Block Scheduling in Secondary Physical Education: East Compared to West Coast United States of America

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Abstract

This study presents findings that investigated the effects of block scheduling (90-120 minute periods) on sixth-to-twelfth grade students attending secondary physical education classes located in the northeast and west-coast United States. Quantitative methods of data collection were utilized. Results found students spent more time "waiting" and in "management" and less time in "activity." Furthermore, although the proportion of appropriate to inappropriate responses to tasks was in the right range, the number of opportunities to respond was low. Therefore, even though it seems there are advantages in adopting block scheduling, including the provision of a larger block of time to carry out state and national learning standards, this study also raises several questions concerning it's effectiveness. Consequently, suggestions that will help improve teaching strategies of teachers, including how to keep the students involved in active learning activities throughout the 90-minute class period, are discussed.

Numerous middle and high school physical education programs in the United States are based on the traditional seven-to-nine, 45-50 minutes period school days. Researchers have found that students spent at least 25 percent of the traditional 45-minute physical education period dressing and waiting (Claxton and Bryant, 1996). Moreover, the physical educator found it difficult to teach sport concepts, improve fitness and sport skills, cultivate a sense of fair play, and develop a lifetime commitment to physical activity (Siedentop, et.al., 1994).

Therefore, secondary administrators are looking at changing the traditional arrangement of the school day in order to improve teaching and learning at the middle and high school level. Block scheduling offers a new and more efficient way to organize the school day (Canady and Rettig, 1995a, 1995b; Edwards, 1995; Rettig and Canady, 1996). It allows students to spend greater periods of time (e.g. 90-120 minutes) concentrating on fewer subjects during any one day. All blocks can be the same length, or some blocks may be longer than others (Table 1).

The block schedule, in its simplest form, requires each student to take the same four courses every day for an entire semester and then switch to four new courses the next semester. In another variation of this schedule, courses are taught on alternative days. That is, a student might enroll in English, Physical Education, History and Foreign Language courses on Monday's, Wednesday's, and Friday's, and Math, Music, Science and Health courses on Tuesday's and Thursday's.

Research concerning block scheduling indicates that the system has many advantages over traditional scheduling. For example, a concentrated class time allows teachers to focus on enriched content (Bukowski and Stinson, 2000; Staunton, 1997). Additionally, Bukowski and Stinson (2000) reported teachers felt rushed when planning during the traditional 50-minute planning period, especially when they were trying to accomplish any major project or task. Block scheduling allows for larger blocks of uninterrupted planning time. Researchers have also found students on a block schedule appear to have more opportunities to participate in in-class discussions (Thomas and O'Connell, 1997).

Table 1

Time Schedule

High School A		High School E	
Period 1:	7:45-9:15	A Block	7:50-8:20
Period 2:	9:20-10:45	Block 1	8:30-9:35
Period 3:	10:50-12:45	Break	9:35-9:50
Period 4:	12:50-2:15	Block 2	9:50-10:55
		Lunch	10:55-11:35
		Block 3	11:35-12:40
		Z Block	12:50-1:20
High School B		Middle School A	
Period 1:	7:45-9:10	Period 1:	7:55-9:25
Period 2:	9:20-10:45	Period 2:	9:30-11:00
Period 3:	10:50-12:15	Period 3:	11:05-1:05
LUNCH:	12:15-12:45	For teachers:	11:05-11:35 Lunch
Period 4:	12:45-2:15	Period 4:	11:35-12:05 Team Meeting
			12:05-1:05 Plan
			1:10-2:40
High School C		Middle School B	
Period 1:	7:30-9:00	Period 1:	7:54-9:25
Period 2:	9:00-10:35	Period 2:	9:30-11:00
Period 3:	10:40-12:10	Period 3:	11:05-12:35
LUNCH:	12:10-12:45	Period 4:	12:40-2:10
Period 4:	12:45-2:20		
High School D			
Period 1:	7:4 5-9:05		
Period 2:	9:09-10:29		
Lunch 1:	*10:33-11:53*		
Period 3:	10:33-12:33		
Lunch 2:	*11:17- 12:33*		
Period 4:	12:37-1:57		

Unfortunately, research on the effects of block scheduling on physical education has been neglected. In one of the few articles that considers the implications for block scheduling in physical education, professionals are urged to "…use extensive networking because the professional literature and undergraduate/ graduate teacher preparation programs have yet to adequately provide the information needed by practitioners," (NYSAHPERED Link, 1996). Bryant and Claxton began researching the effects of block scheduling in physical education in 1996.

Bukowski and Stinson continued the research in 2000. However, their research was limited to the South-East and Mid-West school districts in the United States.

Information centering on adjustments to the curriculum and instruction to meet the possibilities offered by block scheduling is needed in other geographic areas to expand the profession's understanding of block scheduling (Bukowski and Stinson, 2000). This is important so that teachers may have a better chance to meet new school program standards and expectations set by the National Association for Sport and Physical Education (NASPE) in the United States. How all of this may be accomplished in the context of a real school setting has not yet been researched.

Since there has been limited research on block scheduling in physical education, the protocol for comparing effective block scheduling programs in this study has been compared with Seidentop's Academic Learning Time (A.L.T.) (1982). A.L.T. is defined as the amount of time a student spends at an appropriate level of difficulty with the content to be learned being the most critical instructional variable related to student learning (Rink, 2006). The research was conducted at Ohio State University, and is known as the "O.S.U." Study. The research found outstanding schools on a traditional schedule had more instructional time, and minimal time waiting (Table 3). One of the short comings is comparing a longer block of time with a research tool designed for 60 minute period, it at least gives a starting point as to how students are spending their time in physical education.

Therefore, the purpose of this study was to investigate the effects of block scheduling, examining how students spend total time in: (1) instructional episodes, (2) receiving information, & (3) engaging in motor activity.

Methods

Four high schools and one middle school located in the Northeast, and one high school and one middle school on the West Coast United States, were selected to participate in the study (Table 2). Data were collected and analyzed by two investigators who observed a total of 297 classes (3 lessons within each unit, for 3 units, for each physical educator in the school, in each of the 7 schools) over a 2-year period. Quantitative methods of data collection were utilized using Siedentop's, et al., (1982) analysis of overall use of time in class (Table 5).

Coding included the use Siedentop's, et al., (1982) analysis of overall use of time in class by both researchers simultaneously during live performance of the students. In addition, the classes were video taped. The overall use of student time was again analyzed by both researchers. The two researchers compared their coding results of both the live and videotaped recordings to gage reliability. The live performance analysis included a .91 reliability between the two researchers. The video recording analysis included a .95 reliability quotient.

The analysis of "overall use of time in class" is defined as what the class as a whole was doing (Siedentop, et al., 1982). The basic time divisions used in this study included management, transition, waiting, warm-up, and instructional episode.

1. *Management*: Non-substantive time such as roll taking, and announcements.
2. *Transition*: Time between episodes of management and instruction or between instructional episodes. Time coded from signal to begin transition until majority of students are engaged in the next episode.
3. *Waiting*: A subset of time within management and transition. Wait time is coded from point at which majority of Ss have completed the managerial or transitional task and the end of the managerial or transitional episode.
4. *Warm-up*: A start of class warm up period in which activities engaged in and intensity level is such that no fitness improvement is likely to occur.

Table 2

Demographics

School	Number of Faculty in p.e. Department	Total Years Teaching Experience In p.e. Dept.	Years Teaching Experience In p.e. Dept. (average)	Number of Students in the School	Number of Years On Block Scheduling
H.S.a.	5	102	22	1,400	5
H.S.b.	6	90	15	1,253	4
H.S.c.	5	60	12	1,100	6
H.S.d.	5	110	25	968	1
H.S.e. (w)	9	95	15	4,000	5
M.S.a.	6	78	13	970	2
M.S.b. (w)	4	37	9	800	12

w = West Coast Schools

Table 3

Mean Percentage of Total Time in Instructional Episodes

Site	*Management (Including transitions)*	*Waiting*	*Receiving Information (Including Instruction & Cognitive)*	*Engaged in Motor Activity (Including warm ups)*
H.S.a	38%	12%	5%	45%
H.S.b	21%	9%	23%	27%
H.S.c	11%	15%	10%	42%
H.S.d	17%	21%	8%	37%
H.S.e (w)	26%	13%	11%	22%
M.S.a	14%	4%	12%	60%
M.S.b (w)	14%	4%	12%	56%
Average	***20.1%***	***12.2%***	***11.6%***	***42.2%***
OSU Average	17%	.16%	14.38%	67.32%

5. *Instructional episode*: begins when a teacher begins to describe an instructional task and ends when the next instructional episode or a transition begins. There were several kinds of data that were collected within the instructional episode including instructional task data, student responses (success and unsuccessful practice rates), and field notes.
   a. *Instructional tasks*. An instructional task includes any set of instructions to students that focus on subject matter content and tell students what they are to do. The coding sheet had a space to indicate the time the task began.
   b. *Student responses*. After tasks are conveyed to students, the coders randomly selected one student to observe. The coders noted the gender of the student as well as whether the student was, in the coder's opinion, a high, medium or low skilled student. Every response the student made was observed, evaluated and recorded. Each response was judged at two levels.
      i. The first level was used to decide whether the student's response was congruent with the task description (i.e. On stated task: Student tries to practice what the teacher described as the task), modified (i.e. Modified up: Student changes task to make it more challenging or difficult. Modified down: Student changes task to make it less difficult or challenging), or off-task (Student engages in a task unrelated to the task description).
      ii. The second level was used to decide if the response was "appropriate" or "inappropriate." This second judgment involves looking at the topography of the response (decent working form) and the outcome of the response (successful in a probabilistic sense). For example, "Appropriate response" is a response that has an acceptable working form for the level of the student and, if done repeatedly and gradually improved, would yield a high probability of successful engagement. This is the same judgment as made for Academic Learning Time (ALT) which is a combination of looking at the technical form of the response and its success within the context. An "Inappropriate response" is a response where the technical form is such that immediate or eventual success is unlikely.
   c. *Field notes*. Notes were taken on any issue the coder felt necessary to the analysis of data. The general type of accountability utilized (supervision, feedback, challenge, punitive, grade-exchange, etc.) was indicated in this section on the coding sheet as well.

Results

When compared with outstanding physical education classes (Siedentop, 1982), students in this study spent more time in management and waiting, and less time receiving information and in activity (Table 3). Students spent time waiting after the completion of a station, during equipment distribution/clean up by either students and/or teacher, while in transitions (i.e. inside to outside facilities, station rotation), and for teacher directions.

Most of the instructional time was spent in practice, followed by explaining or demonstrating

the skill. The least amount of time was spent changing conditions (making a skill easier or more difficult), refining the skill, informing how to perform a particular task, and practicing skills from a previous lesson (Table 4).

Discussion

Many school systems are contemplating a change from the traditional seven-to-nine, 45-minute periods a day, five days a week with every day the same schedule, to a less hectic block schedule of four, 90-minute periods a day. General educational researchers have found that students on the block schedule have equal or better mastery and retention of material (Carroll, 1994).

Unfortunately, research on the effects of block scheduling on physical education has been neglected. Therefore, it was the purpose of this of this study to focus on physical education programs adjusting to block scheduling.

This study found students spent more time "waiting" and in "management" and less time in "activity." Research indicates that time spent waiting, in management, and changing should be limited and that students spending time in purposeful activity are more likely to stay motivated, improve and are less likely to misbehave (Siedentop, et.al., 1994).

Therefore, the following instructional strategies are suggestions will keep the students involved in active learning activities throughout the 90-minute class period based on the findings of this study.

1. *To decrease waiting time*: (a) Allow students to warm up/practice as soon as they enter the gym (i.e. no sitting on bleachers); (b) Take attendance while students are performing warm ups; (c) Incorporate many opportunities to practice. Teachers should provide one ball per student if possible for effective practice time as well as modify games to emphasize skill development (i.e. use small-sided teams to increase the chance that each player touches the ball often); (d) After the completion of a station, have students rotate to the next station or give them additional tasks to participate in. Start activity as soon as students get to the station (the teachers in this study waited for all the students to get to the station before starting the activity in mass); and (e) Allow students to participate in an activity as soon as they have equipment or get to a station. The teacher could give directions: "As soon as you get the racket and shuttle, practice hitting to yourself ten times."
2. *To increase student motivation*: (a) Make sure fitness activities are of sufficient intensity to benefit students (i.e. at least 20-minutes) and music/stations are used to motivate students; (b) Include a variety of sports in the curriculum and/or elective program. Teachers could consider/ entertain requests from the students about the nature of activities offered. Non-traditional sports and/or unique activities the students may not be familiar with or exposed to are additional resource ideas for teachers (i.e. pickleball, in-line skating, mountain biking, bocce, circus arts, horseshoes, bowling, team handball, broom ball, orienteering, new games, speedball, hackey sack, omnikin, crazy kickball, speed stacks, korf ball, curling. Include self-development courses such as yoga, stress reduction and CPR/first aid). Teachers should allow the students to choose what sport to play (electives) as this increases participation and motivation levels.

Given proper training, physical education teachers could effectively use the larger blocks of a single class period to address all the stated objectives (i.e. concepts in the cognitive, psycho-motor and the affective domains) of physical education and carry out state and national learning

Table 4

Receiving Information & Engaged in Motor Activity

Episode	*H.S.a*	*H.S.b*	*H.S.c*	*H.S.d*	*H.S.e*	*M.S.a*	*M.S.b*	*Avg*
Cognitive task (explanation/ demonstration of skill	14%	24%	46%	19%	20%	42%	40%	29%
Inform (initial presentation how to do a particular task	08%	00%	02%	11%	00%	13%	12%	6.7%
Refine (focus on improvement of the skill/strategy)	08%	00%	02%	04%	00%	03%	04%	03%
Extend (change conditions making skill easy or difficult	02%	00%	00%	00%	00%	01%	05%	1.2%
Apply (practice)	38%	70%	50%	53%	40%	41%	20%	44.7%
Routine (practice from previous lesson)	30%	06%	00%	13%	40%	00%	19%	15.4%

Table 5

Data Recording Sheet

Lesson _____ of _____ Class Size: _____ Date _____

School _____ Page _____

Time:

Episode:

Task Type:

Explicitness:

Account:

S Coded:

Time:

Episode:

Task Type:

Explicitness:

Account:

S Coded:

Time:

Episode:

Task Type:

Explicitness:

Account:

S Coded:

Episode	**Explicitness**	**Task Type**	**Congruency**	**Acct**
M management	FXT fully	C cog	ST on stated	O No
T Transition	PXT partially	I inform	M+ mod up	M
W wait	I implicit	R refine	M- mod down	MI
WU warmup		E extend	OT off task	FB
I instruction		A apply	A appropriate	PR

standards. Bukowski and Stinson (2000) stated that school districts considering block scheduling must provide professional development opportunities for their faculties as these educators need to learn how to organize their classes, teach and assess effectively in larger blocks of time.

For example, Claxton and Bryant (1996) point out how block scheduling provides teachers with the time needed to teach the rules, concepts and strategies of sports and games than the tradition 45-minute class periods. Furthermore, more time is available to teach the scientific foundations of physical fitness (components thereof) including the importance of physical activity, nutrition and health information in physical education classes that could not have been taught in a 45-minute period.

In addition, Claxton and Bryant (1996) explain how meeting objectives in the affective domain has often been left to chance in physical education, even though moral and ethical character development has been a goal of highly esteemed physical educators for many years.

Many educators have assumed that their students will develop a sense of fair play and cooperation simply by playing games. Research however has not supported that assumption (Giebink and McKenzie, 1985). A nationwide movement is underway for schools to develop moral character in their students and physical education is a logical place to address this concern. Deline (1991) suggests several strategies to help students develop cooperative skills through physical education, but points out that meeting these objectives requires a considerable amount of class time. An extended period as provided by block scheduling would provide that time.

Block scheduling creates enough time for students to develop physical skill and for teachers to measure and document skill development. In addition, block scheduling allows students to spend adequate time on fitness development to actually experience improved physical fitness. Likewise, it allows the physical educator to try creative approaches that were not possible when time was the limiting factor.

Even though there are advantages in adopting block scheduling, including the provision of a larger block of time to carry out state learning standards, this study also raises several questions concerning it's effectiveness including the fact students spent more time "waiting" and in "management" and less time in "activity." Therefore, is block scheduling boon or bane to physical education? Claxton and Bryant (1996) elucidate it is very possible that the place for physical education in the new block schedule will depend on the reputation of the existing physical education program. If physical education is regarded as a class which meets no worthwhile objectives, the transition to block scheduling may be a convenient time to eliminate it altogether. However, if it is seen as a vital part of the school curriculum it has a good chance of assuming an equal role with other subjects. For many, change is coming. It could be a very good change.

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