only dance to not show a large difference in physical activity output between schools. This may be because the Merengue is the initial dance in the curriculum and students are receiving a lesson in cognition and behavioral change as a primary outcome of the instruction. Merengue is where the instructor is focusing on a familiarity process with classmates and introducing proper physical contact between genders.

Development Differences Between Gender and Self-Esteem Considerations

Focus group data revealed student feelings toward the Dancing Classrooms experience. While both boys' and girls' groups agreed the dancing component of the program was valuable and enjoyable, the groups maintained very different moods on the "social" and "coed" experience overall. Boys were much more positive and optimistic about dancing with the opposite gender and in front of the class. The majority of the male participants stated they were "pleasantly surprised with their enjoyment of program." Boys also acknowledged dance would enhance sport performance by improving balance and footwork.

The girls expressed some positivity about a variety of elements associated with the program (e.g., using dance as a regular form of exercise, dancing as opposed to "gym sports," learning dances for upcoming quinceañeras) but were far more negative toward the social experience. Much of this was aimed at the visceral discomfort of physical contact shared with the boys (e.g., the close proximity of the boys' face to their bosom). The female participants were typically taller than male participants, and the female participants were steadfast that this issue alone distracted them greatly from focusing on learning the lessons and impeded their motivation to engage fully in program activities. Many also expressed feelings of exposure by

virtue of having to adhere to a dress code that discouraged jackets or sweaters to be worn during class.

Although an important goal of the Dancing Classrooms program is to promote the idea that participants are maturing ladies and gentlemen, the expectation is participants' attitudes should reflect a higher level of etiquette and poise. Therefore, the TAs reinforce a confident posture among participants (i.e., standing up straight, head held high, shoulders back) and a precise dress code. This may include either a school-issued PE uniform (cotton T-shirt and cotton, knee-length gym shorts) or a standard school dress code uniform (khaki shorts or pants and cotton half-button shirt). The Dancing Classrooms program dress code does not allow for added clothing (i.e., hoodie, jacket, sweatshirt, etc.). It was detailed in the girls' focus group that they would have felt more comfortable with a less rigid dress code, thus enhancing their enthusiasm to participate. This suggests that Dancing Classrooms officials may want to look at dress code modifications for middle school students and make accommodations appropriately.

Limitations of the Study

Inherent to this study are a few limitations. School location, teacher style, class size, class time, nonrandomness of the sample, and time spent previously practicing the activities may have caused variation in the physical activity responses measured. The data presented here may have also overestimated the overall physical activity response of the program due to data collection at the very end of the Dancing Classrooms program (Lessons 17 and 18 out of 20 total). By this time in the program, students are familiar with the dances and more confident in their ability to perform the dances correctly.

Recommendations

Recommendations from this study include providing TAs more training protocols that emphasize continuous movement, pace with instruction, and less verbal instruction during the later lessons of the program (e.g., after Lesson 10). We also think that retaining the more up-tempo music selection and higher intensity warm-ups helped ensure students were maximizing their physical activity output for longer durations of class time. In addition, we endorse the utilization of transitional partner changes within each dance after

Lesson 12 to increase the flow of exercise movements throughout the lessons and eliminate idle partner switches. Since middle school students are expected to learn the dances more quickly than elementary students, we believe TAs should move through the curriculum at a faster pace, with fewer pauses in between partner switches, allowing for more constant movement and tempo. This includes adding into TA trainings new progressions that advance partners simultaneously without breaks in the dances. The assumption here is that more time on task will naturally develop the movement skills for students anyway without the TA stopping the class regularly to correct minor imperfections with technique.

Removal of the Waltz in replacement of Salsa showed no effect on increasing physical activity output. The steps associated with the Salsa were perhaps too sophisticated for this population, which led to more remedial teaching and more idle class time (less movement). Additionally, we believe introducing the Salsa lowered students' self-efficacy toward the program, as there appeared to be less overlap with the other dances in the program and more gaps in the learning sequence. In this light, the researchers developed a greater appreciation of each new dance introduced, which is built upon previous dances. In other words, the transition to the Salsa, in place of the Waltz, did not provide learners with this kind of sequential scaffolding, which led to unfamiliar dance steps and thus more idle time. This increased the need for more verbal instruction versus time-on-task repetition and practice. We believe it was this additional yet necessary "idle time" that led to unexpectedly low physical activity output for this dance. Therefore, we recommend the Waltz be added back into the middle school curriculum and the Dancing Classrooms progression for future study.

We also recommend that the program relax its dress code requirements and allow girls at the middle school level to wear sweat-shirts, jackets, sweaters, and so forth to best align with the Dulaine Method teaching of "creating a safe place." The Dulaine Method suggests that a Dancing Classrooms classroom is a place where everyone is equal: the students, the TA, and the school staff. Otherwise known as therapeutic milieu, the environment is so different from

the children's normal daily environment that simply being in the room (and being part of the collective group experience) changes students' perspective about school. Allowing the girls to feel more comfortable in their clothing, in their own skin, is important in establishing this "safe place" for young adolescent ladies and allowing them to get the most out of their physical education experience.

Finally, we believe the Swing dance is the most valuable dance in the Dancing Classrooms curriculum and has important functions to the fitness, enjoyment, and overall motor learning of students in the program. By learning that the students' favorite dance was the same dance they accurately believed was the most physical activity inducing (Swing), we can therefore suggest that developing a physical education curriculum aimed at eliciting high levels of MVPA is not a barrier to student enjoyment. We would encourage Dancing Classrooms officials to find ways to expand upon this dance and find more time for curricular inclusion.

What Does This Article Add?

This article demonstrates the physical activity effect of an increasingly popular physical education dance program that has been consistently growing nationally and internationally. Although the program has traditionally been targeted at fifth-grade students, there is a growing demand for program expansion into secondary school settings. Because there is a steady decline in physical activity participation among adolescent girls, along with a typically "sports heavy" physical education curriculum in middle schools, the results of this study are timely and support an effort to help create and balance a more activity-varied physical education approach. Additionally, the results of this study confirm the Nelson et al. (2011) findings that showed similar heart rate recordings and dance curriculum patterns with elementary students participating in the Dancing Classrooms program. Last, this study has brought to light some of the social-emotional learning and interactive challenges characteristic of a coed dance curriculum and has offered solutions for improved youth development at the middle school level.

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Appendix

Dancing Classrooms teaching artists are expected to plan out their lessons. The lesson plan is a teacher's standard best practice for tracking the progress of students as well as their own teaching. Underlined text indicates modifications/addition.

Sample Lesson Plan

Subject: Merengue Separation Step, Foxtrot Basic Step and Promenade With Progression, Stomp.

Student Objectives: (by the end of this lesson my students will be able to...

- Review Merengue Step
- Review Dance Frame
- Basic Foxtrot Step
- Learn the Stomp

Prior Knowledge/Motivation/Engagement: Students enter in Pasodoble music. Actors Dancers have to warm up, let's all warm up with a what we know at the studio as "the actor's warm up" (1 minute)

Lesson: Foxtrot Basic Step, 15 minutes

Beginning:

- Today, Ladies and Gentlemen, we are going to learn the Foxtrot. Students are in facing inside the circle and we all take 4 steps forward and four steps back. 1, 2, 3, 4 (3 minutes)
- Ladies and Gentlemen, what word do we hear in foxtrot? Fox! Excellent! And fox are smooth, this is a smooth dance, and we are getting on our planes flying to the United States because that is where Foxtrot comes from.
- Let me see Gentlemen in the inside circle, ladies in the outside circle. Pancake HOLD!
- Pancake hold please! And now we will try it with our partners. 1, 2, 3, 4 Forward and Back
- Back, someone spell back for me, someone spell away for me...wonderful. Ladies and Gentlemen, we are going to go back to the circle (2 minutes)

- Now we will take 1, 2 steps away with our partners and FREEZE! After that second step we will go side together step. Like the Merengue step. Away, away Merengue step (side together), back, back Merengue step
- (Promenade step is introduced – Walking exercise with the “three-legged race.” Have ladies and gentlemen face the racetrack – quick explanation of racetrack and in escort position we are walking around the circle/racetrack, stepping with the outside foot first, then the inside. We progress in speed. (without music)
- Reflecting on A step and B step with added Merengue step. Ladies and Gentlemen, listen to my tempo as I clap, then I will ask you to join. (Clapping, “slow, slow, quick quick” tempo shared. Clapping, stamping feet, and chanting.) Add cueing A, away a boom, boom. B, back a boom boom.
- Let’s put it together, Thank you Partner, Hello New Partner! Try again and with music! (add up-tempo foxtrot music)
- Now, Ladies and Gentlemen, dance frame please!! WOW, HOW WONDERFUL!!
- Quick Simon Says review of chopsticks, pancake burnt pancake, dance frame, chopsticks! (2 minutes)

Middle: (10 minutes)

- (Progression step of promenade step introduced. Ladies and Gentlemen, remind me: the “C step” we are walking around the racetrack C, C a boom boom).
- Introducing the C+ step progression.
- Explain that the C progression step is when the lady is turning while the gentlemen stays in basic, then adding another C progression “C++” “it’s like swimming through the water, having both the Lady and Gentlemen turning at the same time.”
- Let’s put it together, Thank you Partner, Hello New Partner! Try again and with music! (add up-tempo foxtrot music)
- Let’s review our Merengue step, change partners
- Say, together turn!!
- Explain that together turn, “it’s like the bicycle belts, where one goes first and the other follows.”
- Go over dance frame

End:

- “May I have everyone in escort position please?! And I want you all in order from tall, taller, and tallest!
- We have one more thing to learn, Ladies and Gentlemen! The Stomp! Separate yourselves.”
- Teach the Stomp

Review: Merengue

Closing Activity:

- Recap the day’s lesson and discussion
- Preview following lesson: Merengue Separation Step and Foxtrot Promenade With Progression Step