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Scheduling Secondary Schools: Questions and Answers

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SCHEDULING

SECONDARY SCHOOLS:

QUESTIONS AND ANSWERS

Submitted by:

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Executive Summary

Some researchers believe scheduling techniques have changed frequently and dramatically since the early 1960s. And, there is no doubt that changes have occurred in education. Changes such as the development of computerized scheduling techniques in the 1960s; the increase in the number of courses offered; the concern for equal opportunity; the individualization of instruction; and the increase in the variety and flexibility of scheduling models available to schools, led to a growing awareness of accountability by the 1970s (Dempsey & Traverso, 1983). The quality of individual opportunity prompted educators to revitalize conventional scheduling, and to consider diverse options.

Though such changes have taken place, however, other researchers maintain that there has been little variation from the basic format of secondary education established over one hundred years ago. Indeed, the research data indicate that the schedule currently being used by the majority of secondary schools in the United States is the traditional schedule (Kosanovic, 1994). Proponents of the traditional schedule model (also known as the classic model, the conventional schedule, the Carnegie structure, or the mass-production classroom model) point out its many advantages. For example, the conventional schedule offers security and ease of scheduling work experience programs; builds on ability grouping, subject matter, and grade-level divisions; and encourages teacher specialization and separation of teaching from administration.

Some educators, however, believe the "old" schedule restricts teaching strategies, flexible grouping, individualized instruction, and independent study, and may have outlived its usefulness (Carroll, 1989; Kosanovic, 1994; Northwest Regional Educational Lab, 1990). Such educators believe that alternative scheduling will best meet the needs of their students and staff. But, the use of non-traditional scheduling sometimes leads to confusion during the process of implementation (Weiss, 1972).

Although disagreement exists, it seems educators agree that all curricular offerings should be taught in a manner which maximizes the ability to learn -- and that this probably is not possible for all subjects in the same structural format (Anderson, 1966). In fact, there is a growing body of evidence that school administrators should direct greater attention to the structuring of the school day. Organization is critical to a successful school operation, and an effective school structure is achieved primarily through the scheduling process (Canady & Hotchkiss, 1985). The schedule is the time-management tool that enables educational programs and objectives to be implemented (Shaten, 1982).

Because of the importance of scheduling, thorough analysis of scheduling options is

needed to aid the development of individual schedules for secondary schools. Knowledge of scheduling and scheduling options is one of the most important educational tools at the service of administrators, teachers, and students. In fact, the quality of the schedule mirrors the competence and experience of the principal and the administrative team. The scholar today

must have a sophisticated knowledge of manual and computerized scheduling techniques, and understand the balance between flexibility and accountability in an effective schedule.

But, whether manual or computerized, conventional or flexible, each approach has its peculiarities. Plus, a schedule can vary significantly from school to school and, with time, even in the same school. The effective administrator must be an authority over these similarities and differences. The schedule must provide appropriate course offerings, time arrangements suitable to effective instruction, and be able to support the individual learning needs of the students. Schools must not allow student needs to become secondary to the prescriptions of the schedule (Dempsey & Traverso, 1983).

It must be remembered that basic to any change in a school system are the components which will be affected by the change. The components are the students, administration, faculty, and community. By planning and initiating the change according to a sound strategy, the change can have a positive influence on the school and its administration, faculty and students (Weiss, 1972).

Schedulers must also realize that the practices of grouping, staffing, and scheduling in particular schools and grades will be influenced by the demographic characteristics of students and staff (e.g., the school's enrollment size, grade levels, heterogeneity of student background, and distribution of teacher specializations), and by the school's underlying assumptions about how best to deliver instruction to its students. Within the demographic constraints of a school, decisions about school practices at each grade will be strongly influenced by direct or indirect assumptions about two key dimensions: 1) curriculum requirements, and 2) students' developmental needs (McPartland, 1987).

In sum, scheduling is a program and time design involving the orchestration of students, teachers, curriculum, materials, and space to creating an optimal learning climate. When carefully done, scheduling facilitates the curricular and personnel decisions of the entire school community. The goal of the schedule, then, is to facilitate the functioning of the whole school program. Scheduling seeks to provide teachers and students with the freedom and structure to pursue profitable instructional goals.

SCHEDULING SECONDARY SCHOOLS:
QUESTIONS AND ANSWERS

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CONTEMPLATING CHANGE

"While it is possible to change without improving, it is impossible to improve without changing"
Carroll, 1990

QUESTION ONE:
What drives a school to change?

Under the traditional structure, teachers typically teach five classes, each approximately 45 minutes in length, and usually deal with about 125 students each day. Too often teachers deal with up to 150 students per day. Virtually all the research concerning better instructional practice emphasized greater individualization of instruction. But, proponents of alternative schedules insist that secondary teachers are caught in a structure that fosters lecture-centered, large-group-oriented instruction and sharply limits their efforts to individualize (Carroll, 1994a).

Additionally, the conventional structure is seen to have an adverse impact on students as well. Students typically enroll in six courses that meet daily during a 180-day school year. In a typical high school, which may have up to seven periods plus a home room and a lunch period, students may be in nine different locations pursuing nine very different activities during the course of an approximately 6½

hour school day. And, regardless of subject, students are taught in classes lasting approximately 45 minutes. Many researchers claim this is an impersonal structure that prevents the teacher from working closely with each student. Indeed, a student may go through an entire day -- or several days -- without having a meaningful interaction with a teacher (Carroll, 1994a).

So, perceiving that the present program of the school is not meeting the needs of the majority of the students, principals can be motivated to change the school's schedule. Or her or she may feel that the staff and students are not utilizing fully their abilities within the present administrative scheduling structure. It is also possible that it is not the principal, but rather state legislature, that recognizes that a restructured education system is necessary. This was the case for public schools in Oregon, after a state law was passed mandating restructuring on the part of the state's public schools (Kosanovic, 1994).

The driving forces for change, then, are basically: 1) dissatisfaction with the present program by the staff and students; 2) concern by staff members regarding what they consider a poor utilization of their abilities; 3) demonstrated anger by students over what they consider an irrelevant curriculum; and 4) pressure by parents who feel that their educational return on their tax dollars is too low (Weiss, 1972). In other words, change occurs when the conventional structure is perceived to be a system under which teachers can't teach effectively and students

can't learn effectively (Carroll, 1994a). It should be noted, however, that change for change's sake can be dangerous and self-defeating (Kosanovic, 1994).

QUESTION TWO:
Who has responsibilities for scheduling?

Since the principal is the educational leader of the building, it is his or her responsibility to organize and oversee the entire scheduling process. Many of the specific scheduling duties may be delegated appropriately to assistant principals, department heads, and counselors, but the principals must direct and supervise the procedures to be followed. Decisions about the basic structure of the schedule, lengths of courses, number of minutes per course days in the cycle, number of periods per day, etc. should reflect the principal's leadership and guidance. All school persons who are affected should have a voice in these important matters, but only the principal can provide the focus and direction.

In addition to the principal, however, everyone within the school community plays a part. The principal's administrative team, department heads, teachers, counselors, and the students can have as active a role as the other participants. The members of the board of education, the parents, the superintendent of schools, and other central office personnel can also enhance or exacerbate the scheduling process (Dempsey & Traverso, 1983).

SECTION TWO:
PLANNING CHANGE

"PLAN, PLAN, PLAN"
Northwest Regional
Educational Lab, 1990

QUESTION THREE:
What are some assumptions
and restrictions involved
in a schedule change?

Assumptions

Schools should not simply assume that the schedule they have been using is the most effective way to structure the school day. There are several questions that should be asked before starting any changes in the scheduling model: 1) Why is the present scheduling model used; 2) What are its weaknesses and strengths; and 3) Is there a better way to achieve educational goals and objectives? (Northwest Regional Educational Lab, 1990)

Assumptions about the following should also be examined: 1) the staff's flexibility regarding a proposed change, 2) the nature of the organization, 3) the value of the goal sought, and 4) the importance of the change effort. These assumptions should be examined thoroughly and the scheduler/principal should feel confident in the direction of the change before the approval of superiors is sought, or before proceeding.

Restrictions

Regarding scheduling restrictions, certain restrictive factors must be addressed early in the process to avoid complications when the cycle is well underway. The more extensive the restrictions, the more complex the scheduling. Restrictive factors include: staffing, rooms, courses, and negotiated contracts. When establishing the schedule, considerations must also be given to state and district mandates, student needs and facility limitations. The following questions are designed to assist in planning for changes in the schedule (Northwest Regional Educational Lab, 1990):

State and district mandates: Will the schedule provide the minimum class contact hours - will there be quarter, semester, trimester, or year courses? How many class periods will there be each day? Will every class meet every day? What will be the length of each class period? Will each course be offered every year? Will students be able to meet prescribed graduation requirements with the schedule?

State and/or local requirements may affect the way in which a schedule is built. The secondary school administrator should be aware of these external requirements and any restrictions they might impose. The school scheduler must be knowledgeable of district and school policies and procedures about such topics as graduation requirements, length of courses, periods in the school day, days in the

scheduling cycle, building clusters, program modifications, study hall configurations, and lunch schedules. Even though the curriculum may be totally determined and rigidly monitored by the school board or a committee, administrators still will probably determine the form and arrangement of the schedule. The administrator must differentiate between those aspects of scheduling which do or do not allow for local option (Dempsey & Traverso, 1983).

Staffing restrictions: How will the schedule accommodate shared staffing with other schools in the district? How will the schedule impact part-time staff? Are there specialized courses which require unique staff qualifications? Are there contract limitations on teacher load assignments? What are teacher strengths and preferences?

Budgetary constraints, student enrollment, negotiated contracts, and restrictions imposed by the teacher union contract (where it exists) are some of the factors that impinge in staffing requirements. Other staffing requirements and considerations include: variable staff loads, implications of course tallies, curricular assignments, team teaching, and long-term considerations.

Student needs: Will the schedule promote student learning? What should happen educationally to the students? Beyond course offerings, what are desired student outcomes relative to attitudes, values, behaviors, content knowledge and

experiences? How many limitations will there be on student electives because of scheduling conflicts? Will there be minimum course enrollment numbers? Will there be more than one section of a particular course to avoid scheduling conflicts? Will the schedule accommodate the differing aspirations of students, i.e. college preparation courses, vocational education courses?

Regarding the curriculum, the scheduler must be thoroughly familiar with and keep current the school's catalog of course offerings/program of studies. Also, student registration process must be developed and supervised, including any preregistration plans that must be made.

Facility limitations: Will the schedule allow flexibility in room assignments for large or small class meetings? Are there seating restrictions in classrooms? Will study halls be scheduled? If learning resource centers (i.e., language labs, science labs) are utilized, will there be adequate equipment and supplies available? How and where does the lunch period fit into the schedule?

The scheduler must be thoroughly familiar with the building layout. In putting together the master schedule, the scheduler must make the most efficient use of available space, differentiating among general purpose classrooms, specialized classrooms, large-group rooms, small-group rooms, seminar rooms, school-within-school, and departmental arrangements. The scheduler must also take into account

the basic floor plan, student traffic throughout the building (especially to and from the cafeteria and the gymnasium, and in the stairwells), room interchanges, teachers without homeroom stations, teachers who work in more than one department, variances in room size, and specialized rooms. A well-designed room chart showing the dimensions and listing estimated capacity is a necessity for any well-organized scheduler. Such a chart will help prevent the improper placement of students and the inappropriate use of rooms (Dempsey & Traverso, 1983).

QUESTION FOUR:
What role does school philosophy have in scheduling?

Educational Philosophy

Each school has its own set of principles that guides its administration and structure. These principles are commonly referred to as the school's educational philosophy. The degree to which students are allowed to contribute to the scheduling process reflects the school's educational philosophy, the flexibility of its scheduling mechanisms, administrative awareness of options, and the willingness of the school to promote student participation (Dempsey & Traverso, 1983).

Since schools should act according to their institutional beliefs, the relationship between the established educational philosophy of the school and the scheduling process should be direct and harmonious. If the school-adopted guidelines for student scheduling and the fundamental purposes of the school and district are not in agreement, an unsound environment that is counterproductive to learning may result.

The school schedule makes visible and evident the educational philosophy of the institution. The school's scheduling model should also reflect district and community curricular philosophy, staff strengths, and needs of the students and

community. If the basic philosophy is traditional, the schedule will likely be a conventional one. If the philosophy is nontraditional, the schedule will probably be flexible or individualized (Dempsey & Traverso, 1983).

Operating Principles

In addition to a school's educational philosophy, or institutional principles, schools have principles that guide their general operation. Anderson (1966) identified six operating principles that should be considered the foundation for any restructuring plans:

1. The size of a group shall be appropriate to its purpose.
2. The composition of a group should be appropriate to its purpose.
3. The time allotments assigned to any group must be appropriate to its purpose.
4. The physical and psychological environment must be appropriate to the activities of the group.
5. The nature of a task assigned to a staff member must be appropriate to his talents and interest.
6. The nature of the supervision provided for a group depends on the nature and the purpose of the group.

QUESTION FIVE:
What are some considerations
regarding course offerings?

Term Length

State and district standards will mandate the number of credits in specific courses that are required of a student for graduation from high school. Within these mandates, variation may allowed as to how a school divides the school year into terms, i.e., quarters, semesters, or trimesters. Within a master schedule, some courses can be scheduled for semester credit, and, at the same time, others can be scheduled for quarter credits. Quarter scheduling can increase the number of course offerings while not interfering with courses that will be offered for one or two semesters.

Using trimester scheduling can also expand the number of course offerings within the yearly schedule framework. If a trimester approach to scheduling is adopted, it should be for all courses. Exceptions would exist for "mini-courses" - those which would be for designated increments of the trimester. Mini-courses provide exploration opportunities for students (Northwest Regional Educational Lab, 1990).

Frequency of Course Offerings

Secondary schools have certain courses which must be offered every year, regardless of the number of students enrolled, in order that students can acquire required credits toward graduation. However, elective courses may be offered only if a specific minimum number of students enroll. In small schools, this may mean that a desired course is never offered because enrollment figures are too small. To compensate for this problem, some schools rotate course offerings on a yearly basis. An example would be to offer chemistry and physics in alternate years. Some other course offerings may be suitable for rotation on a semester basis.

By alternating years or semesters for elective course offerings, students are not deprived of the elective options, and teachers receive some relief from excessive preparation demands. Some small high schools rotate courses on yearly plans wherein a course may be offered every other year or only once in four years. In circumstances where a course is offered only once in four years with all students enrolling, the teacher assigns work that is appropriate to students' academic skills. Imaginative educational strategies are essential with respect to scheduling because communities want more offerings and electives for the students in their schools (Northwest Regional Educational Lab, 1990).

QUESTION SIX:
How can the schedule improve teacher and student relationships?

Team Teaching

Schools should always consider how the schedule will impact the student-teacher relationship, but the teacher-teacher relationship should also be an issue that influences the schedule that is adopted. Hopefully, teachers will want to work as a team to benefit the learning and achievement of their students. The extent to which the concept of team teaching is carried out will determine variations in the structure of the school's schedule.

When students are instructed by a teaching team, they are exposed to strengths of different teachers and experience a variety of instructional strategies. Teachers also benefit because they can observe other types of teaching and experience greater instructional flexibility (Martin & Pavan, 1976). Team teaching requires teachers to work together toward common goals. Teachers must be willing to share and to not claim ownership to particular classrooms.

When a transition is made to incorporate team teaching strategies, there must be clear understanding of educational goals as well as the purpose(s) for changing to a team teaching format. Generally, teachers have a positive view of team teaching

because it allows for a greater variety of instructional creativity. In a study conducted by Bair and Woodward (as cited by Martin & Pavan, 1976), there were no significant differences in middle-school student achievement when comparing team teaching to individual self-contained teacher instruction, nor were there any detrimental effects on cognitive or affective outcomes as a result of team teaching.

As stated above, team teaching is dependent upon cooperation among instructional staff members. When there are circumstances of personality clashes among staff, team teaching can fail to meet desired outcomes. Success of team teaching techniques also relies upon staff having adequate, mutual preparation time which is needed to integrate instructional materials (Northwest Regional Educational Lab, 1990).

Learning Centers

Utilizing learning centers can provide a multi-grade, multi-course approach to the organizational structure of a school's schedule. Learning center instructional activities can work effectively with small groups to promote cooperative learning which, in turn, enhances student achievement. The teaching-learning relationship is personalized, and the specialized help maximizes opportunities for individualized instruction.

Small schools with 7th to 12th grades, with enrollments under 200, that use learning centers and a system of vertical structuring within the schedule can offer the same (or a better) program of courses as schools with enrollments of 375 (Sederberg, 1983). That is assuming that there are at least nine teachers and a six period day (for a description of Vertical Structuring, see Section Three, Question Nine, this document).

There are no formal class presentations in learning centers. Well trained paraprofessionals can manage and supervise learning centers, but close and on-going communication and cooperation with teachers is mandatory. Although the initial set-up of learning centers requires more preparation for organizing, locating and adapting materials, there are not the day-to-day demands on teacher time once centers are established. By extending the number of teacher contract days or providing an additional preparation period for teachers, these implementation concerns can be met. Learning centers can be consolidated or combined as necessary, i.e., social studies and English, science and math (Northwest Regional Educational Lab, 1990).

QUESTION SEVEN:
What are possible administrative areas of concern?

After implementing an alternative schedule at a high school in Nevada, Anderson (1966) identified several areas about which administrators should be concerned when planning a schedule change. Once the following concerns have been addressed, implementation should run more smoothly:

- Can you define clearly your reason for wanting a transformation of schedules?
- Have you considered and made allowances for staff acceptance and approval?
- Are you oriented to the scheduling process?
- Have you involved yourself in the following steps:

  Studied available literature on scheduling?

  Involved the school administration?

  Visited schools using similar schedules?

  Reviewed the physical structure of the school plant?

  Oriented the community to innovation?

  Prepared the students for change?

QUESTION EIGHT:
What information and/or materials are needed before building a schedule?

In a report on scheduling secondary schools, Dempsey & Traverso (1983) identified information and materials that should be gathered in order to successfully implement a new schedule:

- Times for opening and closing of school
- Length of courses and class periods
- Days in the scheduling cycle
- Time for lunch periods, passing periods, etc.
- Class size limits, and the minimum/maximum number of students needed to offer each course
- Number, size, and special facilities of classrooms
- Number of teachers available (or number to be employed) and their teaching preferences
- Course offerings and organization of the curriculum
- Bases for any special grouping and assignments to special classes
- Organization of any special schedules (assembly period, early release, laboratory or shop periods, overlapping sessions, extended school year programs, etc.)
- Student selection of courses (preregistration)

- A scheduling board, scheduling book, key sort cards, computerized scheduling forms
- Printout of master schedule and student programs

SECTION THREE:
TYPES OF SCHEDULES

"All curricular offerings should be taught in a manner which maximizes the ability to learn--and this probably is not possible for all subjects in the same structural format"
Anderson, 1966

QUESTION NINE:
What are the different types of schedules?

TRADITIONAL

With a traditional schedule, all classes meet the same time every day for equal lengths of time. Exceptions would be courses that may meet fewer days a week such as science labs or physical education classes. Every week is the same for teachers and students (Northwest Regional Educational Lab, 1990). Each day usually contains from five to ten periods, with equal minutes per period (usually 45 to 55 minutes) (Kosanovic, 1994). Each day's schedule resembles that of every other day of the week, and each week's schedule is the same as any other week's schedule (Weiss, 1972).

After investigating the daily schedules of 1,631 high schools, Kosanovic (1994) found not only traditional, or classic, schedules being used, but also modified traditional schedules were implemented. A modified traditional schedule is

described as "a traditional or classic type instructional schedule with a variation provided to the day or week" (p. 2).

The basic traditional schedule remains popular and is used in the majority of secondary schools. Many schedulers return to the security of the traditional model after experimenting with other models because of its simplicity and noncontroversial character (Dempsey and Traverso, 1983).

MODULAR

This is an administrative technique which provides flexible arrangements for the conducting of classes. This is accomplished by viewing the curriculum as an area of modular units and assuming that different kinds of courses require different amounts of time. Each teacher assembles his own course design according to the kind of time and facilities needed for that type of educational activity. Modular scheduling enables the curriculum to be conceived of as an area to be scheduled; made up of sub-parts which are derived from units of time, units of class size, and units of course structure (Weiss, 1972).

A modular schedule is good for administrators who want flexibility and want to restructure their conventional schedules to provide variations in the choices of time patterns for class periods, instructional practices and number of students in group settings. A modular

schedule is characterized by dividing the instructional school day into modules, usually between 10 and 30 minutes each, allowing for flexible class offerings by the day and week (Kosanovic, 1994).

For example, a school could employ a 15-module framework, with each module lasting 25 minutes. Certain subjects such as Algebra I are offered in conventional 50-minute classes each day of the five-day cycle. However, physical education and science labs are scheduled for 75-minute uninterrupted blocks. Or, using 30 minute mods, certain subjects, such as Algebra I, may be offered for two 30 minute mods each day whereas physical education and art may be offered for three such mods every other day. Within a conventional modular schedule, team teaching and some large-group activities can exist. Courses may be scheduled for large group meetings on one day, and small group meetings on other days (Dempsey & Traverso, 1983).

Some researchers have developed a set of questions to ask before implementing a modular schedule (Allan, 1967; Weiss, 1972): 1) How long will a module be?; 2) How many modules will be scheduled each day?; 3) Which courses will be offered during this school year?; 4) How long will the scheduling cycle be--Daily? Weekly? Bi-weekly?; 5) What will the priorities of given classes be?; 6) Will the course be a semester course or a year long course?

FLEXIBLE-MODULAR

The flexible-modular (flex-mod) schedule has a number of prominent features. The flexible-modular schedule is similar to a conventional modular schedule (see Modular, above), however, the number of mods that a particular course will meet can vary from day to day (see Daily Modular, below), or week to week instead of being the same for each day or week. School districts with ready access to a computer and a data processing staff adjust the basic flex-mod schedule periodically to meet changing curricular objectives. Some districts, for example, construct a new schedule every nine weeks; others as often as monthly (Dempsey & Traverso, 1983).

Schools that have successfully incorporated the concepts of flex-mod scheduling usually reflect a number of similar characteristics. Some of the essential ingredients are the following (Dempsey & Traverso, 1983):

1. Strong administrative leadership to ensure proper implementation of the model. The principal is the key to the program's success.
2. Thorough planning, involving administrators, teachers, counselors, parents, school board members, and students. A minimum of two years of preparation is usually necessary.
3. Selective implementation based on departmental needs. Some departments may wish to operate within a conventional framework.
4. Flexible physical space to accommodate small, medium, and large-

group instruction, team teaching, departmental resource centers, central learning stations, and independent study experiences.

5. Advisement for students to make good decisions about the use of instructional time. Some students may require close monitoring since large amounts of unscheduled time can be a by-product of the process.

6. Continued support of the board of education, parents, and the community. Scheduling innovations frequently generate community antipathy as problems surface.

DAILY MODULAR

With a daily modular schedule, the school's schedule changes daily. The curriculum is made up of subparts called modular units which are derived from units of time and numbers of student schedules. The modular unit chosen for time should be chosen according to the smallest amount of time that is desired for any instructional purpose. If 40 minute, 60 minute, or 120 minute classes are desired, a 20 minute module would be appropriate. The number of students selected should be also stated in terms of desired class sizes. A ten-student module would accommodate classes of 10, 20, 30, 40, etc. Though any modular unit can be selected for either period length or class size, it is desirable to select as large a modular unit as appropriate to reduce the complexity of scheduling. The smaller

the modular units, the greater the flexibility -- but also the greater the complexity (Anderson, 1966).

ROTATION

Even without using computers, principals who continue to operate with traditional schedules have introduced variety in their schedules by rotating or interchanging the periods. More courses can be offered by extending the number of class periods without extending the length of the student day. For example, a schedule may consist of seven periods, but only six periods meet each day, and the periods rotate meeting times each day thereby falling in different time frames throughout the week. This schedule would repeat itself every eight days, and once every eight days, each of the periods would not meet. A total cycle interchange rearranges the periods in the school day so that no one course meets at the same time throughout the cycle. The typical schedule is modified so that subjects fall in different time frames throughout the week. The interchange of class meeting times rotates so that students will have a subject first period on one day and last period on another.

Since total-cycle interchange is not always feasible in the comprehensive secondary school, a morning-afternoon interchange can be considered. In this schedule, there is a separate and distinct interchange during the first half of the student day (the first four periods, for example) and another during the last half (last four periods). A half-day rotation is useful when students are released either for a work-

experience assignment or for afternoon attendance at a vocational-technical school. Half-day rotation also allows for more flexibility and less conflict in the utilization of shared or part-time staff (Dempsey & Traverso, 1983; Northwest Regional Educational Lab, 1990).

VERTICAL STRUCTURING

Vertical structuring is a flexible scheduling technique that is based on individualized pacing and continuous student progress and allows for a generalized expanded elective program (Book, 1984). This structure is well suited for those courses that go beyond the "first year", i.e., foreign languages. It offers a workable solution to satisfying enrollment minimums and adds depth to the school's curriculum. For example, most schools require four years of English, and traditionally, these requirement are provided in the sequence of English I, II, III, IV with all four courses offered every year. The enrollment restrictions for each course are based on students' respective grade levels rather than specific skill development. Vertical structuring of the English program would remove grade barriers to course enrollment and allow for thematic English course offerings (i.e., European literature, American literature, writing and composition skills). This could also provide the option of offering fewer English courses each year, and allow for courses to be offered in alternating years with enrollment open to all students.

Regardless of age (or grade), students can schedule a course during the period where the course option appears on the master schedule. Students negotiate long-term contracts for each term (quarter or semester) and short-term contracts on a daily/weekly basis. For each lesson, a checklist of all requirements is given to the student (Northwest Regional Educational Lab, 1990).

PARALLEL BLOCK SCHEDULE

In a parallel block schedule, a block of time is scheduled for essential and/or desired small skill groups parallel to large instructional activities and support services. In designing a master schedule, long blocks of time are provided for each content area. After establishing instructional blocks of time for all grade levels in the school, individual grade level schedules are developed. The principal and teachers determine the instructional level for each student. Students are assigned to groups based on these assessments. Then students are assigned base or homeroom teachers, resulting in a heterogeneous combined group (Canady & Hotchkiss, 1985).

THE COPERNICAN PLAN

The Copernican Plan is an umbrella term for the basic idea that schools should consider fundamentally changing the way they use time. A Copernican schedule may involve classes that are taught in longer-than-average periods (90 minutes, two hours, or four hours per day), and that meet for only part of the school year

(30 days, 45 days, 60 days, or 90 days). The goal is for students to be enrolled in significantly fewer classes each day, and for teachers to deal with significantly fewer classes and students each day. The schedule change is not an end in itself, but a means to create a classroom environment that fosters vastly improved relationships between teachers and students and that provides much more manageable workloads for both teachers and students. In theory, the outcome should be schools that are more successful.

Joseph Carroll (1989) coined the term, The Copernican Plan, and proposes moving to a schedule that includes "macroclasses" -- courses which meet either for 226 minutes on each of 30 days or for 110 minutes on each of 60 days (the equivalent of one trimester). Teachers would teach only one macroclass at a time and students would take only one at a given time. The rest of the school day would focus on seminars, music, or physical education, and a preparation, help, study period at the end of the day. This plan allows for six 30-day major courses per year or six macroclasses in three trimesters (Carroll, 1994a).

The Copernican Plan proposes other changes as well; evaluation based on a mastery credit system, individual learning plans, multiple diplomas, a new credit system with two types of credits, and the dejuvenilizing of our high schools (Carroll, 1989).

YEAR-ROUND

In a year-round schedule, students do not attend school under the traditional 9 months on/3 months off schedule. Rather, students attend school during all 12 months of the year, with multiple breaks ("mini-vacations") throughout the year, instead of one longer 3 month summer vacation (Cranston School Department, 1972; Schoefield, 1974; Servetter, 1973).

Some schools opting for year-round classes have incorporated a plan called the "45-15 plan". The 45-15 plan of school operation involves four groups of students who are in school 45 days and then off 15 days on a rotating schedule throughout the year (Forty-five-Fifteen Associates, Inc., 1972). For example, Chula Vista City School District in California adopted the 45-15 year-round plan to help ease a shortage of classroom space while maintaining a quality program for children. Under the plan, each pupil attends school for about nine-weeks and then has vacation for three weeks. Throughout the year, one-fourth of the pupils are on vacation at any time (Tiffany, 1974).

SIX DAY CYCLE

In many parts of the United States and throughout much of Canada, schools operate under a traditional Monday through Friday schedule. This schedule, known as a five-day cycle, has been replaced by some interesting alternatives.

One variation is the six-day cycle initially associated with the flexible-modular schedule (see above). Some advantages of the six-day cycle are: 1) since classes can meet each day, every third day, or every second day, each arrangement meshes smoothly; 2) more opportunity is available to neutralize the effects of holidays and inclement weather in the number of course meetings; and 3) there is much greater scheduling flexibility (Dempsey & Traverso, 1983).

FLEXIBLE FIVE PERIOD DAY

This schedule seeks to provide a variety of instructional time units within an otherwise conventional schedule. Length of period varies throughout the week to allow for both regular instruction and extended time for audiovisual presentations or group research projects (Dempsey & Traverso, 1983)

ACTIVITY PERIOD/SEVEN OVER SIX

Within a 30-period week, this schedule has two multi-purpose periods which can be used for field trips, cocurricular activities, large-group presentations, as period extenders, or occasionally for faculty inservice activities in conjunction with an early release of the student body. These blocks (a "seventh" period) can be placed anywhere in the schedule, not necessarily back-to-back or on the same day. A typical subject meets on four of the five days in the cycle but, because of the six-period day, for a longer time each day (Dempsey & Traverso, 1983).

SINGLE-DOUBLE ROTATION

Similar in some respects to the Flexible Period Schedule, the Single-Double Rotation Schedule calls for a subject to meet five periods during a five-day cycle, but on one day for two consecutive periods and not at all on another day. This kind of schedule works only if there are an even number of total periods per day (Dempsey & Traverso, 1983).

BLOCK

According to Kosanovic (1994), a block-type schedule is defined as "a schedule characterized by offering a set of extended classes on one day, with a different set of extended classes the next, rotating every other day" (p. 2). Dempsey & Traverso (1983) indicate that block scheduling can be used in such a way as to allow music and art, for example, to meet for a double period two or three times a week. The pattern can vary on alternate weeks to provide equal time for each subject.

MODIFIED BLOCK

This is a modification of the basic block of time schedule. Specifically a modified block-type schedule is a regular block-type schedule with a variation to the day or week (Kosanovic, 1994). For example, music and art can each meet for one

single and two double blocks during the five-day cycle (Dempsey & Traverso, 1983).

FLUID BLOCK

In an effort to increase flexibility without loss of student accountability, some variations on the block schedule give a great deal of decision-making responsibility to the faculty members. The fluid block schedule groups students and teams of teachers for large segments of instructional time, up to three hours a day. Since the language arts and social studies programs are generally required in most schools, fluid blocks have frequently been considered around these course areas.

Once the scheduler assigns a group of students to a particular team, the team designates an adviser for each youngster. The adviser helps each student plan a course of study for one-half of the school day that includes language arts, social studies, and electives in art, drama, driver's education, foreign language, mathematics, or music. The remainder of the school day consists of a more traditional program in courses such as algebra, chemistry, consumer economics, physics, typing, or--for vocationally-oriented students--a three-hour vocational-technical block.

The fluid block schedule may include open labs, individualized instruction, large groups, small groups, individual student activities, and mini-courses. The possible variations are almost unlimited, depending on the flexibility of teachers and the availability of open lab options (Dempsey & Traverso, 1983).

PONTOON-TRANSITIONAL

One of the earliest and most successful variations on the block of time schedule is the organizational pattern called the pontoon-transitional design. Intended to integrate two or more subjects from related or unrelated disciplines, this schedule utilizes teacher teams and teacher advisers to organize large-group presentations, small discussion groups, team teaching, and individual study in a flexible block of time. From two to six disciplines can be incorporated in a pontoon. The term emphasizes the function of the schedule as a bridge to individualization. Examples of pontoons are: Art/English/History; Algebra II/Chemistry; Biology/Physical Education. The basic pontoon is predicated on these formulas:

Two subject/teacher/periods = 2 X class size + 10

*Three subjects/teachers/periods = 3 X class size + 10

*For example, If class size is 30, a three-subject pontoon would have three teachers working with 100 students (3 X 30 + 10) in three back-to-back class periods.

A school can employ one or more pontoons without disturbing the basic schedule of the school, and can add as many pontoons as desired. Ultimately, an entire school could be organized in this manner. In pontoon scheduling, the students are organized into subgroups of 12 or 13 students, and these groups are combined to form traditional or seminar groupings for the subject area activities (Dempsey & Traverso, 1983).

DAILY DEMAND

A complex variation of the flex-mod concept is the Daily Demand Schedule. This schedule changes in part every day, based on a weekly format developed by departmental teams working with a full-time coordinator. Some parts of the schedule are prescribed; other parts are elective (Dempsey & Traverso, 1983).

INDIVIDUALIZED

More flexible forms of scheduling customarily involve the reorganization of curriculum into continuous progress sequences, more time for individual projects, and a decrease in conventional class activities.

To schedule, a student meets with his or her adviser and works out a program based on a shortened version of the master schedule developed by the school staff.

Scheduling is accomplished by some variation of the "arena" approach (students sign up for courses or exchange name cards for course cards). Independent/directed study takes place in "resource centers".

On the surface, individualized schedules resemble the typical flex-mods, but a major difference is that--for a justifiable cause--classes can start, end, and even be changed at any time (Dempsey & Traverso, 1983).

QUESTION TEN:
What are the advantages and disadvantages of different schedules?

Many alternative schedules have been beneficial for schools that have implemented them. And, although there may be some disadvantages with a particular plans, with enough attention given to the problem, those obstacles can usually be overcome. Therefore, potential disadvantages can be regarded as "considerations" to be made in the planning process (Northwest Regional Educational Lab, 1990).

It should be noted, however, that while some scheduling models have been evaluated by numerous researchers in various settings, evaluations of other models are needed. Further research on the advantages and disadvantages of all the scheduling options needs to be undertaken.

TRADITIONAL

Advantages:

1. Work experience programs for students are easily scheduled.
2. There is little difficulty in scheduling part-time and shared staff.
3. The unchanging style and uncontroversial aspect of the traditional schedule offers security.

Considerations:

1. Teachers are limited to use those instructional strategies and techniques that fit into a fixed time slot.
2. Variation in class group size (large/small) for integrated instruction is difficult because related classes may not have coinciding periods.
3. There are greater restrictions on individualized instruction and independent course study by students.

MODULAR

Advantages:

1. The variety of choices for time patterns is unlimited.
2. Small group activities (i.e., discussions, simulations) can reinforce large group instruction.
3. Team teaching and integrated thematic unity instruction can be easily incorporated into a flexible modular scheduling format.
4. Implementation can be based on departmental needs and a conventional framework can operate within the flexible schedule.

Considerations:

1. A minimum of two years planning is recommended before implementation of a varied, flexible modular schedule.

2. Flexibility in scheduling physical space (facilities) for varied sizes of class meetings (large/small group, independent study) is necessary.
3. With a highly flexible modular schedule, some unscheduled time for students will result. Therefore, plans on how students are to be monitored during such time are necessary (i.e., study halls, learning centers).
4. All faculty should participate in advising students to assist them in making good decisions on use of instructional time and unscheduled mods.

FLEXIBLE-MODULAR

Advantages:

1. The variety of choices in time pattern appears to be unlimited. Within the same subject area, courses can be scheduled to meet in as many different ways as the imagination allows.
2. Large numbers of students can be scheduled together in one location (e.g. and auditorium) for a lecture, a film, or some similar presentation.
3. The same group of students can be subdivided into smaller units for shorter frames on other days. Small-group discussions, simulations, student projects, and other activities can take place to reinforce the lessons of the large-group activity.
4. In psychomotor skill development areas, such as typing, a flex-mod schedule can provide a conventional instructional period of 45 to 60 minutes per day for each day of a cycle.

5. Certain subjects such as art, music, physical education, consumer education/ home economics, industrial arts, and lab sciences can be scheduled into 75- to 90-minute blocks, meeting on alternate days of a cycle, if desired. (Dempsey & Traverso, 1983)

Considerations:

Seventy secondary schools were sent a 99-item questionnaire concerning problems experienced in the implementation of a modular-flexible schedule. Ten items were identified as problems experienced in the implementation of a modular-flexible schedule. The problems centered around student attendance, criticism by staff in other schools, inability of teachers to properly use time for preparation and student consultation, lack of increased achievement of students, and parents' blaming the schedule for student failure. Principals, however, found that after implementing a major change such as the modular-flexible schedule, subsequent changes were easier to facilitate after successfully implementing the modular-flexible schedule (Sturges & Mrdjenovich, 1973). Specifically, the universal problems related to education innovations and the use of the modular-flexible schedules were:

1. Some "unscheduled time" results in the flex-mod schedule, calling for careful choices on the part of students, parents, and academic advisors.
2. The reason most given by students initially receiving lower grades under the new schedules was that they had not learned to budget their time wisely, or

2. The reason most given by students initially receiving lower grades under the new schedules was that they had not learned to budget their time wisely, or they usually made some allusion to "time" as being a significant contributing factor.
3. The tendency to "cut" classes increased.
4. Although time was provided for teachers to have individual conferences with students, this was not happening to the extent anticipated during the first year of the new schedule.
5. Administrative colleagues alluded to the activities in the school by referring to it in some humorous manner or by coining a "good natured", but subtly derogatory name or phrase to describe it.
6. The results of standardized achievement tests indicated no statistically significant differences from the previous year which could be attributed to the change from the traditional schedule.
7. Many parents of students who previously were not performing well under the traditional schedule, began to blame the new schedule for what they felt was "failure to achieve" by their children.
8. During the first year, teachers tended to dominate small group sessions.

9. The attendance at regional or national conferences, acquisition of materials from prime sources, and/or school visitations, gave you a broader "knowledge base" than did attendance at an institution of high learning.
10. In light of the time which has elapsed since the program was first implemented, it is a rare occasion when a question is asked regarding the program that has not already been asked perhaps many times before.
11. The board of education publicly defended the program against the early criticism leveled against it, but continues to privately question certain aspects of the program.

DAILY MODULAR

Advantages:

1. Increased learning opportunities are provided through additional course offerings as well as through modification of the structure of various courses.
2. A considerable portion of the school day can be devoted to independent study. Independent time provides time for teachers and students to interact concerning problems and also provides a more efficient use of the school day.
3. Teacher control of the course structure, including time used each day, has made group presentations more intense, concentrated, enriched, and less

frequent. This new use of the school day has resulted in fewer discipline problems as well as better school attendance.

4. The daily modular schedule has decreased the amount of time that a student or teacher is scheduled for classes. This arrangement facilitates flexibility, making possible teacher-student conferences and teacher-special group discussions. The teacher, counselor or principal may schedule groups of students on a daily basis without disturbing classes.
5. The schedule has economized the teacher's time by allowing the time allotment and class size allotment to be dictated by the mode of instruction which the teacher uses.
6. Daily scheduling has enabled students of higher academic ability to take more than the usual number of courses plus taking part in other learning experiences within the school day.
7. Students need not take daily assignments home if they use independent study time.
8. Self-directing activities and materials become more important.
9. The daily modular schedule has resulted in a unifying involvement of students, teachers, and members of the professional staff in curriculum decisions (Anderson, 1966).

Anderson (1966), surveyed students' evaluation of advantages of daily modular schedule. Some student responses included:

- You can work at your own rate of speed.
- It's not boring.
- More student responsibility.
- There's no teacher continually standing over you.
- It gives you a day-to-day change.
- There is more free time.
- The students learn to work on their own, without having to be continually helped.
- If you don't get your work in, you are to blame, the teachers don't keep reminding you.
- Gives one a sense of freedom.
- You have different things to look forward to.
- Prepares you for college better.
- This is working out better than any other schedule (better all around).
- The way the noon hour is (with ice cream) it gives you a chance to relax and get back to work.
- You can take breaks from working. I think this is good because you can refresh your mind.
- You can make appointments with the teachers if you need them.
- The teachers can take more personal interest in the students.

- There is not as many restrictions as some schools have. This, I think, is good. Rules (too many) make students hateful and rebellious toward school.

Considerations:

1. Teachers have to be diligent to make a daily flexible schedule successful.
2. Teachers need to change concepts of the use of facilities.
3. Teachers must plan for implementing wise student use of independent study time, such as development of student study guides and long term assignments.
4. Administrators and teachers need to prepare psychologically for more student motion.

Anderson (1966) also surveyed students' evaluation of disadvantages of daily modular schedule:

1. There is not enough up-to-date information on the subjects taught.
2. Some students are not using their time wisely.
3. It's hard to find a really quiet place to study.
4. Freshmen should have more scheduled time, sophomores less, and juniors and seniors should have 50% or more of their time unscheduled.
5. Students should get to class on time.
6. There is too much scheduled time some days.

ROTATION

Advantages:

1. By reducing the number of scheduled periods per day, classes can meet for a longer period of time, and the rotation scheduling also allows for more courses to be offered within the schedule.
2. Students have the opportunity to meet in their selected courses at different times during the day, thus varying their optimum learning times for all courses.
3. This schedule variation can reduce the daily demands of teacher preparation.

Considerations:

1. The schedule must allow for meeting total student contact (instructional) time per course-credit within the prescribed term (i.e., quarter, semester), as mandated by state standards.
2. If a morning/afternoon rotation is used, an even number of periods works more efficiently.

VERTICAL STRUCTURING

Advantages:

1. Vertical structuring offers a solution to satisfying minimum enrollment requirements.
2. Depth is added to the curriculum of a school in that students can pursue advanced study through individualized programs.
3. Instruction is student-centered because not all students scheduled for the same class period of a course will be studying the same level of that course subject.

Considerations:

1. Initial planning for vertical structuring requires time, energy and concentrated effort of the teachers. Additional preparation time in the form of extended contract days is recommended for planning the transition to and implementation of vertical structuring concepts.
2. Teachers must have a strong grasp of the subject matter, and they must keep more complex records as students' continuous progress must be monitored on an individual basis.
3. Teachers must adjust their roles: They will be facilitators of student learning rather than hold center-stage in the instructional process.
4. Utilization of learning centers for each subject area is recommended in a vertical structure program to facilitate greater student learning opportunities.

BLOCK/PARALLEL BLOCK SCHEDULE

Advantages:

1. Parallel block scheduling can lead to improved instructional programs, especially for low achieving children who may be educationally short-changed in a traditional school setting. Specifically, allowing a greater concentration of time for reading and mathematics instruction provides more opportunities for low socioeconomic students to achieve the same relative achievement gains as students from higher socioeconomic backgrounds (Canady & Hotchkiss, 1985).
2. Students benefit from being in smaller classes. Parallel block scheduling reduces class groups for much of the instructional day and provides increased time for mathematics and reading instruction.
3. With the school day organized around instruction in reading and math, school personnel communicate to their public that the focus of the school is on academics.
4. Teachers have long blocks of uninterrupted time with students.
5. All students leave the classroom for special programs; identified children attend resource services while others are provided extension center activities. Because all students leave the classroom, negative comments and attitudes experienced by students who leave the classroom for "pull-out" programs are minimized.
6. Schools in which parallel block scheduling has been implemented have

shown gains in mathematics and reading achievement test scores (Canady & Hotchkiss, 1985).

7. The perceptions of principals and teachers in parallel block scheduled schools were significantly more congruent on seven variables associated with effective schools than were the perceptions of teachers and principals in schools with traditional schedules.
8. Low achieving students benefit from having an equal amount of time allocated for instruction, reduced numbers of students in small groups, less unsupervised seatwork activities, and greater amounts of uninterrupted teacher-directed instruction.

Considerations:

1. Principals must be involved with the instructional programs of teachers to develop successful parallel block schedules (Canady & Hotchkiss, 1985).
2. Although the block schedule is seen as advantageous for most classes involving a laboratory type activity, it has been found to be disadvantageous for Foreign Language and Special Education (Henrico County Schools, 1978).
3. Some researchers have found that block schedules may occasionally have disadvantages for lower achieving and younger students (Henrico County Schools, 1978).

Advantages:

1. Can decrease average class size by 20%.
2. Can increase course offerings or number of sections by 20%.
3. Can reduce the total number of students with whom a teacher works each day by 60-80%.
4. Can provide students with regularly scheduled seminars dealing with complex issues.
5. Can establish a flexible, productive instructional environment that allows effective mastery learning as well as other practices recommended by research.
6. Can get students to master 25 to 30% more information in addition to what they learn in the seminars.
7. Can do all of the above within approximately the present level of funding (Carroll, 1994a).

Considerations:

1. Continuous diagnosis, education, and feedback are essential.
2. Administrators must work to "dejuvenilize" the high school by allowing students to make important decisions.
3. Administrators must discourage the traditional role of students as conformists, and encourage students as initiators of ideas (Carroll, 1994b).

YEAR-ROUND

Advantages:

1. Savings in cost and space (ERIC, 1973).
2. Increased flexibility of scheduling (ERIC, 1973).
3. Higher teacher salaries (ERIC, 1973).
4. The long summer vacation is redistributed into shorter seasonal vacations (Tiffany, 1974).
5. The school facility is in use 12 months a year (Tiffany, 1974).
6. Variations in teacher contracts are possible (Tiffany, 1974).
7. Most of the benefits of the traditional school program are retained (Tiffany, 1974).
8. Increases in academic achievement (Gandara & Fish, 1994).
9. High level of parent and teacher satisfaction (Gandara & Fish, 1994).
10. A cost-effective use of existing school facilities (Gandara & Fish, 1994).
11. Student attendance increased in elementary and secondary schools (White, 1987).
12. Teachers' attendance improved, demonstrated by less sick and personal leave (White, 1987).
13. Over a year, per pupil cost savings was 74 cents (White, 1987).
14. Reduction of high school dropout statistics (White, 1987).
15. Scheduling flexibility accommodated students arriving and departing at each term change and desiring to change teachers (White, 1987).

16. Dropout problems were resolved (White, 1987).
17. Teachers preferred the adaptable lifestyle (White, 1987).
18. Families with both parents employed could arrange vacations.
19. School holding power increased during the standard academic year (White, 1987).
20. The schedule proved to be a feasible means for extending the year for able students and for those needing additional education, without incurring drastic budget increases (White, 1987).

Considerations:

1. The break in the tradition of a long summer holiday (Tiffany, 1974).
2. Difficulties in scheduling and communication (Tiffany, 1974).
3. More expensive maintenance (Tiffany, 1974).
4. The need to study and consider vacation programs throughout the entire year (Tiffany, 1974).
5. A range of functional problems, including those in the areas of curriculum and instruction, finance, scheduling of students, allocation of personnel, facilities and maintenance, transportation, school lunches, student activities and athletics, and support services (Musatti, 1981).

QUESTION ELEVEN:
Which schedules are currently being used in U.S. high schools?

In an attempt to gain an accurate picture of high school scheduling in the United States, the staff at South Eugene High School in Eugene, Oregon, along with a group of researchers at the National Association of Secondary School Principals (NASSP), sent a request to high schools across the nation, seeking a copy of their daily schedule (Kosanovic, 1994). Although a true picture of current scheduling practices at the national level was desired, the researchers limited the scope of their research to schools with a population similar to that of South Eugene High School. The result was 3,983 letters sent to each high school across the nation with an average daily membership of 1,000 students or more, requesting a copy of their daily schedule. The list of applicable schools was provided by The United States Department of Education in Washington, D.C.

Forty-one percent of the total sample sent a copy of their daily schedule to the Oregon group. The 1,631 responses revealed five basic categories of schedules being utilized in U.S. high schools: 1) traditional, or classic, 2) modified traditional, 3) block-type, 4) modified block-type, and 5) modular schedules (see Question Nine, above, for descriptions of the different schedules).

Although five unique schedules were identified, it was concluded that high schools with 1,000 students or more are more similar than different in terms of their daily schedules. Ninety-six percent of the respondents indicated that they utilized a traditional, classic schedule. Of the 1,565 respondents who reported the use of a traditional schedule format, approximately 7 percent, or 110 respondents, modified the traditional schedule in some fashion.

A distinct minority of the respondents (i.e. 66, or 4 percent of the total) were high schools that reported a scheduling format other than the traditional model -- that is, a block, modified block, or modular type schedule. The majority of this group (38 schools) offer a block scheduling format, or a modification of the block type schedule. The remainder of the sample -- 28 out of 1,631 respondents -- reported using a modular schedule format (Kosanovic, 1994).

SECTION FOUR:
IMPLEMENTING CHANGE

"While random selection from a Chinese menu may create a wonderful lunch, a restructuring process conducted in a similarly random manner is unlikely to create an effective school"
Bryk, 1994

QUESTION TWELVE:
What are the steps to building a master schedule?

The school scheduler must set up and maintain files for students, teachers, and courses (a course catalog). Also, comprehensive scheduling procedures should be established so that everyone participating in the process -- including administrators, guidance counselors, department heads, classroom teachers, students, parents -- knows the steps to be taken at various stages. Many of these procedures can appear in the school's program of studies and in registration materials distributed to students and parents. An orientation meeting can be held for the staff.

Additionally, several factors must be addressed in determining the appropriate scheduling procedures for a given school. Among these are: the costs related to the scheduling process; the type of scheduling procedures to be used (manual or computer-assisted), and whether student self-scheduling (arena) will be used

(Dempsey & Traverso, 1983).

Weiss (1972) identified steps involved in the building of a master schedule. Weiss' major phases of scheduling fall into nine basic categories: *Phase I* - sensing change; *Phase II* - diagnosis; *Phase III* - developing change proposal; *Phase IV* - importing expertise, data, diagnosis; *Phase V* - diffusion of data into system; *Phase VI* - student collaboration; *Phase VII* - community collaboration; *Phase VIII* - systematic tryout; *Phase IX* - stabilization and evaluation.

In addition to Weiss' steps, Dempsey and Traverso (1983) developed a list of steps that must be performed by the scheduler, regardless of the method of scheduling. These steps are:

- Determining student needs
- Reviewing the curriculum
- Formulating the program of studies
- Preparing registration material
- Setting the calendar for registration
- Interpreting the course tallies
- Identifying staffing needs (assigning teachers)
- Utilizing a conflict matrix (for rooms, programs, courses)
- Building the master schedule

- Laying out the master schedule using scheduling aids (e.g., chalkboards or magnetic boards)

QUESTION THIRTEEN:
What is a sample plan for building a schedule?

Many factors affect the scheduling calendar. Schedulers should be aware of factors such as complexity of the schedule, size of the student body and faculty, availability of budgetary information (staffing, etc.), standard versus student self-scheduling patterns, and finally, the date set for the distribution of student schedules. The scheduling calendar must take into account factors unique to each locality. School schedulers need sufficient time to prepare the calendar each year, particularly in light of changing school conditions, past experience, and available staff.

Dempsey and Traverso (1983) generated a sample calendar for preparing a master schedule for a secondary school:

September-December: Review the curriculum and modify courses. Print the school's program of studies and prepare registration materials. Conduct the pre-registration process.

January-February: Hold formal registration. Arrange for students to meet with counselors, department heads, and special subject teachers. Secure parents'

approval of students' course selections.

February-March: Assemble enrollment information. After registration figures have been adjusted for cancelled and merged courses, determine staffing needs and submit for approval. Produce conflict matrix.

April: Construct the master schedule.

May-June: For computerized scheduling, review initial computer simulation runs to determine whether the master schedule and/or student course selections must be modified. Contact students regarding conflicts. If scheduling is done by hand, the master schedule should be reviewed to determine its general efficiency for all students. Prepare student schedules, as well as class, study hall, and homeroom lists.

July-August: Continue review of computerized simulations to increase the efficiency of the master schedule. Produce and distribute all schedules, lists, and reports to students and teachers.

QUESTION FOURTEEN:
What methods are
used for scheduling?

Manual scheduling

Schools that perform all scheduling operations manually usually have limited financial resources, small student enrollments, or narrow curricular requirements. Highly efficient schedules can be built manually using a conflict matrix.

Computer scheduling

Data processing hardware and software are now commonly used in the scheduling process. In fact, the most widely used scheduling format is one in which the computer generates the data from which the master schedule is hand built. The data include course tallies and the conflict matrix. Schools with very complex schedules as well as those with computers readily available utilize this type of scheduling most extensively. In these schools, the computer builds the master schedule. The scheduler simply provides information on available courses, teachers, rooms, and any restrictive factors that must be taken into account. A number of software packages are available to perform this task. After the schedule is built, the computer tests the efficiency of the master schedule, loads or places the students into the master schedule, and produces student schedules, class lists, and other helpful reports. Though forms must be counted and data

interpreted, completely computerized scheduling does eliminate many of the laborious procedures associated with manual approaches (Dempsey & Traverso, 1983).

Standard and student self-scheduling (Arena)

School administrators and staff can promote active student participation through student self-scheduling. There are two interrelated steps to student self-scheduling, and the success of the second step is highly dependent on the first.

First, the "build", or generation, phase consists of all the steps and procedures that add up to and include the construction of the master schedule. Particular components are: outlining the curriculum; printing the program of studies; conducting the registration process; interpreting course tallies; identifying course offerings and sections; determining staffing needs; assigning teachers to courses; analyzing conflict matrices; and building an efficient master schedule.

Upon completion of the "build" phase, the scheduler then "loads" or places students in the master schedule. The loading step results in the production of individual student schedules. Students are assigned to specific sections of courses, at specific times of day, with specific teachers.

Student self-scheduling means full student involvement in the "load" phase of

scheduling. Students actually build their own schedules, taking into account a host of factors such as meeting times, assigned teachers, and potential conflicts with other courses.

Many principals have found student self-scheduling to be beneficial. Two of the most important

advantages are the improvement in morale resulting from enhanced student decision-making responsibility, and the immediate resolution of most schedule conflicts (with the subsequent reduction of class changes in the fall) (Dempsey & Traverso, 1983).

QUESTION FIFTEEN: What factors lead to scheduling conflicts?

A number of elements affect the scheduler's ability to construct a schedule with a minimum of conflicts. The greater the number of these factors present, the more difficult it will be to build a conflict-reduced schedule. Some of the elements related to conflict are:

1. Complex schedules such as flex-mod or individualized variations.
2. High subject density within the schedule; e.g., six required courses in a six-period schedule.
3. A proliferation of semester, trimester, or quarter courses.
4. An excessive number of single-section courses
5. Nongraded courses (those open to students in several grade levels; e.g., sixth, seventh, and eighth graders)
6. A large number of restrictive staffing factors; e.g., part-time faculty
7. Constraints in the teacher contract.
8. Many teachers assigned to more than one department.
9. Many double-period subjects, such as science labs (Dempsey & Traverso, 1983).

Weiss (1972) has also identified barriers to a change in the traditional schedule: 1) teachers who are satisfied with the present program, 2) concern by staff members that they anticipate a heavier workload under the proposed change, and 3) a conservative community which is fearful of change.

Scheduling conflicts are also caused by student requests for course changes. These student requests are usually characterized by one or more of the following conditions: scheduling errors, program changes, course changes that are significant, and course changes that are frivolous. Also, schools that have taken the initiative to retool their instructional day have confronted the problem of equivalent class credits (e.g., Carnegie units, 120 hours = 1 credit) (Kosanovic, 1994).

SECTION FIVE:
ASSESSING CHANGE

"The major problem with most efforts to change schools is the failure to plan an evaluation as an integral part of the program"
Carroll, 1994b

QUESTION SIXTEEN:
What issues are involved in the evaluation of schedules?

Several studies have shown clear links between school restructuring and improved student learning (Lee & Smith, 1994). And, these studies that present such compelling evidence that students learn more in restructuring schools are useful because of their evaluative component. The productive unit in education is the school, and that is the natural laboratory in which to test the effectiveness of educational proposals. Research concepts and techniques should be used in evaluating instructional programs. But, to be effective, educators must exercise informed judgment about the meaning of research findings. When changes are considered, the present program must meet the same standards applied to the proposed changes.

There is one question that should be fundamental to all evaluations: Do students function as well and learn as effectively under an alternative structure as they do

under a traditional structure? In evaluations, the baseline data -- the information against which progress or lack of progress must be measured -- should consist of data about student performance under a traditional schedule at that school; the experimental variable should be the implementation of an alternative schedule at the same school. The impact of that experimental variable should be measured by comparing the baseline performance data with same-site performance data from students functioning and learning under the new schedule, and research methodologies should be used in analyzing the data and interpreting the results (Carroll, 1994a).

The failure to include an evaluation in terms of student outcomes is a major problem with most change efforts. Many good professionals will advise administrators and planning teams not to initiate academic evaluations until the new program has been implemented for several years. That is not always good advice, however, claims Carroll (1994a). According to Carroll, experience does not support such a position; new programs should be planned well enough so that there is reason to expect some improvement. The key question is whether a proposed new program is improving the education of students, based on the measures that the profession and the public will accept as "solid". Those who would change schools must be prepared to answer that question (Carroll, 1994a).

QUESTION SEVENTEEN:
Can evaluations be made across schools?

Considerations

There are many alternative schedules. A meaningful concern is whether some schedules are more effective than others. Equally important, if not more so, is the issue regarding whether evaluations can be made across schools. While some researchers have problems with the idea of comparing schools using the same schedule, a larger number are concerned with the issue of comparing schools with different schedules. While a valid evaluative test for a schedule change in any school is a measure of that school's improvement after the change, various researchers strive to compare several types of schedules across schools, in search of the "most effective" schedule.

One problem these researchers come across is that a claim of "uniqueness" is often applied to innovative techniques to improve educational programs. The claim is made that attempts to identify and examine problems that may be common to different implementation plans are not possible because of the many uncontrollable variables that are unique to each school system. However, as Sturges and Mrdjenovich (1973) assert, it is essential that attempts be made to identify common areas of concern in implementing innovative programs; evaluation of the programs will then be facilitated.

In analyzing different schools, it is critically important to remember that effective projects in general are characterized by a process of mutual adaptation rather than uniform implementation, and local factors (rather than federal program guidelines or project methods) dominate project outcomes (McLaughlin, 1990).

One Method

Joseph Carroll (1994a), for example, describes a process used for comparing different schedules. He needed to determine whether different schedules have different impacts on student performance. Carroll compared the effect of alternative, "Copernican" schedules in terms of student conduct, attendance, rate of suspension, dropout rates, and academic performance. Seven high schools with six different schedules were evaluated. Thus the level of implementation of an alternative schedule varied considerably.

To begin, the degree of course and student concentration in the new schedules was quantified. The "Copernican factor" measured this aspect of a program. The Copernican factor is the sum of the number of classes that a typical teacher teaches and the number of classes in which a typical student is enrolled each day. For example, a traditional high school program typically has students taking six classes and teachers teaching five classes per day; the Copernican factor in this case is 11.

Once Copernican factors are determined for each school, it is possible to evaluate the relative effectiveness of the different schedules. If there are seven schools, for example, first the schools are ranked one to seven on the basis of their respective Copernican factors. Then each school is ranked, one through seven, according to its composite score on the performance measures. Finally, correlation between the Copernican factors of the seven schools and their respective composite scores is determined (Carroll, 1994a).

One Example

Joseph Carroll (1994a) analyzed seven schools that had implemented different non-traditional schedules. For each school on each measure, performance during a year under a traditional schedule was compared to performance during a year under the new schedule. Composite scores were determined for each school based on a combination of its performance scores. Carroll gathered data on five measures of student performance for each school. Carroll's results were:

Attendance: The impact of an alternative schedule on attendance was not spectacular, but it was positive, with four schools showing declines in absenteeism, and one showing no change.

Suspension: Four of the five high schools that were able to provide suspension data for the two years showed reductions in the rate of suspension, ranging from 25% to 75% during the first year under a new structure; one high

school reported an 11% increase in suspensions.

Dropouts: The most significant improvement occurred in the area of dropout rates. Six of seven high school reported reductions in dropout rates, ranging from 17% to 63%. The median

change for the seven schools was a 36% reduction in the first year under a non-traditional schedule.

Academics: Each school provided data on all final grades in all subjects for the two years being compared. These data were then analyzed in terms of two measures of academic mastery. The two measures of mastery were based on the premises that: 1) a high grade given by a teacher indicates that a student mastered more of the objectives of a course than did a student who received a lower grade, and 2) if students complete more courses successfully, they have mastered more of the school's academic program than would be the case if they had completed fewer courses. Based on these two premises, the schools' increases in academic mastery ranged from 0% to 46%; the median increase was 18%.

According to Carroll, out of the 33 comparisons, one comparison showed no difference, 27 favored the non-traditional schedule, and only five favored the traditional schedule. The Copernican factors of these seven schools were found to correlate with their respective composite scores. Carroll's data support those models with a lower Copernican factor -- that is, schedules that provide longer

macroclasses and also provide for teachers and students to deal with significantly fewer classes at a time. It should be noted, however, that research on the effectiveness of different schedules is limited. Results such as Carroll's need to be verified and further studies are needed in this area.

QUESTION EIGHTEEN: What role does staff development play in the effectiveness of a schedule?

One of the surprising findings of Carroll's (1994b) evaluations was the relatively limited role that staff development seemed to play in bringing about improvement in student performance. Indeed, Carroll found that the high school that had the poorest staff development before and during the schedule change process -- one that provided its teachers no opportunity to learn how to adapt instruction to a macroclass --- achieved excellent improvements. Conversely, a school with one of the best staff development programs and a good process had the poorest results and was the only school to show no academic improvement. At first read, the results of Carroll's research seems to indicate that staff development is not related to improvement, and, in fact, may even hinder improvement. This, of course, is counter-intuitive and contrary to what we know about the effects of staff development.

Cases such as this are evidence for the extreme importance of using caution in analyzing data and making conclusions. That is, a careful look at Carroll's data reveals some further information that explains the surprising findings regarding the role of staff development. Specifically, it is interesting to note that the school

with poor staff development, but sound academic improvement, had a Copernican factor of 5 (see Question Seventeen, above). The school that had a staff development program, but no academic improvement, had a Copernican factor of 14 -- the highest among the seven schools studied by Carroll. Since the schools with the lowest Copernican factors tended to be the schools with the highest level of academic achievement, it is possible (even likely) that it is the Copernican factor (that is, type of schedule), and *not* staff development, that affected student performance.

The presence of several confounding and interdependent variables (such as diverse schools, numerous schedules, varying staff development), as in Carroll's study, means that the effect of each variable must be looked at carefully and cautiously. Often, it is difficult to determine the direct effect of any one variable alone. For this reason, researchers often discourage comparisons across schools, and it is for this same reason that the role of staff development is difficult to ascertain.

To conclude, a change to a non-traditional schedule has an impact on every student, teacher, and class on every day -- it changes the system. It is reasonable to assume that ambitious and well-prepared staff development programs will not only be helpful to a restructuring school, but also necessary for optimal outcomes. The key is the quality of the staff development program. Poorly designed or inappropriate staff development will hardly benefit teachers and administrators.

Similarly, staff development imposed on an outmoded system will do little to improve classroom practice (Carroll, 1994b). Further research should be conducted on the effect of staff development on factors such as teacher satisfaction, teacher morale, and teacher effectiveness under the new schedule.

QUESTION NINETEEN:
What are some conclusions and recommendations?

Each secondary school has its own unique features. Furthermore, each school's scheduling program is unique because of varying school conditions, past experiences, available staff, and student needs. A successful schedule is one that works efficiently for staff and students as it successfully enables the curriculum to be implemented. Schedules should evolve to best serve the educational needs of students.

In order for schedules to evolve to incorporate new needs, complex changes must occur. The development of innovative, creative schedules depends on the following: 1) willingness to break from dictates of the past and leave behind self-imposed restrictions, 2) knowing the educational needs of the students being served, 3) knowing what is desired for the students to learn (Northwest Regional Educational Lab, 1990).

Imposing a new scheduling model on a school will not ensure its success, however. Significant changes to a schedule require careful and thorough planning to unsure successful implementation. There cannot be too many questions asked

during the planning process. Additionally, it is vital that representatives of all constituents of the school community be involved in the planning stages. Effective planning should involve administrators, teachers, support staff, the school board, parents and community representatives.

It cannot be stressed enough that time is needed for planning schedule changes. The degree of change from the current schedule will dictate the amount of time needed. Generally, a two year time-line is recommended to provide adequate exploration of options, evaluation of how those options will meet the needs of the school, and finally, implementation of the schedule. In sum, planning is the key (Northwest Regional Educational Lab, 1990).

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In 1963 Stanford University selected Virgin Valley High School in southern Nevada as one of four pilot schools to use computerized modular scheduling. Schedules for 165 students and assignments for 14 teachers were developed at the Stanford University Computer Computation Center using 30-minute modules with a total of 80 modules per week. After one year of operation, it was found that greater opportunity existed for individualized instruction, curriculum offerings were increased, release time for teachers preparation resulted, and student and teacher attitudes toward learning improved. Reactions and responses from students and teachers concerning the use of flexible scheduling are quoted in the document.

Allan, B. W. (1967). *Scheduling.* Office of Education (DHEW), Washington, D.C., Division of Plans and Supplementary Centers, 18pp.

The major topic is the modular scheduling program developed for Virgin Valley High School in Mesquite, Nevada. The concept of modular units in curriculum planning is described with various modular units illustrated graphically. Also included is an example of a hand-generated modular schedule system which is adaptable in schools with a 200- to 300-student population. A bibliography of publications relevant to modular scheduling is appended. The report is disseminated by Title III funds of the Elementary and Secondary Education Act.

Anderson, D. N. (1966). *Daily Modular Scheduling Practice at Pahranagat Valley High School.* Nevada Western States Small Schools Project, Carson City, Nevada.

The main topic discussed is a daily modular scheduling system initiated for the small enrollment at Pahranagat Valley High School in Alamo, Nevada, with specific reference to types of instruction, schedule procedures, and conflict problems. An evaluation of the scheduling system is also included. The report is written in dissertation format, which presents a statement of the problem and a definition of terms, a review of literature relevant to modular scheduling, and a discussion of the development of a hand-generated modular schedule.

Book, L. C. (1984, January). *Saving lower enrollment, advanced-level elective programs: A way to get blood from turnips.* San Antonio, TX: Paper presented at the Annual Meeting of the National Association of Laboratory Schools.

An innovative, flexible scheduling technique for advanced levels of a foreign language program is described. The technique, predicated on individualized pacing and continuous progress, is generalizable to all elective programs, and offers a workable solution to satisfy the enrollment "numbers game" and to lend breadth and depth to the curricula of small schools and colleges. Any students beyond the first year, regardless of age and language being studied, can schedule "Advanced Foreign Language" during the hours where this option appears on the master schedule. Students negotiate long-term contracts each quarter and short-term contracts on a daily/weekly basis. For each core lesson, students are provided a checklist that details all the requirements for the lesson and facilitates recordkeeping. In contrast to teacher-center instruction, this individualized instructional method requires teachers to: expend more energy and concentrated effort, have a stronger grasp of the subject matter, keep more complex records, and adjust to being facilitators rather than the center of attention. Appended are sample copies of a master schedule, a long term contract, a student checklist, and a grade record sheet.

Bryk, A. S. (1994). More good news that school organization matters. *Issues In Restructuring Schools*, *7*(Fall), 6-8.

The author comments on why the schools with restructuring practices are so successful at enhancing student achievement and equity, and what implications the findings might have for high schools in general. Promoting greater equality of educational attainment has been a major educational policy initiative for several decades. Schools must remember, the article states, that schools are organizations, and like any organization, effectiveness does demand a rational articulation among the core components that make up the organization.

Bureau of Elementary and Secondary Education. (1972). *Facilitating Learning Through Systems Modification: Planning operational year July 1, 1971 to June 30, 1972.* First Interim Evaluation Report.

The Cape Girardeau Project was involved in planning operational year activities during the 1971-1972 academic year. The two major kinds of activities centered on 1) those dealing with planning and pilot classes in preparation for implementing the innovative Trimester/Modular Scheduling

Plan at Cape Central Senior High School, and 2) those aimed at preparing teachers through inservice education for more effective use of extended class periods under the new scheduling plan. Project activities in preparation for entering into the Trimester/Modular Scheduling Plan consisted of scheduling pilot classes from different disciplines and doing several courses in double-period blocks of time for either one semester (90 days) or one trimester (60 days); planning sessions involving administrators, teachers, guidance counselors, and computer specialists; and professional travel to observe similar innovative scheduling plans. In preparation for the more effective use of extended daily class periods, project teachers were given a 32 week program of inservice education; professional travel to observe and study new kinds of organization for instruction and teaching strategies; supporting instructional services; and planning for team teaching.

Canady, R. L., & Hotchkiss, P., R. (1985). Scheduling practices and policies associated with increased achievement for low achieving students. *Journal of Negro Education*, *54*(3), 344-355.

Describes two parallel block elementary school schedules designed for reduced skill assignments, with details of the mathematics and reading blocks in one grade level. A rationale from the current effective

teaching/effective schools research is presented, along with data supporting the success of the schedules in terms of the subsequent achievement of Black and White elementary students.

Carroll, J. M. (1989). *The Copernican Plan: Restructuring the American High School.* Andover, MA: Regional Laboratory for Educational Improvement of the Northeast and the Islands.

Carroll focuses on a part of schooling with which educators have sometimes "tried to tinker". He demonstrates how tinkering can lead educators to rethink the way they plan and provide instruction. Carroll proposes moving to a schedule that includes "macroclasses" -- courses which meet either for 226 minutes on each of 30 days or for 110 minutes on each of 60 days (the equivalent of one trimester). Teachers would teach one macroclass at a time and students would take only one at a given time. The rest of the school day would focus on seminars, music, or physical education, and a preparation/help/study period at the end of the day. This plan allows for six 30-day major courses per year or six macroclasses in three trimesters. Carroll discusses both the school-wide ramifications as well as the plan's impact on academic departments. He cites supporting research about learning and motivation and effective schools and refers to findings about

similar programs. Finally, he considers issues of implementation. Carroll realizes a modified course schedule is not sufficient. He argues for other changes, including modifying instructional practices and developing an individualized learning plan for each student; moving to evaluation based on mastery learning; and modifying the number, kinds, and criteria for high school diplomas. Thus, he claims, the changes he recommends could be considered Copernican, having a fundamental impact on the entire gestalt of the American high school. The fundamental changes Carroll proposes open the door to rethink how students are evaluated, how credits are given, and how diplomas are awarded. It recommends a change in perspective that Carroll says needs serious, thoughtful, and prolonged consideration.

Carroll, J. M. (1990, January). The Copernican Plan: Restructuring the American High School. *Phi Delta Kappan*, 358-365.

By redeploying its staff members and students so that teachers can concentrate on teaching students, not on "covering" classes, the American high school can transform itself, Mr. Carroll indicates. The Copernican Plan proposes major restructuring of virtually all the basic systems within a high school. But the fundamental change -- the Copernican change -- is the change in the schedule. Instead of having students change locations,

subjects, and activities seven to nine times each day, the Copernican plan asks them to concentrate on one or two subjects at a time, each taught in an extended "macroclass". This change, Carroll writes, allows high school teachers to concentrate on the learning of individual students, which is the key, he says, to better instruction and improved student performance.

Carroll, J. M. (1994a). *The Copernican Plan Evaluated: The Evolution of a Revolution*. Topsfield, MA: Copernican Associates, Ltd.

This book proposes an educational revolution which begins by moving secondary education away from the Carnegie unit. This book is centered on evaluations and research based upon the Copernican plan, a plan for restructuring high schools which was developed by Carroll in 1983. The Copernican plan concentrates school reform on the classroom, on improved relationships between teachers and students and on more manageable workloads for both. The first section of the book deals, conceptually, with research and evaluation and presents an evaluation of the first attempt to implement the Copernican plan. The second section tests the conclusions of the first evaluation against the evaluated experience of seven other high schools that initiated versions of a Copernican structure. The third section summarizes the results and analyzes the meaning of these results. The final

section presents the considerable potential of the Copernican plan for the achievement of this nation's educational goals.

Carroll, J. M. (1994b, October). The Copernican Plan Evaluated: The Evolution of a Revolution. *Phi Delta Kappan*, 105-113.

The Copernican plan challenges an article of educational faith -- the Carnegie unit, which has dominated schools for 100 years. Mr. Carroll presents the evaluation of Copernican schedules in eight very different high schools. The results reported in the evaluations of the Copernican experiments included: a reduction in dropout rates, an increase in academic mastery, and improved problem-solving skills. Carroll concludes that there is no professional reason not to change to Copernican schedules. Furthermore, continuing to rely on the traditional Carnegie structure raises the question of professional malpractice, he says.

Cranston School Department. (1972). *The Continuous School Year: The Cranston Quadricycle Plan for a Continuous School Year.* Project Pacesetter, Rhode Island.

Acting on instructions from the Cranston School Committee, a committee comprised of educational professional staff, community leaders, citizens, and students was organized to consider the methods and feasibility of year-round schools. The year round concept and its application in various plans throughout the country was the subject of investigation by the committee for two years. This report to the community, school department, and elected officials of Cranston presents the progress, findings, and conclusions of Project Pacesetter from its inception to the present stage of its development. The report presents information on curriculum, the proposed model, cost analysis, and the results of surveys of teachers, students, citizens, and business and recreation segments of the community. The information provided in this report should be of significant value to those who intend to plan a year-round school program, and to the citizens of any community who must consider seriously whether this is an alternative they would like to use for their school system.

Dade County Public Schools. (1972). *Status -- Activities and Direction of the Quinmester Program in the Dade County Public Schools.*

This report is designed to provide the preliminary information that must be considered by policymaking management in deciding the future of the

quinmester program. The major sections present 1) a status report of the administration of the secondary quinmester program, 2) a review of the 1972 summer quinmester program, 3) a description of the planned quinmester activities for the 1972-73 school year, 4) a discussion of plans for the development of the elementary quinmester program, and 5) an appendix containing a cost analysis, an evaluation report, and a statistical summary of the quinmester program.

DeGregorio, W. (1973, February 2-7). *Tewksbury's Plan: The Continuous School Day*. Paper presented at the 57th National Association of Secondary School Principals Annual Convention, Dallas, Texas.

Tewksbury High School, Massachusetts, solved overcrowding problems by rearranging its school day. The continuous school day devised to solve this overcrowding is a double overlap schedule under which seniors attend school from 7:30 a.m. to noon, juniors from approximately 9:30 to 2:50 p.m., and sophomores from noon to 4:54 p.m. Under this plan, no more than 943 students at a time are in the building, which has a housing limitation of 1,000 students. Teachers' schedules are staggered and overlap those of the students. The new scheduling has not only solved the overcrowded situation, but has also allowed the school to move from about 90 course

offerings to 183. An evaluation of the program after three quarters of a year of operation, including a survey of teacher and student attitudes toward the new system, is included in the report.

Dempsey, R. A., & Traverso, H. P. (1983). *Scheduling the Secondary school* (Guide No. 88210-147-1). Reston VA: National Association of Secondary School Principals.

This "how-to-do-it" manual on the intricacies of school scheduling offers both technical information and common sense advice about the process of secondary school scheduling. The first of six chapters provides an overview of scheduling, chapter 2 examines specific considerations for scheduling, chapter 3 surveys the scheduling models and their variations, chapter 4 discussed preparing for the master schedule, chapter 5 gives specifics and examples on how to build a master schedule, and chapter 6 provides a summary and suggestions. The text contains 46 figures. A glossary of terms is provided.

DuFay, D. J. (1976). Differential methods of student program planning-scheduling (Doctoral dissertation, University of California, Los Angeles). *Dissertation Abstracts International*, *37*(5-A), 2632-2633.

The counselor, when functioning as program planner and scheduler, may have an influence on a student's academic and social growth. For the student to gain the greatest benefit from program planning and scheduling procedures, the strengths and weaknesses of the different program planning-scheduling methods used by the counselors need to be understood. A clear understanding of program planning-scheduling methods is necessary to the selection by a school of the one which is appropriate to the needs and expertise of the staff and the students. The study compared and evaluated three methods of program planning-scheduling: computer assisted scheduling, student self-scheduling, and counselor pre-scheduling. The study was conducted with counselors in thirteen senior high schools of the Los Angeles Unified School District. Data for the study was obtained from a *Counselor's Questionnaire on Program Planning and Scheduling*, counselor interviews, and a school characteristics questionnaire. The Counselor's Questionnaire, developed for the study, elicited responses on the program planning and scheduling functions of the counselor, the counselor's satisfaction with program planning and scheduling methods, and the input, planning and evaluation of program planning and scheduling policies and procedures. Ninety counselors participated in the questionnaire phase of the study. The interviews, conducted with forty-seven counselors, explored in depth program planning and scheduling methods and procedures, the effects of the scheduling method on students, teachers, parents, and the counselor,

the problem of program changes, the advantages and disadvantages of each method, and improvement needed or made in each method. A program planning-scheduling model, developed by the researcher, was utilized as an external assessment instrument to compare the different methods. Seventeen national authorities in the fields of counseling, guidance, and administration validated the model. The findings of the study indicated that counselors lack satisfaction with all methods of program planning-scheduling. While each method had advantages and disadvantages, the model confirmed that no one method was considered by the counselors superior to the other. Other findings were: 1) planning was viewed as more important than scheduling by all counselors, 2) counselors indicated that they thought groups external to the counseling office often judged their success by their expertise in program planning and scheduling, 3) counselors do not believe that any method is highly efficient in placing students in classes, nor do they feel strongly towards any scheduling method's ability to generate additional time to do other counseling functions, 4) counselors indicated some lack of confidence in any scheduling method, 5) the school characteristics of proportion of minority students, transience, attrition, and student academic ability discriminate among the methods of program planning-scheduling. The findings support the observation that there is no universal program

planning-scheduling method applicable to all schools. The selection of a method appropriate for a school depends upon its characteristics, needs, and expectations.

ERIC (1973). ERIC Abstracts: A Collection of ERIC Document Resumes on the Year-Round School. *ERIC Abstracts Series, No. 31.*

Among the advantages of year-round operation of schools over conventional 9-month operations, the documents in this annotated bibliography cite savings in cost and space, increased flexibility of scheduling, and higher teacher salaries. Various year-round plans are discussed and recommendations offered for implementation of a year-round schedule. The listing is complete for all issues of RIE through July 1973 and includes documents processed by this and other clearinghouses. Based on the document resumes in RIE, the following information is presented for each document: personal or institutional author, title, place of publication, publisher, publication date, number of pages, ERIC document (ED) number, price of the document if it is available from the ERIC Document Reproduction Service, alternate availability, and the abstract. Documents are listed alphabetically by author and are numbered.

Forty-five-Fifteen Associates, Inc. (1972, August 10-11). *National Workshop on "45-15"*. Paper presented at the National Workshop on "45-15", South Burlington, Vermont.

This document explores the various aspects of the 45-15 plan of school operation, whereby four groups of students are in school 45 days and then off 15 days on a rotating schedule throughout the year. The publication overviews the general aspects of 45-15, considering the basic concept and its origin, general implementation, how the plan compares with other year-round school calendars, and its efficiency and flexibility. The implications of the 45-15 plan on curriculum, community, students, finance, and legislation are discussed. Student evaluation under the 45-15 plan is considered, and sample progress reports are included. The document outlines the 45-15 scheduling procedure and the multiple access scheduling; including discussions on establishing the course catalog, student and teacher assignments, calendar selection, the scheduling process, and student transportation.

Frasher, J. M., & Bentley, E. L. (1971). *The four-quarter school year as implemented in metropolitan Atlanta secondary schools -- Final report.*

National Center for Educational Research and Development, Washington, D.C.

This investigation had as its objective the collection of relevant information in a systematic fashion concerning the actual, implemented four-quarter program. The investigators sought to identify what was currently operational in cooperating metropolitan school systems and to assess the degree to which the operational four-quarter plan met the objectives upon which the plan was formulated. Factual data were gathered in a series of interviews with central office personnel, and with the principals and counselors of numerous secondary schools. Related literature, including unpublished documents and working papers of the cooperating school systems, was reviewed; a survey instrument was also designed, tested, and implemented. Responses were received from the students and professional staffs of 31 high schools from four Metropolitan Atlanta school systems. Analysis of the results indicate a wide diversity between systems and among schools within the systems in their achievement levels relative to the objectives for the ideal four-quarter plan.

Gandara, P., & Fish, J. (1994). Year-round schooling as an avenue to major structural reform. *Educational Evaluation & Policy Analysis*, *16*(1), 67-85.

Reports on a study that sought to experiment with multiple education reforms in the context of an extended school calendar year. Three schools, with very different characteristics, undertook to extend their school year to approximately 223 days (from the previous 180 days), reorganize funding to provide more days of schooling for many students, and increase the length of the work year, and consequently the salaries of teachers. All 3 schools were able to demonstrate increases in academic achievement, a high level of parent and teacher satisfaction, and a cost-effective use of existing school facilities.

Goldman, J. J. (1983 July). Flexible Modular Scheduling: Results of evaluations in its second decade. *Urban Education*, *18*(2), 191-228.

Reviews the literature on flexible scheduling, with particular emphasis on flexible modular schedules in secondary schools. Analyzes problems with flexible modular scheduling that might have contributed to its declining popularity in the 1970's. An extensive bibliography is appended.

Greer, R. M., & Richardson, M. D. (1992). Restructuring the guidance delivery system: Implications for high school counselors. *School Counselor, 40*(2), 93-96.

Discusses flexible scheduling for school counselors as an alternative to traditional delivery modes to meet the increasing needs of students and their parents. New demands require a restructuring of the counseling delivery system that is congruent with an analysis of the clientele system served by counselors. Reasons that counselors should have flexible hours include: (1) reflecting parents availability due to work schedules, (2) addressing needs of students with societal problems, and (3) meeting with students regarding financial aid and college scholarships. A model program using flexible scheduling at a rural high school is described.

Henrico County Schools. (1978). *Evaluation Report of Block Program at J. R. Tucker High School.* Department of Research and Planning, Henrico County Schools, Richmond, VA.

For a period of time during the second semester of the 1973-74 school year, Tucker High School adopted a "block program" involving periods 1 and 2. A decision was made by the school staff to expand the program to include periods 1 - 6 on Monday through Thursday at the beginning of the

1974-1975 school year. At the request of the Division of Curriculum and Instruction, an evaluation of the block schedule was made. The primary research question was, "Does the block schedule enhance the effectiveness of teaching and learning?" The report is divided into the following sections: 1) report of interviews with selected staff members, 2) summary of previously conducted surveys and questionnaires, 3) analysis of scholastic ability and achievement test results, 4) summary and analysis of teacher and student questionnaires conducted as part of this evaluation, 5) analysis of homeroom attendance data, and 6) summary of the evaluation.

Kosanovic, G. E. (1994). *Retooling the Instructional Day - A Collection of Scheduling Models*. National Association of Secondary School Principals.

The author describes a study whose purpose was to provide a picture of high school scheduling in the United States. Almost 4,000 high schools across the nation with average daily memberships of 1,000 or more students were sent letters requesting a copy of their daily schedule. A total of 1,631 schools responded. Results indicated that 1,565 of the schools (96 percent of all respondents) utilized a traditional, classic schedule and 66 schools (4 percent of the total) used alternative schedules. The alternative schedules were block scheduling (38 schools) and a modular format (28 schools). The

publication also lists variables that need to be considered by schools that retool their instructional day. Such variables include: graduation requirements, number of course offerings, instructional minutes per day, building constraints, staffing issues, teacher contracts, state law and district policy, class credits, and curriculum requirements.

Lee, V. E., & Smith, J. B. (1994). High school restructuring and student achievement -- A new study finds strong links. *Issues In Restructuring Schools, 7*(Fall), 1-5.

In this issue report, authors point out that the recent movement to restructure schools has raised fundamental questions: Can changes in school structure improve student performance? Under what conditions might some structures be more effective than others? The authors present evidence that restructuring high schools can indeed make a difference for students. This analysis, using data on more than 11,000 students enrolled in 820 high schools nationwide, shows links between school restructuring and improved student learning. Although the study has not been able to show how or why these links occur, it offers evidence that students learn more in restructuring

schools. The authors suggest the findings might be explained through the contrast between schools that are organized bureaucratically and schools that are organized communally.

Logan, N. S. (1970). *Master Schedule Building and the Flexibly Scheduled School.* Department of Defense, Washington, D.C. and Utah University, Salt Lake City, UT.

The paper contains a model of a technique for increasing the quality of educational and instructional opportunity for all students. This model is developed around the flexible or modular scheduled secondary school. Also included is a procedure containing a computer program, with which the administrator can develop the master schedule of the school.

Lynn, L. (1994). Views from the front line. *Issues In Restructuring Schools*, 7(Fall), 12-13.

Lynn reports the reactions of three experienced high school principals to the Lee and Smith study in the same issue on restructuring practices. The interpretations of the study suggest that the Lee and Smith study of high-school restructuring will provide important new information -- and

ammunition -- for reformers who are pushing to restructure U.S. high schools. The findings reported by Lee and Smith offer guidance to practitioners on numerous important issues, the educators said. And the study is important because it provides possibly the strongest scholarly support for school restructuring yet published. One principal summed up the views of the educators in a statement that students do better in schools that "are really learning about their kids, getting to know them well, knowing their learning styles and their personal situations".

Martin, L. S., & Pavan, B. N. (1976, January). Current Research on Open Space, Nongrading, Vertical Grouping, and Team Teaching. *Phi Delta Kappan*, 310-315.

The authors review research on innovations such as open space, nongrading, vertical groping, and team teaching. They conclude that, overall, the research to date indicates that, when properly interpreted and implemented, such innovations may be a step toward educational improvement and are, in any case, valid alternatives to the traditional mode of teaching.

McLaughlin, M. W. (1990, December). The Rand change agent study revisited: Macro perspectives and micro realities. *Educational Researcher, 19*(9), 11-16.

The Rand Change-Agent study, undertaken from 1973-1978, indicated a significant shift in the ways people thought about affecting planned change in education. Rand found that effective projects were characterized by a process of mutual adaptation rather than uniform implementation, and that local factors (rather than federal program guidelines or project methods) dominated project outcomes. Revisiting these findings in light of today's changed practices and understandings reinforces some of Rand's findings and suggests modifications in others. This reconsideration also underscores the essential contribution of teacher's perspectives as informant and as a guide to policy and suggests that the challenge lies in understanding how policy can enable and facilitate effective practice.

McLaughlin, M. W. (1994). Somebody knows my name. *Issues In Restructuring Schools*, *7*(Fall), 9-11.

The author suggests that when it comes to encouraging student engagement with school and a willingness to work hard to achieve academic goals, the

extent to which a secondary school environment is a personal one matters more than any other single factor. Structures such as those collected under the rubric "restructuring practices" make a difference in student achievement and engagement when they support personal and sustained connections between students and adults in the school setting, and when they facilitate the sharing of knowledge about students as individuals and learners. McLaughlin offers some reasons why these things matter for student achievement and equity outcomes.

McPartland, J. M. (1987). *School structures and classroom practices in elementary, middle, and secondary schools.* (Technical Report No. 14). Johns Hopkins University, Baltimore, MD.

This paper analyzes data from the Pennsylvania Educational Quality Assessment (EQA) and the National Assessment of Educational Progress (NAEP) to provide a description of grouping, staffing, and scheduling practices that currently exist in elementary, middle, and high schools. The practices are found to follow a continuum from elementary through high school that proceeds from an early emphasis on "pupil orientation" to a later emphasis on "subject-matter orientation". These emphases drive decisions about the scheduling, staffing, and grouping practices that foster the

particular learning environments and activities that define a school's instructional program. The paper specifically examines the implications of these practices for middle schools. Survey data are displayed in graphs and tables.

Miller, B. (1987). *What are the advantages and disadvantages of small, rural, high schools and how can a school district minimize the disadvantages?* Portland OR: Northwest Regional Educational Laboratory.

The author discusses advantages and disadvantages of small rural schools. This paper discusses the issue that rural America, dependent on resource-based industries, has faced a distressed economy and declining populations. In addition to economic problems, small, sometimes multi-cultural, rural schools need specialized preservice teacher education programs to prepare teachers. There is an apparent lack of rural content in teacher preparation programs nationwide.

Mussatti, D. J. (1981, April 2-4). *Year-Round High School Programs.* Paper presented at the 12th Annual Meeting of the National Council on Year-Round Education, Anaheim, CA.

The author surveys the status of and issues surrounding year-round programs in secondary schools in order to provide background for deciding which school calendar is the most effective educationally, financially, and socially. The best programs and those discontinued are listed, as are the dates of the most important developments in year-round schooling. The current status of year-round programs is shown from data drawn both from California and nationwide. A series of tables also shows the public, curricular, and instructional issues most affected in schools that operate year-round. Along with summaries of the most vexing problems reported by experimental year-round programs, the report enumerates a range of functional problems, including those in the areas of curriculum and instruction, finance, scheduling of students, allocation of personnel, facilities and maintenance, transportation, school lunches, student activities and athletics, and support services. The paper also lists some advantages and points out the most promising programs.

National Association of Secondary School Principals. (1986). *National Association of Secondary School Principals (NASSP)/Comprehensive Assessment of School Environments (CASE) Sampler Kit.* Reston, VA: NASSP.

The Sampler Kit contains several surveys. One survey is the school climate

survey which asks different groups in a school and community what most people think about the school. These groups include students, teachers, school administrators, other school workers, school board members, and parents or other members of the community. The parent satisfaction survey asks the parents to indicate their satisfaction with various aspects of the school. The student satisfaction survey requires students to rate their degree of happiness regarding various aspects of the school. The teacher satisfaction survey, like the parent survey, asks the respondents to indicate their satisfaction with various aspects of the school. Also included is one NCS answer sheet and one examiner's manual.

National School Boards Association. (1984). *Polling Public Opinion: An Educational Goals Survey Kit.* National School Boards Association, copyrighted by Policy Studies in Education.

This kit offers a comprehensive and adaptable package of materials to enable local school leaders to conduct opinion polling in their communities. The materials are disseminated under the National School Boards Association's constitutional mandates "to study and interpret educational programs and to relate them to the needs of pupils" and "to promote public understanding of the role of school boards and school board members in the improvement of

education". Additionally, a purpose of the Educational Goals Survey is basically to provide an answer to the question, What should students be taught in school?

Newmann, F. M., & Wehlage, G. G. (1994). From knowledge to understanding. *Issues In Restructuring Schools*, *7*(Fall), 14-16.

It is commonly suggested from many sources that a major goal of school restructuring is to transform education from the transmission of knowledge to the development of understanding. But, the authors note that instead of learning only to recite facts and definitions and to follow rules, students should learn to make sense of, interpret and use such knowledge to solve unanticipated problems. It is further indicated that communitarian, personalized schools are necessary, but certainly not sufficient for substantially enhancing academic achievement or maximizing its equitable distribution.

Northwest Regional Educational Lab. (1990). *Literature search on the question: What are the advantages and disadvantages of various scheduling options for small secondary schools (high schools and middle schools)?* Information Analysis, Northwest Regional Educational Lab, Portland, OR.

Thorough investigation of scheduling options is needed to facilitate the development of a tailor-made schedule for the small school. The traditional scheduling model usually only works well in urban or suburban schools. When this mass production model is imposed on small schools, student needs become secondary to the dictates of the schedule. The traditional model offers security and ease of scheduling work experience programs. But it restricts teaching strategies, flexible grouping, individualized instruction, and independent study. The rotation model allows for more course offerings, varying optimum learning times, and reduction of daily teacher preparation, but must allow for meeting the prescribed instructional time. The modular model offers variations in the choices of time patterns for class periods, instructional practices, and number of students in group settings, but must have a minimum of 2 years planning, flexible physical space, and monitoring of students during their unscheduled time. The vertical model is based on individualized pacing and continuous student progress and allows for an expanded elective program but requires more initial planning, use of learning centers, more complex record keeping by teachers and an adjustment of the role of the teacher. Other scheduling considerations include term length, frequency of course offerings, team teaching, and learning centers. Addendum tables present: 1) in-house options for maintaining a broad curriculum, 2) options for using outside resources, and 3) use of new technologies to maintain a broad curriculum.

Report on Education Research. (1990, December 26). High school looking up, thanks to a pilot restructuring plan. *Report on Education Research*, 5-6.

This article describes, and reports reactions to, Joseph Carroll's pilot program at Masconomet Regional High School in Massachusetts. The pilot is one of Carroll's Copernican plans for restructuring high schools using a few mechanical changes in structure to get education moving in a different direction. The pilot involved placing 80 ninth graders in two 100-minute academic "macroclasses" per trimester. The core classes are supplemented by optional seminars on related issues, a help/study period, and the usual music and physical education classes.

Richmond Public Schools. (1994). *John Marshall High School Restructuring Survey Form.* John Marshall High School, Richmond Public Schools, Richmond, VA.

As part of an effort to improve the school's total program and to aid in planning, surveys were distributed to students, teachers, and parents. The student survey asked the students to provide responses about student attentiveness and performance, curriculum coverage, teacher collaboration and experimentation, student-teacher-parent relationships/attitudes toward

school, overall impression of the new approach, and general comments and observations. The teacher surveys were the same as the students surveys, but with an additional question that inquired about teacher time. The parent surveys were similar to the students' as well; they contained questions regarding student effort and performance, curriculum coverage, teacher collaboration and experimentation, student-teacher-parent relationships/attitudes toward school, overall impression of the new approach, and general comments and observations.

Schaeffler, W. S., & Collier, A. B. (1978). *Development and Interdependence: A One-semester Model Curriculum For Secondary Schools and Undergraduate Colleges.*

The interdisciplinary curriculum on global economic and social development and interdependence traces Western development trends, investigates current issues and processes in development, and offers a development planning exercise. An introductory section serves as a teacher's guide. It discusses the skills developed by the activities, suggests scheduling alternatives, and offers ideas for evaluation. Objectives include helping students develop a global perspective, examine personal attitudes and sense of individual responsibility, and understand why there is disparity of wealth

and power among nations. This guide lists resources for each unit as well as an annotated bibliography of 143 citations.

Schofield, D. (1974). Year-Round Schools. School Leadership Digest Series, #1. *ERIC/CEM Research Analysis Series, #3.*

The first of a series of 13 monthly reports, this paper reviews the issue of the year-round school -- a variety of calendar changes aimed at increasing the educational and economic efficiency of the school system. The author first reviews the major pros and cons of the year-round controversy, focusing on the questions of potential learning benefits to students and money saved on building costs in relation to money spent on additional staff and services. She then investigates the economic and social impact of year-round scheduling on the community as a whole, outlines a method to plan and initiate a year-round plan, and describes several plans already in operation. A selected bibliography is provided.

Sederberg, C. H. (1983). Courses = Classes: Catch 22 for Small Schools. *Research in Rural Education*, *2*(Spring 1983), 43-48.

Sederberg describes a project that used simulated master schedules as an alternative to grade-level, subject-matter, classroom-group organization of instruction in small schools. A multigrade, multicourse learning center approach is also described. The approach decouples the course = class equation and allows small schools to offer a stronger educational program.

Servetter, L. (1973). *Year-Round School Program: A case study*. Chula Vista City Schools, California.

This book describes the year-round school program of Chula Vista City School District. It begins with a discussion of the planning that occurred prior to the implementation of the program that includes descriptions of the problem, the legislation needed, and school relations with teachers and parents. The second section examines the first year of the operation at three different schools. Next, the publication explores the problems of developing an evaluation plan to assess effects of year-round school scheduling on pupils, parents, and staff. This section also summarizes the knowledge gained from one year of year-round school operation. The book concludes with a look at the future of year-round schools. The appendices contain

three year-round school calendars and a study comparing the open space traditionally scheduled elementary school to the open space year-round elementary school.

Sharman, R. G. (1990, December). Student dropouts and scheduling patterns in secondary schools: An exploratory study. *Alberta Journal of Educational Research, 36*(4), 325-326.

The records of 4,886 students in 18 Ontario high schools revealed that, compared to traditional full-year schools, dropout rates in matched semestered schools were lower for general-level students and much lower for basic-level students. There were no differences for advanced-level students.

Shaten, N. L. (1982, February). Building the Schedule: Breaking from the mold of traditional thinking. *NASSP Bulletin*, 91-95.

According to Shaten, the schedule is the time-management tool that enables educational programs and objectives to be implemented. In this article, Shaten offers suggestions for using computers to institute an innovative, creative school schedule that allows for flexibility in the curriculum.

Sturges, A. W., & Mrdjenovich, D. (1973). Anticipated and experienced problems in implementing a flexible-modular schedule. *Journal of Educational Research, 66*(6), 269-273.

Seventy secondary school principals were mailed a 99-item questionnaire concerning problems experienced in the implementation of a modular-flexible schedule of classes. Responses (32) were compared with those of a national jury of 6 prominent educators noted for their work in modular-flexible scheduling. Specifically, data were analyzed using chi-square tests between responses of principals and between responses to the questionnaire completed by principals and members of the national jury. Ten items were identified by both principals and jury members as problems. These include student attendance, criticisms by staff in other schools, inability of teachers to properly use time for preparation and student consultation, lack of increased student achievement, and parents' blaming the schedule for student failure. There was disagreement on two problems. Jury members predicted earlier arrival by students, but principals did not report this effect. National jury members also believed that, after implementing a major change such as the modular-flexible schedule, principals would find subsequent

program modifications equally as hard to implement as the original plan. Principals did not agree, but found subsequent changes were easier to facilitate after successfully implementing the modular-flexible schedule.

Survey Research Laboratory. (1994, January). *A study concerning the restructuring of public schools across the Commonwealth of Virginia.* Virginia Commonwealth University, Richmond, VA.

This study was being conducted by Lisa Martin, Assistant Principal at I. C. Norcom High School in Portsmouth, Virginia. The Survey Research Laboratory at Virginia Commonwealth University assisted with the study. The surveys include information on student experiences, the professional life of teachers, leadership, management and governance, coordination of community services, teacher/administrator demographic information, and school demographic information.

Tiffany, B. C. (1974, April 27 - May 2). *Year-Round School.* Paper presented at the 53rd National Association of Elementary School Principals National Convention, Anaheim, CA.

This presentation describes the year-round school operation of the Chula Vista City School District in California. Chula Vista adopted the 45-15 year-round plan to help ease a shortage of classroom space while maintaining a quality program for children. Under the plan, each pupil attends school for about nine-weeks and then has vacation for three weeks. Throughout the year, one-fourth of the pupils are on vacation at any time. Major advantages of the year-round program are that the long summer vacation is redistributed into shorter seasonal vacations, the school facility is in use 12 months a year, variations in teacher contracts are possible, and most of the benefits of the traditional school program are retained. Disadvantages include the break in the tradition of a long summer holiday, difficulties in scheduling and communication, more expensive maintenance, and the need to study and consider vacation programs throughout the entire year. The document also considers answers to questions often asked about implementation of a year-round school program. The 1974-75 year-round school calendar for each student group is included.

Walden, R. L. (1970). Flexible scheduling: Factors related to change in academic achievement (Doctoral dissertation, Northwestern University). *Dissertation Abstracts International, 30*(7-A), 2786.

It was the purpose of this study to identify personality and/or ability factors which relate to change in grade point average when a school shifts from a traditional schedule to a flexible schedule. The flexible, or modular, schedule used in the high school in this study reduced the amount of time spent in class, and students were given the freedom to choose between academic and social areas during their unscheduled time. A theory of academic vs. social choice was developed to predict which of these two types of choices would be made most frequently by students with certain characteristics and abilities. The theory assumes that frequent selection of a social area will result in a lowering of grade point average, and frequent selection of an academic area will result in an improvement in grade point average. The theory led to two general hypotheses. The first hypothesis was: students who experienced the largest increase in grade point average are likely to have characteristics associated with high achievement motivation, high motivation to delay gratification, and low affiliation motivation. The second hypothesis was: students low in these first two motivations and high in affiliation motivation are likely to have experienced the largest decrease in grade point average. Three groups of fifty students were set up for the study. Students whose grade point average improved the most one semester after flexible scheduling was introduced made up the "improved group". The "retrogressed group" was made up of students who went down the most in grade point average, and the "control group" consisted of students who

made no change. The following information was obtained for each student: 1) results of the Cooperative School and College Ability Tests, the Cooperative English Test, and the Sequential Test of Educational Progress, 2) the number of parents in the home, socioeconomic status, parents' education, characteristics of the census tract where the student lives, 3) race, 4) year in school, 5) scores on each of the eighteen dimensions of the California Psychological Inventory. Each variable was analyzed by either a one-way analysis of variance, or by a chi-square test. The variables were also examined simultaneously by two computer programs: a discriminant analysis, and a factor analysis. The first hypothesis was rejected because no variables were found which were related to an upward change in grade point average. There was some support for the second hypothesis. A factor which contained five variables significantly related to change in grade point average in the predicted downward direction was extracted in the factor analysis. Students who score low on the three standardized tests of achievement and ability, who come from families low in socioeconomic status, and whose parents have less than a high school education, are most frequently found in the retrogressed group. The retrogressed group also has significantly lower mean scores on the responsibility and social maturity scales of the California Psychological Inventory. Although none of the other sixteen dimensions of the California Psychological Inventory differ significantly between the groups, the results of the discriminant analysis

indicate that all the personality dimensions considered simultaneously effectively discriminate between the groups. One of the major implications of these results is that schools similar to the one in this study planning to use a flexible schedule should be cautious and make special provisions when applying the flexible schedule to certain students. These students are those low in achievement motivation and motivation to delay gratification, as indicated by low socioeconomic status, low educational level of parents, and low scores on standardized tests of ability and achievement.

Weiss, R. P. (1972). *A Readiness Model to Implement Modular Scheduling, 1971-1972.* Educational Research and Development Council.

This study was part of the ERDC's (Educational Research and Development Council's) overall program of evaluation of various aspects of modular scheduling in its member schools. A readiness model to implement modular scheduling was developed, based on a review of the literature on modular scheduling and on practices and theoretical aspects of change and its implications. The model was tested by surveying 25 secondary schools that have successfully implemented modular scheduling. Nine phases of the model signify when and which members of the school and community should be involved in the change process. Each phase also lists specific points for

facilitation of the model to further assist the staff in accomplishing the objectives of that particular phase.

White, W. D. (1987). *Effects of the year-round calendar on school attendance.* Jefferson County, Colorado.

This report explores effects of a year-round schedule on pupil and teacher attendance in the Jefferson County, Colorado, School District. Information is drawn from a 1977 district study and from interviews with teachers and principals. Comparison of data on attendance before the program and after its first year found that attendance increased in elementary and secondary schools. Teachers' attendance improved as well, demonstrated by less sick and personal leave. Over a year, per pupil cost savings was 74 cents. An unanticipated result (of the year-round school experience) was reduction of high school dropout statistics. Students returned to school (at no cost to the student) during a fifth quarter vacation in larger numbers: 2,010 additional spaces were utilized and additional credits totaled 1,171. Similar gains occurred among junior high schools. Elementary students often chose short courses offered during vacations. Interviews with experienced administrators and teachers include the following observations: scheduling flexibility accommodated students arriving and departing at each term change and

desiring to change teachers. Dropout problems were similarly resolved. Teachers preferred the adaptable lifestyle; families with both parents employed could arrange vacations. School holding power increased during the standard academic year. The schedule proved to be a feasible means for extending the year for able students and for those needing additional education, without incurring drastic budget increases.

Wood, F. H., & Gresso, D. W. (1990, December). For next change, think vertically. *Phi Delta Kappan*, 39.

The authors describe tips for implementing major changes in schools. To assist schools piloting new programs or innovations to improve schools, the authors recommend using vertical scheduling. Vertical teams consist of eight to ten district educators who are affected by the change being piloted, who can assist principals implement the change, and who can help develop a plan to implement the change on a districtwide basis. Six suggestions for establishing vertical teams to support a major restructuring in schools are identified, including: identification and appointment of the vertical team; involvement of the team in team-building activities; involvement of the principals in the group in piloting the desired change with the help of the team; identification of inservice training needed to carry out the roles of the

team members; analysis of the team members' experiences and identification of what is required to implement the changes on a districtwide basis; and appointment of a facilitator for the vertical team's activities.