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The Power of Innovative Scheduling

Alternative schedules may not add hours to the school day, but they can vastly improve the quality of the time students spend at school.

Robert Lynn Canady and Michael D. Rettig

Scheduling is a valuable but untapped resource for school improvement. Through our work in schools across the country, we have seen again and again how a well-crafted schedule can

- result in more effective use of time, space, and resources (human as well as material);
- improve instructional climate;
- help solve problems related to the delivery of instruction; and
- assist in establishing desired programs and instructional practices.

We believe that Deming was right when he said that it is more often the structure of an organization than the inadequacies of the people who work within it that causes problems (Bonstingl 1992). The examples we'll discuss only hint at the power of scheduling to improve schools. But, first, let's review some problems that scheduling can help alleviate.

Three Issues All Schools Face

Although scheduling varies from elementary school through high school, three areas of concern span all levels.

1. Providing Quality Time

Fragmented instructional time is an issue at all levels. In elementary school, a variety of practices contribute to this problem. For example, haphazardly scheduled pullout programs (for ESL or special education, for example) disrupt classroom instruction; and because the schedules of specialists (for music and art, for example) are created for periods of varying length, core teachers must plan instruction around the remaining chopped-up time. In addition, when special programs classes meet just once a week for a short period, students receive piecemeal instruction.

At the middle and high school levels, fragmentation occurs in a different way. Students traveling

through a six-, seven-, or eight-period day encounter the same number of pieces of unconnected curriculum each day, with little opportunity for in-depth study. In middle schools, this problem may have been exacerbated by exploratory programs, which in many schools have evolved from risk-free explorations to full academic courses with tests, grades, and homework.

Recently we worked with a district where students spent four periods daily in English, mathematics, social studies, and science, and two periods in six-week exploratory "wheels." In other words, students saw 4 core teachers and 12 exploratory teachers during the year. Is having so many teachers per day and per year consistent with what we know about middle school students?

2. Creating a School Climate

The daily schedule can have a great effect on a school's climate. At the elementary level, discipline problems can result from the way small-group reading and math instruction is scheduled. Many teachers continue to divide their classes into reading, language arts, and math groups, which meet separately with the teacher while other students complete worksheets or work in learning centers. All too often, teachers must interrupt small-group instruction to address discipline problems that arise in the back of the room.

In middle and high schools, traditional schedules create at least four situations that may contribute to the number of discipline problems.

- Many disciplinary referrals result from scheduled transitions, when large numbers of students spill into hallways, lunchrooms, and commons areas, or congregate in locker rooms and bathrooms. If students are not sent to the office directly, the problems often carry over into the classroom, where teachers must deal with them before beginning instruction.
- The assembly-line, traditional period schedule contributes to the depersonalizing nature of high schools. When teachers are responsible for 100–180 students daily, and students must answer to six, seven, or eight teachers a day, it is nearly impossible to develop close relationships, which may help reduce discipline problems.
- Short instructional periods may also contribute to a negative classroom climate. When students who misbehave do not respond to a quick correction, many teachers send them to the office. With only 40- to 55-minute class periods, these teachers view any time taken away from classwork as unacceptable.
- The middle school schedule, in particular, often makes teaming efforts difficult. Students in seven-period schools often are enrolled in three non-core classes, while the four-teacher teams—one teacher each from English, math, science, and social studies—are assigned five classes daily. Thus, during many periods of the day, 20 percent of the students are "off core." As a result, teams must remain in a period schedule, and the team structure, which usually facilitates disciplinary control, is weakened.

3. Providing Varying Learning Time

Perhaps the most critical (and unresolved) time allocation issue that schools face is the

indisputable fact that some students need more time to learn than others. In secondary schools, reliance on the Carnegie unit has made all students "Prisoners of Time" (National Education Commission on Time and Learning 1994). High schools, and to a lesser extent middle schools, experience this problem, especially in late January. After receiving their first-semester grades, some students conclude that they will not pass the subject regardless of their performance during the second semester. Believing they have nothing to gain by doing the work, some of these students act out and skip classes. In a way, we *have* created a system to handle students who need more time to learn: we give them *F*s and make them repeat the course during summer school or the next academic year!

On the other end of the spectrum, possibilities for acceleration in U.S. schools are very limited. Most districts, however, offer one celebrated occasion for advancement. At the end of 7th grade in middle and junior high schools, teachers must decide whether or not a student should enroll in algebra during the 8th grade. This inflexible system forces instructors to make premature decisions about a student's potential in mathematics. If the school schedule were not as rigid, perhaps educators could make the decision to accelerate students at more appropriate times.

In elementary school, our usual reaction to the need for different amounts of time for learning is to provide individual assignments to those who learn quickly, and to regroup, slow down, and provide pull-out programs for those who need more time. The problems with these accommodations are that (1) sometimes the activities provided for those who learn quickly are thrown together haphazardly (Renzulli 1986), and (2) students placed in the lower groups fall farther behind. In addition, students in pullout programs often are stigmatized by their participation in them.

Scheduling as a Solution

Redesigning the school schedule can help address each of these three issues. We begin with the elementary school.

Elementary School Scheduling

A number of elementary schools across the country have adopted parallel block scheduling to reduce instructional fragmentation, improve discipline, and provide regularly scheduled, yet flexible, opportunities for extended learning enrichment (Canady 1988, 1990; Canady and Reina 1993). Figure 1 illustrates part of such a schedule, designed for four base teachers and an extension center.

Teachers A and B work with their homeroom classes for an uninterrupted 100 minutes to begin the time block shown. They can use this time for language arts and social studies or perhaps for a whole class reading lesson. Teachers A and B may team together for this block if desired.

During the next 50 minutes, Teacher A works with Reading-Writing Group 1; Teacher B instructs Group 3. Teaching about half of the class, the base teacher conducts a reading group, or a writers' workshop, or perhaps conferences with individual students. Discipline is improved because independent groups are no longer in the back of the room. The extension teacher picks up Reading-Writing Group 2 from Teacher A and Group 4 from Teacher B and escorts these students to the extension center.

Figure 1. A Parallel Block Elementary School Schedule for Four Base Teachers and an Extension Center

Teachers	50 mins	50 mins	50 mins	50 mins
Teacher A	Language Arts & Social Studies (Reading-Writing Groups 1 & 2)		Reading-Writing Group 1	Reading-Writing Group 2
Teacher B	Language Arts & Social Studies (Reading-Writing Groups 3 & 4)		Reading-Writing Group 3	Reading-Writing Group 4
Teacher C	Reading-Writing Group 5	Reading-Writing Group 6	Language Arts & Social Studies (Reading-Writing Groups 5 & 6)	
Teacher D	Reading-Writing Group 7	Reading-Writing Group 8	Language Arts & Social Studies (Reading-Writing Groups 7 & 8)	
Extension Center	Reading-Writing Groups 6 & 8	Reading-Writing Groups 5 & 7	Reading-Writing Groups 2 & 4	Reading-Writing Groups 1 & 3
Note: Depending on the size of the school, this plan can work with four 5th grade teachers, two 4th and two 5th grade teachers, or four teachers of four different grade levels.				

At the end of this 50-minute period, the extension center teacher returns Reading-Writing Groups 2 and 4 to their classrooms and picks up Groups 1 and 3 for their extension time. The rest of the school day is devoted to math, science, music, the arts, and physical education. Sleepy Hollow Elementary School in Fairfax County, Virginia, has operated a similar schedule for the past four years.

In the extension center, students who need more time to learn receive assistance through reteaching and reinforcement, and they have opportunities for practice. Any pullouts for special services—special education, English as a second language, gifted and talented, or Chapter 1—

are provided during extension center time. Students who have mastered basic concepts work on enrichment activities.

The extension center position can be staffed in different ways. Increasing homeroom size frees up regular teaching staff. An alternative is to staff the center with Chapter 1, English-as-a-second-language, gifted and talented, or special education teachers. Still other options are to use the computer lab or a foreign language program as the extension center or to rotate library/media, guidance, and reading enrichment professionals for a specific period of time (three weeks, for example).

Other Tips for Elementary Schools

- Schedule all specialists for equal periods of instruction on a rotating schedule during the same time block each day. Consider four- or six-day cycles, rather than the unwieldy and unfair Monday through Friday schedule.
- Rotate shared itinerant specialists who travel to different schools on a nine-week or semester basis, rather than two days a week here and two days a week there.
- Schedule recess time contiguous to another class change such as for lunch or specials' classes to reduce time lost to movement.
- Avoid short periods of time such as 15-minutes between lunch and specials. These often are wasted.

Middle School Scheduling Models

We'll look at three models at the middle school level.

The four-block schedule. One schedule being used with increasing frequency across the country greatly reduces fragmented instruction. In the four-block schedule, students spend one block of the day (about 90 minutes) in language arts, a second block in mathematics, and a third block in either social studies or science. The block of social studies/science is rotated every other day, every other unit, by semester, or on some other basis. Students spend the fourth block of the day in physical education, music, and/or exploratory courses, which meet for 90 minutes every other day. They attend only three academic courses daily.

Language arts and mathematics teachers teach three groups every day for the entire year; social studies and science teachers work with three groups per day, but with six groups for the year; and physical education, exploratory, and elective teachers work with only three groups per day. With this scheduling plan, both teachers and students experience less stress and fragmentation.

The four-block middle school schedule significantly reduces the daily number of class changes, thereby reducing discipline problems. Examples of schools operating this schedule during the 1994–95 year include: Newberry Middle School in Newberry, South Carolina; Goochland Middle School in Goochland, Virginia; and Wilbur Wright Middle School in Dayton, Ohio. Districts that operate the 4 × 4 semester block high school schedule may find this plan a logical transition for middle schools.

The 75-75-30 plan (Canady and Rettig 1993). W. Marshall Sellman School in the Madeira School District in Cincinnati, Ohio, implemented this unique 180-day school calendar for the 1994–95 school year. According to teachers, students, and parents, the program was a great success.

Under the Sellman plan, the school follows a fairly typical middle school team block schedule for the first 150 days. Courses end after two 75-day terms, and students begin their final six weeks of school enrolled in specialized courses, created and designed by teachers. Such specialized courses provide (1) additional learning time for students who have yet to master grade-level objectives, and (2) academically enriching activities for all students. Course titles at the Sellman School include Principles of Mathematics, Team-Accelerated Instruction, Water Science, Inventioneering, Mock Trial, and Fun with Poetry.

The concept-progress model. This approach is another attempt to address students' differing needs for learning time (Canady and Rettig 1992, Canady 1989). Several elementary and middle schools across the country are using it to provide mathematics instruction to heterogenous groups. Figure 2 illustrates one version of this plan.

Figure 2. A Concept/Progress Middle School Model for a Six-Day Cycle with 50- to 60-Minute Periods per Day

Teachers	**1 Monday**	**2 Tuesday**	**3 Wednesday**	**4 Thursday**	**5 Friday**	**6 Monday**
Math A	Concept Math Groups 1 & 4	Concept Math Groups 1 & 4	Progress Math Group 1	Progress Math Group 1	Progress Math Group 4	Progress Math Group 4
Math B	Progress Math Group 2	Progress Math Group 2	Concept Math Groups 2 & 5	Concept Math Groups 2 & 5	Progress Math Group 5	Progress Math Group 5
Math C	Progress Math Group 3	Progress Math Group 3	Progress Math Group 6	Progress Math Group 6	Concept Math Groups 3 & 6	Concept Math Groups 3 & 6
Computer Lab	Groups 5 & 6	Groups 5 & 6	Groups 3 & 4	Groups 3 & 4	Groups 1 & 2	Groups 1 & 2

Math teachers A, B, and C present the basic concepts of a mathematical topic to their entire classes two days of every six-day cycle. Math Teacher A's Concept Math Group meets on Days 1 and 2 of the six-day cycle. During concept math time, the teacher focuses on grade-level instruction, ideally using cooperative learning, providing direct instruction, and, when needed, illustrating with manipulatives. The teacher does not test and grade students in concept groups.

After working with their whole groups, Teachers A, B, and C divide students into two Progress Math Groups—temporary, flexible, homogeneous groupings of students, based on their understanding of the basic ideas taught in the Concept Math Group. Math Teacher A instructs Progress Math Group 1 on Days 3 and 4, and Group 4 on Days 5 and 6. (Note that Progress Math Groups 1 and 4 equal Teacher A's Concept Math Group.) Teachers monitor and adjust instruction during this time, providing enrichment and additional assistance as needed; however, Progress Math Groups remain on the same topic. For example, if teachers have planned to work on long division for 18 days, Progress Math Group 2 might focus on dividing two digits into three digits, while Progress Math Group 5 might be dividing three digits into four. Note, however, that all groups work in long division for the number of days determined by the pacing guide that teachers developed at the beginning of the school year. Students are graded based on their progress within the topic.

In the computer lab, similar adjustments are made in the selection of software for each group. The concept-progress model is just one way of designing the school schedule to serve students with varying instructional needs by providing

- whole-group instruction without the pressure of testing and grading;
- small groups so that teachers can monitor and adjust instruction without having to teach one group while policing another group; and
- both extended learning and enrichment time on an individual student basis.

Other Middle School Scheduling Tips

- Many middle schools can benefit from operating on some of the more popular high school block scheduling models, such as the Day 1/Day 2 schedule. Students have fewer classes daily, and fewer class changes are necessary.
- Consider adding a nontraditional core teacher to the interdisciplinary team. At Glasgow Middle School in Fairfax County, Virginia, a foreign language teacher is now on each 8th grade interdisciplinary team. At other schools, related arts teachers are on teams on a rotating basis. For example, an art teacher might be the fifth person on a team for nine weeks of art, followed by nine weeks of computer technology, nine weeks of teen living, and nine weeks of drama. Being part of the team increases the likelihood that the content of these exploratory subjects will be integrated with the core.
- Another way of reorganizing the 180-day calendar, which is similar to the 75-75-30 Plan, is the 35-(5)-35-(15)-35-(5)-35-(15) Plan. Each semester students attend regular classes for 35 days and have 5 days for reteaching and/or enrichment. Then they continue

regular classes for 35 days and end the semester with 15 days for extended learning time or enrichment/electives (See Canady and Rettig 1995, Chapter 5).

High School Scheduling Models

During the past 10 years, high schools across the country have begun to implement block schedules to address curriculum fragmentation. Many schools operate alternate-day schedules, the 4 X 4 semester plan, and many variations (For a detailed treatment of these plans see Canady and Rettig 1995). Each plan can also have a positive effect on school discipline. Here are two examples.

- *A trimester plan with daily periods for extended learning*. In the fall of 1994, Parry McCluer High School in Buena Vista, Virginia, used a trimester schedule with extended classes for enhanced learning (Canady and Rettig 1995, Chapter 4). In such a plan, students enroll in two classes per trimester; each class meets for two hours in the morning and reconvenes for an additional 45 minutes of extended learning time each afternoon. Nearly all students require this additional time for learning; however, a few have been permitted to contract out of the extended learning time for advanced study with another faculty member. An equally small number of students require more time than can be allocated each trimester to complete course objectives. If these students have worked hard and simply need more time, they may be granted an "Incomplete," which they can make up during extended learning time of the next trimester.
- *A schedule that provides algebra for all students*. In one school district—where 40 percent of the students enrolled in first-year algebra failed the course, and where approximately one-third of the students who had passed the course the previous year failed the state proficiency examination—we designed the following schedule to provide varying learning time for students in Algebra I.

As shown in Figure 3, four sections of Algebra I are scheduled in the same period or block, and the curriculum is divided into four distinct segments. During Quarter 1, all students begin together as heterogeneous groups with teachers A, B, C, and D. After completing Quarter 1, students who need more learning time are regrouped into a separate section, which repeats Part 1 with Teacher D during Quarter 2. Teachers A, B, and C continue Part 2 of the course with students who, at the time, are performing successfully. At the end of each quarter, teachers determine whether a regrouping is necessary. When a group must repeat one of the four parts of the course, we recommend using a different teaching approach—for example, having that teacher reteach the group using a software package in the computer lab or having one of the other four teachers reteach that part of the course.

Figure 3 shows some students finishing the course in four quarters, and some in five, six, seven, or even eight quarters. Variable learning time is provided for students, and no student is forced to sit through a repeat of the entire class. The same idea shown in Figure 3 can be designed for English, particularly for grade 9 students, by basing the parts of the course on an identified sequence of writing and reading skills.

Figure 3. A Middle School Schedule That Provides Varying Learning Times for Students Taking Algebra I

<table>
<tr><th>Quarters</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr>
<tr><td>Teacher A</td><td>Part 1</td><td>Part 2</td><td>Part 3</td><td>Part 4</td><td colspan="4">Students take new course. Teacher offers new course.</td></tr>
<tr><td>Teacher B</td><td>Part 1</td><td>Part 2</td><td>Part 3</td><td>Part 4</td><td>Part 4</td><td>Computer Lab</td><td colspan="2" rowspan="2">½-credit electives available</td></tr>
<tr><td>Teacher C</td><td>Part 1</td><td>Part 2</td><td>Part 2</td><td>Part 3</td><td>Part 3</td><td>Part 4</td></tr>
<tr><td>Teacher D</td><td>Part 1</td><td>Part 1</td><td>Part 2</td><td>Part 2</td><td>Part 3</td><td>Part 3</td><td>Part 4</td><td>Part 4</td></tr>
<tr><td colspan="9">Note: The Algebra I curriculum is divided into four parts. Quarters indicate the time it would normally take to complete 1/4 of the course. In a single period or A/B schedule, this would be nine weeks. In a 4 × 4 semester plan, this would be four and a half weeks. (For more information about these scheduling plans, see Canady and Rettig 1995.)</td></tr>
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Other High School Scheduling Tips

- Schools may periodically alter the regular schedule so that each class meets for a full day on a rotating basis. For example, in a six-period school (on a six-day cycle), teachers would meet with each of their five classes for a full day and then have a full day off for planning or professional development.
- Some schools have scheduled one long lunch period rather than two or three short periods. During this extended time the library, gym, computer lab, and outdoor recreational areas are opened for student use. Teachers schedule office hours for extra help; club meetings and other activities also may be held. Several serving sites are necessary to accommodate students purchasing lunch.

Harnessing the Power of Scheduling

We've looked at ways that some elementary, middle, and high schools have redesigned their schedules to reduce curriculum fragmentation, discipline problems, and student failure. We need to move beyond individual school models of scheduling, however, and toward districtwide plans.

Ultimately, we envision students progressing from school to school in a seamless design. Such a plan may even enable 5th and 8th grade teachers, for example, on an every-other-year basis, to continue with their students during their first year in middle or high school.

Only in the last decade have educators begun to capitalize on the potential of scheduling to improve schools. With open minds and equal doses of creativity and technical expertise, school administrators, teachers, parents, and students can harness this power.

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Robert Lynn Canady is Professor, Department of Educational Leadership and Policy Studies, Curry School of Education, University of Virginia, Charlottesville, VA 22903-2495. **Michael D. Rettig** is Assistant Professor, School of Education, College of Education and Psychology, James Madison University, Harrisonburg, VA 22807.

Association for Supervision and Curriculum Development (ASCD)
1703 N. Beauregard Street, Alexandria, VA 22311 USA • 1-800-933-2723 • 1-703-578-9600