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Article

# Utilizing Social Media in a Sport Education Season to Promote Out-of-School Physical Activity

**Zachary Wahl-Alexander[1,*], Peter A. Hastie[2], Danielle Wadsworth[2]**

[1] *Department of Kinesiology and Physical Education, Northern Illinois University, DeKalb, IL 60115, USA*

[2] *Department of Kinesiology and Physical Education, Auburn University, Auburn, AL 36830, USA*

**Abstract:** The purpose of this study was to examine if the inclusion of a group-based contingency involving social media would have a positive impact on a cohort of middle school students' out-of-school physical activity. Ninety-two eighth-grade students (50 females, 42 males; average age = 12.98) from three physical education classes in a middle school in the Midwest region of the United States participated in a 22-lesson Sport Education season of disc golf (an activity selected by students). During the competitive parts of the season, students were able to earn bonus points for their teams by practicing outside of school time with family/friends, or with members of their class. For these points to be registered on the class league table, at some point while playing, students would create a Snapchat story which they then sent to their classmates and the teacher. Out-of-school activity was measured by each student wearing a Yamax DigiWalker SW 701 pedometer. Results showed significant increases in out-of-school step counts during those phases of the season in which the Snapchat contingency resulted in team points accrual. These results provide support for the utility of providing group-oriented contingencies within Sport Education, as they appear to be an effective and authentic context for promoting autonomous out-of-school time physical activity.

**Keywords:** dependent group-oriented contingency; snapchat; disc golf; pedometers

## 1. Introduction

The past decades have seen a proliferation in physical inactivity and sedentariness among adolescents across the globe [1]. Consistent participation in daily physical activity has proven to provide numerous short- and long-term physical [2], social [3], and psychological benefits [4]. In an attempt to secure these benefits, the World Health Organization recommends youth engage in a minimum of 60 minutes of moderate to vigorous physical activity(MVPA) [2] or 12,000 daily steps [5]. Despite well-established benefits, the study of Aubert et al. [6] involving data from 57 countries showed that overall physical activity was the indicator with the lowest average grade (D). This corresponded to an estimation of only 27% to 33% of young people meeting the recommended amount of daily MVPA.

The proliferation of screen time usage per day among youth is hypothesized as a major catalyst for the influx of sedentary behaviors [7]. Adolescents aged 13–18 in the United States have been reported as spending on average nearly seven and a half hours each day with digital entertainment or social media [8]. More recently, social media use among the adolescent population has gained popularity. As of 2017, the average American

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* Corresponding: zwahlalexander@niu.edu

adolescent spent over 185 minutes per day, on social networking sites, increasing 25% since 2012 [9].

Children in the United States spend more awake time in school than any other context, making the academic setting a plausible preventative site with respect to addressing inactivity [10]. This aligns with the IOM [11] advocating 50% of daily activity time to occur during the school day, and others suggesting 5,500 steps during the school day as a sufficient target to adhere to US Department of Health and Human Services guidelines [12]. Unfortunately, few physical education classes contribute to this endorsement [13], with high school students spending nearly 36% of lesson time in MVPA [14].

Recently, scholars have focused attention on identifying solutions for this problem, aiming to determine if specific pedagogical approaches can positively impact in-class physical activity levels. One such model that appears effective is Sport Education [15 – 17]. Sport Education is one of the most extensively employed and researched pedagogical approaches, aiming to deliver students with an authentic sporting experience that mimics professional sport [18]. This approach, unlike other modes of instruction, engages students in extended units called seasons (lasting 16 – 24 lessons), small-sided gameplay, and an emphasis on fair play [19]. The primary objectives of Sport Education are to create competent, literate, and enthusiastic sportspeople, by focusing instruction on the key tenets, a) team affiliation, b) formal competition, c) seasons, d) record keeping, e) statistics, f) festivity and g) culminating event [18]. Due in large part to these key features, scholars have illustrated the model's ability to enhance competency [20], literacy [21], and enthusiasm among participants [22].

As adolescents have become more sedentary, attention has concentrated on the ability of Sport Education to promote and accentuate physical activity. Although there was early apprehension [23], this model has demonstrated an ability to exceed daily physical education recommendations with a variety of different contents [15, 24 – 26]. Further, initial indications reveal that in-class activity within Sport Education seasons can be additionally augmented by integrating various behavior modification strategies [27]. While these results optimistically indicate employing Sport Education can provide elevated opportunities for students to be active during physical education, it is unlikely enough to ensure step count recommendations are me [12].

Over the past decade, emergent literature has focused on promoting outside engagement with the content delivered during Sport Education. During the school day (i.e., lunch and recess), the studies of Wallhead et al. [28], and particularly that of Knowles et al. [29] provide preliminary support for the notion that the autonomy supportive nature of Sport Education has the potential to promote trans-contextual participation if students' autonomy support is also facilitated within the extra-curricular sport context. In support of this, Hastie et al. [30] used prompts and prompting plus group-oriented contingencies to successfully promote outside engagement in a jumping rope Sport Education season. Compared to the baseline, students in this study nearly doubled the total step count when prompting and group contingency were utilized. This significant improvement in out-of-school activity was largely attributable to being able to earn bonus points toward the league standings. Although this was the first investigation aimed at exploring the impact of using group-oriented contingencies in this capacity, these authors called for, "systematic replication across different Sport Education seasons and grade levels to further strengthen the generality of the study" [30].

It is estimated over 90% of adolescents use some sort of social media on a regular basis [31], with many citing this as the preferred method for connecting with friends and sharing pictures [32]. Given adolescents' proclivity toward using social media use, and the need to increase physical activity outside of school, it appears merging these two concepts is justifiable. Since Sport Education has previously demonstrated an ability to promote outside engagement by having students verify participation by returning proof via parent/guardian documentation, doing so via social media may deliver additional advantages. Therefore, the purpose of this study was to examine if social media use to verify outside engagement within a Sport Education season can impact out-of-school physical activity.

Behavior modification strategies are a proven, effective way to alter behavior in both children and adults, with over 90 different techniques focused on altering physical activity patterns and healthy eating behaviors [33]. Fundamentally, group-oriented contingencies offer a common contingency in exchange for a specific behavior of, (a) each member of a group (independent group-oriented contingency), (b) part of the group

(dependent group-oriented contingency) or (c) everyone in the group (interdependent group-oriented contingency [34]). For this study, an independent group-oriented contingency was employed, where a reinforcer was dependent on each student achieving a given criterion (e. g., playing disc golf outside of school). While there are limited studies exploring the use of various contingencies in physical education, this practice has previously proven to effectively improve on-task behavior [35], promote fair play [36], and specific to this study both in and out of class physical activity [27,30] when embedded within a Sport Education season.

## 2. Method

### *2.1. Participants and Settings*

The participants in this study were 92 eighth-grade students (50 females, 42 males: Mage = 12.98) from three physical education classes in a middle school in the Midwest region of the United States. Fifty-two percent of the participants were African American, 31% Latino, 12% Caucasian, and 5% Asian. All three of the physical education classes met four times per week, with each lesson lasting 55 minutes.

The physical education teacher was a Caucasian male in his early thirties with eleven years experience teaching both health and physical education. He had taught over 45 seasons (varying content) of Sport Education prior to this study, and all students had participated in a minimum of two previous seasons. Informed consent from all legal guardians and participant assent were obtained before the start of data collection, and approval for the project was obtained by the first author's university review board for human subjects' research.

### *2.2. Sport Education Season*

Prior to the season, the physical education teacher created a Google poll to gather student input concerning season content and potential social media outlets. Two items made up the poll. The first question asked each student to identify activities they would enjoy playing as part of a Sport Education season, but also one that they had sufficient environmental (space, equipment, etc.) and social resources (friends, family) that would allow them to practice or play outside of school. Following this, each student was provided with a description of how social media would be integrated into the unit, and specifically how it would be used as a group-oriented contingency towards the league standing board. Each student was then asked if they (a) had a social media account, (b) would be willing to use their social media account for this purpose, and (c) which social media platform they preferred. The overwhelming choice of activity was disc golf (74 of the 92 participants), and Snapchat (81 of 92 participants) was the preferred platform of their choice.

The Sport Education season consisted of 22 lessons of disc golf, with each of the three classes following the exact same season plan. The season was divided into three phases (Table 1), including a seven-lesson pre-season, an 11-lesson regular season, and a four-lesson post season. Throughout the season, lessons took place inside the gymnasium, outside on a football field, and in a wooded area within walking distance from the school.

The pre-season consisted of seven lessons focused on season logistics, introducing key concepts, skills, strategies, rules, and etiquette of disc golf. In addition, each class was tasked with locating courses in their neighborhood that they could play after school hours. The teacher directed initial daily skill practices; however, team coaches were tasked with facilitating practices guided by task cards beginning in lesson six.

At the beginning of each regular season lesson, team coaches received a task card created by the teacher aimed at facilitating independent team practice which took up the first half of each lesson. Following team practice, students participated in either skill competitions (e. g., putting and long drive) or golf format competitions (e.g., stroke play, best ball, match play). At various points within this phase (lessons 12 and 16), groups of teams re-designed the 9-hole course to ensure it remained novel.

The post-season took place over the final four days of the unit. During this time a two-day stroke play competition occurred which funneled the top two players from each team into a sudden death match play championship round. The match play championship was extremely festive including "fans" from other class periods in attendance, pre-match interviews, and a caddy accompanying each participant. The last lesson consisted of an extensive award ceremony that recognized the "Justin Spieth MVP," "David Leadbetter Coach

of the Year," "Bubba Watson Best Shot," and "Rickie Fowler Most Enthusiastic," among others. Select students were tasked with organizing and hosting the award ceremony.

Consistent with the tenets of Sport Education, a league standings board was publicly displayed and updated daily. Points toward league standings were gained from three sources: skill competitions and formal competitions (20 points per contest); fair play evaluations (10 points per context); and outside engagement.

At the beginning of the season, each student was provided with an informational sheet that explained the process for receiving points specific to outside engagement. Beginning lesson eight, students were able to obtain points for practicing at home (half a point), on a course with family/friends (one point), or on a course with members of their class (two points). During their outside engagement, students were tasked with creating a Snapchat story which they sent to their classmates and the instructor. Six students in the classes did not have a Snapchat account, and instead accumulated points toward the league standings board by demonstrating their participation through google classroom.

**Table 1.** Disc Golf Season Plan.

| Phase of Season | Lesson Number | Content |
|---|---|---|
| Pre-Season | 1 | Selection of team name, color, mascot, handshake, discussion of social media involvement |
| | 2 | Selection of team roles, rules and etiquette of disc golf, equipment tutorial, disc golf basics and grips |
| | 3 | Teacher directed skill practice focused on driving, student led activities, walking the course, rules and etiquette of disc golf |
| | 4 | Review rules and etiquette of disc golf, locate disc golf courses within walking distance of school and students' homes |
| | 5 | Teacher directed skill practice on approach shots, student led driving activities, poster creation |
| Regular Season | 6 | Student led approach practices, rules quiz and review etiquette |
| | 7 | Teacher directed putting skill practice, training of officials rules quiz |
| | 8 | Student directed putting practice, approach shot competition |
| | 9 | Team practice, stroke play competition |
| | 10 | Team practice, stroke play competition |
| | 11 | Team practice, best ball competition |
| | 12 | Teams 1-4 design new 9-hole course, putting skill competition |
| | 13 | Team practice, best ball competition |
| | 14 | Team practice, scramble competition |
| | 15 | Team practice, scramble competition |
| | 16 | Teams 5-9 design new 9-hole course, long drive competition |
| | 17 | Team practice, match play competition |
| | 18 | Team practice, match play competition |
| Post-Season | 19 | Master's Course- Stroke play Round 1 |
| | 20 | Master's Course- Stroke play Round 2 |
| | 21 | Top two player from each team Match play championship |
| | 22 | Award Ceremony |

### *2.3. Instruction and Treatment Validity*

There have been strong recommendations to authenticate instructional validity when using models-based instruction [37]. According to Hastie and Casey, providing a rich description of the curricular elements of the unit (see Table 1—Disc Golf Season Plan), a detailed validation of the model implementation (Table 2), and a detailed description of the program context that includes previous experience of instructor and students (see

participants and setting) are essential to ensure model fidelity.

**Table 2.** Demonstration of Sport Education—specific pedagogical behaviors during the season.

| Benchmark Element | | Disc Golf Season | |
|---|---|---|---|
| | | Planned | Actual |
| Teacher plans the unit around principles of a "season" | Management / organizational phase | ✓ | ✓ |
| | Team selection phase | ✓ | ✓ |
| | Pre-season scrimmage phase | × | × |
| | Regular season phase | ✓ | ✓ |
| | End of season event | ✓ | ✓ |
| The teacher promotes the "affiliation" concept | Students involved in team selection | × | × |
| | Consistent teams for duration of season | ✓ | ✓ |
| | Incorporation of student roles | ✓ | ✓ |
| Teacher promotes students taking "responsibility" | Teaches holds students accountable | ✓ | ✓ |
| | Teacher provides referee training | ✓ | ✓ |
| | Teacher provides task sheet | ✓ | ✓ |
| | Teacher adopts facilitator approach | ✓ | ✓ |
| | Teacher encourages conflict resolution | ✓ | ✓ |
| Teacher uses "formal competition" within season | Formal schedule of competitions is established | ✓ | ✓ |
| | Fair play and sportsmanship utilized | ✓ | ✓ |
| Teacher utilized a form of "record keeping" within unit | Teacher provides rubric for scorekeeper | ✓ | ✓ |
| | Incorporates peer assessment as part of record keeping process | ✓ | ✓ |
| Teacher uses "culminating event" near the end of the season | Culminating event is festive in nature | ✓ | ✓ |
| Teacher creates "festivity" within unit | Teams are easily identifiable (team names, team colors, posters) | ✓ | ✓ |
| | Teacher emphasizes the celebration of fair play | ✓ | ✓ |

To authenticate model implementation of the disc golf season, two researchers with extensive experience randomly selected six lessons from each of the three classes to observe. During these observations, both researchers coded using the Sport Education model evaluation criteria [38]. Inter-observer reliability was conducted through document analysis of all plans and observations from two lessons during each phase (pre-season, regular season and post season). In accordance with van der Mars recommendations [39], inter-observer reliability equaled 100%. Results demonstrate the physical educator exhibited almost all Sport Education specific teaching behaviors following Sinelnikov's criteria [38].

### *2.4. Data Collection*

During the last 10 minutes of the final school period each day, all students were provided with a Yamax Digi Walker SW 701 pedometer (Tokyo, Japan), and holding case. Each participant was instructed to wear the pedometer for the remainder of the day and place it into the holding case once they got into bed at night. Each student was instructed to bring the holding case to school each morning and place it in the physical education teacher's office upon arrival. This was a convenient dropping-off point as all students arrived and checked into school in the gymnasium where the physical education teacher's office was located. This same protocol was followed four days before (baseline), and throughout the entirety of the Sport Education season until the day of

the award ceremony. In total, there were 25 data collection days. Eighty-four of the 92 (91%) students returned their pedometer accurately and successfully each day.

### *2.5. Data Analysis*

Summary statistics (mean and standard deviation) were determined for each class's out-of-school activity for each lesson across each of the three phases of the season (pre-season, regular season, and post-season). Following a screening for outliers, univariate analysis of variance (ANOVA) was conducted to determine any significant differences between classes and season phase, with the Newman-Keuls method of post-hoc testing incorporated.

## 3. Results

Figure 1 displays the students' mean out-of-school step count across the baseline and the Sport Education season. In the original data, lesson 12 presented as a potential significant outlier, with students' ability to participate outside limited by a heavy rainstorm. With a mean of 2738 steps versus a median score for out-of-school during the regular season of 8206, this presented a notable case of potential leverage. Following the recommendations of Leys et al. [40], the median absolute deviation (MAD) of this lesson was calculated, and given it lay outside the median plus or minus three times the MAD, it was not included in the results of the study.

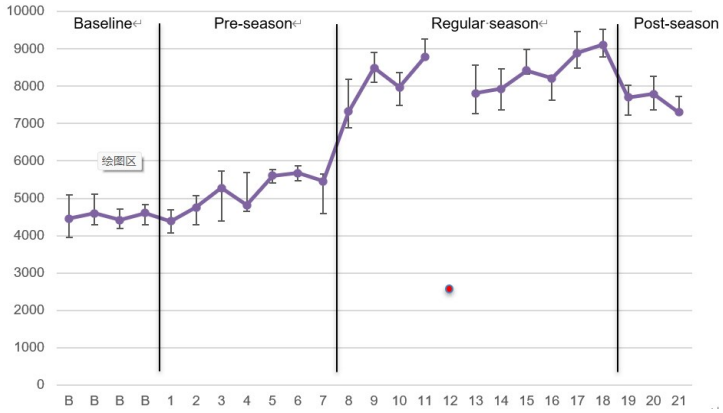


**Figure 1.** Out-of-school step count by lesson.

Table 3presents the means and standard deviation for each phase of the season. Data are presented as the mean for the three classes, as preliminary examination showed no differences between class means $F(1, 2) = .771$, $p = .383$, $\eta^2 = .011$ and no significant class by phase interactions $F(1,3) = 2.133$, $p = .063$, $\eta^2 = .176$. As suggested by visual inspection of Figure 1, outside-of-school physical activity was confirmed as stable during the baseline with no significant differences between lessons $F(1,3) = .153$, $p = .925$, $\eta^2 = .054$.

**Table 3.** Mean Step Counts for each Season Phase.

| Phase of Season | Mean | St. Dev |
|---|---|---|
| Baseline | 4517.33 | 390.29 |
| Pre-Season | 5118.71 | 592.06 |
| Regular Season | 8279.50 | 695.16 |
| Post-Season | 7498.56 | 398.56 |

During the pre-season, there was a small increase in out-of-class step counts accompanied by increased variability ($t = 3.14$, $p = .002$). However, as the regular season commenced (the stage of formal competition), there was a marked increase in physical activity outside-of-school, evidenced by the sizable separation and steady increase in data points ($t = 16.96$, $p < .001$). This provides a strong rationale for the increase in out-of-school physical activity being attributable to the students' ability to gain points toward the league standings

board by using social media as a platform to track outside engagement. Although students' activity levels decreased during the post-season ($t = 3.20$, $p < .001$), the means were over 40% greater than baseline ($t = 17.17$, $p < .001$) .

Social Media Usage

Throughout each of the three disc golf seasons, students were able to obtain points for their team by practicing at home, playing on a course with family/friends, or playing on a course with a classmate. In order to authenticate their outside engagement, students were required to document their engagement through the Snapchat stories. Table 4 demonstrates the quantity of stories shared within each of the three criteria throughout the different phases of the season.

**Table 4.** Descriptive account of Snapchat Stories Shared throughout Season.

| Phase of Season | Practice at Home | Play on Course with Family/Friends | Play on Course with Classmates |
|---|---|---|---|
| Pre-Season | 54 | 12 | 7 |
| Regular Season | 63 | 119 | 36 |
| Post-Season | 14 | 28 | 15 |

## 4. Discussion

The results of this study suggest that using a social media platform as the mechanism through which a dependent group-oriented contingency was put in place was effective in promoting high levels of physical activity out-of-school. Indeed, these counts neared the 9000 steps which are considered equivalent to recommended MVPA daily target of 60 minutes [41]. The use of these contingencies, in which all members in the group are reinforced if a specific individual or a small group of individuals meets a criterion, has been shown to be effective in previous studies in physical education (e.g., Vidoni and Ward, 2006 [36]), and more relevant to the current case, effective in promoting out-of-school activity during a season of Sport Education [30]. Further, it is generally agreed upon that the idea of the "persisting team" is a critical element in the attraction for students of all age levels towards Sport Education. By consequence, group-oriented contingencies may seem more authentic to students (and hence more likely to be attractive) when they are linked to meaningful group membership.

It could also be suggested that the high levels of student autonomy that were built into this unit were significant contributors to their out-of-school physical activity engagement. Not only were the students given the autonomy to select the sport which they believed would contribute to their motivation within and after school, they also had a voice in how the contingency would operate. As Assor, Kaplan and Roth [42] suggest, what students perceive as highly motivating is not merely the act of choosing, but mostly the extent to which the available choices relate to the students' personal values and goals.

What is unknown is whether the student's participation in out-of-school activity was due mostly to the extrinsic reinforcing nature of the contingency in terms of earning points for the team, or whether their motivation was more introjected and socially reinforced (through avoiding shame by not contributing to the team), or perhaps more intrinsically associated with stimulation or relatedness. Again, the idea of persisting teams and their potential for promoting feelings of commitment are central here. Furthermore, the drive for out-school physical activity may have been impacted by utilizing a social media platform to provide contingency evidence. The act of using social media itself as a novel form of "homework," extrinsic nature of the video itself, or feelings of enhanced relatedness may have prompted out-of-school physical activity. For adults, the impact of social media on feelings of relatedness is centered on perception of the social media platform [43]. However, the literature is deficient in understanding how social media use translates to initiation and/or

sustaining health behavior. To truly appreciate the motivation of the students' out-of-school activity would require that each of them participate in a formal individual interview where they were asked to explain the relative contributions of their commitment to the team, their commitment to the contingencies, or even their own intrinsic motivation to be active post-school.

What is needed, however, are future studies that examine how extrinsic contingencies can potentially be faded across time to be replaced by more social contingencies or intrinsic drive. As Gillison et al. [44] note, introjected regulation represents the first step in the process of internalizing behaviors, and thus may play a pivotal role in how adolescents first come to adopt activities introduced to them by others. Social media may impact this process by providing social contingencies that increase feelings of relatedness or detract from an intrinsic drive by demonstrating the need to provide an idealization.

## 5. Conclusions

This paper adds to our understanding of how out-of-school physical activity can be promoted through the use of social media acting as a group-oriented contingency. It also adds to the veracity of the Sport Education model as an authentic vehicle through which to incorporate these contingencies. This is valuable in that is the first study to involve students' voice in determining both the content of a season of Sport Education, but also the mechanism through which they would be held accountable for extracurricular activity participation. The study also provides evidence supporting the need for continued study into the motivational mechanisms through which students engage in physical activity out-of-school hours that are based on autonomous motivation.

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## Author Contributions

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## Conflicts of Interest

The authors declare no conflict of interest.

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