



## Research Brief

### Center for Policy Studies, Education Research, and Community Development

A Consortium Serving Idaho, Montana, Utah, and Wyoming

#### High school trimester system vs. semester system

##### Introduction

“Educators have not definitely concluded that block scheduling is a valuable gem, although it may have potential as a vehicle for good teaching and learning” (Lare, Jablonski & Salvaterra, 2002, p. 57).

There has been a ubiquitous adoption of block scheduling (Hamdy & Urich, 1998; Lare, Jablonski & Salvaterra, 2002, Marchant & Paulson, 2001; Veal & Flinders, 2001). The most common forms are the trimester and semester models, which are designed to optimize learning time. The semester typically consists of two 90-day-long units, while the trimester is made up of three 60-day units. Both models can be implemented using any one of three different scheduling models: (a) traditional model, (b) block scheduling, or (c) the hybrid model. Just like adopting any change, questions have to be asked about whether the preferred model would improve student achievement, improve student disciplinary issues, improve relationships among teachers and ultimately improve the school climate. Lare, Jablonski & Salvaterra (2002) have suggested educators answer two specific questions before implementing block scheduling. The first is, does block scheduling improve student achievement? The second, is the model benefiting the school at a reasonable material and financial cost? Of critical importance is the underlining factor that structural changes such as the semester or trimester model have to be supported by staff development and giving teachers more planning time to prepare for the change.

##### Purpose of this brief

The purpose of this research brief is to compare and contrast the trimester and semester systems using the three scheduling models.

##### Definition of terms

For the purposes of this brief,

1. Block scheduling refers to longer blocks of time per subject—typically 85 to 100 minutes—resulting in a reduced number of classes that students take and that teachers teach per day to roughly four to five a day (Jenkins, Queen, & Algozzine, 2002). In the popular 4 x 4 design, students have four classes that meet every day for one semester, and four different classes in the second semester. On a 90-minute-block schedule, students take eight courses a year or up to 32 credits over four years in high school.

2. The trimester model is when the school year is divided into three equal sessions. Under this model, students can either use block scheduling with some subjects or all subjects. Student data is reported three times a year.
3. Traditional scheduling refers to allocating less time—typically 40 to 55 minutes—per subject, resulting in six to eight subjects per school day.
4. Hybrid scheduling incorporates both traditional and block scheduling. This is popularly known as the A/B or block-8 design. Students take eight classes (usually seven classes plus a study hall) all year, with blocks of four classes alternating every other day or, in some cases, alternating every few weeks.

### **Methodology**

This brief was written using information from recent journals and information retrieved from the Internet

### **Findings**

There are mixed results on the effectiveness of each system on student achievement. In addition, each method is contingent upon certain conditions, such as the guiding theoretical framework for introducing block scheduling, teacher comfort level, the quality of the student, and the overall school climate. Critical issues to be considered when choosing either model are school size, nature of the student population, the community, special programs, school goals and a host of other factors (Wild, 1999). For instance, some schools could not adopt block scheduling because they offered music as an elective and could not move music classes to block scheduling without upsetting the local community. This clearly demonstrates that there are issues unique to each state or community before block or semester scheduling models can be adopted.

### **Literature review**

The rationale for introducing block scheduling in schools, especially high schools, is embedded in the idea that teachers do not have enough time to teach using more effective, active learning methods in the traditional schedules. Of concern is that school districts and principals have implemented block scheduling without adequate understanding of the implications (Marchant & Paulson, 2001; Veal & Flinders, 2001, Lare, Jablonski & Salvaterra, 2002).

Students and teachers like block scheduling for a variety of reasons (Eineder & Bishop, 1997). Students like it because there are fewer classes to concentrate on, less homework, and fewer materials to organize. Teachers like it because it gives them more variety in lesson plans due to longer instructional time offered under block scheduling. It also gives teachers more time on task and the opportunity to monitor homework and improve relationships with students.

Several concerns about the implications of block scheduling have to be addressed. These include (a) cost, (b) student achievement, (c) the effect of longer class periods on student-teacher relationships, and (d) the effect of scheduling on student behavior and other questions (Eineder & Bishop, 1997). Adopting block scheduling without a theoretical framework can actually do more academic harm than good, especially with academically challenged students and students with short concentration spans. Hackmann warns, “Faculties that do not internalize the principles of constructivism run the risk of

implementing block scheduling without changing their instructional approaches to incorporate active learning strategies. In all likelihood, many teachers will continue to lecture—only in longer time frames—and students may become increasingly disconnected from the learning process” (p. 70). Teachers have to be trained to work in a block scheduled environment (Lare, Jablonski & Salvaterra, 2002; Kramer, 1997). Four principles were outlined by Hamdy and Urich, 1998). The first is that alternating block scheduling is not for every school. The second is teachers must have extensive staff development before any block scheduling is implemented. The third is interdisciplinary teams must have common planning time scheduled within the school day and the fourth is interdisciplinary teams should be provided staff development on effective teaming characteristics. Resorting to any kind of block schedule affects retention of such students especially where they have to take examinations such as those for Advanced Placement in the sciences (Hassenpflug, 1999).

Although most teachers and students are for block scheduling, there are some criticisms about it (Hamdu & Urich, 1998). The first is mathematics and language teachers feel that the time gaps between semesters hinders their teaching and affects the retention of knowledge as most students forget what they learn. Long review lessons were needed to improve mastery of concepts. Implied in this is duplication and inefficient use of time under block scheduling. This suggests that block scheduling may not actually give the benefit of greater content coverage and higher learning levels as students have longer breaks before the next class meeting. The second concern is that block scheduling may be more suitable for advanced learners; the average and below average students do not seem to benefit academically, as the longer instructional periods affect their concentration span. As mentioned earlier, block scheduling may be doing more academic harm than good among academically challenged children. Hamdy and Urich (1998) argued that 9<sup>th</sup> and 10<sup>th</sup> grade students may not be mature enough to endure longer class periods for block scheduling, and it may be more appropriate with 11 and 12<sup>th</sup> grade students. The third concern is class sizes under block scheduling increase, creating a host of classroom management problems. Teachers may spend more time on disciplinary problems than actual teaching. Large classes may hinder teachers from using the media center or engaging in activities that are appropriate for block scheduling.

The cost effectiveness of block scheduling has to be investigated. Block scheduling should work ideally if school districts adopt class sizes of 15, but this modification is certainly expensive for school districts as some school districts are bound by bargaining units that address class size and (Lare, Jablonski & Salvaterra, 2002).

A study by Eineder and Bishop (2002) highlighted that, under block scheduling, teachers had smaller loads and students had significantly fewer teachers to satisfy.

A trend of Iowa secondary schools revealed the following characteristics.

Table 1. Scheduling in Iowa schools

Scheduling Model	Number of schools (Percentage)
Ten-period daily	1 (0.03%)
Nine-period daily	14 (3.5%)
Eight-period daily	205 (51.4%)
Seven-period daily	52 (13.0%)
Six-period daily	4 (1.0%)
Daily schedule with some blocks	21 (5.3%)
Ten-block alternating	1 (0.03%)
Eight-block alternating	50 (12.5%)
Six-block alternating day	2 (0.05%)
5 x 5 semester block	1 (0.03%)
5 x 5 trimester block	1 (0.03%)
4 x 4 semester block	31 (7.8%)
4 x 4 semester block with all blocks split into two periods	1 (0.03%)
Modified block: alternating between periods and blocks	14 (3.5%)
Modular schedule	1 (0.03%)
Total	399 (100.0%)

Source: Hackmann (1999, p. 72).

As of 1999, most Iowa high schools (276) followed the traditional daily schedule, while 86 secondary schools predominantly implemented block scheduling (Hackman, 1999).

Educators should have a theoretical framework of what they need to do with block scheduling. Hackmann (1999) argued that block scheduling has its foundation in the theory of constructivism. The learner has to be actively involved, creating his or her own knowledge, and negotiating meaning of what he or she is learning. Social interaction of students is a critical component of constructivism.

Literature points to several success and failures of the trimester and semester models.

### **Characteristics of the semester model**

The semester model typically adopts the popularly known 4x4 model (Kramer, 1997) and is used with 11 and 12<sup>th</sup> graders (Wild, 1999). Students take four classes or courses each semester, normally two in the morning and two in the afternoon. A semester aims at completing eight academic courses, the target being to finish a yearlong course in one semester.

The general sentiment is that there are some monetary gains in implementing block or the semester schedule according to Hassenpflug (1999). The first is block scheduling reduces some expenses because not many books are bought for a course that finishes in one semester. The second is that if semester or block scheduling was introduced to solve a specific problem like study halls. However others are of the view that block scheduling increases cost by causing a significant increase in staff sizes, besides, the planning period is never monitored and could be better used learning new instructional strategies (Lare, Jablonski, & Salvaterra, 2002). The district can spend more money on high schools primarily in personnel costs.

While the academic subjects have acceptable enrollment sizes per class, block scheduling often creates a problem for elective classes such as music, art, home

economics and physical education. The high teacher-student ratio creates disciplinary problems and, inevitably, the quality of work suffers as teachers end up attending more to disciplinary problems than concentrating on instruction.

### **Models of block scheduling**

#### **Alternating Day 10 Block Schedule**

##### Week 1

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:14	Block IB	Block IG	Block IB	Block IG	Block IB
9:19-10:38	Block 2B	Block 2G	Block 2B	Block 2G	Block 2B
10:43-11:57	Block 3B	Block 3G	Block 3B	Block 3G	Block 3B
12:02-1:46	Seminar	Block 4G	Seminar	Block 4G	Seminar
1:51-3:05	Block 4B	Block 5G	Block 4B	Block 5G	Block 4B

##### Week 2

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:14	Block IG	Block IB	Block IG	Block IB	Block IG
9:19-10:38	Block 2G	Block 2B	Block 2G	Block 2B	Block 2G
10:43-11:57	Block 3G	Block 3B	Block 3G	Block 3B	Block 3G
12:02-1:46	Block 4G	Seminar	Block 4G	Seminar	Block 4G
1:51-3:05	Block 5G	Block 4B	Block 5G	Block 4B	Block 5G

Source: Hackmann and Waters, 1998, p. 86.

The advantages given for this kind of model are that it allows all students to enroll in eight courses and have a seminar or advisement period each year. Students have an opportunity to complete 36 units during their high school career.

#### *Academic Achievement*

Though most teachers and students generally favor the semester model, research suggests mixed feelings towards the academic achievement of students (Lare, Jablonski & Salvaterra, 2002). Major studies by Raphael, Wahlstrom and McLean (1986) reveal that 12<sup>th</sup> grade students in traditional models performed better in all tested areas compared to students under the semester model. They were tested in biology, mathematics, chemistry and physics, but the authors argue that students in block scheduled models are more likely to enroll in challenging courses. However, other studies suggest there are no significant differences in reading and mathematics achievement as a result of block scheduling. Academic achievement as measured by test scores remained constant, as did SAT, PSAT and Advanced Placement test scores. ACT scores fluctuated but remained similar to mean scores before block scheduling (Lare, Jablonski & Salvaterra, 2002).

Block scheduling had a positive effect on student achievement in North Carolina schools that switched from traditional scheduling to block scheduling (Kramer, 1996). Contrary to the success stories of academic achievement under block scheduling is

Bateson's study (1990) in which students in traditional schools scored significantly higher than students in semestered schools on all 120 test questions.

*Instructional changes*

Generally block scheduling would require new pedagogical methods because of increased time. Teachers need to be taught and make deliberate efforts to shift from methods suitable in traditional models to methods more suitable for block scheduled environments because “methods that teachers learned from experience in traditional classrooms do not seem to translate successfully into block scheduled classrooms” (Kramer, 1997, p. 30). Typically one should see a decline in the lecture method and an increase in activities that involve students.

About the breadth of coverage, there seems to be a consensus that content coverage decreases with block scheduling, but depth of coverage increases. For instance, mathematics teachers reported using more time to cover the same content in comparison with traditional scheduling (Kramer, 1997). Longer instructional time was conducive to experimentation with new teaching strategies that hopefully would improve student achievement (Lare, Jablonski & Salvaterra, 2002). In fact, block scheduling or the semester model slows down the pace and reduces stress on the teachers and students, allows students to take more courses in high school careers, and study fewer courses at a time.

**Characteristics of the trimester model**

The trimester model is an example of intensive scheduling where students take may take three courses at a time with

**Figure 1.1 A trimester model showing 8 courses**

	<b>Trimester 1 60 Days</b>	<b>Trimester 2 60 Days</b>	<b>Trimester 3 60 Days</b>
<b>Trimester Course 140 Minutes</b>	<b>Course 1</b>	<b>Course 2</b>	<b>Course 3</b>
<b>5 minutes</b>	<b>Class Change</b>		
<b>Lunch 25 Minutes</b>	<b>Lunch</b>		
<b>Year-Long Course 50 Minutes</b>	<b>Course 7</b>		
<b>5 Minutes</b>	<b>Class Change</b>		
<b>Year-Long Course 50 Minutes</b>	<b>Course 8</b>		
<b>5 Minutes</b>	<b>Class Change</b>		
<b>Trimester Course 140 Minutes</b>	<b>Course 2</b>	<b>Course 4</b>	<b>Course 6</b>

Source: Canady (1995, p. 125).

**Advantages and disadvantages**

Intensive scheduling allows concentrated study in one course at a time. Students enroll in one course every 45 days. This model provides the opportunity to study exploratory courses throughout the year.

	<b>Quarter 1 45 Days</b>	<b>Quarter 2 45 Days</b>	<b>Quarter 3 45 Days</b>	<b>Quarter 4 45 Days</b>
<b>Morning Core Session</b>	<b>English</b>	<b>History</b>	<b>Science</b>	<b>Mathematics</b>
<b>Year-Long Course</b>	<b>Foreign Language, Arts, or Music</b>			
<b>Lunch</b>	<b>Lunch</b>			
<b>Year-long Course</b>	<b>Foreign Language, Arts, or Music</b>			
<b>Afternoon Core Session</b>	<b>English</b>	<b>History</b>	<b>Science</b>	<b>Mathematics</b>

Source: Canady (1995, p. 128).

#### *Benefits*

Several benefits maybe realized from a trimester model according to Lybbert (1998):

1. It helps to realize most of the advantages of block scheduling.
2. Provides a smooth transition from traditional scheduling.
3. Teachers have fewer students.
4. Fewer textbooks are required.
5. Trimester is not dependent on the better quality issue, as is the block schedule as there is actual no actual loss of time.
6. Model allows each teacher to have as many or more overall class sections each year compared to other models.
7. Students who fail a course one term can retake the course in the third term.
8. Allows easy scheduling of half credit classes and other possible courses.

#### *Disadvantages*

1. Students' class needs and course conflicts have to be projected over three semesters.
2. It is difficult to meet the needs of children who fail in the first two semesters, especially those retaking courses to stay on pace academically.
3. The time slots available make it imperative to increase the number of electives.
4. Retention of information is another concern associated with the trimester model. A student might take a course in the first two trimesters and, in the gap between the last class and an exam (such as the Advanced Placement Exam), forget valuable material.
5. Transfer students may be affected by the trimester system as they may find it hard to align their class needs with both the traditional and block scheduling models. Depending on whether they are transferring into or out of the trimester model, students may be two months ahead or two months behind other students. It is almost impossible to provide a workable schedule for transferees.

## **Conclusion**

Block scheduling using the semester or trimester model requires teachers and administrators planning together to come up with a model that is suitable for their district or school. What may work in one district or state may not necessarily work in a different area. The questions that have to be addressed are whether the model is improving the academic performance of all students, whether the model's results justify the cost, and whether the school climate is improved. Research has mixed results about the benefits of block scheduling in schools. Schools need to conduct their own studies to gauge whether models in place bring organizational benefits that ultimately boost student achievement. Further, teachers need staff development to prepare them for and sustain them through the rigors of each model.

## **References**

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