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ABSTRACT

This report summarizes the procedures and results of a 2-year project carried our collaboratively by a university-based research and development center and a nearby high school. The first section summarizes the setting and rationale of the project (the Focused Flexibility project.) The ideas basic to the project were (1) a school should try to provide for each student only as much flexibility of activities as the student can profit from educationally and as much as the school can handle organizationally; (2) extensive measures of student outputs should be routinely collected and used, not only to maximize the student's chance for educational progress but also to provide appropriate positive feedback to all students. The next section of the report describes how these ideas were implemented. It emphasizes the importance of records management activities and describes a school records system called GREG, also developed for the project. Some difficulties with respect to records-management are discussed. The concluding section considers some of the main reasons for the difficulties encountered in establishing and maintaining accurate internal files in a school. It argues that these difficulties highlight an important but seldom recognized requirement for successful flexibility -- the capability to design and use records-management systems of high quality within the school. (Author/EA)

THE "FOCUSED FLEXIBILITY AND GREG" PROJECT AT WALBROOK HIGH SCHOOL

Summary Report

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INTRODUCTORY STATEMENT

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers and Curricula program bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the School Organization program, summarizes the procedures and results of a two-year project designed to provide secondary school students with flexible choice of courses and more frequent measurement of progress.

ABSTRACT

This report summarizes the procedures and results of a two-year project carried out collaboratively by a university-based research and development center and a nearby high school. The first section summarizes the setting and rationale of the project, which was called the Focused Flexibility project. The basic ideas motivating the project were as follows: (1) a school should try to provide for each student only as much flexibility of activities as the student can profit from educationally, and as much as the school can handle organizationally; (2) extensive measures of student outputs should be routinely collected and used, not only to maximize the student's chance for educational progress but also to provide appropriate positive feedback to all students.

The next section of the report describes how these ideas were implemented. It emphasizes the importance of records management activities, and describes a school records system called GREG, also developed for the project. The scheduling and registration aspects of GREG, based on a "walkaround" procedure, have proven quite successful. On the other hand, some difficulties with respect to records-management also have been discovered and are discussed. The latter sections of the report provide a detailed description of the GREG procedures. The concluding section considers some of the main reasons for the difficulties which were encountered in establishing and maintaining accurate internal files in a school. It argues that these difficulties highlight an important but seldom recognized requirement for successful flexibility -- the capability to design and use records-management systems of high quality within the school.

ACKNOWLEDGMENTS

This report, though written by one person, reflects the hard work of many. Numerous persons at Walbrook High School have put in long hours during the last two years, and their dedication and perseverance has made the difference between a successful project and one which might have terminated prematurely. In particular, the work done by Anne Emery, principal, Gerard McCarron, assistant principal, and Maurice Wells, formerly assistant principal, has been inspiring. Dr. Joel Carrington, Assistant Superintendent for Secondary Education in Baltimore, has supported and contributed to the project by thought, word, and deed, from its very beginning to the present.

At Hopkins, the same kind of dedication and initiative were shown on numerous occasions by Truman Prevatt and Lawrence Howe, who worked on the computer processing of the various files of data. Cynthia Duffy, Lawrence Howe, and Patricia Hughes also performed admirably in several minor crises, and preserved the records-management system during some of the inevitable stumbles.

Finally, the project benefited at various times and in various ways through the interest and suggestions of several colleagues at Hopkins. James McPartland, John Hollifield, and especially Gail Fennessey and Nancy Karweit, were frequently able to act as willing listeners, and provided helpful comments. Of course, although the project and its outcome is the result of the efforts of many, the author of this report alone must take responsibility for its limitations.

INTRODUCTION

Background

In the fall of 1970, when Walbrook High School was still under construction, an informal study group was established, comprised of the principal-designate for Walbrook, three other principal-designates for other secondary schools then under construction in Baltimore, and several social scientists from the Center for Social Organization of Schools at The Johns Hopkins University. The study group explored various organizational arrangements for possible use within these new secondary schools, arrangements which would benefit the pupils more than the customary ones, but which would be workable in an ordinary, large-city school.

The study group members met frequently and worked intensively over a period of about ten months. Their investigations included site visits to several secondary schools throughout the country which had successfully created unusual but effective school programs. From this investigation and the consequent discussion, several common impressions emerged. These common themes, and others which seemed appropriate for each particular school, gradually were developed into specific organizational plans for each of the new schools.

The common theme that appeared most important to the group was that dogmatic adherence to one particular educational ideology is likely to be a poor strategy. In any school, any particular arrangement is likely to work more successfully with some persons than with others. For example, an attempt to impose flexible modular scheduling is likely to create problems as

well as benefits. In general, a pragmatic rather than a dogmatic approach to new organizational forms is more promising. Moreover, any new arrangement should be watched carefully, and continued only where and when it actually produces a net increase in the school's success.

For Walbrook High School, the distinctive theme which seemed to offer the most promise was the following: Individualized sequences of instructional activities should be organized around clearly stated behavioral objectives, and should emphasize continuous student progress. Some discussion of this theme will be given in a later section of this report.

At about this time, the central school administration made a decision to operate the new schools as year-round schools. This decision made it more feasible for the Walbrook administrators to use one type of continuous progress, because the quarterly changes of course would allow additional flexibility in arranging an individual student's schedule to suit his needs. Based on these considerations, a general plan for Walbrook began to take shape.

One essential element of this general plan was that course offerings at Walbrook would be structured on a quarterly basis. Students would have only minimal restrictions as to the courses they might take each quarter. No courses were to be required; the only general requirement would be that each student acquire the number of credits in each subject area required by law for graduation. For certain specialized courses (e.g., foreign language courses and some mathematics courses), there would be a prerequisite that the student already have passed other related courses.

The quarterly opportunity to restructure his schedule would allow a student to switch courses sooner than in a semester or year-long arrangement if he felt that another course would be better for him (and, of course, provided that his counselor had no strong objections).

Another central element of the plan was that the performance of students would be monitored more frequently and fully than in conventional arrangements. This monitoring would allow more precise determination of, and response to, the student's level of success. For example, if a student were observed to be having academic or motivational problems, remedial action could be taken more quickly and appropriately. Conversely, if a student were performing especially well, he could more readily be given appropriate reinforcement and opportunities for enriched activities. Under a system of frequent and detailed grading, more students would experience educational success and social approval in school, and thus break the vicious cycle of failure and negative reinforcement which many of them had experienced in their earlier school careers.

In short, the frequent and detailed monitoring of student outcomes would provide the <u>focus</u> through which the program's <u>flexibility</u> could be used intelligently. That is, through this monitoring of outcomes, decisions concerning an individual student, and decisions concerning the program itself, could be made in terms of student development. For this reason, the project came to be referred to as the "Focused Flexibility" project.

Rationale for the Plan

The rationale behind this general plan for Walbrook had the following elements.

First, it was recognized that students and teachers vary considerably in their ability to work successfully within different kinds of organizational structures. This conclusion had been formed by the study group on the basis of their site visits and other experiences, and is supported by a wide variety of research findings as well. It led to a desire to make the organization at Walbrook flexible enough to allow some persons to work differently than others but still be in harmony with the general plan.

Second, it was felt that individualization and flexibility, though perhaps necessary conditions for development of an effective school, are never sufficient simply by themselves; indeed, misused individualization can be detrimental to a school. Thus, another element of the rationale was that flexibility is not an end in itself, but is rather a means for improving the school's effectiveness. If any particular aspect of the flexibility seemed to be ineffective after being tried, it would be reconsidered, modified, or eliminated, as needed.

Third, it was felt that a number of students who would be coming to Walbrook had previously been somewhat alienated by their school experiences. Many of them seldom had experienced success or formal approval in school. To counteract this alienation, it was intended that each student, whatever his academic preparation or talent, should have frequent opportunities for feeling academically successful at Walbrook.

Fourth, it was expected that there would be close collaboration between the school staff and the workers from the Johns Hopkins Center in order to collect extra data and analyze the new program in detail. The analysis

thus could be based largely on "hard" data, and any needed changes could be made in confidence that the changes would in turn be scrutinized to see their consequences.

Organization of the Project

Since the opening of Walbrook High School in September 1971, staff members at Walbrook and at Johns Hopkins University have worked to implement the ideas outlined in the preceding pages, and to develop a program based on the notion of focused flexibility. Their efforts have produced much progress, and a school which is generally quite successful; at the same time, there have been some disappointments, and various items of unfinished business remain. This report will attempt to present a balanced description and summary.

When the school began operating in September 1971, there was general agreement that a comprehensive review and evaluation of the general plan would be carried out after two years. The program budget at the Hopkins Center allowed no funds for operational activities beyond the two-year point. This budgetary limitation existed simply as a consequence of the mission of the Center, which is to gain and verify objective knowledge about promising patterns of school organization, but not to act as a source of supplemental operating support for individual schools.

The remainder of this summary report is organized around three substantive sections. The first of these sections describes the distinctive features of the "Focused Flexibility and GREG" project. (GREG is an acronym comprised of grading, effort, and registration, and is meant to describe the system of records-generation and processing developed as part of the project activities.)

The second section describes the history of the project over the two academic years during which Walbrook High School has been in operation. It enumerates the problems encountered, the responses made, and the accomplishments and shortcomings as they emerged. The third section describes in some detail the activities and steps involved in the GREG package of records-handling at Walbrook and at Hopkins. These three substantive sections are followed by a concluding section which provides major findings from the project, a discussion of some possible options for future action, and some recommendations about these options.

DISTINCTIVE FEATURES OF THE WALBROOK SYSTEM

The distinctive features of the system now in use at Walbrook High School fall into five categories. These are (1) the philosophy of focused flexibility; (2) the close collaboration between Walbrook staff and Hopkins staff; (3) the emphasis on use of information within the school; (4) the actual scheduling and registration procedures (GREG); and (5) the actual grade reporting procedures (GREG). This section discusses each of these features in turn.

The Philosophy of Focused Flexibility

Focused flexibility is basically unphilosophical. That is, it does not claim that a certain kind of organization is best for all schools, nor for all persons within a single school. On the contrary, it argues that the ideal organizational arrangement is one which allows each participant in the school as much flexibility of activities as that individual and the school organization can successfully handle. The word "successfully" means that each particular kind of flexibility should demonstrably promote the school's basic objectives--the academic and personal-social development of its students. If a particular kind of flexibility is (on balance) detrimental to an individual within the school, then that particular flexibility should be withdrawn from the individual. Similarly, if a particular kind of flexibility is (on balance) detrimental to the students or the school in general, then that flexibility likewise should be withdrawn, even though it is perhaps beneficial to some students. This philosophy recognizes that there are limits on the degree to which a school with ordinary resources can provide perfect flexibility to all its members,

and uses that recognition in making certain difficult choices. The philosophy also urges the review of any particular arrangement whenever an important change in the related circumstances occurs. Thus, a particular bit of flexibility which was not advi ble last month may be advisable this month, if some circumstance has changed.

In the project at Walbrook, initial steps to implement this philosophy were taken by setting up an organizational program which allowed students considerable flexibility in their choice of courses. Other kinds of flexibility within the school were (for the time being) kept at a more conventional level. It was decided that evaluation of this program would be made on an ongoing basis. Also, a summary assessment would be made after a sufficient period of time had elapsed for any start-up difficulties to have been resolved.

Collaboration Between Walbrook and Hopkins

One of the distinctive features of this project is that it has been a strictly joint enterprise. Planning and implementation at every stage have been worked out co-operatively by the Walbrook staff and the Hopkins staff. There has been a high degree of mutual respect and trust among all persons involved with the project, and this has contributed in large measure to the general sense of positive progress.

Hopkins staff members have provided expertise in the planning of data processing systems, and in the administration of large data files. They have also provided considerable supplies and manpower for the initial ("shakedown") operation of the system. The supplies have included punchcards, paper to be used for reports and schedules, gummed labels for records and schedules, filing materials, and miscellaneous computer supplies. The services have

included computer operation, computer time, clerical assistance in working with the data files, keypunching of large volume data, and administrative activity. Thus, collaboration has been physical as well as intellectual.

One result of this close collaboration is that each group has remained highly sensitive to the needs, capabilities, and limitations of the other. The occasions for mutual help have been frequent, and in almost all areas, the final product is the result of joint effort. The important point about this collaboration is not that the persons responsible for individual activities need to be identified or praised, but that the total kinds and amounts of planning and operating energy and skills be made clear.

Emphasis on Use of Information Within the School

The philosophy of focused flexibility requires that operating decisions be based primarily on concrete information from the situation rather than on abstract principles. This in turn implies a need for specific organizational structure in the school to collect, process, and use the relevant information. One objective of the project was to establish these organizational capabilities, and it was primarily this objective which led to the decision to adopt a computer-based system for registration and grading. As is clear from the experiences of many other schools, the actual details of scheduling, registration, and grading can be accomplished fairly well (assuming that manpower is available) with only manual procedures, as long as the demands are moderate. The particular advantage of the computer approach is that it makes possible various reports based on the data for registration and grading, reports which could not be compiled if the data were available only in manual form. Naturally, the computer also reduces the amount of human

clerical work required, but that should not be the primary reason for using it. The primary reason here was that the computer not only processes the basic information as needed for registration and grading, but also allows this information to be used more fully in analyzing either (a) the school operations, or (b) the performance of an individual student.

Scheduling and Registration Procedures

The most visible, concrete aspect of the GREG system is the walkaround registration procedure used each quarter. The scheduling and registration procedure can be broken down into two major parts: (1) determining what courses will be offered at what times and in what rooms; and (2) registering the individual students into a particular room and course during each period of the day.

The first major activity, the construction of a master schedule, is performed manually. The first step in schedule construction is to prepare and distribute to each student a preliminary catalogue of courses. This catalogue briefly describes each of the courses that will be offered during the next quarter. It is used by the students to help them decide which courses they wish to take.

In the second step, each student fills out a course request sheet indicating the courses he intends to take next quarter. Counselors supervise the completion of the course request sheets, and then use them to make up a tally showing (for each course) how many students intend to take it.

In the third step, these tallies of course requests are given to each department head for the courses in his department. Working from these tallies and his knowledge of the available teaching resources, each department

head then makes up a tentative master schedule for his own department, showing the teaching assignments for all members of his department, and the period and room number for each section of each course. These separate (and tentative) master schedules are then studied by the schedule co-ordinator, who may suggest modifications if he sees situations that are likely to produce problems. This judgment about the likelihood of schedule conflicts or other problems is made on the basis of the tallies and past experience; there is no calculation of a potential conflict matrix. Thus, the procedure cannot guarantee that the schedule which is finally chosen will be optimal. In practice, however, the schedules constructed this way have proved quite workable. Also, the flexibility of the walkaround registration procedure makes this limitation less serious than it would be if registration were performed by clerks (see Fenressey, 1973).

Once the master schedule has been established, punchcards for student names and for courses are prepared by Hopkins as the fourth major step. The fifth major step is the actual walkaround. In this activity, each student comes to a large room where a number of tables have been set up, one table for each department. At the beginning of the walkaround, the student picks up a punchcard with his name on it. Then, as he registers at each department table, he picks up other punchcards with the course information on them. He completes his registration by turning in all of the punchcards at an exit desk, where they are examined to be sure that he has one name card, a course card for each period, and no conflicts in any period.

The sixth step is the processing of these punchcard decks (which now contain the complete schedules of all students who have registered) on the Hopkins computer to yield: (1) a printed listing of schedules for all students,

(2) a set of gummed labels, one per student, showing each student's schedule, (3) class enrollment lists for each class; and (4) a list of any problems encountered in the schedules. The last major step is to process any students who are "exceptions," such as students who fail to come to the registration room.

The walkaround registration has been used successfully on five occasions, beginning in December 1971. The procedures have gradually been refined and coordinated, so that the most recent registration (March 1973) was highly successful. At that time, there were 1767 students registered, of 1882 live enrollment. Of the 1767, only 65 (3.68%) had problems with their schedule, and most of these problems were minor. Thus, the walkaround registration procedure, when used with careful checking at the exit desk, provides workable schedules for approximately as many students (96+%) as do most computer-based procedures.

One problem which occasionally has been serious is that some students do not come to the registration room at all. This indicates that the flexibility of course options is not contributing to the academic and personal-social development of these students. Also, because they must be scheduled by hand, their absence has created administrative problems at the beginning of the term. This experience has led to a modification of the course registration procedure, which aims to preserve the flexibility where needed, but to remove it where it is creating problems. Thus, in the most recent version of the procedure, a number of students who were deemed unlikely to benefit from the flexible schedule opportunity were identified and registered ahead of time by the administrators into a pre-arranged block of classes.

Other students who did not show up for the walkaround registration were given default schedules. All of this was done manually, but probably could be handled by machine.

Subsequent to the registration and creation of the initial schedules and class lists, there have been at least one and perhaps two or more cycles of activity to "update" the registration information. This updating is necessary for two reasons: (1) so that the student-locator files used in the main office and elsewhere will be as accurate as possible; and (2) so that the computer-assisted grading procedures likewise will be feasible and accurate. Difficulties in this updating of schedules have been the most serious single obstacle encountered to date in the GREG activities. A new updating procedure has been developed, in the last few months, in light of previous experience, but has not yet been tried. In any event, even this new procedure (based on maintaining a punchcard file of student schedules at the school) will make demands that are likely to tax the available resources.

Some of the difficulty encountered in operating these record-management procedures is due to the lack of an adequate base of equipment and personnel to maintain machine-oriented files. For example, if there were a keypunch and a highly dependable keypuncher on hand, data could be stored more compactly and changes in files could be made more readily. The same would be true if an on-line terminal were available in the school office. In short, many of the awkward characteristics of the present system are the result of tight constraints on resources for equipment and specialized personnel.

There is also an additional problem -- one which exists in most schools, but which usually remains invisible. Records management within schools is typically regarded as a relatively peripheral activity. Keeping various files

posted, though important, simply is not as vividly necessary as many other activities. Thus, many school records are not designed or maintained as perfectly as possible. One consequence of a program of increased flexibility is that a considerable increase in input to, and dependence on, the various records occurs. This makes the records-management problem apparent. Some further discussion of this issue will be provided in the final section of this report.

Grade-Reporting Procedures

The last major element of the GREG system is the set of procedures for collecting, recording, and reporting grades in each course. As mentioned earlier, this aspect of the system is the major basis for "focusing" the flexibility in the Walbrook program. At present, the grade-collection, recording, and reporting aspects of the system function well internally, but their usefulness is limited by the difficulties in maintaining accurate, up-to-date information on the actual schedule of all students.

The procedures used for collecting grades are quite simple. First, the updated schedule information is processed to yield updated class enrollment lists. These lists then are printed by the computer as "grade submittal forms." One such form is prepared for each section and each period. A total of about 500 sheets are prepared, with each teacher receiving about 4 or 5 sheets. On these forms, a teacher writes in the grade, the conduct, the effort, and the days absent for each student. This information can be taken directly from the teacher's personal record book, and needs to be written only once.

The sheets are then taken to a commercial keypunching service and the data on them are punched onto computer cards. These cards are used to introduce the grade data into the Hopkins computer for processing so that each student receives a report card, showing his grades in each course. The system also provides class lists of grades, which are handed back to the teachers as a check for their records, and gummed labels for the permanent record of each student. Finally, the average grade for each student, and his eligibility for honor roll status, also is determined with computer processing.

The grading system at Walbrook uses numbers from 60 up through 100 for students who pass a course. If a student has not passed a certain course, the grade he receives is "no credit" or NC. This grade is not the same as a "fail." It has no numerical value and is not counted at all in determining the student's grade average. The only implication of a "no credit" grade is that the course does not count toward graduation requirements.

Grades for effort and conduct are given separately, on a five-point scale for each dimension (Excellent, Good, Satisfactory, Fair, Unsatisfactory). As already mentioned, an original intention of the project was to develop more adequate means of determining, assigning and using effort and conduct grades. With this kind of arrangement, a student who was trying his best could receive recognition and incidental rewards just as these now are received by students who obtain high grade point averages. One possibility would be to calculate an effort honor roll and a conduct honor roll, and use these as bases for praise and privileges. To date, however, this phase of the project has not developed as rapidly as had been planned.

HISTORICAL SUMMARY

This section discusses some of the successes and some of the problems in the implementation of the focused flexibility program and the GREG system. The presentation, proceeding chronologically, indicates how the major sequences of activities were developed.

When Walbrook began operation in September 1971, the registration procedure did not use the walkaround method, but instead relied upon a small number of clerks to manually "stuff" the punchcards for the courses requested by each student. For various reasons, this arrangement did not work well (see Fennessey, 1973), and was changed during the second registration cycle (December 1971). The grading procedure, designed before the school began operation, had been planned to make use of the registration information, and to use "portapunch" cards. According to the plan, each teacher would receive and punch grades onto a set of partially prepunched cards for the students in his courses. However, because the many changes in student schedules had not been captured by the computer files, it was not possible to provide the teachers with prepunched cards already sorted by class list. These events are detailed in the earlier report mentioned above.

During the second quarter of operation (December 1971 - March 1972) two major changes in the GREG system were made. First, the walkaround procedure was used for registration, and second, a completely separate data collection effort was used to update class lists so that preprinted grade submittal sheets could be prepared. The walkaround registration seemed successful, except that a sizeable number of students were absent from registration. The revised grading procedure was mechanically quite workable; however,

there were problems with the accuracy of the class lists, and a number of teachers had to write in many additional names on their grade submittal sheets. A procedure was developed for incorporating these added names and recording these grades.

During the spring 1972 quarter, the third quarter of operation, the registration system was refined and computer processing was added to simplify the generation of records. The grade reporting system was used again in much the same form as in the winter quarter, and it again performed adequately except that there was incomplete schedule information.

Project activities during the fall 1972 quarter were devoted to further refinements to each part of the GREG system, and the beginning of planning to increase the salience of the "effort" grade. The registration and grading procedures were regarded as basically mature. For the first time, the class list information was being maintained on punchcards at the school. This was intended to resolve the difficulties of maintaining accurate class lists. This procedure relied upon the counselors and central office staff to move cards from one class to another, on an ongoing basis, whenever a student changed courses.

Development efforts during the fall 1972 quarter concentrated on ways to increase the salience of the effort grades and on ways to generate useful output information from the data. Several meetings were held concerning new effort grading procedures, and some preliminary analyses of grade data were carried out. However, at the end of the fall 1972 quarter (December 1972), it became clear that the updating problem (maintaining accurate files on student schedule information) still had not been solved. Although schedule updates for the fall quarter had been made on the punchcard file, enough errors had

remained that a large number of changes to the final grade submittal sheets had to be made by hand. Also, it became clear that the updating had not been carried out on an ongoing basis, but that it had piled up and was done on a rush basis at the end of the quarter. Under these circumstances, there was no opportunity for a trial run of grade lists before the actual grade lists were printed. These facts became apparent at about the middle of January 1973.

At the same time, it also became apparent that the walkaround registration operations carried out in early December had been less perfect than previously. A large number of students had been absent from the walkaround procedure, and some of those who had been registered had received incorrect schedules due to a combination of clerical and computer malfunctions. All of this created an extremely large number of schedule changes which had to be made during the winter quarter. The procedures for making these changes had not been planned in such a way as to permit this large number of changes to be handled, and in many cases, there was no feasible way to determine exactly what courses a student was taking. In short, the problem of updating schedules had precipitated a crisis of record-keeping, Through many hours of "crash" work for Walbrook and Hopkins staff, as well as the hiring of temporary clerks, most of the necessary changes were made, and the winter quarter grading (done in March-April 1973) proceeded smoothly, though behind schedule.

It has become clear, however, that updating of student schedules is a major bottleneck in the system as it now stands. Several distinct factors contribute to the problem, and each of these needs to be kept in mind, despite the natural tendency to look for a single cause and focus upon it. First,

part of the problem arose because in December, approximately 280 students did not register in the ordinary manner. These students had to be registered individually by the counselors and the central office schedule coordinator during the first few days of the winter term. This kept those people unusually busy at a time when they might have been dealing with other schedule problems. A second factor was that many students had erroneous Home Economics courses listed, because of a malfunction of the computer during the registration program. The short time between walkaround and the beginning of the next quarter allowed no opportunity to rectify these errors (or even discover them) until after the term had begun.

A third factor was the lack of clear restrictions on allowable changes of course during the quarter, and the lack of a cut-off date after which no changes of course were permitted. A fourth factor was that all persons involved became somewhat careless in recording the details of the transfer process, due in part to the pressure of other duties. As a result, more effort was ultimately required to make the changes than would have been the case if procedures had been better designed and followed more carefully. Finally, a further element, one which remains a problem, is simply the lack of personnel available for regular assignment to these tasks so that they can become specialized, and also be held accountable for the accuracy of the records.

In the latest round of GREG activities (March 1973) the walkaround registration was accomplished smoothly, thanks in large part to the availability of a specially trained clerk at the check-out desk. This clerk had only one assignment -- to check that each student turned in a consistent and complete schedule. Of 1767 students who participated in the walkaround, only 65 students had any errors in their schedules, and most of these errors

involved just a single course. The errors were identified prior to the beginning of the spring term and were corrected without difficulty. The number of students not registered in the ordinary way was about 120, considerably below the number missing in previous runs. Much of this improvement results from the prior selection of approximately 120 students for scheduling by the central office. The elimination of this group from the walkaround simplified both the walkaround itself and also the construction of the schedules for these students. Staff and students alike reported feeling highly satisfied with the registration activities in March.

The grading operation in March 1973 likewise went smoothly. The report cards, the class lists of grades, the gummed labels for the permanent record files, and the lists of honor roll and grade averages were prepared with little difficulty. The updating operation for winter grades was not entirely completed, due to lack of time and manpower. The response to this problem was to resolve conflicts by treating any course in which a student received a higher grade as the valid course, and to print on the report sheet a symbol next to the course indicating a possible problem. With this approach, the grading results turned out to be quite accurate.

DETAILED DESCRIPTION OF ACTIVITIES AND COSTS

This section describes the current version of the GREG records-management system, and suggests some further refinements. The description will include the structural elements of the system (the various types of records and files) and also the dynamic aspects (the sequences of activities involved).

There are two "basic" files maintained on an active basis by the school data office in the GREG system: (1) the student enrollment file, and (2) the course offerings file.

The student enrollment file is created at the beginning of each academic year, based on returning students and new entrants. It is updated throughout the year from time to time as necessary. One point at which the system could be further refined would be to adopt a code to be used to indicate that a student was withdrawn from the school, without actually removing his name from the file. This would simplify the problem of re-entry of a student after a temporary withdrawal, which has caused some problems in the past. Also, it would be desirable, but has not been feasible thus far due to lack of manpower, to have a periodic reconcilement (perhaps weekly) of changes made to the computer file with changes made by the school administrator in charge of pupil entry and withdrawal. Finally, one point worthy of note is that homeroom assignment should be regarded as primarily an administrative convenience, and for that reason should remain fixed throughout the year. In this way, although other aspects of a student's program may change substantially during the year, there will be a single teacher (the homeroom teacher) who can be expected to be in contact with the student each day.

The course offerings file is the second "basic" file. It is created anew for each quarter, and is updated occasionally during the quarter as course-sections are added, deleted, or changed, or as teacher assignments are changed. The basic lifetime of the student enrollment file is one academic year, and the lifetime of the course offerings file is one quarter.

Using these two basic files, the GREG system creates at the beginning of each quarter two additional "derived" files. These derived files are: (1) the student schedule file; and (2) the class list file. It should be noted that the two derived files are basically the same records, but simply sorted in differing sequences. Each record in one of these files pertains to a particular student and to a particular class section. For the student schedule file, all of the records for a particular student are arranged together, in order of period of the day. For the class list file, all of the records for a particular class section are arranged together, and presented in order by alphabetical listing of the students' last names.

These two files come into being at the walkaround registration, and are supplemented by any additional registration which is done manually or individually. At the end of each quarter, additional information, that is, the grades and attendance information, is added to the student schedule records and the class list records. These files then are used to create various reports (i.e., report cards for the students, transcript information for the student cumulative records, and class grade summaries for each teacher) for the school. After that, the files are regarded as inactive and become part of the school archives. They remain available for further processing if additional reports are desired.

The version of the GREG system described here is seen as a prototype. The basic design parameters have been identified, and some actual record formats and procedures for working with these records have been developed and used. However, it is recognized that this version of the system is a crude one in its own terms; also, it has not been integrated as fully as possible into the ongoing records-management activities of the school. The computer records have been seen by most school personnel as an added-on component, rather than as part of the integral filing system of the school. This represents one of the dilemmas emerging from the project, and one which can be resolved only through intervention by officials at the district level. That is, these administrators must be willing to commit resources for (at least) automated unit record equipment as part of the basic data mangement operation of the school. Thus, the description provided here should be regarded as offering only a first approximation to the kind of records-management system that could actually be developed.

The purpose of the GREG system is: 1) to provide a coherent and efficient set of procedures for defining, creating, and maintaining records such as these within large, flexibly operated schools, 2) to insure that the records are created accurately and updated periodically during their active life, and 3) to define and use reports based on these records for locating students and providing transcripts and other performance records and administrative reports. The activities involved in operating the GREG system fall into several major categories:

1. create, edit, maintain the student enrollment file (activity #100-199)

2. create, edit, maintain the current course offerings file (activity #200-299)

3. create the student schedule file and class list file (activity #300-399)

4. edit and maintain the student schedule file and/or the class list file (activity #400-499)

5. capture and process grading and attendance data (activity #500-599).

The system has been implemented through a collaborative arrangement involving periodic use of an IBM 1401 computer (16K storage, four 729 tapes, one 1311 disk, one 1402 reader-punch, and one 1403 printer) at the Hopkins Center. The files have been created and are maintained at the school on paper and on punchcards; the punchcards are processed at Hopkins using tape and disk storage and reports are returned to Walbrook. Various computer programs have been written to perform the particular activities required. It should be noted that although these programs are fully functional, they have been written as prototypes. No claim is made that they are particularly efficient from a data processing standpoint. The programs are available at present, and should run with no modification on any similar computer configuration.

The tables on the following pages describe the cycle of activites in GREG. The activities performed within the school are indicated in relatively general terms (using all capital letters), and those performed at Hopkins are presented in more detail. Each of these detailed activities is numbered for ease of reference. Also, for each activity, an estimate is provided of the typical amount of real time required to perform it using the hardware and

programs now available. These time estimates are in terms of actual hours. For activities which consume materials and/or supplies, a note is provided indicating what these supplies are, and their approximate cost. The usual commercial charge for computer service on an IBM 1401 is approximately $30.00/hour plus $6.00/hour operator salary. Finally, an occasional comment is made indicating the nature or attributes of an activity.

GREG SYSTEMS

ACTIVITIES

REF#	ACTIVITY	AVG TIME *	SUPPLIES MATERIALS	COMMENTS
100	CONSTRUCT STDNT ENROLLMENT CARD FILE	MACRO	Paper,cards; (file trays)	
101	CODE NEW STUDENT INFORMATION	VARIABLE	Paper	WALBROOK
102	PUNCH NEW CARDS	VARIABLE	Cards	WALBROOK
103	SORT ALL CARDS BY HOMEROOM	3.00	-	WALBROOK
111	Load homeroom card file N= 2000) onto tape	0.25	-	JHU
112	Sort tape by 5 digit ident number	0.20	-	JHU
113	Run check for dupl ident numbers	0.10	-	JHU (edit)
114	List file by ident number	0.30	Paper	JHU optional
115	Sort tape by BCPS number	0.15	-	JHU
116	Run check for dupl BCPS number	0.10	-	JHU (edit)
117	List file by BCPS number	0.30	Paper	JHU
118	Sort tape by alpha	0.20	-	JHU
119	Run check for dupl names	0.10	-	JHU (edit)
120	List file by alpha	0.30	Paper	JHU
121	CORRECT ANY ERRORS REVEALED BY EDITS	VARIABLE	Cards	WALBROOK
122	Punch (by computer) name cards for walkaround	0.60	4000 cards	JHU
123	Interpret name cards	0.80	-	JHU or WALBROOK

* MACRO means that this is a broad class of activities, involving several distinct cific activities.

REF#	ACTIVITY	AVG TIME	SUPPLIES MATERIALS	COMMENTS
200	CONSTRUCT COURSE OFFERINGS CARD FILE	MACRO	Paper, 1000 Cards	
201	DRAFT CATALOG OF COURSES	VARIABLE	Paper	WALBROOK
202	PRINT & DISTRIBUTE CATALOG	VARIABLE	Paper	WALBROOK
203	DISTRIBUTE, COMPLETE, and COLLECT COURSE REQUEST SHEETS	VARIABLE		WALBROOK
204	TALLY COURSE REQUESTS	VARIABLE		WALBROOK
205	DETERMINE COURSE TIME & PLACE	VARIABLE		WALBROOK
206	PUNCH HEADER CARD FILE	1.00	500 Cards	WALBROOK
207	Load header card file (N = 500) onto tape	0.10	-	JHU
208	Sort tape by dept, room, period, course	0.08	-	JHU
209	Assign serial numbers and check for dupls	0.08	-	JHU (edit)
210	Print worksheets for teacher/title cards	0.15	Paper	JHU
211	CODE TEACHER/TITLE INFO	VARIABLE	-	WALBROOK
212	PUNCH TEACHER/TITLE CARDS	1.50	500 Cards	WALBROOK
213	Load teacher/title cards onto tape	0.10	-	JHU
214	Sort tape by serial #	0.08	-	JHU
215	Sort header tape by serial #	0.08	-	JHU
216	Merge teacher/title and header info	0.15	-	JHU
217	List course offering file	0.12	-	JHU
218	Punch (by computer) course cards for walkaround	2.00	20,000 Cards	JHU
219	Interpret course cards	4.00	-	JHU or WALBROOK

REF#	ACTIVITY	AVG TIME	SUPPLIES MATERIALS	COMMENTS
300	WALKAROUND REGISTRATION	MACRO	-	
351	Load kid-course cards (N = 13,000) onto tape	0.75	-	JHU
352	Clear disk	0.20	-	JHU
353	Load stdnt enrollment tape onto disk	0.25	-	JHU
354	Sort kid-course tape by alpha	0.25	-	JHU
355	Load kid-course tape and course info tape onto disk	1.50	-	JHU
356	Write student schedule tape and expanded kid-course tape from disk	1.50	-	JHU
357	Run check program on schedule tape	0.40	-	JHU (edit)
358	Sort schedule tape	0.40	-	JHU
359	List student schedules from tape	0.50	Paper	JHU
360	Print gummed labels of schedules	0.75	2000 Labels $25.00	JHU
361	Sort expanded kid-course tape	0.75	-	JHU
362	Punch (by computer) cards for stdnt schedule file	1.30	13,000 Cards	JHU
363	Interpret cards	2.60	-	JHU
364	Block records on kid-course tape	0.25	-	JHU
365	Sort blocked tape by serial #, alpha	1.00	-	JHU
366	List class list file from tape	0.50	Paper	JHU

REF#	ACTIVITY	AVG TIME	SUPPLIES MATERIALS	COMMENTS
400	MAINTAIN & UPDATE CARD FILES	MACRO	Card file equipment	
401	UPDATE STUDENT ENROLLMENT CARD FILE	MACRO	VARIABLE	
402	EDIT STUDENT ENROLLMENT CARD FILE	MACRO	VARIABLE	
403	UPDATE COURSE OFFERINGS CARD FILE	MACRO	VARIABLE	
404	EDIT COURSE OFFERINGS CARD FILE	MACRO	VARIABLE	
405	UPDATE KID-COURSE OR SCHEDULE CARD FILE	MACRO	VARIABLE	Problem Area
406	EDIT KID-COURSE OR SCHEDULE CARD FILE	MACRO	VARIABLE	

REF#	ACTIVITY	AVG TIME	SUPPLIES MATERIALS	COMMENTS
500	COLLECT & PROCESS GRADES AND ATTENDANCE DATA	MACRO		
501	List grade submittal sheets for each class	0.40	Paper	JHU
502	TEACHERS RECORD GRADES	VARIABLE	-	WALBROOK
503	Keypunch data from grade submittal sheets	35.00	2000 Cards	JHU, now WALBROOK (cash cost $200)
504	Load grade-attend cards onto tape	0.75	-	JHU
505	Fill grades from tape onto disk	1.50	-	JHU
506	Write report card tape from disk	1.50	-	JHU
507	List report cards from tape	3.00	Paper $30.00	JHU
508	Block tape	0.25	-	JHU
509	Print gummed labels	0.75	Labels $25.00	JHU
510	Collapse records and calculate averages	1.00	-	JHU
511	Determine honor roll	0.50	-	JHU
512	Sort tape by serial, alpha	1.00	-	JHU
513	Print class list of grades	1.00	Paper	JHU

FINDINGS, OPTIONS, and RECOMMENDATIONS

This final section of the report summarizes the major results which have emerged from the Focused Flexibility project thus far, and outlines some possible courses of action for future work. It also makes some recommendations as to the desirability of these actions.

The most pervasive and positive finding is that scheduling via the walkaround registration procedure works smoothly and is well-liked by students and staff at Walbrook. These conclusions rest upon several cycles of experience and upon informal conversations with teachers, counselors, and administrators at Walbrook. The procedures used for construction of a master schedule have been simple and unmechanized, but have proven quite effective. The "walkaround" registration procedure is likewise technically effective and also provides a sense of involvement not possible with other kinds of registration procedures (cf Fennessey, 1973).

The next finding of importance is that, each quarter, the task of updating the schedule or class list files has not been adequately accomplished. This failure makes the operation of any computer-assisted grading procedure unfeasible. It should be made clear that the actual procedure for recording grades and producing reports has proven fully workable. The limitation lies in the inability of the record-keeping operation to maintain an accurate central file containing the current schedule of each student. A related finding is that Walbrook students and staff generally express less support for the computer-assisted grading than for the walkaround registration.

A third major finding is that there is strong commitment to the quarter system and the flexible course offerings arrangement. Many of the staff and students are convinced that this flexibility provides Walbrook with its distinctive appeal to students, and is in large measure responsible for the generally positive climate within the school.

The fourth finding concerns the obstacles encountered in making this flexible course choice program operational. In addition to limitations on the resources now available within the school, there is a seldom recognized relationship between the need for flexibility of choice and the need for accurate records and control. These two objectives are reconcilable only if a substantial "overhead" operation of record-keeping is introduced. This relationship, and consequent recognition of the importance or records, is not something that is easily appreciated by the typical school staff member. Thus, there have been specific problems in design and operation of the GREG system due to failures to co-ordinate planning, to work on details, and to be careful and thorough in execution. Aggravating the problem is the fact that many other demands compete for the time of the persons who must maintain the records.

Some specific aspects of this general finding are as follows:

(1) school staff tend to depend upon personal communication rather than upon formal records whenever possible ("people more than paper"). This tends to make the records seem less important, and thus permits them to be inaccurate without creating perceived problems.

(2) machinery and personnel for expanded records-management activities typically are temporarily "borrowed." That is, no one is permanently and officially assigned to carry out the clerical tasks. Various persons are asked to pitch in while still performing their regular duties. These helpers often are not well prepared for the tasks, and they are not fully responsible for the correctness of the results.

(3) the complex nature of the school, including its diversity of student backgrounds and aspirations, and its varied curricular program, magnify the tasks involved in even a routine operation, and demand that conscious efforts be made to co-ordinate the various "student-processing" activities.

(4) decentralized instruction and record-keeping creates "political" and status problems of coordination and control.

These problems are neither simple nor separate. To deal with them adequately will require a concentrated and planned effort. Under these conditions, it appears that there are three broad kinds of options available.

The first of these broad options would be simply to conclude that the school cannot maintain its present degree of flexibility. The amount of latitude in course choices could be considerably reduced. Of course, choosing this path would imply foregoing the benefits of the flexibility. The second broad option would be to reallocate existing resources within the school to make the flexibility more workable. Fully adopting this option would require that certain other activities be relatively neglected, and so would be opposed by persons who believe that the other activities should be maintained. A third broad option would be to obtain outside support and resources to operate the flexible scheduling program in the next year and thereafter.

These three options are not mutually exclusive. It is possible, and probably desirable, to partially adopt each. One sensible procedure would be to reduce the flexibility somewhat, thereby reducing also the burden on the record processing facilities. This could be accomplished by continuing to "block-schedule" a small fraction of the students, and by temporarily switching to a manual grading system, so that the work of grading would be performed by the individual teachers. With this arrangement, the core of the flexibility -- the walk-around registration for quarter courses -- would be maintained. At the same time, some resources within the school could be reallocated to improve the efficiency of the registration process. This would require careful planning and consultation within the school. Finally, some modest additional assistance in the form of computer processing service perhaps could be supplied by the central office of Baltimore City Department of Education, on an experimental basis.

A final recommendation is that the future progress of the entire Walbrook project be supervised by a combined advisory panel, including representatives of Walbrook staff and students, of the data processing personnel, of the Superintendent's office, and perhaps of Hopkins. This panel would meet periodically to review objectives and accomplishments and also to plan, co-ordinate, and document major developments. One of its tasks might be to prepare a formal proposal for financial support from an outside source, and to administer such support once it is obtained.

REFERENCES

Fennessey, James, "Focused Flexibility in a Secondary School: A Description and Analysis," Report #149, Center for Social Organization of Schools, The John Hopkins University, January, 1973.