

Washington School Research Center

# Schedule Matters

*The Relationship between High School  
Schedules and Student Academic Achievement*

• • • • • • • • •

Research Report #9  
October 2006

Duane Baker  
Jeff Joireman  
Joan Clay  
Martin Abbott

**The Washington School Research Center (WSRC)** is an independent research and data analysis center within Seattle Pacific University. The Center began in July 2000, funded through a gift from the Bill & Melinda Gates Foundation. Our mission is to conduct sound and objective research on student learning in the public schools, and to make the research findings available for educators, policy makers, and the general public for use in the improvement of schools. We believe that sound data and appropriate data analysis are vital components for the identification of school and classroom practices related to increased student academic achievement.

Washington School Research Center  
3307 Third Ave. W., Suite 318  
Seattle, WA 98119-1957  
Phone: 206.378.5377  
Fax: 206.281.7393  
Web: [www.spu.edu/wsrc](http://www.spu.edu/wsrc)

**Martin L. Abbott, Ph.D.**  
Executive Director  
Professor of Sociology

**Duane B. Baker, Ed.D.**  
Director of Research

**Heather R. Stroh, Ed.D.**  
Assistant Researcher  
and Data Manager

Copyright © 2006 by the Washington School Research Center, Seattle Pacific University.  
All rights reserved. Additional copies of this report may be downloaded in PDF free of  
charge at [www.spu.edu/wsrc](http://www.spu.edu/wsrc).

# Schedule Matters

*The Relationship between High School  
Schedules and Student Academic Achievement*

• • • • • • • • •

A Research Report From  
The Washington School Research Center



Washington School Research Center



## TABLE OF CONTENTS

<b>INTRODUCTION .....</b>	<b>1</b>
<b>STUDY DESIGN .....</b>	<b>7</b>
<b>RESULTS.....</b>	<b>9</b>
<b>DISCUSSION .....</b>	<b>13</b>
<b>REFERENCES.....</b>	<b>15</b>
<b>APPENDIX .....</b>	<b>17</b>



# Schedule Matters

## *The Relationship between High School Schedules and Student Academic Achievement*

### INTRODUCTION

Beginning two decades ago, and more recently since the passage of Washington State HB 1209 into law in 1993, there has been a growing interest in how to maximize the school structure to bring about change in student outcomes. High schools in particular have explored ways to organize the school year and school day. Although there is a great deal of research on the matter of high school schedules, there is not a definitive answer to the question: “What is the best schedule for high schools?” Our study was designed to contribute to the research-based information around this ongoing question.

We were prompted to conduct this study by several inquiries we received about types of high school schedules available and their effectiveness. Based upon this interest we designed and carried out a study to answer one primary research question: Is there a relationship between high school schedules in Washington State and academic achievement as measured by the Washington Assessment of Student Learning (WASL)? In this report we provide an historical background essential to understanding why we have multiple schedules at the high school level, describe the research methodologies, present the results of the study, and discuss implications for schools exploring the impacts of various school schedules.

### Historical Background

Secretary of Education T. H. Bell created the National Commission on Excellence in Education on August 26, 1981 in response to concern over “the widespread public perception that something is seriously remiss in our educational system” (National Commission on Excellence in Education, 1983). In the commission’s report, *A Nation at Risk*, the authors explained how declines in educational progress create risk for our country, summarized evidence of our declining educational performance, and proposed several recommendations for improving our educational systems. Suggested recommendations included restructuring school schedules for more effective use of time and an increased focus on core academic subjects. Despite the passing of over two decades since the publication of this report, improvement of academic achievement of American students continues to be an area of concern for state and national policy makers.

Subsequent to the publication of *A Nation at Risk*, The National Commission on Time and Learning (1994) published *Prisoners of Time*, a report that addressed concerns

over the allocation and use of time in public schools. The report begins auspiciously by the author chastising the relationship of time and learning in American Public Schools:

Learning in America is a prisoner of time. For the past 150 years, American public schools have held time constant and let learning vary. The rule, only rarely voiced, is simple: learn what you can in the time we make available. It should surprise no one that some bright, hard-working students do reasonably well. Everyone else—from the typical student to the dropout—runs into trouble. (National Education Commission on Time and Learning, 1994)

One of the recommendations from the National Education Commission on Time and Learning was that “state and local boards work with schools to redesign education so that time becomes a factor supporting learning, not a boundary marking its limits (p. 1).” Block scheduling was put forth as one possible way to help time become a factor, rather than a boundary, for learning.

Block scheduling is, in general, any restructuring of the school day schedule that results in fewer, but longer, class periods each day (Jones, 1995). The traditional secondary school schedule features 50 minute class periods (six to eight periods per day), whereas block schedules feature 90-120 minute class periods (four periods per day). Schools are at liberty to devise block schedules that are idiosyncratic to local needs. Thus, there are unlimited possibilities for block schedule models. However, there are several general models of block scheduling, including 4x4 block (four classes per day), the Alternating (A/B) Block (eight blocks over two days), and the Modified Block (both blocked and traditional periods) (Canady & Rettig, 1995).

## Benefits of Block Schedules

Traditional schedules require students to be in nine different locations and teachers to work with 125-180 students over the course of a six and a half hour school day (Irmsher, 1996). Joseph Carroll (1994) stated that the traditional schedule is “a hectic, impersonal, inefficient instruction environment” (as cited in Irmsher, 1996). Block schedules provide advantages for students, teachers, and school climate (Center for Educational Reform, 1996).

### ***Students***

Students participating in a 4x4 block schedule only have four classes to contend with in a given semester. Thus, students can focus more time and effort on each course (Center for Educational Reform, 1996). The longer class periods allow students to engage in more in-depth learning and experience a wider variety of instructional strategies (Rettig & Canady, 1996). Students in block schedules often have better attendance, fewer late arrivals, higher grades, and a reduced failure rate (Schoenstein, 1995). Additionally, the block schedule allows schools to expand their course offerings. Thus, students are able to enroll in more electives or retake failed courses quickly to keep pace with classmates (Irmsher, 1996).



## **Teachers**

Teachers participating in a 4x4 block schedule see fewer students per day, teach fewer classes per day, and have longer planning periods (Rettig & Canady, 1996). Thus, teachers develop closer relationships with their students and are able to provide students with more individualized instruction (Canady & Rettig, 1996). Teachers waste less time on administrative tasks, such as taking roll, announcements, start-up activities, and wrap-up (Irmsher, 1996). In addition to utilizing more engaging instructional strategies, teachers have time to implement more varied and authentic assessment strategies (Freeman & Maruyama, 1995).

## **Schools**

Block scheduling helps improve school climate in a variety of ways. There are fewer distractions throughout the day because of reduced number of passing periods (Canady & Rettig, 1995). Class breaks are usually longer, resulting in calmer students and fewer discipline problems (Freeman & Maruyama, 1995).

## **Concerns about Block Schedules**

A variety of concerns and criticisms have been posed in regard to block schedules. These concerns range from practical considerations (e.g., course sequencing) to more conceptual ideas (e.g., changing beliefs about instruction). Questions also abound about various aspects of block scheduling, including dealing with absences, handling transfer students, and scheduling year-long programs (e.g., band, journalism). There is also concern that there is no solid evidence that block schedules improve academic achievement.

## **Scheduling**

Block schedule critics are concerned that music and advanced placement (AP) courses cannot be effectively integrated into the schedule (Schoenstein, 1995). The Center for Innovative School Scheduling (1998) suggested that band, journalism, and other yearlong courses be scheduled outside the 4x4 format. Additionally, the Center for Innovative School Scheduling (1998) recommended that band not be scheduled in conflict with AP or other advanced courses. Subjects that build on previous knowledge, such as math, science and foreign languages, do not necessarily lend themselves to intensity rather than breadth (Center for Educational Reform, 1996). Students may complete a full year's work in one semester then not revisit the subject for up to a year. This poses problems with testing programs (e.g., assessment tests, AP exams), since students' skills may be rusty if students are not studying a particular subject when it is time for testing (Schoenstein, 1995). Course sequencing is also a concern, since students may not be able to access necessary courses in a timely fashion if schedules are not devised properly. Other practical suggestions from the Center for Innovative School

Scheduling included scheduling AP classes with consideration for testing dates and scheduling Level 2 foreign language courses as close to Level 1 as possible.

### ***Administrative considerations***

Critics have also voiced concern about the repercussions of student absences. When a student misses one day of a block schedule, it is equivalent to missing two days under a traditional schedule. Freeman and Maruyama (1995) noted that students only have to make up work for three to four classes instead of six to eight under a traditional schedule. Another administrative problem is transitioning transfer students into the schedule. Proponents of block scheduling agree that this is a difficult issue, but schools can devise credit conversions, and transfer students can get a fresh start at semester (Freeman & Maruyama). Additional administrative issues to be considered include: calculating instructional time, accreditation issues, teacher contract policies, scheduling software, and bookkeeping issues related to student data (Gruber & Onwuegbuzie, 2001; Northwest Regional Laboratory, 1997).

### ***Conceptual issues***

Restructuring a school from a traditional schedule to a block schedule requires changes in teachers' beliefs and understandings about teaching and learning. Simply switching to longer class periods will not ensure success (Northwest Regional Laboratory, 1997). Staff members will have to alter their instructional methods to ensure student success in a block system (Schoenstein, 1995). Additionally, change of any kind is difficult, and staff members will be more amenable to undertaking the work of restructuring if they are involved in the decision-making process. Once staff members have decided to restructure the schedule, ample professional development must be provided to support changes in instructional methodology (Northwest Regional Laboratory). In addition, students and community members must be involved in the decision-making process.

### ***Academic achievement***

Data on the relationship between block scheduling and improvement of standardized test scores is inconsistent (Center for Innovative School Scheduling, 1998). There is evidence that the 4x4 block schedule increases the odds of attaining the following outcomes: increased numbers of honor roll students; increased student GPA; increased graduation rate; reduced failure rates; reduced overall drop-out rate; and increased numbers of students in AP classes (Center for Innovative School Scheduling). However, in a review of literature on the effects of block scheduling, Trenta and Newman (2002) reported, "Over the last decade, a number of studies and evaluations have been done on block scheduling in which some have found evidence of improved student achievement. Others found no significant improvement or significant decline (p. 55)."

## Suggestions for Successful Implementation

Block scheduling provides teachers and students with time to engage in more in-depth learning and to experience a wider variety of instructional strategies (Rettig & Canady, 1996). However, the literature is clear that teachers must be supported with effective professional development to transition from lecturing to more active, hands-on teaching strategies. Teachers need ample time and adequate resources for professional development about appropriate instructional strategies for block schedules. Queen (2000) suggested, “The major problem in block scheduling today is the limited use of appropriate instructional strategies.” Types of instructional strategies that would be appropriate in block schedules include cooperative learning, case method, Socratic seminar, synectics, concept attainment, inquiry method and simulations (Queen & Isenhour, 1998). Queen, Algozzine, and Eaddy (1996) determined that the most important teaching skills for success in a block class are: 1) The ability to develop a pacing guide for the course in nine-week periods, which includes weekly and daily planning; 2) The ability to use several instructional strategies effectively; 3) The skill to design and maintain an environment that allows for great flexibility and creativity; 4) The desire and skill to be an effective classroom manager; and 5) The freedom to share the ownership of teaching and learning with students.

Queen (2000) stated, “The success of block scheduling depends greatly on the professionals who implement it.” With that in mind, Queen (2000, p. 14-15) recommended the following for maximizing the positive impact of block scheduling:

1. Teachers must develop and follow monthly, weekly, and daily pacing guides.
2. Teachers must master a minimum of five instructional strategies and engage students directly in the learning process and should aim to master seven or eight.
3. Teachers should pace each lesson by changing grouping patterns, varying presentations, and using different instructional strategies every ten to fifteen minutes. In most cases, a teacher should use a minimum of three instructional strategies during any class period.
4. Teachers should incorporate alternative and authentic assessment practices when evaluating students.
5. Teachers must use the entire class period every day for instruction.
6. Teachers should strive to be creative and flexible in assigning activities and should incorporate outside assignments into regular classroom activities.
7. Teachers should monitor individual students consistently to be sure of total student participation in small and large groups.
8. Successful block teachers should mentor, formally or informally, beginning teachers and veteran teachers having difficulty with instruction in block scheduling.
9. Principals or staff development personnel must provide initial and continuing staff development for all teachers throughout the year on topics of curriculum and instructional alignment, instructional pacing and strategies, and time management.

10. Principals must develop a monitoring team to verify that all teachers are using pacing guides and various instructional strategies effectively.
11. Principals must take appropriate disciplinary action with teachers who are unwilling to follow the basic principles and procedures necessary in block scheduling.
12. Principals should work with less effective teachers in developing and implementing an instructional improvement plan.
13. Superintendents should contact colleges of education in their region and demand that block scheduling methods be included in teacher and principal training programs.
14. Superintendents should require that, before schools move to a block format, principals and teachers spend from one to two years in staff development.
15. Boards of education should ensure that all stakeholders—including students, teachers, parents, administrators, and community organizations—have the opportunity to be involved in investigating, planning, designing, implementing, and evaluating the block schedule.

## Summary of Research Literature

Concern over the student academic achievement has prompted American public schools to undergo a variety of reform efforts in order to improve students' performance. Block scheduling is a restructuring of the school day so students attend fewer, but longer, classes each day. Block schedules are purported to have several advantages over traditional schedules, including more time to learn, an increase of in-depth learning, and an improved school climate. Concerns about block scheduling range from practical considerations (e.g., course sequencing) to more conceptual ideas (e.g., changing beliefs about instruction). Questions also abound about various aspects of block scheduling, including dealing with absences, handling transfer students, and scheduling year-long programs (e.g., band, journalism). There is also concern that there is no solid evidence that block schedules improve academic achievement.

The literature is clear, however, that successful implementation of block scheduling requires shared decision-making regarding the change as well as ample professional development. Teachers will need time to develop new instructional strategies for teaching in block schedules. Their teaching must move away from lecturing towards more active, hands-on teaching strategies. School staff members must also consider a variety of other issues to be effective with a block schedule. These issues include, but are not limited to pacing, student assessment, use of time, individualization, teacher mentoring, continued staff development, monitoring teaching and learning, remediation of teaching skills, and open communication with stakeholders.

## STUDY DESIGN

### Participants

There are over 400 high schools in Washington State, but because of the nature of this study, we did not include alternative high schools. Thus, there were a total of 322 schools available for participation in this study. We called all 322 schools, and 296 schools provided the required data elements (91% return rate).

### Classification of Schedules

As part of a telephone survey, we asked the each school contact person to describe the school schedule. After talking to the participants about how they organized time during the day and throughout the week, we classified the schedule into one of the following five categories:

- Traditional seven-period day
- Traditional six-period day
- 4x4 block
- Alternating (A/B) block
- Modified block (both blocked and traditional periods)

We subsequently asked the school contact person to confirm the accuracy of the categorization.

### Additional Data Elements

In addition to classifying the school day schedule, we gathered contextual information and achievement data. Additional data elements included:

1. Number of years the schedule has been in place;
2. If changed in the last two years, what type of schedule was previously in place;
3. Number of minutes per class period;
4. A measure of family income (Eligibility for Free/Reduced priced meals);
5. Dropout rates;
6. Presence of an advisory period; and
7. If there is an advisory period, how often do they meet and for how long.

The Office of Superintendent of Public Instruction (OSPI) provided the Washington School Research Center with student level WASL data (reading, writing, and math) that was aggregated to the building level for analysis.

## Data Analysis

In order to address our primary research question, we compared student achievement in reading, math, and writing on the WASL on the different types of schedules. Because much of the past research has documented a relationship between student achievement and measures of family income (e.g., Abbott & Joireman, 2001), we included school measures of eligibility for free/reduced meals (FRL) in the analyses. This approach allowed us to see what differences in student achievement appeared among the types of schedules when the schools were “equated” in terms of a family income measure.

## RESULTS

### Frequency of Types of Schedules

The types of schedules offered in Washington State high schools are presented in Table 1. A majority of schools (62.8%) offered a traditional seven- or six-period day. The remainder offered some type of non-traditional (block) schedule. The 4x4 block and the modified block were the most common types of non-traditional schedules offered and represented 14.2% and 15.9% of schools, respectively. A small percentage of schools (7.1%) offer an alternating (A/B) block.

**Table 1**  
***Frequency of types of school day schedules in Washington state high schools***

Type of Schedule	(n)	%
Traditional seven-period day	64	21.6
Traditional six-period day	122	41.2
4x4 Block	42	14.2
Alternating (A/B) Block	21	7.1
Modified Block	47	15.9
Total	296	100.0

### Student Achievement Data

We conducted an analysis of covariance for each of the three criterion variables. Covariate adjusted means and standard errors are summarized in Table 2 and displayed in Figures 1-3. For further information, readers may consult the technical statistical appendix. To summarize, each analysis revealed a significant effect of the covariate, FRL (all  $ps < .0001$ ), as well as a significant effect of the five-level schedule variable (all  $ps < .005$ ).<sup>1</sup> As expected, FRL showed a significant negative relationship with the percentage of students meeting the standard for math ( $r = -.62$ ), reading ( $r = -.55$ ), and writing ( $r = -.48$ ). While the overall results were statistically significant, the effect size, or strength of the relationship between schedule and achievement, was weaker (partial eta squared values of .06) than that between FRL and achievement (partial eta squared values ranging .26 – .39).

An examination of the means for math and reading across the different types of schedules (Figures 1 and 2, respectively) reveals a very similar pattern. In each figure, means whose standard errors do not overlap are significantly different. As can be seen,

<sup>1</sup> Preliminary analyses revealed no significant interactions between schedule type and the continuous covariate, FRL (all  $ps > .11$ ). As such, the schedule x FRL interaction term was dropped in favor of an analysis of covariance model specifying only the main effects of schedule type and FRL. Additional analyses revealed no effect for presence/absence of an advising session ( $ps > .15$ ).

## Results

---

schools using the seven-period or modified schedules performed significantly better than those using any of the remaining three schedule types. An examination of the means for writing revealed a slightly different pattern. In this case, schools using the seven-period, modified or alternating (A/B) block schedules performed better than those using either the six-period or the 4x4 block schedule.

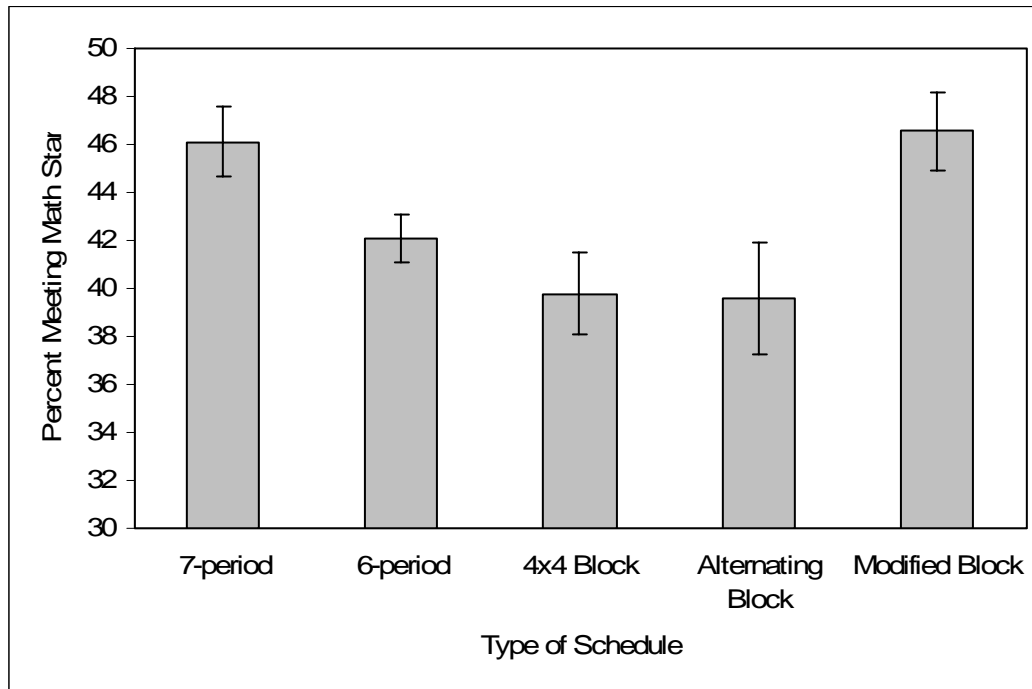
**Table 2**  
***Covariate Adjusted Means on Percent Meeting the Standard for Math, Reading, and Writing as a Function of Type of Schedule***

---

Criterion Variable	Type of Schedule				
	Traditional 7-period	Traditional 6-period	4x4 Block	Alternating Block	Modified Block
Math					
Mean	46.10	42.10	39.78	39.59	46.55
Standard Error	1.46	0.99	1.69	2.30	1.61
Reading					
Mean	68.86	63.28	61.61	61.88	67.00
Standard Error	1.44	0.97	1.67	2.27	1.59
Writing					
Mean	68.48	63.36	63.02	67.80	69.57
Standard Error	0.49	1.01	1.73	2.36	1.65
<i>N</i>	54	116	39	21	43

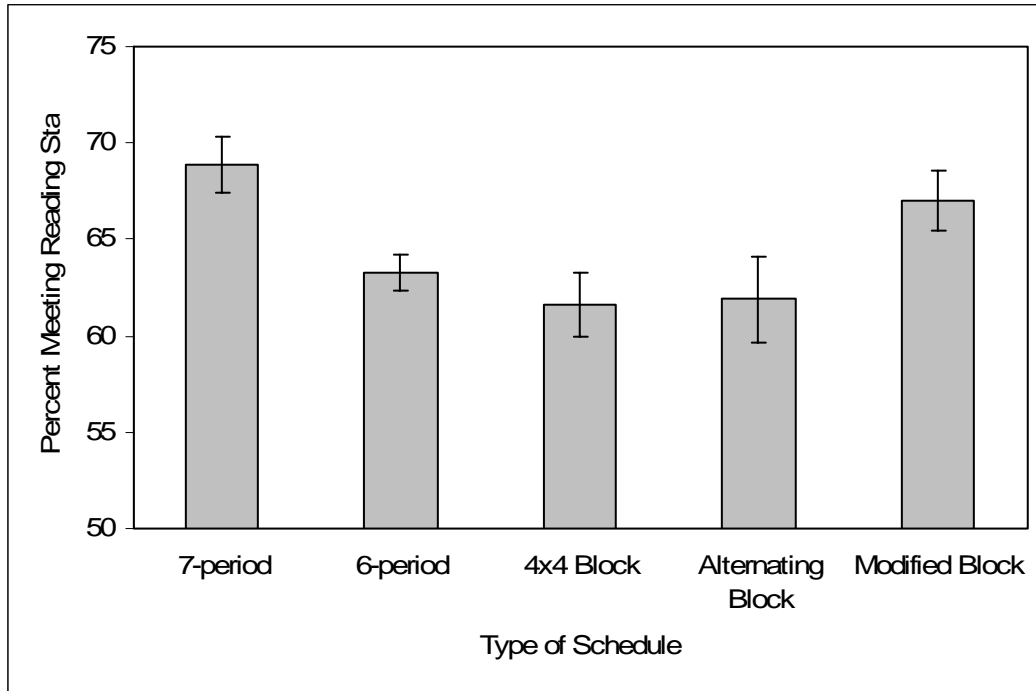
---



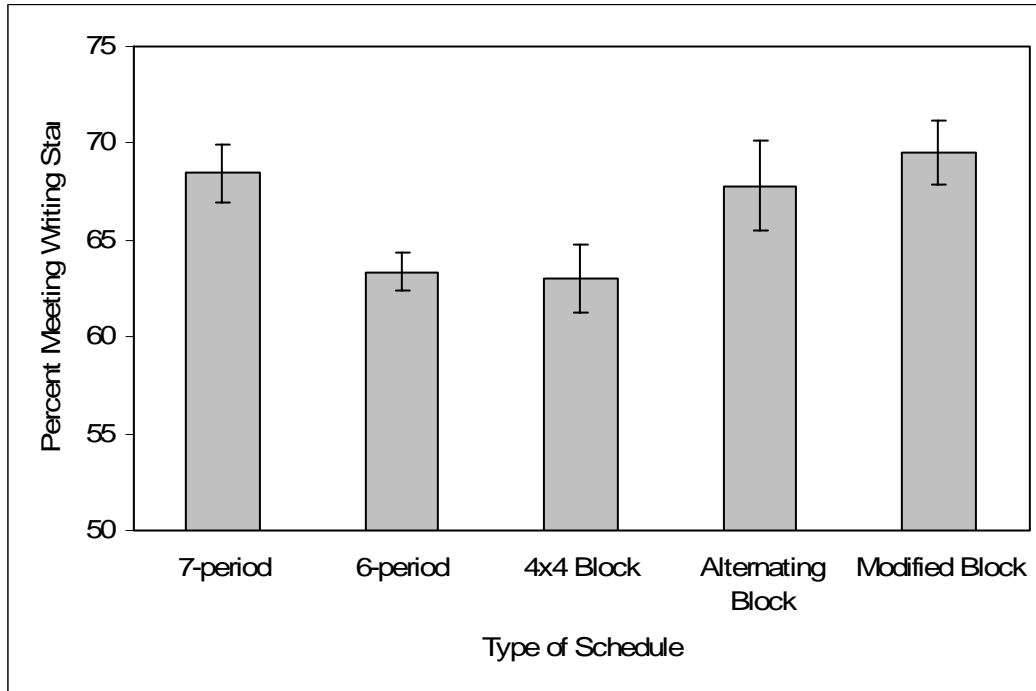


**Figure 1. Covariate Adjusted Means for Percent Meeting Math Standard in Five Schedule Types<sup>2</sup>**

<sup>2</sup> Figures 1-3 show “error bars” or (+/-) one standard error of the mean. If the areas bounded by these bars do not overlap, the differences are typically determined to be significant. However, statistical significance depends upon the adequacy of the sample, accurate measurement, and similar considerations. Therefore, readers should use extreme caution when assigning statistical significance to these findings.



**Figure 2. Covariate Adjusted Means for Percent Meeting Reading Standard in Five Schedule Types**



**Figure 3. Covariate Adjusted Means for Percent Meeting Writing Standard in Five Schedule Types**

## DISCUSSION

This study sought to answer the research question: Are some types of high school schedules more effective than others in Washington State? That is, is there a relationship between type of schedule and student achievement? When embarking upon this study the research team questioned whether to expect significant differences among the various schedules, because typically structural, cosmetic, and first-order changes are not associated with student achievement or achievement gains. However, the results of the study led to two fundamental findings. First, the seven-period and Modified Block schedules were, overall, the highest performing schedules correlated with reading, writing, and math WASL. Second, the 4x4 and A/B Alternating Block schedules were, overall, the lowest performing schedules correlated with reading, writing, and math WASL. It is important to note that there is no statistical difference between the Traditional seven-period day and Modified Block schedules. Both outperformed the other three schedules, and both were equivalent to each other.

Taken out of context, it would be easy to draw the conclusion from this study that simply having one type of schedule rather than another would lead to higher aggregate student achievement. However, this conclusion would be inappropriate from several standpoints. First, we cannot make causal inferences from this study due to the nature of the study data. Second, study variables were limited, so there may be a number of additional influences that might affect this relationship if included in the study. Third, the effect sizes are small and do not by themselves represent compelling practical differences among the schedule types.

There is an additional consideration that follows from this study. Why are there achievement differences among the schedule types, even though they may not be considered large? In our past work and related literature, we pointed to the need for deeply rooted philosophical changes for real school improvement to occur. “First order changes,” like making structural changes by themselves, would not necessarily lead to outcomes like student achievement gains. Clearly, the results from this study call into question why the different schedules are related to different achievement outcomes. What are the features of the schedules that might result in achievement gains, and how do the schedules differentially support the work of school staff?

We concur with the findings of a meta-analysis conducted by Zepeda and Mayers (2006):

Implementation of a major change such as block scheduling requires detailed planning by a variety of stakeholders. Many decisions lay the groundwork for more active forms of planning. Questions that need to be answered include: Do we implement a block schedule? What type of block schedule best fits the context

of our school? and, What challenges will we need to overcome to be successful?  
(p 155)

Combining the findings of this study with some of our previous work, it seems appropriate to suggest that simply applying a schedule to a high school does not make the difference in and of itself. What matters is that the schedule serves the purpose of the work at the high school.

We encourage school and district leaders to interpret these findings with caution and to use the findings to guide conversations at the school level about the best schedule to meet the needs of the students. In this study one traditional schedule and one block schedule emerged, having statistically significant correlations with student achievement (WASL). In context of our previous research published in the Decade of Reform report (2003), it appears that what really matters about the schedule, is that schools select a schedule that meets their particular needs and that schools provide professional development to support it.

## REFERENCES

- Abbott, M. L., & Joireman, J. (2001). *The relationships among achievement, low income, and ethnicity across six groups of Washington State students. Technical Report #1*. Lynnwood, WA: Washington School Research Center, Seattle Pacific University. Available at: <http://www.spu.edu/orgs/research/currentresearch.html>
- Canady, R. L., & Rettig, M. D. (1995). *Block scheduling: A catalyst for change in high schools*. Princeton, NJ: Eye on Education.
- Carroll, J. M. (1994). Organizing time to support learning. *The School Administrator*, 51(3), 26-28, 30-33.
- Center for Educational Reform. (1996). Scheduling: On the block. *CER Action Paper*. Retrieved September 17, 2005, from <http://www.edreform.com/index.cfm?fuseAction=document&documentID=667>.
- Center for Innovative School Scheduling. (1998). What we've learned about block scheduling. Retrieved September 17, 2005, from <http://curry.edschool.virginia.edu/centers/ciss/learned/summary.html>
- Freeman, C., & Maruyaman, G. (1995). Primer: Extended-period schedules. Center for Applied Research and Educational Improvement. Retrieved September 17, 2005, from <http://education.umn.edu/CAREI/Blocksscheduling/QandA/Primer.pdf>
- Gruber, C. D., & Onwuegbuzie, A. J. (2001). Effects of block scheduling on academic achievement among high school students. *High School Journal*, 84(4), 32-42.
- Irmsher, J. (1996). Block scheduling. ERIC Digest 104. Retrieved September 17, 2005, from <http://eric.uoregon.edu/publications/digests/digest104.html>.
- Jones, R. (1995). Wake up! *The Executive Educator*, 17(8), 15-18.
- National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform*. Retrieved January 29, 2003, from <http://www.ed.gov/pubs/NatatRisk/>
- National Commission on Time and Learning. (1994). *Prisoners of time*. Retrieved October 5, 2005, from <http://www.ed.gov/pubs/PrisonersOfTime/index.html>
- Northwest Regional Laboratory. (1997). *Scheduling alternatives: Options for student success*. Retrieved September 17, 2005, from <http://www.nwrel.org/request/feb97/article3.html>.

## References

---

- Queen, J. A. (2000). Block scheduling revisited. *Phi Delta Kappan*, 82(3), 214-222.
- Queen, J. A., Algozzine, R. F., & Eaddy, M. A. (1996). The success of 4x4 block scheduling in the social studies. *Social Studies*, November/December, 251.
- Queen, J. A., & Isenhour, K. G. (1998). *The 4X4 block schedule*. Princeton, NJ: Eye on Education.
- Rettig, M. D., & Canady R. L. (1996). All around the block: The benefits and challenges of a non-traditional school schedule. *The School Administrator*, (53)8, 8-14.
- Schoenstein, R. (1995). The new school on the block. *The Executive Educator*, 17(8), 18-20.
- Trenta, L., & Newman, I. (2002). Effects of a high school block scheduling program on students: A four-year longitudinal study of the effects of block scheduling on student outcome variables. *American Secondary Education*, 31(1), 54-71.
- Washington School Research Center. (2002). *Decade of Reform: A summary of research findings on Classroom, School, and District Effectiveness in Washington State report #3*. Lynnwood, WA: Washington School Research Center, Seattle Pacific University.
- Zepeda, S. J., & Mayers, R. S. (2006). An analysis of research on block scheduling. *Review of Educational Research*, 76(1), 137-168.

**Appendix      Analysis of Covariance on Percent  
Meeting the Standard on Math, Reading,  
and Writing as a Function of FRL and  
Type of Schedule**

---

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	MPCTMET	19620.510 <sup>a</sup>	5	3924.102	35.249	.000	.398
	RPCTMET	14974.476 <sup>b</sup>	5	2994.895	27.789	.000	.342
	WPCTMET	11730.101 <sup>c</sup>	5	2346.020	20.146	.000	.274
Intercept	MPCTMET	187750.024	1	187750.024	1686.504	.000	.863
	RPCTMET	335457.564	1	335457.564	3112.624	.000	.921
	WPCTMET	336134.958	1	336134.958	2886.526	.000	.915
FRL	MPCTMET	19135.262	1	19135.262	171.887	.000	.392
	RPCTMET	14636.464	1	14636.464	135.808	.000	.337
	WPCTMET	10984.061	1	10984.061	94.325	.000	.261
NEWCODE	MPCTMET	1732.524	4	433.131	3.891	.004	.055
	RPCTMET	1839.135	4	459.784	4.266	.002	.060
	WPCTMET	1987.502	4	496.876	4.267	.002	.060
Error	MPCTMET	29723.770	267	111.325			
	RPCTMET	28775.454	267	107.773			
	WPCTMET	31092.056	267	116.450			
Total	MPCTMET	555704.920	273				
	RPCTMET	1183849.640	273				
	WPCTMET	1219266.880	273				
Corrected Total	MPCTMET	49344.280	272				
	RPCTMET	43749.930	272				
	WPCTMET	42822.157	272				

a. R Squared = .398 (Adjusted R Squared = .386)

b. R Squared = .342 (Adjusted R Squared = .330)

c. R Squared = .274 (Adjusted R Squared = .260)





Washington School Research Center  
Seattle Pacific University  
3307 Third Ave. W., Suite 318  
Seattle, WA 98119-1957  
Phone: 206.378.5377  
Fax: 206.281.7393  
Web: [www.spu.edu/wsrc](http://www.spu.edu/wsrc)