

Block Scheduling and Achievement: Historical and Current Perspectives

Ann-Maureen Pliska

Matt T. Harmston
ACT

Donald G. Hackman
Iowa State University

Abstract:

This study examines historical perspectives on block-scheduling in high schools, and the realities of success and failure over time. In addition it reports the relationship of block scheduling with the ACT composite score against a traditional eight-period day in 568 public high schools in Illinois and Iowa (school-level data was examined and not individual student data). The findings suggest that block-scheduling is not a panacea for all that ails schools. Scheduling does not exist in a vacuum—not in the past, not currently, and not in the future. Preliminary findings suggest that merely adopting a different schedule without engaging in any additional initiatives within a school will have little effect, if any, on student achievement.

Introduction

The school reform movement through the 1980s and 1990s prompted school district administrators to critically examine the influence of secondary school scheduling models on instructional practices. Recognizing that the school schedule governs how curriculum content is presented to students, thereby affecting students' abilities to master the content, the National Education Commission (1994) advocated for more flexible time scheduling and the creation of extended blocks of time for learning.

Given that extended-block-of-time scheduling is not a new phenomenon, Iowa State University and ACT, joined forces in the Summer and Fall of 2000 to look at 568 public high schools from the states of Iowa and Illinois that utilized block-scheduling, and whose seniors had completed the ACT Assessment during 1999. Of these 568 schools, 67% of Illinois' and 66% of Iowa's graduating seniors took the ACT Assessment. This produced an N count of 38,089 students.

In this paper we will present an historical view of block-scheduling and provide preliminary results regarding whether the use of block-scheduling improves student performance on standardized tests or not. The use of standardized tests as a litmus test for academic achievement is based on the notion that scores from such tests are often ones that colleges and the public-at-large use as a measure of achievement. The first part of the paper is a snapshot of the history of block-scheduling, and the second part is a brief overview of the study conducted.

Historical Overview

The secondary school schedule can be described as a plan to bring together people and curriculum at a designated time for instruction. An exemplary instructional structure empowers teachers to make pedagogical decisions based upon the learning needs of their students, without being constrained by such barriers as insufficient instructional time or the inability to make flexible use of time allocated for instruction. As the secondary school has evolved throughout history, the creation of a uniform scheduling model has emerged as an organizational solution to the problem of efficiently educating students, while simultaneously attempting to appropriately address individual learning needs.

Before the 1900s, instructional flexibility was inherent in the structural design of early high schools and

academics. Subjects were routinely offered in varied formats with each course differing in the number of days per week in which instruction was delivered (Gorman, 1971). However, in 1892 the Committee of Ten on Secondary School Studies, charged with the task of standardizing the high school curriculum, proposed a rigid sequencing of subjects that primarily were designed as preparatory to college entry. In 1895 the Committee on College Entrance Requirements subsequently suggested standardization of the number of credits required for college admission. This recommendation led to the adoption of the Carnegie unit by the College Entrance Examination Board in 1909, which mandated a total of 120 hours of classroom instruction, based upon a school year of 36-40 weeks and class periods of 40-60 minutes in duration (making this approximately three hours a week per subject)(McNeil, 1996; Ornstein & Hunkins, 1998).

The movement toward a uniform instructional unit was influenced in the early 1900s by the scientific management era, with its emphasis on efficiency, work uniformity, mass production, and the identification of the one best way for task completion. Ellwood Cubberly, education professor at Stanford University and former superintendent of schools, advocated the extension of the factory model approach to the educational arena. Cubberly noted, "Our schools are in a sense, factories in which the raw products (children) are to be shaped and fashioned into products to meet the various demands of life" (Cubberly, 1916, p388). During this era, the daily-period schedule was created wherein class met 40-60 minutes each day. The schedule was a time-efficient means to standardize the education of mass numbers of students.

There were relatively few attempts to deviate from the traditional daily-period schedule until the late 1950s and early 1960s, when the flexible modular schedule appeared on the secondary school scene. Tremendous flexibility was the hallmark of this approach, with instructional sessions scheduled according to the number of modules (small instructional units) needed to teach a concept (Trump & Baynham, 1961). This model provided teachers and administrators with the ability to arrange courses in varied formats throughout the school week, with classes potentially meeting daily or on alternating days, and with differing module lengths, depending on the planned learning activities.

Modular scheduling reached its peak in the late 1960s and early 1970s, with approximately 15% of the nation's high schools experimenting with this approach (Goldman, 1983). Although many students and teachers perceived the model as being successful, it was exceptionally difficult for school leaders to develop a well-crafted master schedule. As a result, high percentages of students remained unscheduled at various times during the day, which led to problems with student supervision and increased disciplinary referrals. Additionally, teachers frequently were unprepared to adapt their teaching methods to the varied module lengths (Goldman, 1983). Consequently, although some vestiges still remain, modular scheduling essentially began to fade from the secondary scene, and the overwhelming majority of schools utilized daily-period scheduling through the late 1970s and 1980s.

The publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) in the 1980s provided the impetus for the school accountability movement that continues to the present time. Calls for educational reform rose from a variety of sectors, and the status quo, particularly in relation to secondary school curriculum and instruction, no longer remained unquestioned. In 1994, *Prisoners of Time* (National Educational Commission on Time and Learning, 1994) denounced the rigidity with which educators approached the learning process: "The degree to which today's American school is controlled by the dynamics of clock and calendar is surprising" (p. 7).

A new concept for teaching and learning, constructivist theory, began to emerge in the late 1980s. It challenged the time-honored instructional practices of direct instruction and the lecture method. In contrast to behaviorist theory, which focused on the process of teaching, constructivism maintains a focus on the student's role in the process of learning. Constructivist principles include the concept of actively engaging the learner in the process of constructing meaning, encouraging social interaction, applying new concepts in context-based problem-solving activities, and metacognition throughout the process (Glatthorn, 1995). Proponents of constructivism assert that depth of knowledge is desirable over surface coverage of content.

Educators striving to create constructivist classrooms express the need for larger blocks of instructional time, so that learners may be actively engaged in the process of making meaning (Elmore, 1995). Although not specifically referring to constructivist theory in its *Breaking Ranks* report, the National Association of Secondary School Principals (NAASP) (1996) recommended that high schools promote active student involvement in the learning process. Furthermore, noting the deficiencies of the traditional departmentalization of subjects employed in most high schools, NAASP also advocated an interdisciplinary approach to learning, to facilitate learning connections among the disciplines. To fully develop these recommendations, NAASP suggested that faculties develop flexible scheduling models that

utilized larger blocks of time than the traditional daily-period scheduling approach.

High School Scheduling Approaches: Current Status

Prompted by the educational reform movement, in the late 1980s high school educators began to experiment with several creative approaches to organizing the school day. Although taking a variety of forms, current high school scheduling models generally can be divided into four categories: a) daily-period, b) block-of-time, c) modular/flexible, and d) combination. These approaches are described briefly in the following paragraphs.

Daily-Period Schedules

The daily-period schedule separates the instructional day into equal divisions of time, known as "periods." Six-, seven-, and eight-period schedules are the most common, with periods approximately 42-55 minutes in length. The average period length is 51 minutes (Canady & Rettig, 1995b). Faculties typically are categorized by departments, and curriculum is delivered in disciplinary fashion. The primary advantages of this approach are that students can be scheduled into their course selections with relative ease, teachers and students quickly establish a daily routine, and concepts (arguably) can be efficiently covered in shorter timeframes.

As noted previously, the daily-period schedule has drawn increasing criticism in recent years. Critics assert this model fragments the instructional day, reinforces use of the lecture method, discourages in-depth treatment of content, and does not promote cross-disciplinary learning connections. Furthermore, since teachers frequently teach five or more classes and have contact with 160 students or more each day, positive teacher-student relationships are difficult to maintain (O'Neil, 1995).

Block-of-Time Schedules

Arriving on the high school scene in earnest in the late 1980s, block-of-time schedules represent the fastest growing scheduling type in the nation. It is estimated that approximately 30% of the nation's high schools currently utilize some form of block-of-time-schedule (Rettig & Canady, 1999). Block schedules carve the school day into larger timeframes of 75-100 minutes, typically double that of the daily-period approach. The models can vary greatly in format, but two approaches have emerged over the past decade as the most frequently employed: the alternating-day schedule and the 4x4 semester plan.

Alternating-day block-schedule— With the alternating-day schedule, also called the A/B schedule, students receive instruction in one-half of their classes on alternating days and are enrolled in their courses throughout an entire academic year. An eight-block model is the most common arrangement; for example, blocks 1-4 and 5-8 rotate on a two-day cycle throughout the year (Hackmann, 1995b), although a small number of schools have elected to implement six- or ten-block alternating-day

models. Some schools elect to use a seven-block model, in which students enroll in seven classes. In this approach, blocks 1-3 and 4-6 alternate, and the seventh class (sometimes called a “skinny”) meets daily. If blocked classes were 90 minutes in duration, the “skinny” would meet for 45 minutes.

4x4 semester plan— With the 4x4 semester model, classes are scheduled in instructional blocks that meet for one semester only. The student enrolls in four classes the first semester and another four the second, for a total of eight for the academic year. One variation is the 3x3 plan, in which students complete three blocked classes each semester and a “skinny” which meets the entire year, for a total of seven courses. The Copernican plan (Carroll, 1989) displays similarities to the 4x4 model, although it utilizes a trimester approach. In this model, students would complete nine courses in an academic year.

Block scheduling advocates point to positive changes in the building climate, including decreased disciplinary referrals, improved teacher morale, improved teacher-student relationships, fewer daily teacher preparations, improved attendance, and more active student involvement in learning (Buckman, King, and Ryan, 1995; Hackmann, 1995a; Wilson, 1995). Disadvantages of block scheduling include students’ inability to maintain attention levels during the longer timeframes, difficulties implementing constructivist teaching methods, and a potential need to hire additional staff (Hackmann, 1995b). Extensive professional development is necessary to train teachers in effective use of the blocks and some teachers may be unwilling to change their instructional methods.

Modular/Flexible Scheduling

With modular scheduling, which is attributed to J. Lloyd Trump, the school day was subdivided into numerous small “modules,” each 10, 15, or 20 minutes in length, and classes were flexibly scheduled according to the number of modules deemed necessary for content instruction (Trump & Baynham, 1961). As previously mentioned, this approach affords educators the ability to move away from uniform, routine instructional days and provides a seemingly limitless number of instructional formats for class sessions. The primary advantage to this highly flexible scheduling type is that it “avoids the necessity of giving equal time to unequal subjects” (George & Alexander, 1993, p.371). Additional time can be allocated for core academic classes (language arts, social studies, math, and science), while elective offerings may have instructional time reduced. The schedule can be adapted to provide extended time for laboratory exercises or field trips, or shortened when direct instruction on a specific concept is necessary.

The disadvantages of this model were described earlier and will be expanded upon briefly. As mentioned, creating a master schedule with few student conflicts could be a logistical nightmare for an inexperienced scheduler. Additionally, the large periods of time in which students could be unscheduled, and possibly not closely supervised, could provide administrative challenges. Some students

may not be sufficiently mature to make full use of their unscheduled time for independent study. Finally, since no two days may be similar in a flexible schedule, it can be difficult for teachers and students to settle into a daily routine with a modular approach.

Combination Models

Some schools have created hybrid models that incorporate components of multiple approaches, in an effort to capitalize upon the best features of each. These combination models typically fall into three categories: a) daily-period schedules with disciplinary blocks, b) daily-period schedules with interdisciplinary blocks, and c) combination alternating-day/daily-period schedules.

Daily-period schedule with disciplinary blocks—This approach essentially is a daily-period schedule with a small number of double-period blocked classes. Occasionally, teachers or departments may request that their classes be double-blocked to allow additional time for laboratory work or coverage of increased academic content. Such classes are typically found in science (such as chemistry or physics), or in college-level Advanced Placement (AP) courses where extra time is needed for AP examinations preparation.

Daily-period schedule with interdisciplinary blocks—Since NASSP (1996) recommended that schools integrate the curriculum, some schools are experimenting with the interdisciplinary teaming concept long recognized as a signature practice at the middle school level (George & Alexander, 1993). Teachers and groups of students are being scheduled as a team, usually at the freshman and sophomore levels, with large blocks of time provided for instruction in language arts, science, mathematics, and social studies. Teachers have the flexibility to divide their blocks, which encompass four periods, in any fashion they feel is appropriate for their instructional needs (Hackmann & Waters, 1998). The remainder of the school is scheduled in traditional daily-period fashion.

Combination alternating-day/daily-period schedule—This combination includes features of both period and block models. For example, an eight-block alternating-day model may be modified so that all classes will meet one day each week (blocks 1-4 M-W-F, blocks 5-8 Tu-Th-F) rather than changing on each week. Other models may rely more heavily on the daily-period approach, scheduling all eight periods on M-Th-F with blocks 1-4 Tuesday and blocks 5-8 on Wednesday. In another approach, some schools have elected to schedule the morning classes in blocked format, while reserving afternoons for three or four daily-period classes.

The perceived benefit of combination models is to provide the “best of all worlds.” Larger instructional blocks are regularly provided, permitting variety from one school day to the next. One disadvantage is that a combination model simply may have been adopted as a compromise between two groups of faculty—those supporting a block approach and those favoring the daily-period model—and actually may not satisfy anyone.

Until now there has been little empirical evidence that supports the contention that block-scheduling enhances student achievement. Block-scheduling does not appear to be supported by a large empirical research base. In the past, it was hoped that block-scheduling would produce significantly better results in student achievement as assessed by school grades. However fluctuations in school grades may be hard to attribute to any one variable such as the school schedule type.

One of the greatest challenges in empirically evaluating the influence of schedule type is in determining appropriate measures of student achievement. During a study conducted last summer, relationships between schedule type and achievement measured by the ACT Assessment were studied. The study was the first step in an ongoing longitudinal study. The study provides a snapshot between ACT scores and schedule types for ACT scores for one year.

Iowa State University and ACT Empirical Study on Block-Scheduling

The empirical study examined the relationship between scheduling format and average ACT composite scores, after controlling for lifestyle factors indicators (PRIZM), gender, state, school enrollment levels, number of examinees, and years under scheduling model. Participants were 38,089 seniors in 568 public high schools in Illinois and Iowa who completed the ACT Assessment during 1999. This study used mean ACT composite scores from 351 schools using a traditional eight-period day, 161 schools using an eight-block alternating-day, and 56 schools using a 4x4 semester model.

Hierarchical linear regression analysis was conducted to determine if schedule type accounted for significant variability in ACT composite scores. No significant variability was determined. Review of literature and results of the study led to three general conclusions:

- ❖ In general, the findings show that the scheduling type used within a school does not predict ACT composite scores when examined at the school level.
- ❖ The findings suggest that schools that are considering changing scheduling approaches need to weigh various factors and consider scheduling alternatives carefully. If the scheduling type is implemented with no accompanying changes such as professional development or consideration for individual learning styles and needs of students, then the scheduling initiative will likely not be effective.
- ❖ The study suggests that block scheduling may not be the panacea that some advocates believe it to be. Since scheduling models do not exist in a vacuum, the mere adoption with no consideration for other school level reforms likely will have a marginal effect, if any, on student achievement.

Conclusion

School reform, specifically at the schedule level, has been and continues to be a significant vehicle for attempts to improve student achievement. Though many approaches exist, not all are equally effective. Future evolution of scheduling models is necessarily a function of philosophical, political, and empirical evidence as they apply and appeal to the school district level. In the end, we need all three perspectives to agree on what constitutes an appropriate model for a given school. It is the pursuit of this empirical evidence that we will be undertaking to inform and enlighten scheduling decisions.

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educationists to occupy themselves with history. But is history really an essential part and if so, why?

Another open question remains. The degree of education of a human being is usually measured according to the amount and the nature of the knowledge, which this human being has acquired in the course of its life. For this reason for example a curriculum vitae always delineates the educational background in detail. There can be no objection to such knowledge collected in an individual biography. In Platon's dialogues its acquisition is taken for granted, as well, but he wouldn't have gone so far as to call that knowledge *paideia* [education in the full sense of the word]; and in the tradition of German pedagogy, we wouldn't go so far as to speak of *Bildung*. Platon's dialogues as well as the neo-humanistic education theory in Germany are orientated towards other aims. I have learned from Plato that we have to ask for the *spirit* of knowledge, for the sense it makes in a given society, and for the principles that guide the application of knowledge. I agree with Platon that there is no conclusive answer to be given, and that the answer can rather be found in the preoccupation – asking questions in a way, though, that is as intense and profound as Platon demonstrates it in his dialogues. Is that sufficient in our days, or is it even a luxury that, as in Socrates' society, only the upper classes can afford

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