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ABSTRACT

This report presents the evaluation design and results of a two-year pilot test of the Wisconsin System for Instructional Management (WIS-SIM) in seven Wisconsin elementary schools. WIS-SIM is a management information system designed to support management processes in Individually Guided Education programs. The evaluation design, which is based on perceptual and judgmental information from users as well as objective data on system operation, examines the functioning, utilization, and effects of the system. Inservice training for computer-terminal aides, teachers, principals, and school-level coordinators was found to be essential for effective system functioning. System utilization varied greatly from school to school, and those schools that used WIS-SIM most frequently appeared to be most satisfied with it. Evidence on effects of the system suggests it reduced the amount of time required for clerical tasks. Teachers reported that the hours spent on planning did not change, but the effectiveness of time spent on planning increased. Student achievement showed an increasing trend, but these changes cannot be directly attributed to WIS-SIM implementation. WIS-SIM was found to be more cost-effective as a management tool than as a recordkeeping system. (Author/JG)

Technical Report No. 438

EVALUATION OF THE WISCONSIN SYSTEM FOR INSTRUCTIONAL MANAGEMENT (WIS-SIM PILOT TEST)

by

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Report from the Project on
Studies of Administration and Organization for Instruction

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ABSTRACT

The Wisconsin System for Instructional Management (WIS-SIM) is designed to provide record keeping and management support for programs of Individually Guided Education. This paper reports the results of a two-year pilot test of the implementation of WIS-SIM in seven Wisconsin elementary schools. The evaluation design includes consideration of system functioning, utilization and effects, based on perceptual and judgemental information supplied by users, as well as actual data collected on system operation.

System functioning is concerned with the capabilities of both the human and physical components of the information system. Inservice sessions were successful in increasing particpants' knowledge about and understanding of WIS-SIM. The essential nature of effective training of computer-terminal aides, teachers, principals and school level coordinators on successful implementation is emphasized. Turn-around time was examined as a part of system functioning. While WIS-SIM is capable of very fast turn-around, it is considered that this level responsiveness is not required for most school level decision needs.

The utilization of the system varied greatly from school to school. Those schools in which the system was used most frequently appeared to be most satisfied with it. Most accesses to WIS-SIM were for the purpose of computing information; the most frequently requested reports were for individual student achievement records and for information to assist with the grouping of students. Users rated all reports as being useful and teachers reported that many of their tasks were affected by WIS-SIM.

The presumed effect that WIS-SIM had in the allocation of teacher time to clerical, planning and instructional activities was examined. The evidence suggests a reduction in the amount of time required on clerical tasks. Teacher comments expressed that the number of hours spent on planning had not changed, but that the effectiveness of time spent on planning had increased. Student achievement demonstrated an increasing trend, but neither the changes in teacher time on activities nor the changes in student achievement can be directly attributed to WIS-SIM implementation because of design limitations. Teachers in schools where the system was used reported very positive attitudes toward the system and its effects.

The cost of operating WIS-SIM varies widely depending on system usage and what costs are included in the estimate. Exclusive of software development and system implementation, operational costs are

estimated at approximating $.80 per student per month in each curricular area, but not all of these costs necessarily represent increases to the total school budget. It is concluded that the cost effectiveness of WIS-SIM resides in its potential as a management tool, not as a record keeping system.

Recommendations are included in the report concerning site selection, staffing and inservice and system implementation. The evaluation framework used for this study is reviewed as a basis for future research and evaluation studies on management information systems. The study concludes that the majority of objectives and design goals have been attained. The pilot test of WIS-SIM is important as a proof of the concept of instructional management information systems but does not provide strong evidence that this system is cost effective in improving educational outcomes.

I

EVALUATION DESIGN

This report contains the design and evaluation results of a two-year pilot test of the Wisconsin System for Instructional Management (WIS-SIM). WIS-SIM is a management information system designed to support management processes in individualized programs of education, particularly educational programs being implemented in accordance with the precepts of Individually Guided Education (IGE). Individually Guided Education is a comprehensive system of education designed to produce higher educational achievements through providing for individual differences between students in areas such as rate of learning and learning style. Although the overall concept of IGE includes components such as a multiunit organization, provisions for a variety of curriculum materials, evaluative procedures, and a program for home-school-community relations, it is the instructional programming model that is especially important for the design of the computer management system, WIS-SIM.

The instructional programming model assumes the existence of a set of measurable objectives for a curriculum area. It is designed to take into account the pupil's beginning level of performance, rate of progress, style of learning, motivational level, and other characteristics important in the context of the educational program of the school. The instructional programming model provides a basis for curriculum components developed at the Wisconsin Research and Development Center for Cognitive Learning, two of which were supported by WIS-SIM during the pilot test: Wisconsin Design for Reading Skill Development (WDRSD) and Developing Mathematical Processes (DMP).*

Individualized programs are generally quite complex in design and even more complex in operation. While the task of creating an initial list of goals or objectives for a particular curriculum area may be difficult, the task of keeping track of students as they progress through the various goals or objectives is an even greater problem. The teacher's task is made difficult by the need to assess initial performance levels for each curriculum unit, make a diagnosis of instructional need, select an appropriate instructional strategy to meet the need, and give a criterion-referenced test to ascertain levels of goal attainment for each student.

*An extensive discussion of Individually Guided Education and these two curriculum components may be found in Klausmeier, Rossmiller, & Saily, 1977.

A comprehensive, manually-operated system of individualized instruction may not be feasible. Rather, it seems evident that individualized instructional programs may require support from automated information storate, processing, and retrieval mechanisms. Areas of an individualized system which are difficult to manage manually involve capturing, storing, retrieving, and reporting information. Lists of objectives for each instructional area need to be formulated, filed, constantly updated, and maintained. They need to be continually reviewed in terms of both group and individual progress. Pupil performance on assigned objectives must be recorded and reviewed. Testing of pupils occurs at both pre- and post-instructional stages and machine scoring of these tests is particularly feasible and desirable, especially for comprehensive placement tests. Perhaps most important of all, reports to pupils, teachers, school administrators, and parents, that can assist them in the process of instructional decision making, can be provided accurately and rapidly when a system of computer managed instruction is employed.

Computer managed instruction (CMI) systems seek to facilitate the processing of information and supplying this information at appropriate times and places so that it can be applied directly to instructional decision making. The instructional cycle in programs of individualized instruction may be defined as involving five processes and two decision areas. Initially, testing, designed to provide placement information about students, is carried out (Process 1). These placement tests are then scored and the results compared with mastery or performance levels that have been specified for each student and for each instructional objective (Process 2). Diagnosing (Process 3) produces information that is utilized in assessing instructional need, relative to a particular curricular program (Decision Area 1). Prescribing or guiding (Process 4) is designed to provide information useful for selecting those instructional activities (Decision Area 2) that are most appropriate for meeting the student's instructional needs. The selected activities are carried out systematically during instruction (Process 5) after which testing (Process 1) again takes place to determine if the student has met the instructional objectives.

The basic structure of programs of individualized instruction, as discussed by Spuck, Hunter, Owen, & Belt (1975), leads to the following assumptions concerning instructional programs that may be supported by a system of computer management:

1. There exist instructional missions and goals that are reducible to sets of measurable instructional objectives

2. Testing instruments and procedures that may be used to assess mastery of the instructional objectives are available

3. Levels of mastery, or performance standards, are specified for each child and for each instructional objective

4. Objectives that form a part of each student's instructional program are delineated

5. Dependencies existing between objectives are specified

6. Normative information exists, if required, for input into the specifying of long-range performance expectations

7. Educational activities and materials exist that provide individualized instructional experiences toward the accomplishment of the specified instructional objectives

8. It is possible quantitatively and qualitatively to assess the individual characterisitcs of students essential to individualizing instructional activities

9. It is possible quantitatively and qualitatively to assess the resource implications of alternative educational experiences.

EVALUATION PLAN

A primary purpose of the evaluation of a management information system (MIS) is to assess the extent to which the goals and objectives of the system are being realized and to identify factors associated with successful outcomes. The information collected in an evaluation can be used to make decisions about system design, refinement, and operation, as well as decisions concerning the continuation or expansion of the system. When the evaluation focuses on system development and improvement, it is called formative; when it is concerned primarily with continued or expanded use of the system, it is called summative. This evaluation was designed to be formative. As such, the information collected was utilized in making decisions about system design and refinement. The process of WIS-SIM development is continuing, and the design of a more generalized instructional management system was formulated on the basis of the pilot test evaluations presented in this report. (See Belt & Spuck, 1975, for a description of the general design for this system.)

More generally than the formative assessment of the goals and objectives of WIS-SIM, this evaluation may be viewed as a proof of the concept of computer managed instruction, and seeks the answer to the following question: Can a system of computer managed instruction designed to support programs of individualized education such as IGE be successfully developed and implemented?

Formative and summative evaluation may vary both in the type of information collected and in the design of the evaluation. In summative evaluations, the information collected should be directly related to the impact the system has on the ultimate goals of the system.

In an educational environment, this would include student learning and changes in student behavior. The designs employed should be as rigorous and as experimental as possible, and should take place when system development has stabilized. When the evaluation is formative, the information collected relates to both direct and ultimate effects of the system, to whether the system is being implemented in accordance with design specifications, and to whether progress is being made toward achieving the outcomes for which the system was developed. The design of the formative evaluation will, of necessity, be less experimental and less formal than a summative evaluation. In both formative and summative evaluations, the primary focus is on the objectives of the program or system to be evaluated. In formative evaluations especially, however, an attempt should be made to examine the implementation in a manner that extends beyond the objectives, in order to identify positive or negative factors associated with the implementation that may not be included in the statement of objectives.

Management information systems such as WIS-SIM are formal configurations of human and physical resources that support management decision processes within an organization. The main goal of WIS-SIM is to improve decision making in order to maximize the educational progress for each child while making efficient use of the available human, material, and financial resources. The objectives of WIS-SIM are:

1. To identify decisions that are related to the instructional process

2. To determine what information would be most useful to decision makers involved with the decision

3. To arrange mechanisms to capture required data

4. To summarize the data in a form most usable to the decision maker

5. To arrange for the timely delivery of appropriate information to the decision maker

6. To evaluate the utility of the information to the decision process.

An extensive description of WIS-SIM and its reporting capabilities is included in a chapter by Spuck, 1977.

A number of design goals were used as guides in the development of WIS-SIM. The following six goals are those that received primary emphasis in the development of this system (Belt & Spuck, 1974):

1. To facilitate the learning environment for each child in terms of the instructional and organizational requirements of IGE

2. To provide information that is useful to educational decision makers at the unit, school, and district levels

3. To improve communications with parents and upgrade the quality of reporting to them about student achievement

4. To make minimal demands on teachers to learn the system

5. To make minimal demands on teachers to perform tasks that are different from normal classroom activities and, where possible, to reduce the paper work requirements of school personnel

6. To make computer management of instruction available to a large number of IGE schools.

In order to ascertain the extent to which the goals and objective of WIS-SIM were being met, a formative evaluation framework was developed, as presented in Figure 1. This framework includes three dimensions of formative evaluation and three types of information. Formative evaluation is comprised of the dimensions of functioning, utilization, and effects. Evaluation in each of these dimensions seeks to answer the following questions:

1. Functioning--Are the various components of the management information system, both human and physical, capable of operating in accordance with design expectations?

2. Utilization--For which management processes is the system being employed, and are these processes consistent with those identified in the system design?

3. Effects--What results are achieved from the utilization of the system, and are the objectives of the system being met?

Information available for the assessment of the system is classified into three types:

A. Actual--Objective information derived from a primary source

B. Perceptual--User descriptions of system operations and effects.

C. Judgemental--User conclusions or attitudes about the perceived value and benefit of the system.

FORMATIVE EVALUATION

TYPES OF INFORMATION		FUNCTIONING Are the various components of the system capable of operating in accordance with design expectations?	UTILIZATION For which management processes is the system being employed and are these processes consistent with those identified in the system design?	EFFECT What results are achieved from the utilization of the system and are the objectives of the system being met?
	A ACTUAL Information from primary and objective sources.	User knowledge of system operations Testing of computer-system capabilities Turn-around time	Number and type of system accesses	Student achievement. Teacher time usage System costs
	B PERCEPTUAL User descriptions of system operations and effects		Usage of and usefulness of reports School tasks	Changes in school operations
	C JUDGEMENTAL User conclusions about the perceived value and benefits of system	Feelings about CMI and its potential helpfulness		Advantages of WIS-SIM

Figure 1. Formative Evaluation Plan for WIS-SIM.

The three levels in each of the two dimensions presented in Figure 1 create a nine-celled matrix. The various information collected in the evaluation may be classified within these cells. The information listed in these cells will be discussed in the remaining chapters of this report and will be organized by the three dimensions of formative evaluation of WIS-SIM: functioning, utilization, and effects. Detailed evaluation plans were written by Lawrence (1975a) and Bozeman (1976) and were published as Project Technical Memoranda #3 and #7, respectively. An evaluation of the try-out of WIS-SIM was published as Technical Memorandum #5 (Lawrence, 1975b).

Prior to the presentation of the findings of the evaluation, a brief historical overview of the project will be given and a profile of each school participating in the pilot test will be presented. This information is useful in the interpretation of evaluation findings.

HISTORY OF WIS-SIM DEVELOPMENT

While research and development activities in computer managed instruction were being conducted at the Wisconsin Research and Development Center during the late 1960's under the direction of Dr. M. Vere DeVault (DeVault, Kriewall, Buchanan, & Quilling, 1969), WIS-SIM development began in the spring 1972, as a cooperative effort between the Wisconsin Research and Development Center and the Duluth Public Schools. Dr. Sidney L. Belt of the Research and Development Center and Dr. Roger Giroux of the Duluth Public Schools, Minnesota, met approximately monthly to develop a CMI system to support the Wisconsin Design for Reading Skill Development (WDRSD) reading program. Upon the completion of the preliminary CMI system design, computer programmers in Duluth began the coding of software in the fall of 1972. Implementation of a preliminary CMI system for WDRSD in Duluth became a reality in December 1972, when the program became operational on Duluth's UNIVAC 9400 computer.

System design work to develop computer management for the Developing Mathematical Processes (DMP) program began early in 1972. These initial design activities resulted in Working Paper 109 (Belt, Marshall, & Romberg) which was published in November 1972. A graduate student was employed part-time in the spring of 1972 to begin the programming of this system.

Prior to the fall of 1973, there was no principal investigator for the WIS-SIM project. At that time, Professor Dennis W. Spuck of the Department of Educational Administration accepted the position of principal investigator; the project staff was expanded over the next year to include a half-time coordinator for system development, a full-time coordinator for school relations, and two full-time programmers. Additionally, several graduate assistants were employed by the project.

Project efforts from fall 1973 to fall 1974 were devoted to the development of a conceptual basis for WIS-SIM and the continued design and development of WIS-SIM for WDRSD and DMP. A working paper outlining the updated WIS-SIM design was published in January 1974 (Belt & Spuck, 1974) and work began on the coding of these systems, the development of inservice training materials and procedures, and the identification of pilot test sites. The WIS-SIM/WDRSD system became operational on the Madison Academic Computing Center's UNIVAC 1108 and the WIS-SIM/DMP became operational on the Wisconsin Research and Development Center's Harris (Datacraft) computer during the summer of 1974. A cooperative project with the Wisconsin Research and Development Center and the McFarland Community Schools was funded under ESEA Title III in June 1974. This supplemental project allowed for the modification of WIS-SIM to support a science curriculum, Science...A Process Approach (SAPA).

In fall 1974, a CMI program for the Word Attack component of the WDRSD program was implemented in two schools in McFarland and two schools in Waukesha, Wisconsin. This system was operated in batch mode with a courier service. In January 1975, DMP was also implemented in the McFarland schools as a batch program. In March 1975, DMP was implemented as a completely interactive system in both Waukesha and McFarland. WIS-SIM/WDRSD also continued to be operated in the Duluth Public Schools. An interactive front-end, operating on the Harris computer that supported WIS-SIM/WDRSD on the UNIVAC computer, was added in September 1975. This development permitted the schools to carry out all WIS-SIM activities in an interactive mode.

Also in the fall of 1975, two schools in the Stevens Point School District in Wisconsin, Jackson Elementary and Plover-Whiting Elementary, were added to the network. WIS-SIM, at this time, was being utilized in three school districts in both WDRSD and DMP and operating in an interactive mode. In Decmeber 1975, Henry David Thoreau Elementary School in the Milwaukee Public Schools was added to the network. The SAPA program was implemented in the McFarland schools in January 1976, as an interactive program.

The 1975-76 pilot test, then, was conducted in six schools in three school districts, with an additional school added in December 1975. The 1976-77 pilot test was reduced to three schools, primarily for budgetary reasons (other reasons are discussed in the last chapter), with two schools in McFarland and the one school from Milwaukee being included. The preliminary version of the CMI system to support WDRSD, developed cooperatively with the Duluth Public Schools, Minnesota, continued to be operated in that school district during the period of this pilot test, but was not considered to be an integral part of the test, since the system being implemented there was considerably different from that being implemented at the Wisconsin sites.

SCHOOL PROFILES

During 1975-76, seven schools used WIS-SIM to help manage some parts of their instructional program. The various evaluative data for these years were collected from the Conrad Elvehjem and McFarland Elementary Schools (McFarland School District, Wisconsin), Barstow and Northview Elementary Schools (Waukesha School District, Wisconsin), the Plover-Whiting and Jackson Elementary Schools (Stevens Point School District, Wisconsin), and the Henry David Thoreau Elementary School (Milwaukee Public Schools, Wisconsin).

Profiles of each school are given in Table I.

TABLE I. WIS-SIM PILOT TEST SCHOOL PROFILES, 1975-76

	McFarland	Elvehjem	Barstow	Northview	Jackson	Plover-Whiting	Thoreau
Number of Students	379	321	136	453	540	235	650
Number of Teachers	12	14	6	14	21	8	28
Number of Aides	3	2	4	7	6	2	13
Number of Aides Using Computer	5	5	1	3	3	2	1
Number of Administrators	1	1	1	1	1	1	2
Programs Supported by WIS-SIM	WDRSD DMP SAPA*	WDRSD DMP SAPA*	WDRSD DMP	WDRSD DMP	WDRSD	WDRSD	WDRSD
Period of Using WIS-SIM through June 1976	22 mos.	22 mos.	22 mos.	22 mos.	9 mos.	9 mos.	7 mos.

*since January 1976

Several different modes of operation were used in the various sites participating in the pilot test. The two McFarland community schools, McFarland Elementary and Conrad Elvehjem Elementary, operated as one large school when using WIS-SIM. These two schools are located next to each other, each with its own staff. One is a K-3 school and the other contains grades 4, 5, and 6. Since McFarland had received a Title III grant to support WIS-SIM in their district, they employed a coordinator and an aide with these funds. About half of the coordinator's time and most of the aide's time were devoted to the implementation of WIS-SIM in the two schools. Information requests were made by teachers, processed through the coordinator and aide, and the output returned to the teachers.

Barstow Elementary School did not have a computer terminal located in the building; rather, they utilized the terminal located in the other Waukesha school, Northview Elementary School. In each school an aide was used to coordinate WIS-SIM operational activities. Initially, Jackson Elementary School did not have a terminal located in Plover-Whiting Elementary School. This was not a satisfactory arrangement because of the distance between the two schools. In January 1976, a terminal also was installed in Jackson Elementary School. In these two schools, aides also coordinated WIS-SIM operational activities.

Thoreau Elementary School in Milwaukee was implementing WIS-SIM in the reading area only, and the reading coordinator working in the school also assumed responsibility for coordinating WIS-SIM operational activities in this school. A computer terminal aide was also employed. The reading coordinator not only coordinated WIS-SIM activities in Thoreau Elementary School, but also acted as a major decision maker (user of the system) in that school; in fact, few other teachers in Thoreau needed to come in contact with WIS-SIM, since information requests, updated achievement information, and instruction diagnosis and prescription in reading were carried out by the reading coordinator.

Three schools used WIS-SIM during the 1976-77 school year. Profiles of these schools, McFarland (McFarland Elementary and Conrad Elvehjem) and Henry David Thoreau are given in Table II. The two McFarland schools are listed together on this profile since, as noted, use of CMI was carried out through the WIS-SIM coordinator and computer terminal aide serving both schools.

TABLE II. WIS-SIM PILOT TEST SCHOOL PROFILES 1976-77

	McFarland Schools	Thoreau
Number of Students	746	640
Number of Teachers	25	28
Number of Aides	7	16
Number of Aides Using Computer	1	1
Number of Administrators	2	2
Programs Supported by WIS-SIM	WDRSD, DMP SAPA	DMP
Period of Using WIS-SIM through June 1977	32 months	17 months

The next three chapters of this report include an analysis of information pertaining to the functioning, utilization and effects of WIS-SIM during the two-year pilot test of the system. The last chapter contains a summary of the report and recommendations for future WIS-SIM development and implementation.

II

SYSTEM FUNCTIONING

System functioning is concerned with whether or not the various elements of the system are capable of operating in accordance with design expectations. System elements are composed of both physical (computer) devices, including hardware and software, and of humans using the system. The functioning of the human elements of the system is assessed in terms of understanding their contributions to the system and evaluating the ability of users to carry out their roles effectively. Their learning and the assessment of their understandings and abilities constituted the inservice programs. The functioning of the physical components of the system was assessed in terms of a try-out (test) of all input and output routines under simulated conditions and later, through test of the speed with which requested information could be generated and data bases could be updated (turn-around time).

INSERVICE PROGRAMS 1975-76

This section summarizes the results of WIS-SIM inservices that staff members conducted in Wisconsin school districts as follows:

1. McFarland School District--for Conrad Elvehjem and McFarland Elementary Schools staffs held at Conrad Elvehjem School on August 26, 1975.

2. Waukesha School District--for Northview and Barstow Elementary School staffs held at Northview School on August 28, 1975.

3. Stevens Point School District--for Plover-Whiting and Jackson Elementary Schools staffs held at Plover-Whiting School on September 27, 1975.

4. Milwaukee School District--for Henry David Thoreau Elementary School staff held at Milwaukee on December 9, 1975.

Expectations for teachers, principals, and computer-terminal aides were formulated and are outlined below:

I. All participants will:

   A. Be able to recognize the functions and limitations of WIS-SIM in individualized education.

B. Develop a positive attitude toward the value of WIS-SIM in the instructional process.

II. Teachers will be able to:

A. Comprehend and apply the information contained in:

1. Unit Performance Profiles.

2. Individual Performance Profiles.

3. Instructional Grouping Recommendations.

4. Prerequisite Deficiency Reports.

B. Decide which types of reports are needed for specific instructional decisions.

III. Computer aides will be able to:

A. Correctly request needed reports.

B. Correctly submit student assessment information.

Several recommendations of the CMI Inservice Report, March 1975 (Lawrence, 1975c), were incorporated into the Inservice Plan for the fall 1975. In particular, less time was spent on overviews, theories, and models, and more time was spent on practical application, such as practicing form usage and procedures. Additionally, the teacher handbook (Computer Applications Project, 1975) was redesigned as a year-long users' manual.

The McFarland teachers' inservice involved four CMI staff, one principal, 31 teachers, and eight other participants (mostly aides). The inservice for Waukesha staff included four CMI staff, two principals, 17 teachers, and four other participants. The Stevens Point inservice involved four CMI staff, one principal, 37 teachers, and three other participants. The Milwaukee inservice involved two CMI staff, one principal, 31 teachers, and four other participants.

The same design was used for each of the four inservice sessions. Each lasted between three and three-and-a-half hours and conformed to the following schedule:

TIME	ACTIVITY
8:30-9:00	INTRODUCTION 1975-76 Plans for WIS-SIM Pretest
9:00-10:30	BASIC INFORMATION AND WIS-SIM SIMULATION Use of Teacher's Guide Content and Use of the Reports Short Discussion on Decision Making WIS-SIM Simulation
10:30-10:45	BREAK
10:45-11:00	REQUESTING REPORTS--Large Group
11:00-12:00	WORK PERIOD in Unit Groups
12:00	Posttest Evaluation of the Inservice

Condensed summaries of the evaluation results were made available to WIS-SIM staff after the Waukesha inservice. These results did not indicate a need to make any changes in the design and, consequently, the same format was used for the Stevens Point and Milwaukee inservices.

Inservice Evaluation Results

Pretests and posttests were administered to assess improvement by participants on objectives IB, IIA, and IIB. Both tests were constructed by CMI staff, and each contained questions pertaining to the four reports listed under objective IIA. Identical questions were on the pretest and posttest, but with reference to different curriculum programs (DMP or WDRSD), ensuring that the tests were parallel. Each test was comprised of seven major questions, subdivided into 20 parts. The tests were scored by the number of correct responses out of 20 on the basis of one point per item. The pretest and posttest data were analyzed for each school separately and for the total for all schools by using a one-way analysis of variance (fixed effects). The results appear below in Tables III and IV. A copy of the instruments used is included in Appendix A.

From Tables III and IV, it can be seen that participants made a mean gain of 4.02 points out of 20 or, approximately, a 20 percent

gain from pretest to posttest, and that the improvement over each course separately and over all courses was highly significant. The mean posttest score of 16.89 out of 20, or 84.45 percent, is sufficiently high to be taken as an indication that objectives IIA and B were fulfilled. It is recommended that a criterion

TABLE III

INSERVICE PRETEST AND POSTTEST MEANS AND STANDARD DEVIATIONS

School	PRETEST			POSTTEST		
	N	Mean	SD	N	Mean	SD
McFarland	43	12.93	3.25	41	16.95	3.48
Waukesha	24	13.38	3.09	25	18.60	1.26
Stevens Point	52	13.87	3.11	43	16.84	2.98
Milwaukee	36	11.00	3.12	33	15.61	3.53
Total	155	12.87	3.30	142	16.89	3.18

TABLE IV

ANALYSIS OF VARIANCE OF INSERVICE PRETEST AND POSTTEST DIFFERENCES

School	Mean Square(DF) Between	Mean Square(DF) Error	F	p
McFarland	339.34(1)	11.301(82)	30.03	.0005
Waukesha	334.29(1)	5.48(47	60.99	.0005
Stevens Point	207.87(1)	9.31(93)	22.33	.0005
Milwaukee	365.28(1)	11.04(67)	33.08	.0005
Total	12.03.48(1)	10.51(295)	114.47	.0001

of acceptability of 85 percent mastery overall be adopted for future inservice courses of this nature.

An analysis inservice evaluation instrument (Appendix A) was conducted on the posttest responses by selecting every third answer sheet, resulting in a sample of 50 out of a population of 142. The results of the item analysis, Table V, indicate that question IV, in particular, and questions V2 and VII are areas that should be explored by project staff. The relatively poor response to question IV probably can be accounted for by ambiguity in the question. It may be that teachers confused "not insufficient" in the question with "insufficient" in the instructions. It is suggested that the question be reworded to include "insufficient" rather than "not sufficient." Question V2 refers to the symbols used in recording students' achievement on topic tests, which were not well known by the selected Milwaukee respondents (only 5 out of 12 answered question V2 correctly). This highlights their relative lack of exposure to CMI when compared to respondents from other schools, many of whom had practical experience with CMI before this inservice course. Question VII refers to requesting appropriate forms. It is recommended that project staff emphasize the appropriate use of the various reports in their visits to schools. This recommendation applies particularly in the case of schools with little previous exposure to WIS-SIM.

Two computer-terminal aides each, from McFarland, Waukesha, Stevens Point, and Milwaukee, received instruction in reading and interpreting request forms, the procedures for requesting WIS-SIM reports, submitting student achievement information, and logging on and off the computer. The two computer aides from McFarland successfully completed all sections of the checklist of computer terminal competencies for computer aides (see Appendix A) during the inservice courses. The two computer aides at Waukesha were unable to use the terminal during the inservice course because the computer was down and therefore received verbal instruction on the procedures. No subsequent assessment of their terminal competencies was made. The two computer aides at Stevens Point and the two aides at Milwaukee successfully completed all sections of the checklist.

Attitudes Toward CMI

Inservice participants' attitudes toward CMI were investigated in Section VIII of both the pretests and posttests and analyzed separately from Sections I to VII. The instruments used in assessing participant attitudes toward CMI are contained in Appendix A. Tables IV and V, which summarize participants' feelings toward CMI as indicated on a five-point rating scale, are given. Matching each individual particpant's pre- and post-course attitudes was not attempted and it should be noted that, generally, more participants

TABLE V

ITEM ANALYSIS ON A SAMPLE OF 50 POSTTEST RESPONSES

Question			# Correct	% Correct
I	1.		49	98.0
	2.		45	90.0
II	1.		46	92.0
	2.		50	100.0
III	1.		49	98.0
	2.		50	100.0
	3.		49	98.0
IV			28	56.0
V	1.		48	96.0
	2.		37	74.0
	3.		47	94.0
VI	1.		43	90.0
	2.		42	84.0
	3.		44	88.0
VII	1.	School	36	72.0
		Unit	38	76.0
		Teacher	37	74.0
	2.		37	74.0
	3.		35	70.0
	4.		37	74.0

TABLE VI

ATTITUDES TOWARD CMI

Question: How are you feeling about CMI?

School	Test	Choice Distribution Favorable 1	2	3	4	Unfavorable 5	N	Mean	SD	t	p ≤
McFarland	Pre	8	14	14	0	0	36	2.20	.76	1.97	.05
	Post	11	19	6	0	0	36	1.86	.68		
Waukesha	Pre	0	1	16	3	2	22	3.27	.70	1.55	.125
	Post	[illegible]	4	11	1	1	17	2.90	.74		
Stevens Point	Pre	19	7	14	1	0	41	1.42	1.08	1.92	.06
	Post	21	11	4	2	0	38	1.11	.95		
Total	Pre	27	22	44	4	2	99	2.31	.99	2.36	.01
	Post	32	34	21	3	1	91	1.99	.91		

TABLE VII

ATTITUDES TOWARD USEFULNESS OF CMI

Question: Do you think that CMI will be helpful to you in making instructional decisions?

School	Test	Choice Distribution Favorable 1	2	3	4	Unfavorable 5	N	Mean	SD	t	p ≤
McFarland	Pre	11	13	12	0	0	36	1.94	.86	.61	.55
	Post	10	20	5	0	0	35	1.83	.62		
Waukesha	Pre	0	1	16	3	2	22	3.27	.70	2.38	.02
	Post	0	3	13	1	0	17	2.56	1.09		
Stevens Point	Pre	21	8	7	2	0	38	1.74	.95	1.03	.35
	Post	22	9	2	2	0	35	1.51	.89		
Total	Pre	32	22	35	5	2	96	2.20	1.03	1.88	.05
	Post	32	32	20	3	0	87	1.93	.86		

responded pre-course than post-course. Responses to each question were analyzed for pretest and posttest differences using a t-test (independent samples). The independent samples t-test was chosen because the identity of the respondents was unknown. A dependent t-test would have been more appropriate if the respondent's identity was known from pretest to posttest. This analysis was performed for each inservice course separately.

No Milwaukee participants completed Section VIII Pretest and only 17 out of 36 of those participants completed the Posttest. Consequently, pretest and posttest differences were not analyzed, although the comments made by the Milwaukee participants are considered in the next section. Pretest responses were not collected from the Milwaukee participants because of their complete lack of knowledge of what constituted a system of computer managed instruction.

It is apparent that the McFarland participants' attitudes were clearly positive, pre-course and even more positive, post-course. By contrast to these obviously positive comments expressed by the McFarland participants, the Waukesha participants' pretest comments were generally unfavorable, although these attitudes seemed to ameliorate. The Stevens Point participants, similar to the McFarland participants, were clearly favorably disposed to CMI at pretest and even more so at posttest. For the total group, for both questions, the pretest mean was approximately 2.30 and the posttest mean was about 1.95, representing movement from somewhat favorable attitudes at pretest to very favorable attitudes at posttest. The differences for both questions were significantly improved from pretest to posttest. It is recommended that suitable criteria of acceptability for future inservice courses be a mean ranking of 2 on each of questions 1 and 2.

As part of Section VIII of the instrument, participants were asked to summarize their positive and negative feelings about CMI in a word, phrase, or sentence. These written responses were summarized separately for each inservice group.

Pre-inservice comments from McFarland inservice participants mainly concerned the utility of WIS-SIM for record keeping and grouping purposes. Less frequently-mentioned positive comments referred to savings of time and usefulness in individualizing instruction. It was clear that the posttest comments referred primarily to the utility of the inservice and the inservice materials, although this was not the intention of the test item that referred to "your positive feelings about CMI." The great majority of respondents commented very favorably on the usefulness of the inservice manual in terms of its presentation and its reference value. Other common comments referred to the good organization of the project and also its improving quality. The essential difference in the pretest and posttest comments was that respondents seemed more optimistic about the future utility of the project after the inservice; this attitude may have been a direct outcome of the inservice itself.

Pre-inservice negative comments included references to insufficient teacher knowledge of the system and no saving of time spent in preparing records. Doubts about cost benefits and the presence of human errors in supplying information to the computer were also expressed. The negative comments were much less-frequently reported, and less strongly so, than the pre-inservice positive comments. Again, the post-inservice comments referred to the inservice rather than, specifically, to CMI. Some comments referred to insufficient time in the course to understand all of its content.

In conclusion, it was evident from the comments about CMI expressed by the respondents from McFarland that their attitudes towards CMI were favorable before the inservice and that the inservice strengthened these attitudes.

By contrast to the obviously positive comments expressed by the McFarland teachers both pre- and post-inservice course, the Waukesha respondents' comments were generally unfavorable on the pre-inservice questions, although these attitudes seemed to temper in the post-course responses. The only positive comment expressed several times was the opinion that the computer-supplied information is helpful during parent-teacher conferences. The negative comments most often dealt with duplication of record keeping, unreliability of the computer services, and the time consumed in forming the groups. These negative comments were not as frequently reported after the inservice, but the negative comments still continued on the quantity of record keeping involved. The difficulties encountered in the implementation of the DMP program in the classroom were commented upon several times.

The positive comments, as in the case of the McFarland inservice, often referred to the quality of the inservice course itself. Again, the inservice manual was favorably considered. The CMI project was seen to be well organized by a quarter of the respondents and about the same number saw CMI as assisting to individualize instruction. Based on the frequency of the comments expressed, it seems that the Waukesha respondents are still negatively oriented toward CMI, although not nearly to the same degree as before the inservice.

Only slightly more than half of the Stevens Point participants made pre-course comments, which probably reflects their inexperience with CMI. However, approximately 80 percent of the respondents made post-course comments. By far, the most frequently made positive comment offered pre-course concerned the expectation that CMI would result in less time spent on record keeping and, especially, on record keeping applied to grouping. The only other positive comment made more than once was that CMI promised to be a complete record keeping system. The negative comments expressed pre-course were more widely distributed and, in the main, referred to extra paper work that might be involved, extra costs involved, and the necessity for adequate inservice.

The post-course responses were similar to those made pre-course except that more responses were made post-course. Again, most participants identified the potential saving of time, especially in grouping students, as the greatest advantage of CMI. Post-course negative comments emphasized the extra work involved for the aides, requiring them to spend less time on some other duties. Four participants referred to the possibility of providing alternative groupings based on other student characteristics, thus, making for more flexibility in grouping.

The Milwaukee participants made no pre-course comments and less than half made post-course comments. These were mainly one word comments. Areas of potential concern most frequently reported were extra costs and the loss of identity of students. Areas of expected improvement most-frequently mentioned were time saved in grouping students and better groups (groupings) of students. Generally, the Milwaukee participants' post-test comments, although sparsely and concisely made, reflected the trend in the comments of participants in other schools.

Evaluation of Inservice

Participants in the inservice were asked to assess the inservice in terms of its usefulness, their interest, and areas of emphasis. A copy of the inservice evaluation instrument is included in Appendix A. Question 1 referred to teachers' assessments of the usefulness and their interest in each of the four sections of the inservice: basic information, simulation, requesting reports, and work period. It is clear from teachers' ratings that only a very small number of participants considered any of the sections as "slightly useful" or "not at all useful" (5/116, 5/104, 4/135, 12/122 for the four respective sections). A justifiable conclusion, therefore, is that the great majority of participants considered each section of the inservice to be useful. A lesser number of participants considered the inservice very interesting although, again, the great majority of participants considered each of the sections as being either very interesting or fairly interesting. Although the work period, during which teachers began the task of grouping their own students in preparation for instruction in the fall semester, was rated as being both useful and interesting, it was rated the least useful and the least interesting of the four sections of the inservice; differences in participants' ratings between sections were small.

Question 2 asked teachers to indicate whether or not the emphasis given to each of the objectives of the inservice was satisfactory. Slightly less than 20 percent of the participants considered each of the objectives IA and IB to require more emphasis, the other participants indicated that the emphasis was satisfactory. When

referring to objectives listed under Section II, approximately 30 percent of the respondents recommended that more emphasis be given to comprehending both the Instructional Grouping Recommendation Report and the Prerequisite Deficiency Reports, and, also, to correctly submitting student assessment information.

The great majority of teachers rated the level of difficulty of the material as being fairly or slightly difficult; only one respondent considered the material very difficult, whereas about 25 percent considered it to be not at all difficult.

Only 16 out of 138 participants were not at all favorably disposed toward taking the pretest and posttests and about 67 percent indicated that they were fairly favorably or very favorably disposed toward taking the tests.

From the summary of participants' responses, it is clear that the inservice was considered useful and interesting, that the emphasis given to all course objectives was appropriate (although it seems warranted to place greater emphasis on objectives IIA and IID) that the level of difficulty was appropriate, and that the administration of pretests and posttests was not viewed unfavorably by most participants.

Summary of 1975-76 Inservice Results

The information on which these conclusions are based consists of participants' responses on pretests and posttests of content covered during the inservice course, competency tests administered to computer aides, assessments of participants' attitudes toward CMI, and participants' evaluation of the inservice course.

1. The analysis of the pretest and posttest results indicate that very significant improvement was effected by the inservice course and that participants achieved a high order of comprehension of the material covered in the course. The responses to Question VI (requesting of appropriate reports) indicate that follow-up assistance in this area may be beneficial to teachers.

2. The incomplete instruction of computer aides at the inservice course may require follow-up assistance.

3. The attitudes of participants towards CMI both pre- and post-course was, overall, strongly positive. The relatively neutral attitudes of the Waukesha respondents cause some concern, and project staff could direct more attention towards improving this situation.

4. Participants viewed all aspects of the inservice very favorably. Perhaps more emphasis should be given to the Grouping Recommendations and Prerequisite Deficiency Reports.

Evaluation of Inservices 1976-77

This section summarizes the results of CMI inservices conducted by CMI staff members as follows:

1. McFarland School District--for Conrad Elvehjem and McFarland Elementary School staffs held at Conrad Elvehjem School on August 23, 1976.

2. Milwaukee School District--for Henry David Thoreau Elementary School staff held at the school on September 23, 1976.

Because McFarland was beginning its third consecutive year of WIS-SIM usage and Henry David Thoreau was beginning its second consecutive year, an intensive inservice training program was not considered necessary. Rather, a brief review of WIS-SIM was given the staffs at both schools. Questions regarding system usage and modifications to the system were discussed.

A questionnaire was administered to the inservice participants at the conclusion of the session. The results of this survey are presented for the two schools in Tables VIII and IX. The questionnaire is included in Appendix A. The attitudes of the faculty and staff at the McFarland schools toward CMI, as reflected by the ratings on the two survey questions, are clearly positive. Only three of the 24 respondents rated the first question with a rank of three. No one ranked the second question below two, where responses of one and two are favorable.

Only four unit leaders were involved in the inservice at Henry David Thoreau School. Therefore, the attitude survey is not conclusive. Those participating, however, did indicate a favorable disposition toward CMI system usage.

As part of the review inservice evaluation, participants were asked to comment about CMI in a word, phrase, or sentence. Comments were specifically requested regarding general feelings about CMI, problems anticipated, adequacy of the review inservice, and suggestions for future inservices.

The McFarland respondents' feelings about CMI were quite favorable. Responses indicated that they considered the system very helpful in the management of the instructional program. Several teachers also reported that they considered the system to be better than when initially implemented. The only comments that were not totally positive concerned apprehensiveness about changes incorporated into WIS-SIM, e.g., report formats. No respondent anticipated any problems using WIS-SIM during the coming school year. The one-hour review inservice was considered by all the participants to be sufficient to refresh their knowledge of the system. With respect

TABLE VIII

ATTITUDES TOWARD CMI

Question: How are your feelings about CMI?

School	Favorable	Choice Distribution			Unfavorable	N	Mean	SD
	1	2	3	4	5			
McFarland	9	12	3	0	0	24	1.75	.67
Milwaukee	1	2	1	0	0	4*	2.0	.816

*Due to the way in which WIS-SIM was implemented in Milwaukee, only four unit leaders and the reading specialist participated in the Milwaukee inservice. One questionnaire was not returned.

TABLE IX

HELPFULNESS OF CMI

Question: Do you think that CMI will be helpful to you in making instructional decisions?

	Favorable	Choice Distribution			Unfavorable	N	Mean	SD
	1	2	3	4	5			
McFarland	11	13	0	0	0	24	1.54	.509
Milwaukee	1	2	1	0	0	4*	2.0	.816

*See Note in Table VI

to future inservices, it was suggested that they, also, be concise. Additionally, a mid-year review inservice was recommended.

The four participants in the Thoreau inservice did not indicate negative feelings regarding CMI, but did reflect less familiarity with the system than McFarland. This was anticipated, as Thoreau teachers have little direct contact with WIS-SIM. Rather, grouping and other aspects of the reading program are managed by the reading specialist. They did indicate that they were looking forward to using the system and did not anticipate any problems during the coming school year.

Summary of 1976-77 Inservice Results

It appears that a concise, rather than lengthy, review inservice is viewed favorably. Based on the respondents' comments, it seems best to plan two inservices for each user school, one for returning faculty members already well acquainted with the system and a second for new staff members unfamiliar with WIS-SIM. The initial inservice for a school just starting on WIS-SIM would need to be of the more comprehensive type used in the 1975-76 pilot tests. The suggestion regarding a mid-year inservice appears appropriate also. This would provide an opportunity for users to become informed about changes or anticipated changes as well as to provide feedback to the CMI staff regarding problems, modifications, or system improvements.

TESTING COMPUTER SOFTWARE

A critical prerequisite to the smooth implementation of a computer system is the careful testing of that system to ensure that it operates in accordance with the design specifications for the system. Individual software components were tested as coding was completed. Additionally, the system was tested as a whole by project staff members. Any discrepancies between the design specifications and system operation were noted and changes were made to the system. Project staff members using the system were also asked to offer suggestions for system improvement. These suggestions were reviewed and those meriting inclusion were implemented in the next system update.

Prior to the two-year pilot test reported here, WIS-SIM was implemented in two Wisconsin school districts to try out the system. During the year in which the system was first implemented in the Waukesha and McFarland schools, considerable staff time was spent at the schools, in close contact with the users of the system. When problems were noted, they were resolved as quickly as possible. Suggestions for improvement were carefully noted and, periodically, priorities among the suggestions were established, taking account of the potential benefit of their implementation against the cost of implementing them. The system was in a state of developmental

transition during the entire period of the tryout. In addition to the tryout in the Wisconsin schools, the progress of the cooperative effort with Duluth Public Schools, Minnesota, was carefully monitored. An evaluation report of the tryout year was published by the project in 1975 (Lawrence, 1975b).

TURN-AROUND TIME

While the system may be capable of generating the reports and carrying out other operations for which it was designed, the system is of little value to users if it cannot carry out these operations within their time requirements. Preliminary assessments of the time constraints surrounding system functioning indicated the majority of requests could be processed overnight or within a few hours, but some needs were more urgent than that, and required faster turn-around. It was difficult to get teachers to assess realistically the turn-around requirements needed and to separate what they desired, or might need, from what they actually did need. Since it was determined that there were needs that necessitated fast turn-around, an interactive system was designed and implemented for DMP, and a front-end that could submit batch jobs in priority modes was implemented in WDRSD. Both systems were designed to be able to produce requested reports and accept data base updates within one-half hour of the initial request.

Limited information was collected on turn-around time during the 1975-76 school year. Data were collected, however, from the two McFarland schools from May 24, 1976 to June 15, 1976. For the purposes of this data collection, turn-around time was defined as the difference in the time of the request and the time of the receipt of the report at the terminal. Table X shows the mean times for each report and program, WDRSD and DMP/SAPA. It should be noted that, in WDRSD, the user can request a turn-around time of less than an hour, about an hour, overnight, or over the weekend. DMP and SAPA were examined together because both of these programs are processed at the R & D Center, whereas the WDRSD program is processed at MACC. This latter processing can be expected to be slower than the former because having been processed at MACC, the data requested is sent back to the R & D Center. The user then has to call in again to the R & D Center to confirm if the report is available.

Turn-around time may be misleading because of the levels of computing priority the user may select. Under the MACC UNIVAC 1110 system, the user may choose five levels of priority which correspond to relative processing time requirements, although this may vary. For example, when little use is being made of the 1110, all priorities may provide approximately the same turn-around time. The four levels are: express (less than an hour), normal (about an hour), deferred (overnight), and convenience (over the weekend). As the mode of

TABLE X

TURN-AROUND TIME AT MCFARLAND
May 24 - June 15, 1976

Report	DMP/SAPA	WDRSD*
UPP	N = 14 Mean Time = 16.6 SD = 20.6	N = 14 Mean Time = 73.5 SD = 43.4
IPP	N = 16 Mean Time = 25.9 SD = 23.4	N = 40 Mean Time = 67.2 SD = 42.4
IGR	N = 2 Mean Time = 12.5 SD = 3.5	N = 2 Mean Time = 82.0 SD = 18.4
All Reports	N = 32 Mean Time = 21.0 SD = 21.7	N = 38 Mean Time = 69.3 SD = 41.7

TABLE XI

TURN-AROUND TIME AT MCFARLAND
April 11 - April 29, 1977

Report	DMP/SAPA	WDRSD*
UPP	N = 8 Mean Time = 28.4 SD = 22.5	N = 11 Mean Time = 13.0 SD = 18.2
IPP	N = 30 Mean Time = 15.9 SD = 13.5	N = 14 Mean Time = 11.7 SD = 9.0
IGR	N = 9 Mean Time = 17.9 SD = 7.7	N = 11 Mean Time = 17.2 SD = 12.1
All Reports	N = 47 Mean Time = 18.4 SD = 14.98	N = 36 Mean Time = 13.8 SD = 13.14

* Deferred and convenience runs excluded.

demand increases, so does the associated cost of computing. Therefore, users are encouraged to use the lower priority modes as much as possible.

During the school year 1976-1977, a log was maintained by the McFarland CMI project director and the computer terminal aide on turn-around time for the entire year. For the purposes of data collection during this year, turn-around time was again defined as the time actually required for processing (time the request was entered on terminal to the time of receipt on terminal). This was considered to be more useful information, as a teacher request for a report might conceivably be held before processing due to work loads, personnel availability, or other factors. Data were sampled using the three-week period of April 11, 1977 to April 29, 1977. Table XI shows the number of respective reports, average turn-around times, and standard deviations of each type of report and program.

More individual performance profiles (IPP's) were requested each year than either unit performance profiles (UPP's) or instructional grouping requests (IGR's); a larger percentage of IGR's were requested during the second sampling period than the first.

For DMP/SAPA, turn-around time averaged approximately 21 minutes during the sample period in 1976 and 18 minutes in 1977. This turn-around time is well within the requirements specified and is noted to be improving with a drop of approximately 3 minutes from 1976 to 1977.

The turn-around time for WDRSD was about 69 minutes in 1976. The user can influence the turn-around time for WDRSD in two ways. First, the user can enter a desired turn-around time, as was noted, and second, the user must enter a separate request for the return of the report. In other words, the requested report may have been processed quickly but not returned for several hours, when it was needed. The mean turn-around time improved in 1977, to a mean of 13.8 minutes. It is anticipated that the majority of the change from 69 to 14 minutes was a result of user-controlled factors, rather than improvements in system functioning, although the 1976 sample was taken at a time of year when demand on the MACC computer may have been heavy. In any event, turn-around time for both WDRSD and DMP/SAPA is judged as being within acceptable limits.

III

SYSTEM UTILIZATION

System utilization is concerned with the management processes for which the system is being employed and, specifically, with whether or not the actual uses of the system are consistent with the designed uses. Included in this chapter is a consideration of the number and type of system accesses, the usage and usefulness of reports presented and an assessment of the school tasks affected by WIS-SIM operation.

Number of System Accesses

The number of system accesses by the users was estimated by tabulation of system logs during selected periods of the 1975-76 school year and the 1976-77 school year. This information was recorded separately for each of the WDRSD, DMP, and SAPA programs. The collection periods for the two years are as follows:

1975-76

WDRSD	DMP
12/1/75 - 12/15/75	4/14/76 - 4/28/76
5/17/76 - 6/1/76	5/17/76 - 6/1/76

1976-77

WDRSD	DMP
3/14/77 - 3/18/77	9/20/76 - 9/24/76
3/21/77 - 3/25/77	1/10/77 - 1/14/77
3/28/77 - 4/1/77	1/24/77 - 1/28/77
4/4/77 - 4/8/77	2/28/77 - 3/4/77

In addition to the tabulations of accesses, a computer record was maintained beginning February 2, 1977, that contained McFarland's system accesses of the WDRSD program. This included the total number of WDRSD runs as well as tabulations and percentages of the WDRSD reports generated.

Analysis of 1975-76 Accesses

Table XII, which includes the system accesses in 1975-76 made by each school using WDRSD, shows these accesses in terms of requests for Individual Performance Profiles (IPP's), Grading (update of student records), Instructional Grouping Recommendations (IGR's), Score Submission Form (SSF's), and Unit Performance Profiles (UPP's). There is a general increase in the number of accesses from December to May in all schools, except those in Waukesha. Grading is the most frequent use of the system, with IPP's and UPP's being the most frequently requested reports.

Table XIII shows the number of system accesses made by each school using DMP in 1975-76 and shows these accesses in terms of requests for IPP's, Grading (updating of student records), IGR's, Prerequisite Deficiency Reports (PDR's), UPP's, and Implement Instructional Groups (IIG's). As with WDRSD, grading is the most frequent use of the system, followed by requests for IPP's. Waukesha recorded no machine use during the periods sampled, no IGR's were requested, and only one IIG access was recorded.

For the reading program, 56 percent of all requests were for grading, 19 percent for IPP's, 14 percent for UPP's, 10 percent for IGR's, and only 1 percent for SSF's. Approximately the same pattern exists for DMP, with 68 percent of the accesses for grading, 17 percent for IPP's, 8 percent for IGR's, 6 percent for UPP's, 1 percent for IIG's, and no requests for PDR's.

For both WDRSD and DMP, the McFarland Schools are, by far, the most frequent users of the system (74.0 accesses per week), with the Waukesha Schools being the least frequent users (5.0 accesses per week). These same observations apply for both time periods sampled. The average number of accesses per week for each school is shown below:

School	WDRSD	DMP	Both Programs
McFarland	41.5	32.5	74.0
Jackson	12.5	-	12.5
Plover-Whiting	-	3.5	3.5
Waukesha	5.0	0.0	5.0
Thoreau	9.5	-	9.5
All Schools	68.5	36.0	104.5

TABLE XII

FREQUENCIES OF SYSTEM ACCESSES MDRSD

Schools	Reports	IPP	Grading	IGR	SSF	UPP	Totals
McFarland	Dec	18	32	5	0	3	58
	May	23	56	12	0	17	108
	Total	41	88	17	0	20	166
Jackson	Dec	0	4	3	0	1	8
	May	2	36	4	0	0	42
	Total	2	40	7	0	1	50
Waukesha	Dec	0	11	1	1	2	15
	May	0	5	0	0	0	5
	Total	0	16	1	1	2	20
Thoreau	Dec	0	0	2	1	5	8
	May	9	10	0	0	11	30
	Total	9	10	2	1	16	38
Totals	Dec	18	47	11	2	11	89
	May	34	107	16	0	28	185
	Total	52 (19)*	154 (56)	27 (10)	2 (1)	39 (14)	274

*(n) = percentages

TABLE XIII

FREQUENCIES OF SYSTEM ACCESSES DMP

Schools	Reports	IPP	Grading	IGR	PDR	UPP	IIG	Totals
McFarland	May	7	25	2	0	5	1 (2)	40
	April	16	61	9	0	4	0	90
	Total	23	86	11	0	9	1	130
Plover-Whiting	May	0	5	0	0	0	0	5
	April	2	7	0	0	0	0	9
	Total	2	12	0	0	0	0	14
Waukesha	May	0	0	0	0	0	0	0
	April	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0
Totals	May	7	30	2	0	5	1	45
	April	18	68	9	0	4	0	99
	Total	25 (17)*	98 (68)	11 (8)	0 (0)	9 (6)	1 (1)	144

*(n) = percentages

The average number of accesses per week for WDRSD was 17.1 and the average number of accesses per week for DMP was 12.0. Some of the schools were likely under-utilizing the system and McFarland was placing heavy demand on it; therefore, the average number of accesses for a typical user would be expected to fall between McFarland's usage and the mean usage of the other pilot test schools.

Analysis of 1976-77 Accesses

Tables similar to those prepared for the 1975-76 pilot test year were also prepared for the 1976-77 data. Only the McFarland schools utilized WIS-SIM/DMP and SAPA during 1976-77. Tables XIV and XV show the number of accesses in these schools over four one-week periods. A total of 262 accesses were reported in DMP and 76 in SAPA. As was the case in 1975-76, most of the accesses were for grading purposes. IPP and IGR reports were requested more frequently than others.

Shown in Tables XVI and XVIII are the accesses for WDRSD in the McFarland Schools and the Thoreau School for 1976-77. Grading continues to be the most frequent use of the system for Thoreau, but IPP requests form a larger percentage of the total accesses in McFarland. IGR requests form about 15 percent of the total accesses for WDRSD in each school. McFarland's usage continues to be nearly four times that of Thoreau in the reading area alone.

Automated system-monitoring of accesses was initiated in WDRSD in February 1977. Table XVIII contains the number and percentage of accesses in the McFarland Schools from the date of implementation of monitoring to the end of the school year. According to this assessment, 62 percent of the 1044 accesses were for grading purposes, 21.3 percent for IPP's, 9.3 percent for UPP's and 5.8 percent for IGR's. Score submission forms (SSF's), used in conjunction with grading, accounted for 1.3 percent of the accesses, and the skills eligibility profile (SFP), a newly implemented form, accounted for only .3 percent of the accesses. Since the data reported in this table are comprehensive for a four-and-a-half month period, they probably provide the best estimate of the number and distribution of accesses by function.

For all the time periods sampled, McFarland is clearly the more frequent user of WIS-SIM as in 1975-76. The average weekly accesses by McFarland and Thoreau are given below. Based on the four week samples in 1975-76 and 1976-77, McFarland and Thoreau show a definite increase in system usage.

TABLE XIV

ACCESSES OF WDRSD IN THE MCFARLAND SCHOOLS 1976-77

	3/14/77-3/18/77		3/21/77-3/25/77		3/28/77-4/1/77		4/4/77-4/8/77		TOTAL	
FUNCTION	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
IPP	43	45.7	1	3.8	47	51.6	29	43.9	120	43
GRD	30	31.9	15	57.7	18	19.8	23	34.8	86	31
IGR	4	4.3	10	38.5	22	24.2	5	7.6	41	15
UPP	17	18.1	0	0	4	4.4	9	13.6	30	11
SSF	0	0	0	0	0	0	0	0	0	0
SEP*	0	0	0	0	0	0	0	0	0	0
TOTAL	94		26		91		66		277	

*Skill Eligibility Profile

TABLE XV

ACCESSES OF DMP IN THE MCFARLAND SCHOOLS 1976-77

	9/20/76-9/24/76		1/10/77-1/14/77		1/24/77-1/28/77		2/28/77-3/4/77		TOTAL	
FUNCTION	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
UPP	1	1.5	2	3.3	1	2.1	13	14.6	17	6
IPP	13	19.7	18	30.0	9	19.1	32	36.0	72	28
IGR	11	16.7	5	8.3	0	0	10	11.2	26	10
IIG	5	7.6	7	11.7	3	6.4	4	4.5	19	7
PDR	2	3.0	0	0	0	0	0	0	2	1
GRD*	32	48.5	28	46.7	32	68.1	28	31.5	120	46
DELSCR**	2	3.0	0	0	2	4.3	2	2.2	6	2
TOTAL	66		60		47		89		262	

*Grading.
**DELSCR-Spellout

TABLE XVI

ACCESSES OF SAPA IN THE MCFARLAND SCHOOLS 1976-77

	9/20/76-9/24/76		9/10/77-1/14/77		1/24/77-1/28/77		2/28/77-3/4/77		TOTAL	
FUNCTION	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
UPP	0	0	1	6.7	0	0	0	0	1	1
IPP	2	11.1	4	26.7	0	0	4	25.0	10	13
IGR	0	0	0	0	2	6.5	3	18.8	5	7
IIG	0	0	0	0	1	3.2	2	12.5	3	4
PDR	0	0	0	0	1	3.2	0	0	1	1
GRD	8	44.4	10	66.7	27	87.1	7	43.8	52	68
DELSCR *	4	22.2	0	0	0	0	0	0	4	5
TOTAL	14		15		31		16		76	

*Spell out DELSCR

TABLE XVII

TOTAL WDRSD ACCESSES IN THE MCFARLAND SCHOOLS 1976-77

2/2/77-6/15/77

FUNCTION	FREQUENCY	%
IPP	222	21.3
GRD	647	62.0
IGR	61	5.8
UPP	97	9.3
SSF	14	1.3
SEP	3	0.3
TOTAL	1044	

TABLE XVIII

ACCESSES OF WDRSD IN THE HENRY DAVID THOREAU SCHOOL 1976-77

	3/14/77-3/18/77		3/21/77-3/25/77		3/28/77-4/1/77		4/4/77-4/8/77		TOTAL	
FUNCTION	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
IPP	0	0	0	0	4	36.4	2	5.4	6	8
GRD	1	50.0	18	75.0	4	36.4	24	64.9	47	63
IGR	0	0	2	8.3	0	0	8	21.6	10	14
UPP	0	0	2	8.3	0	0	3	8.1	5	7
SSF	0	0	2	8.3	1	9.1	0	0	3	4
SEP	1	50.0	0	0	2	18.2	0	0	3	4
TOTAL	2		24		11		37		74	

TABLE XIX

AVERAGE NUMBER OF ACCESSES/WEEK

	1975-76	1976-77	% Increase
WDRSD			
McFarland	41.5	69.25	67.3
Thoreau	9.5	18.5	94.7
DMP			
McFarland	32.5	65.5	101.5

USAGE OF REPORTS

In May 1976 and April 1977, unit leaders, teachers, and aides in each of the user schools were surveyed to determine what uses were being made of WIS-SIM reports. The emphasis in this evaluation was on the uses of reports other than their stated purposes. It was assumed that the reports were used for the purpose for which they were designed; therefore, purposes reported by the respondents were in addition to these purposes. The evaluation of the usefulness of the report for the purpose for which they were designed is not addressed in this section but, rather, is addressed separately in a later section.

The questionnaires administered in this survey are presented in Appendix B. It should be noted they are not identical in appearance, as the 1977 instrument consolidated both the usage and usefulness evaluations. Items C and D of the questionnaire relate to report usage.

In the 1976 questionnaire, five reports were listed together with their stated purpose. The reports were:

1. Unit Performance Profile (UPP).
2. Individual Performance Profile (IPP).
3. Instructional Grouping Recommendation-Summary (IGR-S).
4. Instructional Grouping Recommendation-Omissions (IGR-O).
5. Prerequisite Deficiency Report (PDR).

Respondents were asked to describe briefly any uses they had made of reports, other than their stated purposes. Respondents were also asked to describe any other uses they had found for any WIS-SIM reports, other than the five specifically referenced. It was considered that the five reports above were those likely to be used.

The 1977 questionnaire was similar in format and design except for the inclusion of two additional reports and samples of these reports. The two additional reports were:

1. Skill Eligibility Profile (SEP).

2. Instructional Grouping Recommendation-Group (IGR-G).

The number of respondents to the 1976 and 1977 surveys are shown in Table XX.

TABLE XX

NUMBER OF RESPONDENTS USAGE OF REPORTS QUESTIONNAIRE

	1976		
	Unit Leaders	Teachers	Aides
McFarland	4	6	2
Jackson	1	2	1
Plover-Whiting	1	4	0
Barstow	2	5	1
Northview	2	10	3
Henry David Thoreau	5	7	4
Total	15	34	11

1977

	Unit Leaders	Teachers	Aides	Total
McFarland	5	9	0	14
Henry David Thoreau			1	2*

*Due to the organizational structure at Thoreau, only the reading specialist and terminal operator were surveyed.

Analysis of 1975-76 Usage

A total of 31 uses were reported: the great majority of respondents listed no extra uses for any reports. No additional uses for WIS-SIM reports were given. Blanks were taken to mean that no extra uses were made of the reports. The respondents from Barstow and Jackson reported little or no use was made of the reports--Jackson, because of the late assembly of the data base and the lack of a terminal in their school building, and Barstow, because of the lack of a terminal in their school building. Consequently, no other uses of reports were identified by respondents from these two schools. Henry David Thoreau (although several respondents reported uses) organizes its WIS-SIM services through the one person, a reading specialist and, consequently, Thoreau respondents characteristically did not report many extra uses of WIS-SIM reports. Most extra uses came from McFarland respondents with some from Northview and Plover-Whiting. In this report, where extra uses were mentioned by multiple users, this is noted. Otherwise, it can be taken that extra uses were reported only once.

Unit Performance Profile (UPP). The use of the UPP as an aid in evaluating instructional programs at the year's end was reported by a unit leader from McFarland. Although not mentioned specifically by the respondent, it appears as though the UPP contains useful information on progress in an instructional program being made by a group of students and, over time, this helps to assess the usefulness of a program in meeting the educational needs of students. Several respondents pin the UPP on a board to permit students to see what progress they are making both individually and as a group.

Several rather conventional uses related to the grouping of students were reported, e.g., using the UPP in deciding what skills to request for grouping and in deciding where to place students who do not appear on the grouping recommendations. However, three respondents reported using the UPP as an aid when forming groupings within classrooms.

Individual Performance Profile (IPP). Four schools reported using IPP's during end of semester parent conferences. Two respondents noted that parents found the IPP's difficult to comprehend. However, it was also noted that achievements and deficiencies of individual students can be readily identified to the parents. The ready availability of current IPP's is also useful for quickly-convened conferences.

IPP's have been used by at least three respondents when students are transferred into and out of schools. IPP's can be sent to receiving schools and from sending schools as a convenient means of communicating information on student progress. One teacher reported using IPP's as a means of communicating information to special services.

Similar to uses reported for the UPP, two respondents used IPP's to indicate to students how they were progressing and, in one instance, each student was given his own copy of the IPP. The only other use noted of the IPP was by one respondent who used it as the subject of an introduction to uses of the computer. No extra uses were reported for the Instructional Grouping Recommendation-Summary, the Instructional Grouping Recommendation-Omissions, or the Prerequisite Deficiency Report.

Analysis of 1976-77 Usage

The respondents from the McFarland Schools indicated the greatest number of additional uses for the seven reports addressed in the questionnaire. As indicated in Table XXIII, the instrument was not given to the teachers at Henry David Thoreau because primary use of WIS-SIM and its reports were made only by the reading specialist and aide in the reading center. The reports are listed separately in this section. When additional uses were indicated, the design purpose is given followed by the respondents' uses.

Unit Performance Profile (UPP). The design purpose of the UPP report is to determine the achievement status of students. Uses for this report indicated by the McFarland respondents in addition to the design purpose are given below. The number in parentheses refers to the number of respondents identifying that same particular use.

1. Identification of students requiring pretesting (3).
2. Determination of next topic to be taught to particular students.
3. Grouping of students (3).
4. Update information on students.
5. Evaluation of unit goals and objectives.

6. Record of moving students within school and from school-to-school.

7. Use by students in keeping their own records.

The Thoreau respondents indicated the use of the UPP as class charts in Word Attack and Study Skills. Duplicate charts are kept in the unit and the reading center.

Individual Performance Profile (IPP). The purpose of the IPP is to provide achievement information for an individual student. Additional uses indicated for the report are:

1. To determine why a student is not ready for a certain skill.

2. Record keeping and planning of schedules by student.

3. Student personal record keeping.

4. Report for student leaving school (3).

5. Parent-teacher conferences (6).

6. Forming small instructional groups (2).

7. Use when student isn't included on a grouping recommendation.

8. To facilitate teaching objectives with which students have difficulty.

The primary additional use of the IPP indicated by the Thoreau respondents was the updating of a profile card when a student leaves the school. Other uses included use for parent conferences or when a student leaves the school.

Instructional Grouping Recommendation-Summary. The function of this report is to identify students who need instruction in the skill requested. The only additional use indicated for this report concerned assistance in identifying weaknesses of planning and teaching strategy by presenting the needs of a group in an overall format.

Instructional Grouping Recommendation-Omission. No additional uses were indicated by the respondents for this report.

Prerequisite Deficiency Report. The purpose of this report is to show the prerequisite achievement status of students ineligible for a requested topic. Additional uses indicated are:

1. To provide information as to why a student is listed on the omissions report and to specify objectives.

2. To help keep teachers accountable.

3. To facilitate small group work within large groups (2).

Skill Eligibility Profile. The purpose of this report is to show the number of students who have mastered a particular skill, how many are eligible, and how many are not eligible because of prerequisites. Additional uses reported include:

1. Determining where most students need skills.

2. Determining which skills to teach (2).

Instructional Grouping Recommendation-Group. No additional uses for this form were reported.

Many of the stated uses related very closely to the intended uses; other uses mentioned take the place of other reports designed for the purpose. For example, the use of the UPP, "update information on students", or the use of the SEP, "determining when most students need skills", are closely aligned with the stated purposes of the reports. The uses of the IPP, "grouping of students", or of the IPP, "to determine why a student is not ready for a certain skill", are uses that replace other forms, the IGR and the PDR, respectively. Most of the uses noted, however, represent creative, additional uses of the reports. The project needs to determine the management needs underlying these uses, whether these are broadly based, important needs, and the extent to which the reports generated, adequately meet these needs.

Appropriateness of WIS-SIM Forms

The seven user schools were asked to evaluate the appropriateness of WIS-SIM report and request forms in January 1976, by completing a rating scale on each form. Additionally, the respondents were asked to provide suggestions for improvement of the forms. Twelve forms were assessed, with the two performance profiles and three grouping forms further separated for DMP and WDRSD. In all, seventeen assessments were made. The rating scale used is shown in Appendix B. Appropriateness of WIS-SIM forms was not evaluated in 1977.

All seven user schools completed the evaluation, but the results from the Plover-Whiting School were not received and are assumed lost along with the tasks identification results. This evaluation of WIS-SIM forms was therefore completed without information from Plover-Whiting, which used WIS-SIM for the WDRSD program. The results from the two McFarland schools are combined under the school district name, McFarland. The McFarland Schools, Northview, and Barstow, use WIS-SIM forms for both DMP and WDRSD. Jackson, Plover-Whiting, and Henry David Thoreau use only the forms for WDRSD and, consequently, did not assess DMP forms where these were separately identified.

The respondents to this questionnaire were half of each of school's staff. The complementary half responded to the Tasks Identification questionnaire as reported later in this chapter. All respondents were asked to assess forms that they had used previously. The varying numbers of respondents within the same school giving assessments for individual forms indicate that these instructions were followed. As a further consequence, eight selected teachers did not complete any sections, each claiming to be unfamiliar with any forms. Limiting respondents' assessments to forms that they had previously used should yield more valid assessments than those from non-users. In all, 44 responses were received: nine from McFarland, six from Jackson, four from Barstow, twelve from Northview, and thirteen from Henry David Thoreau.

The purpose of the rating scale was to have users assess the appropriateness of the format of each WIS-SIM form. Usefulness of these same reports was not assessed by this instrument; only aspects of the format or design of each form was considered. Some aspects of format include its arrangement, spacing, size, and inclusion of all essential data. Respondents were asked to suggest improvements to the format where they considered this necessary. A five-point scale was used with 1 representing appropriate to 5 indicating inappropriate. As well as providing ratings, respondents also were asked to suggest improvements for each form, where these were considered necessary.

The results of the assessments of each form are shown in Table XXIV. They are reported separately by school, by all schools, and by all forms combined. The assessment for each form is shown both as a fraction and as a decimal. For example, the assessment of the Unit Performance Profile by McFarland is 8/6=1.33 (see Table XXI, column 2). This indicates that 8 was the total assessment obtained from 6 respondents from which is obtained a mean assessment of 1.33 for the Unit Performance Profile.

The mean assessment over all forms by all respondents was 2.19, with nine forms having ratings less than or equal to 2.19 and eight forms having ratings of 2.19 or higher. Six forms received ratings of 2.00 or less and eleven received ratings greater than 2.00 (see Table XXII). Only one form, the Prerequisite Deficiency Report, received a rating of greater than 3 and is, therefore, considered, on the average by the ten respondents, to be inappropriate.

The number of suggestions received from respondents was scant. Only 23 comments were received out of a possible 748. Of those received, 13 were made by McFarland users. Therefore, it appears fruitless to use respondents' comments as indications of what they found unsatisfactory about the forms. Of the 23 comments, ten were not related to format; several more were unintelligible. Specific comments made include the following:

TABLE XXI

APPROPRIATENESS OF WIS-SIM FORMS*

Mean Ratings by Schools

Form	McFarland	Jackson	Barston	Northview	H. D. Thoreau	All Schools
UPP - DMP	8/6 = 1.33	-	7/3 = 2.33	10/4 = 2.50	-	25/13 = 1.92
- WDRSD	11/7 = 1.57	20/6 = 3.33	10/4 = 2.50	20/11 = 1.82	18/12 = 1.50	79/40 = 1.97
IPP - DMP	10/8 = 1.25	-	7/3 = 2.30	10/4 = 2.50	-	27/15 = 1.8
- WDRSD	13/9 = 1.44	6/2 = 3.00	10/4 = 2.50	20/11 = 1.82	21/13 = 1.61	70/39 = 1.79
IGR - Group						
- DMP	12/6 = 2.00	-	9/3 = 3.00	9/3 = 3.00	-	30/12 = 2.50
- WDRSD	16/7 = 2.29	5/2 = 2.50	12/4 = 3.00	25/12 = 2.08	28/13 = 2.15	36/38 = 2.26
IGR -Summary						
- DMP	9/5 = 1.80	-	8/3 = 2.67	8/3 = 2.67	-	25/11 = 2.27
- WDRSD	12/7 = 1.71	3/1 = 3.00	11/14 = 2.75	24/12 = 2.00	26/12 = 2.17	76/36 = 2.11
IGR -Omission						
- DMP	10/4 = 2.50	-	10/3 = 3.30	8/3 = 2.67	-	28/10 = 2.80
- WDRSD	13/6 = 2.17	3/1 = 3.00	13/4 = 3.25	19/10 = 1.90	20/10 = 2.00	68/31 = 2.19
Score Submission Form	23/6 = 3.83	8/5 = 1.60	12/4 = 3.00	9/7 = 1.29	9/6 = 1.50	61/28 = 2.18
Card Inserts	13/7 = 1.86	-	6/2 = 3.00	4/2 = 2.00	3/2 = 1.50	26/13 = 2.00
Objective Check-list Cards	9/6 = 1.50	-	6/2 = 3.00	4/2 = 2.00	3/2 = 1.50	22/12 = 1.83
Grading Update Report Cards	12/4 = 3.00	-	9/3 = 3.00	10/4 = 2.50	4/2 = 2.00	35/13 = 2.69
Prerequisite Deficiency Report	10/5 = 2.00	-	8/3 = 2.67	12/4 = 3.00	2/1 = 2.00	32/10 = 3.20
CMI Request Form	9/6 = 1.50	4/1 = 4.0	9/3 = 3.00	7/3 = 2.33	9/4 = 2.26	38/17 = 2.23
Student Status Report Form	8/4 = 2.00	3/1 = 3.0	9/3 = 3.00	27/7 = 3.86	5/3 = 1.67	52/18 = 2.89
All Forms	198/103 = 1.92	52/19 = 2.74	144/55 = 2.62	226/102 = 2.21	148/80 = 1.85	780/356 = 2.19

*Scale: 1=Appropriate to 5=Inappropriate

TABLE XXII

WIS-SIM FORMS RANKED BY APPROPRIATENESS SCORES*

1	IPP (WDRSD)	(1.79)
2	IPP (DMP)	(1.80)
3	Objective Checklist Cards	(1.83)
4	UPP (DMP)	(1.92)
5	UPP (DMP)	(1.97)
6	Card Inserts	(2.00)
7	IGR-Summary (DMP)	(2.11)
8	Score Submission Form	(2.18)
9	IGR-Omission (WDRSD)	(2.19)
10	CMI Request Form	(2.23)
11	IGR-Group (WDRSD)	(2.26)
12	IGR-Summary (DMP)	(2.27)
13	IGR-Group (DMP)	(2.50)
14	Grading Update Report (Group)	(2.69)
15	IGR-Omission (DMP)	(2.80)
16	Student Status Report Form	(2.89)
17	Prerequisite Deficiency Report	(3.20)

*Scale: 1=Appropriate to 5=Inappropriate

1. Four respondents from Northview requested that the Student Status Report form be amended to be usable for more than one entering student and that a separate form be used for leaving students (again, for multiple leavers). The views of these respondents may have been directly responsible for the low ranking of the Student Status Report Form.

2. (a) Student names do not line up with numbers on the DMP Instructional Group Roster-Card Inserts.

   (b) A preference for the use of #2 pencils with Card Inserts (one respondent).

3. One respondent considered that more than three recommendations on the IGR Omission form are necessary.

4. The opening in the plastic holder for the Objective Checklist Cards should be wider to facilitate filing in N, P, or M (one respondent).

5. One respondent saw the need to include other data on the Individual Performance Profile, such as standardized test scores.

6. One respondent preferred the use of 8" x 11" printout sheets for Unit Performance Profiles and further recommended that faint lines would assist in reading the Unit Performance Profile.

7. One respondent considered the Unit Performance Profile to contain too much information, but gave no specific details.

The ratings and the small number of comments indicate that users feel, generally, that the forms are appropriate, with the exception of the Prerequisite Deficiency Report. User suggestions should be considered in later revisions and updates of the system.

USEFULNESS OF REPORTS

In May 1976, the seven user schools were asked to evaluate the usefulness of WIS-SIM reports by completing a rating scale on each of five forms:

1. Unit Performance Profile (UPP).

2. Individual Performance Profile (IPP).

3. Instructional Grouping Recommendation-Summary.

4. Instructional Grouping Recommendation-Omissions.

5. Prerequisite Deficiency Report.

In April 1977, a similar evaluation was performed of the above reports and the following additional reports:

1. Skill Eligibility Profile.

2. Instructional Grouping Recommendation-Group.

The purpose of this rating scale was to assess the usefulness of the information contained in the reports for making decisions about the instruction of students. In addition to rating the forms on a scale, the respondents were asked to make suggestions with regard to each of the respective forms. Those surveyed were asked to respond only about reports that they had used.

The purpose of the rating scale was to assess the usefulness of some WIS-SIM reports to users. Aspects of informational utility include the relevance of the information to the decisions users make about the instruction of students, the adequacy of the amount of information, and the accuracy of the information. A 5-point scale was used with 1 representing very useful to 5 representing not useful for each item. Respondents were also asked to suggest improvements to the forms or their use where they considered this necessary. The instrument used in May 1976 is included in Appendix B. The questionnaire used in April 1977 is consolidated with the questionnaire also included in Appendix B.

Analysis of the 1975-76 Survey

The numbers of respondents answering the usefulness questionnaire is summarized in Table XXIII for each school and respondent type.

TABLE XXIII

NUMBERS OF RESPONDENTS TO USEFULNESS OF REPORTS 1976 QUESTIONNAIRE

	Unit Leaders	Teachers	Aides	All Staff
McFarland	4	6	0	10
Jackson	1	2	1	4
Plover-Whiting	1	2	0	3
Barstow	2	3	1	6
Northview	2	7	3	12
Thoreau	6	7	3	16
All Schools	16	27	8	51

TABLE XXIV

USEFULNESS OF REPORTS: 1976

MEAN RATINGS OF UNIT PERFORMANCE PROFILE

	Unit Leaders	Teachers	Aides	All Staff
McFarland	4/4 = 1.0	8/6 = 1.33	-	12/10 = 1.2
Jackson	-	2/2 = 1.0	2/1 = 2.0	4/3 = 1.33
Plover-Whiting	3/1 = 3.0	7/2 = 3.5	-	10/3 = 3.33
Barstow	6/2 = 3.0	13/3 = 4.33	2/1 = 2.0	21/6 = 3.5
Northview	4/2 = 2.0	19/7 = 2.71	5/3 = 1.67	28/12 = 2.33
Thoreau	20/6 = 3.33	24/7 = 3.43	9/3 = 3.0	53/16 = 3.3
All Schools	37/15 = 2.47	73/27 = 2.7	18/8 = 2.25	128/50 = 2.56

TABLE XXV

USEFULNESS OF REPORTS: 1976

MEAN RATINGS OF INDIVIDUAL PERFORMANCE PROFILE

	Unit Leaders	Teachers	Aides	All Staff
McFarland	5/4 = 1.25	7/6 = 1.16	-	12/10 = 1.2
Jackson	2/1 = 2.0	4/2 = 2.0	3/1 = 3.0	9/4 = 2.25
Plover-Whiting	3/1 = 3.0	6/2 = 3.0	-	9/3 = 3.0
Barstow	8/2 = 4.0	8/2 = 4.0	2/1 = 2.0	18/5 = 3.6
Northview	3/2 = 1.5	14/6 = 2.33	11/3 = 3.67	28/11 = 2.54
Thoreau	14/6 = 2.33	19/7 = 2.51	8/3 = 2.67	41/16 = 2.56
All Schools	35/16 = 2.18	58/25 = 2.32	24/8 = 3.0	117/49 = 2.39

TABLE XXVI

USEFULNESS OF REPORTS: 1976

MEAN RATINGS OF INSTRUCTIONAL GROUPING RECOMMENDATION-SUMMARY

	Unit Leaders	Teachers	Aides	All Staff
McFarland	5/4 = 1.25	14/6 = 2.33	-	19/10 = 1.9
Jackson	2/1 = 2.0	4/2 = 2.0	1/1 = 1	7/4 = 1.75
Plover-Whiting	3/1 = 3.0	6/2 = 3.0	-	9/3 = 3.0
Barstow	6/2 = 3.0	11/3 = 3.67	3/1 = 3.0	20/6 = 3.33
Northview	4/2 = 2.0	19/5 = 3.8	7/3 = 2.33	30/10 = 3.0
Thoreau	8/6 = 1.33	10/7 = 1.43	4/3 = 1.33	22/16 = 1.22
All Schools	28/16 = 1.75	64/25 = 2.56	15/8 = 1.88	107/49 = 2.18

TABLE XXVII

USEFULNESS OF REPORTS: 1976

MEAN RATINGS OF INSTRUCTIONAL GROUPING RECOMMENDATION-OMISSIONS

	Unit Leaders	Teachers	Aides	All Staff
McFarland	10/4 = 2.5	13/6 = 2.16	-	23/10 = 2.3
Jackson	-	5/2 = 2.5	-	5/2 = 2.5
Plover-Whiting	3/1 = 3.0	6/2 = 3.0	-	9/3 = 3.0
Barstow	8/2 = 4.0	8/2 = 4.0	4/1 = 4.0	20/5 = 4.0
Northview	3/2 = 1.5	19/5 = 3.8	7/3 = 2.33	29/10 = 2.9
Thoreau	9/4 = 2.25	8/4 = 2.0	10/3 = 3.33	27/11 = 2.45
All Schools	33/13 = 2.54	59/21 = 2.81	21/7 = 3.0	113/41 = 2.76

TABLE XXVIII

USEFULNESS OF REPORTS: 1976

MEAN RATINGS OF PREREQUISITE DEFICIENCY REPORT

	Unit Leaders	Teachers	Aides	All Staff
McFarland	10/4 = 2.5	16/6 = 2.67	-	26/10 = 2.6
Jackson	4/2 = 2.0	15/8 = 1.88	-	19/10 = 1.9
Plover-Whiting	3/1 = 3.0	5/1 = 5.0	-	8/2 = 4.0
Barstow	6/2 = 3.0	10/2 = 5.0	-	16/4 = 4.0
Northview	4/2 = 2.0	10/3 = 3.33	-	14/5 = 2.8
Thoreau	8/3 = 2.67	10/4 = 2.5	6/2 = 3.0	24/9 = 3.78
All Schools	35/14 = 2.5	66/24 = 2.75	6/2 = 3.0	107/40 = 2.68

TABLE XXIX

USEFULNESS OF REPORTS: 1976

MEAN RATINGS ON ALL FIVE REPORTS

	Unit Leaders	Teachers	Aides	All Staff
McFarland	34/20 = 1.7	58/30 = 1.93	-	92/50 = 1.84
Jackson	4/2 = 2.0	15/8 = 1.88	6/3 = 2.0	25/13 = 1.92
Plover-Whiting	12/4 = 3.0	30/9 = 3.33	-	42/13 = 3.23
Barstow	34/10 = 3.4	52/12 = 4.33	11/4 = 2.75	97/26 = 3.73
Northview	18/8 = 2.25	81/26 = 3.11	30/12 = 2.50	129/46 = 2.80
Thoreau	59/25 = 2.36	71/29 = 2.45	37/14 = 2.64	167/68 = 2.46
All Schools	161/69 = 2.33	307/114 = 2.69	84/33 = 2.54	552/216 = 2.55

It should be noted that different categories of users utilize the reports for different purposes and, consequently, these reports may have different degrees of usefulness for different users. Accordingly, Tables XXIV to XXIX are presented in terms of unit leaders, teachers, and aides. Administrators were omitted from the survey on the assumption that they did not use the reports in their daily work.

Neither the Jackson nor the Barstow schools use WIS-SIM to the same extent as other user schools. General comments to this effect were made by many respondents from these two schools, indicating they did not use the forms specified and, consequently, could not assess their usefulness. An important factor is the different organizational structures that different schools use to implement WIS-SIM and IGE.

At Henry David Thoreau, the reading specialist operates the system independently of other teachers and, therefore, these teachers were not able to make many assessments. Different personnel are responsible for different uses of WIS-SIM in different schools and, consequently, their perceptions should be weighted to show these differential responsibilities. This was not attempted in this evaluation; the perceptions of all users being preferred and presented in terms of categories. Local organizational peculiarities, where shown, can be taken into account when interpreting Table XXIX.

The results of this assessment are shown separately for each of the five reports by school and by category of user. The assessment for each form is shown both as a fraction and as a decimal. This permits the reader to note the number of respondents contributing towards the mean rating of a particular form.

The mean rating given by all respondents over all reports is 2.55 (see Table XXIX) with the IPP and the IGR-Summary having ratings less than (more useful) this average. The IGR-Summary report was seen by unit leaders and aides to be the most useful of all reports assessed. The IGR-Omissions report was seen to be the least useful compared with other reports, but is still rated as being useful, overall. In terms of assessments over all schools and all users, reports were ranked according to their usefulness as follows:

1. Instructional Grouping Recommendation-Summary (2.18).
2. Individual Performance Profiles (2.39).
3. Unit Performance Profiles (2.56).
4. Prerequisite Deficiency Report (2.68).
5. Instructional Grouping Recommendation-Omissions (2.76).

Unit leaders consistently rated reports higher than did either teachers or aides--the exception being the Unit Performance Profile, which was rated higher by aides. This trend is particularly noticeable for Northview and, to a lesser extent, for McFarland and Thoreau.

The McFarland Schools consistently rated the usefulness of reports higher than did other schools, the exception being the Prerequisite Deficiency Report. The mean rating on all five reports is presented in Table XXIX.

The schools ranked all reports according to the degree of their usefulness as follows:

Rank	School	Mean Rating
1	McFarland	1.84
2	Jackson	1.92
3	Thoreau	2.46
4	Northview	2.80
5	Plover-Whiting	3.23
6	Barstow	3.73

Jackson also was consistently high (comparatively) in its assessment of all forms. Barstow consistently ranked the usefulness of the reports lowest.

Based on the mean rating of all schools, the reports considered most useful were the Instructional Grouping Recommendation-Summary and the Individual Performance Profile. However, it is doubtful that meaningful overall conclusions can be reached regarding the usefulness of reports by all schools. Usefulness must be judged relative to, and tempered by, the organizational structure and degree of WIS-SIM implementation. In evaluating a low usefulness rating, one must question whether this results from a low level of system use and implementation or whether the low usage is a function of the user's perception of a lack of system usefulness, including the reports.

Those forms with a rating of 2.5 or less should be considered useful, not presently in need of further modification, and their position in the WIS-SIM need not be altered. Those forms with a rating of greater than 2.5 should be investigated further with a view toward modification of their role in WIS-SIM.

Analysis of the 1976-77 Survey

The numbers of respondents answering the usefulness of reports questionnaire in 1977 are summarized in Table XXX.

TABLE XXX

NUMBER OF RESPONDENTS TO USEFULNESS OF REPORTS QUESTIONNAIRE

	Unit Leaders	Teachers	Aides	All Staff
McFarland	5	9	0	14
Thoreau			1	2*

*Only reading specialist and terminal operator were surveyed

The results of the 1977 questionnaire regarding usefulness of reports are presented in a different format than those in the 1976 survey, included in the previous section: A total of 14 unit leaders and teachers were surveyed in the McFarland schools. No aides were included in the 1977 survey. Only the reading specialist and the aide (computer-terminal operator) in the reading center at Thoreau were surveyed as they are normally the only ones who use the reports directly.

The results of this survey are presented separately for each of the seven reports and by user school. The data are presented by the number of respondents rating each report, the mean rating given the report by the respondents, and the standard deviation of this rating. Tables XXXI through XXXVII reflect the ratings of the seven reports while Table XXXVIII refers to the mean rating of all the reports.

The McFarland Schools, by far the largest users of the system, ranked the usefulness of the reports as given below. The number in parentheses is the mean rating.

1. Unit Performance Profile (1.29).
2. IGR-Omissions (1.92).
3. Individual Performance Profile (2.08).
4. Skill Eligibility Profile (2.20).
5. IGR-Summary (2.23).
6. IGR-Group (2.38).
7. Prerequisite Deficiency Report (2.40).

TABLE XXXI

USEFULNESS OF REPORTS: 1977

RATINGS OF UNIT PERFORMANCE PROFILE

	N	Mean	Std. Dev.
McFarland	14	1.29	.61
Thoreau (R.S.)	1	1.0	
(Aide)	1	1.0	

TABLE XXXII

USEFULNESS OF REPORTS: 1977

RATINGS OF INDIVIDUAL PERFORMANCE PROFILE

	N	Mean	Std. Dev.
McFarland	13	2.08	1.38
Thoreau (R.S.)	1	3.0	
(Aide)	1	2.0	

TABLE XXXIII

USEFULNESS OF REPORTS: 1977

RATING OF INSTRUCTIONAL GROUPING RECOMMENDATION-SUMMARY

	N	Mean	Std. Dev.
McFarland	13	2.23	1.20
Thoreau (R.S.)	1	2.0	
(Aide)	1	2.0	

TABLE XXXIV

USEFULNESS OF REPORTS: 1977

RATINGS OF INSTRUCTIONAL GROUP RECOMMENDATIONS-OMISSIONS

	N	Mean	Std. Dev.
McFarland	10	2.20	1.03
Thoreau (R.S.)	1	3.0	
(Aide)	1	1.0	

TABLE XXXV

USEFULNESS OF REPORTS: 1977

RATINGS OF PREREQUISITE DEFICIENCY REPORT

	N	Mean	Std. Dev.
McFarland	10	2.40	1.08
Thoreau (R.S.)		(Not Used)	
(Aide)			

TABLE XXXVI

USEFULNESS OF REPORTS: 1977

RATING OF SKILL ELIGIBILITY PROFILE

	N	Mean	Std. Dev.
McFarland	10	2.20	1.03
Thoreau (R.S.)	1	1.0	
(Aide)	1	1.0	

TABLE XXXVII

USEFULNESS OF REPORTS: 1977

RATING OF INSTRUCTIONAL GROUPING RECOMMENDATION-GROUP

	N	Mean	Std. Dev.
McFarland	13	2.38	1.50
Thoreau (R.S.)	1	1.0	
(Aide)	1	1.0	

TABLE XXXVIII

USEFULNESS OF REPORTS: 1977

MEAN RATING OF ALL SEVEN REPORTS

	N	Mean	Std. Dev.
McFarland	86	2.05	1.20
Thoreau (R.S.)	6	1.83	.98
(Aide)	6	1.33	.52

The unit performance profile continued to be rated as the most useful report and the prerequisite deficiency report rated as the least useful, but still useful. The rating of the IGR-Omissions improved greatly between 1976 and 1977.

Henry David Thoreau ranked the usefulness of the reports high, as did McFarland, except for the Individual Performance Profile which they indicated was rarely used. The overall rankings of Thoreau were higher, however, than McFarland. This must be tempered by the fact that only two respondents were included in the Thoreau survey.

Given the high ratings of the reports by the two user schools, it may be concluded that user perception of the usefulness of the reports is positive. These mean ratings are consistent with the previous year's survey. McFarland's numerical ranking was .21 higher and Thoreau's was .63 lower. While these are not necessarily valid comparisons, the rankings do appear to indicate an on-going and overall satisfaction with the usefulness of the reports.

ASSESSMENT OF TASKS AFFECTED BY WIS-SIM

User Identification of School Tasks Supported by WIS-SIM

Certain school tasks are assumed to be affected by the use of computerized procedures such as the WIS-SIM system. Faculty and staff members were surveyed by means of a questionnaire designed to identify those tasks supported by the CMI system. This questionnaire was administered to a random sample of staff members in February 1976 end April 1977. The questionnaire, which was prepared by project personnel, is shown in Appendix B.

All seven user schools completed the questionnaire, but the 1976 results from the Plover-Whiting School were not received, and it is assumed they were lost in transit. Therefore, this evaluation was completed without information from Plover-Whiting. The results from the two McFarland schools were not considered separately and are combined under the school district name McFarland. No school identification was coded onto the questionnaire forms used in this survey. Survey respondents were asked, however, to indicate their position, i.e., administrator, teacher, aide, or unit leader.

Staff lists for each school were obtained and half of each school's staff was selected randomly to complete the questionnaire. The remaining half completed another questionnaire. All respondents (1976 and 1977) were asked to identify those school tasks that are supported by computerized procedures and to indicate whether their role in the task had changed as a result of WIS-SIM. A task supported by WIS-SIM was defined as one that involved the use of computer printouts in carrying out the task. Fifty-five responses were

received in 1976: sixteen from McFarland, five from Barstow, twelve from Northview, twelve from Jackson, and thirteen from Henry David Thoreau. Twenty-one responses were received in 1977: fifteen from McFarland and six from Henry David Thoreau. The 1977 respondents did not include aides, first year teachers, or administrators, as it was felt their responses might tend to distort the findings. Also, due to the unique organizational structure at Thoreau, only the unit leaders and the reading coordinator were surveyed in 1977.

Twenty-seven tasks were included in the questionnaire. Each was selected after a survey of IGE literature and the questionnaire included tasks considered typical for IGE schools. Several tasks were included that were considered as not involving WIS-SIM. There were four possible responses to each task, and respondents were asked to select the one that best described the involvement of WIS-SIM in the task. The possible responses were:

1. The task involves a WIS-SIM procedure that has completely replaced a manual procedure.

2. The task involves a CMI procedure that has partially replaced a manual procedure.

3. The task is new and extra because of WIS-SIM.

4. The task has not been affected by WIS-SIM.

For each task, respondents were also asked to indicate whether their role or responsibilities in the task had changed because of WIS-SIM. Responses were either Yes or No. Respondents were also asked to identify any computer-supported tasks not included in the questionnaire.

It should be noted that the questionnaire was designed to identify those school tasks supported by computerized procedures and those affected by WIS-SIM. User evaluation of the system was not the purpose, nor were user value judgements of the effectiveness or efficiency of the system requested. Therefore, the results obtained cannot be interpreted as measures of user satisfaction or dissatisfaction with the system.

Tables XXXIX through XLIII show, for each school, the percentage of respondents selecting each of the four possible responses. Table XLIV shows those percentages for all user schools combined. In each table, columns 1-4 refer to the first aspect of WIS-SIM's involvement in the task and columns 5 and 6 refer to the role of each respondent in the task. Not all percentages add to 100 percent because some respondents did not provide information on each of the 27 tasks.

Analysis of the 1975-76 Survey

In the 1975-76 survey, only two tasks, "Maintaining Unit Performance Profiles" (UPP), task 3, and "Updating Student Performance Information", task 24, were considered by more than 10 percent of the respondents as being new and extra because of WIS-SIM. The Jackson School identified more tasks, more strongly, as being extra because of WIS-SIM than did any other school. Ten out of the twelve Jackson respondents saw "Identifying Individual Student Instructional Needs", task 21, as being extra because of WIS-SIM; seven identified "Maintaining UPP's" as extra; five identified IPP's as extra; five identified "Updating Student Performance Information" as extra. It seems that Jackson's respondents have perceived WIS-SIM as providing more extra tasks than in other schools whose respondents only occasionally referred to tasks as being extra because of WIS-SIM.

Columns 1 and 2 of Table XLIV provide information on respondents' perceptions of the extent WIS-SIM's involvement in different tasks, and column 4 provides the complementary information on tasks not affected by WIS-SIM. Thirteen of the twenty-seven tasks were noted by more than half the respondents as being affected by WIS-SIM (found by totalling the percentages in columns 1 and 2). Those tasks most strongly perceived as being affected by WIS-SIM were:

1. Grouping Students for Instructional Purposes - task 11.

2. Maintaining IPP - task 4.

3. Maintaining UPP - task 3.

4. Identifying Individual Student Instructional Needs - task 1.

5. Updating Student Performance Information - task 24.

All other tasks were perceived by more than 40 percent of respondents as not being affected by WIS-SIM nor as being extra because of WIS-SIM. Table XLV lists the tasks in order of magnitude of perceived affect by WIS-SIM.

Table XLIV also reveals that proportionately few respondents considered that WIS-SIM had completely replaced a manual procedure (column 1). Maintaining UPP's, maintaining IPP's, and assessing student learning outcomes were the only tasks that were considered by 25 percent or more of the respondents as involving a complete change to WIS-SIM procedures. Eight tasks were identified by at least 25 percent of McFarland respondents as being completely performed by WIS-SIM procedures. Thoreau respondents placed six tasks in this category, and Northview respondents so placed four tasks. Barstow, which infrequently used the system, and Jackson, a new user of the system, placed no tasks in this category.

The information in column 2 of Tables XXXIX through XLIV show respondents' perceptions of those tasks partially replaced by WIS-SIM procedures. Seventeen tasks were perceived by at least 25 percent of respondents as being partially supported by WIS-SIM. Nine tasks were perceived by at least 40 percent of respondents as being partially supported by WIS-SIM. These data indicate the use of WIS-SIM procedures for many school-related tasks. Diverse educational tasks such as evaluating learning activities with respect to unit goals, assessing the status of entering students, reporting student progress to parents, maintaining permanent school records of students' progress, determining the rate of progress of individual students, and determining students' readiness for the next instructional step indicate that the effects of WIS-SIM are being felt in a wide variety of educational activities. These effects are more evident when the results of columns 1, 2, and 3 are considered jointly. The Northview and McFarland respondents perceived more tasks as being affected by WIS-SIM than did Barstow (almost a non-user) or the newer users from Jackson and Henry David Thoreau.

The same tasks perceived by respondents as being most affected by WIS-SIM were also noted by most respondents as involving role changes. Table XLV is a list of tasks ranked in order of those producing most changes in roles as perceived by respondents. The strong correlation between ranks by effect of WIS-SIM and change in role is noticeable, the Spearman Rank Order Correlation being .95, which is significant at the .0001 level.

Although three user schools used WIS-SIM in the management of only one instructional program, and although Barstow infrequently used the system, it is evident from the data presented that WIS-SIM is having a significant effect on a number of important educational tasks, as perceived by users.

The following two lists indicate those tasks that WIS-SIM was expected to affect, and those tasks which WIS-SIM was not expected to affect. Listed after each task is the percentage that in each category at least 50 percent of the teachers would respond in the anticipated direction. Such is the case in 21 of the 27 cases, with the remaining six cases being within 5 percent of the 50 percent goal.

Tasks Anticipated to be Affected by WIS-SIM

1. Identifying individual student instructional needs (69).
2. Assessing student learning outcomes (45).
3. Maintaining unit performance profiles (70).
4. Maintaining individual performance profiles (71).
6. Assessing attainment of unit goals (45).

TABLE XXXIX

SCHOOL TASKS AFFECTED BY WIS-SIM

MCFARLAND SCHOOLS

N = 16

Percentage Responses

1975-1976

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	44	56	0	0	75	19
2. Assessing student learning outcomes	12	56	0	31	56	44
3. Maintaining unit performance profiles	62	31	0	6	75	25
4. Maintaining individual profiles	50	50	0	0	87	12
5. Comparing the status of students in unit to school, system or other norms	6	19	12	62	25	62
6. Assessing the attainment of unit goals	19	50	0	25	50	44
7. Assessing the attainment of individual student goals	37	56	0	6	69	31

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	6	12	6	75	19	75
9. Developing instructional objectives for each child in the unit	6	37	6	50	50	50
10. Evaluating learning activities with respect to unit goals	0	50	12	37	25	75
11. Grouping students for instructional purposes	25	75	0	0	69	25
12. Counseling students about their progress and future schooling	6	31	6	56	31	56
13. Selecting appropriate materials, media, and supplies for instruction	0	12	0	87	12	75
14. Evaluating unit operation	12	19	6	56	19	62
15. Assessing the status of entering students	19	50	0	31	50	44

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
16. Maintaining school's inventory of instructional materials	6	0	0	87	6	81
17. Reporting school's progress to central administration	19	44	6	19	50	31
18. Reporting student progress to parents	12	69	0	6	81	19
19. Maintaining permanent school records of students' progress	12	56	6	19	75	25
20. Developing daily teaching schedules	0	19	12	69	12	75
21. Assessing students in terms of their learning characteristics	6	0	6	87	6	75
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	6	25	19	44	31	62
23. Communicating student information to state agencies	6	37	12	31	25	56

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	44	56	0	0	81	19
25. Marking or scoring tests	6	6	6	81	6	81
26. Determining rate of progress of individual students	37	44	6	12	56	44
27. Determining students' readiness for the next instructional step	44	56	0	0	81	19

TABLE XL

SCHOOL TASKS AFFECTED BY WIS-SIM

JACKSON SCHOOL

N = 12

Percentage Responses

1975-1976

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	17	0	83	0	8	92
2. Assessing student learning outcomes	0	17	0	83	8	92
3. Maintaining unit performance profiles	0	25	58	17	67	33
4. Maintaining individual profiles	8	17	42	33	58	42
5. Comparing the status of students in unit to school, system or other norms	0	8	0	92	0	100
6. Assessing the attainment of unit goals	0	8	0	92	8	92
7. Assessing the attainment of individual student goals	0	8	0	92	8	92

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	0	8	8	83	0	100
9. Developing instructional objectives for each child in the unit	0	17	33	50	0	100
10. Evaluating learning activities with respect to unit goals	0	8	0	83	0	100
11. Grouping students for instructional purposes	0	33	33	33	17	83
12. Counseling students about their progress and future schooling	0	0	8	92	8	92
13. Selecting appropriate materials, media, and supplies for instruction	0	8	0	92	8	92
14. Evaluating unit operation	0	17	0	83	8	92
15. Assessing the status of entering students	0	25	0	75	17	83

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
16. Maintaining school's inventory of instructional materials	0	0	0	100	0	100
17. Reporting school's progress to central administration	0	0	8	92	8	92
18. Reporting student progress to parents	8	17	0	75	8	92
19. Maintaining permanent school records of students' progress	0	8	17	75	17	83
20. Developing daily teaching schedules	0	8	8	83	8	92
21. Assessing students in terms of their learning characteristics	0	17	0	83	8	92
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	0	17	0	83	8	92
23. Communicating student information to state agencies	0	0	8	92	0	100

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	0	17	42	42	50	50
25. Marking or scoring tests	0	8	0	92	8	92
26. Determining rate of progress of individual students	0	8	0	92	8	92
27. Determining students' readiness for the next instructional step	0	17	0	83	8	92

TABLE XLI

SCHOOL TASKS AFFECTED BY WIS-SIM

BARSTOW SCHOOL

N = 5

Percentage Responses

1975-1976

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	0	80	0	20	0	100
2. Assessing student learning outcomes	0	60	0	40	0	100
3. Maintaining unit performance profiles	0	80	0	20	0	100
4. Maintaining individual profiles	0	80	0	20	0	100
5. Comparing the status of students in unit to school, system or other norms	0	40	0	60	0	100
6. Assessing the attainment of unit goals	0	40	0	60	0	100
7. Assessing the attainment of individual student goals	0	40	0	60	0	100

Test	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	0	40	0	60	0	100
9. Developing instructional objectives for each child in the unit	0	20	0	80	0	100
10. Evaluating learning activities with respect to unit goals	0	20	0	80	0	100
11. Grouping students for instructional purposes	0	80	0	20	0	100
12. Counseling students about their progress and future schooling	0	20	0	80	0	100
13. Selecting appropriate materials, media, and supplies for instruction	0	0	0	100	20	80
14. Evaluating unit operation	0	80	0	20	0	100
15. Assessing the status of entering students	0	20	0	80	0	100

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
16. Maintaining school's inventory of instructional materials	0	20	0	80	0	100
17. Reporting school's progress to central administration	0	20	0	80	0	100
18. Reporting student progress to parents	0	60	0	40	20	80
19. Maintaining permanent school records of students' progress	0	80	0	20	0	100
20. Developing daily teaching schedules	0	0	0	100	0	100
21. Assessing students in terms of their learning characteristics	0	0	0	100	0	100
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	0	40	0	60	0	100
23. Communicating student information to state agencies	0	20	0	80	0	100

Task	1. Completely Replaced by WIS-SIM	2. Partially Replaced by WIS-SIM	3. Extra Because of WIS-SIM	4. Not Affected by WIS-SIM	5. Your Role Changed: Yes	6. Your Role Changed: No
24. Updating student performance information	0	60	20	20	20	80
25. Marking or scoring tests	0	0	0	100	0	100
26. Determining rate of progress of individual students	0	60	0	40	0	100
27. Determining students' readiness for the next instructional step	0	60	0	40	0	100

TABLE XLII

SCHOOL TASKS AFFECTED BY WIS-SIM

NORTHVIEW SCHOOL

N = 12

Percentage Responses

1975-1976

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	33	58	0	0	50	33
2. Assessing student learning outcomes	8	42	17	25	42	42
3. Maintaining unit performance profiles	42	50	0	0	50	33
4. Maintaining individual profiles	42	50	0	0	42	42
5. Comparing the status of students in unit to school, system or other norms	8	17	0	17	0	58
6. Assessing the attainment of unit goals	8	42	0	25	25	58
7. Assessing the attainment of individual student goals	17	50	0	25	50	33

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	17	25	0	33	25	58
9. Developing instructional objectives for each child in the unit	8	50	0	17	25	58
10. Evaluating learning activities with respect to unit goals	8	50	0	17	25	58
11. Grouping students for instructional purposes	17	50	8	0	50	33
12. Counseling students about their progress and future schooling	0	0	0	33	0	50
13. Selecting appropriate materials, media, and supplies for instruction	0	8	0	58	0	75
14. Evaluating unit operation	0	17	0	25	0	50
15. Assessing the status of entering students	0	42	17	8	17	58

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
16. Maintaining school's inventory of instructional materials	0	8	0	42	0	75
17. Reporting school's progress to central administration	17	0	0	17	8	42
18. Reporting student progress to parents	0	50	8	8	17	42
19. Maintaining permanent school records of students' progress	25	33	17	8	50	33
20. Developing daily teaching schedules	0	8	0	42	0	58
21. Assessing students in terms of their learning characteristics	0	8	0	42	0	58
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	0	17	8	17	0	58
23. Communicating student information to state agencies	0	0	0	25	0	42

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	0	58	17	0	50	25
25. Marking or scoring tests	0	0	17	50	17	58
26. Determining rate of progress of individual students	8	33	8	17	17	42
27. Determining students' readiness for the next instructional step	8	50	17	8	42	42

TABLE XLIII

SCHOOL TASKS AFFECTED BY WIS-SIM

HENRY DAVID THOREAU SCHOOL

N = 13

Percentage Responses

1975-1976

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	23	38	15	0	46	54
2. Assessing student learning outcomes	8	38	0	15	54	38
3. Maintaining unit performance profiles	54	8	0	0	62	38
4. Maintaining individual profiles	46	15	0	0	85	8
5. Comparing the status of students in unit to school, system or other norms	8	46	0	38	23	69
6. Assessing the attainment of unit goals	0	38	0	38	15	62
7. Assessing the attainment of individual student goals	8	31	0	38	15	62

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	0	54	0	15	15	62
9. Developing instructional objectives for each child in the unit	0	31	0	46	8	69
10. Evaluating learning activities with respect to unit goals	8	31	0	38	8	69
11. Grouping students for instructional purposes	54	46	0	0	54	46
12. Counseling students about their progress and future schooling	0	23	0	46	8	69
13. Selecting appropriate materials, media, and supplies for instruction	0	8	0	77	0	92
14. Evaluating unit operation	0	31	0	46	8	69
15. Assessing the status of entering students	8	54	8	31	46	54

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIm	4 Not Affected by WIS-SIm	5 Your Role Changed Yes	6 Your Role Changed No
16. Maintaining school's inventory of instructional materials	0	8	0	92	0	100
17. Reporting school's progress to central administration	8	23	0	38	15	54
18. Reporting student progress to parents	38	23	0	38	23	77
19. Maintaining permanent school records of students' progress	31	54	0	0	54	38
20. Developing daily teaching schedules	0	8	0	69	0	77
21. Assessing students in terms of their learning characteristics	0	23	0	46	8	62
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	0	0	0	85	0	92
23. Communicating student information to state agencies	0	15	0	46	8	62

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	62	23	0	0	85	8
25. Marking or scoring tests	0	15	0	85	15	85
26. Determining rate of progress of individual students	0	54	0	46	8	92
27. Determining students' readiness for the next instructional step	0	54	0	47	15	85

TABLE XLIV

SCHOOL TASKS AFFECTED BY WIS-SIM

ALL SCHOOLS

1975 - 1976

N = 55

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	25	44	4	20 (5)	45 (6)	49
2. Assessing student learning outcomes	7	38	4	40 (10)	40 (7)	55
3. Maintaining unit performance profiles	35	35	13	7 (1)	62 (2)	35
4. Maintaining individual profiles	31	40	9	9 (3)	62 (3)	33
5. Comparing the status of students in unit to school, system or other norms	5	20	4	56 (21)	13 (18)	73
6. Assessing the attainment of unit goals	7	38	0	47 (15)	25 (12)	69
7. Assessing the attainment of individual student goals	16	40	0	42 (13)	36 (90)	60

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	5	27	4	56 (20)	15 (16)	80
9. Developing instructional objectives for each child in the unit	4	35	9	47 (64)	22 (15)	75
10. Evaluating learning activities with respect to unit goals	4	36	4	49 (16)	15 (17)	82
11. Grouping students for instructional purposes	24	53	9	9 (2)	47 (5)	47
12. Counseling students about their progress and future schooling	2	16	4	62 (22)	13 (19)	73
13. Selecting appropriate materials, media, and supplies for instruction	0	9	0	80 (26)	5 (26)	82
14. Evaluating unit operation	4	27	2	53 (17)	9 (23)	75
15. Assessing the status of entering students	7	44	5	36 (9)	33 (11)	60

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
16. Maintaining school's inventory of instructional materials	2	5	0	80 (27)	2 (27)	89
17. Reporting school's progress to central administration	11	20	4	40 (11)	22 (14)	55
18. Reporting student progress to parents	9	45	2	33 (7)	36 (9)	55
19. Maintaining permanent school records of students' progress	16	40	9	25 (6)	49 (4)	45
20. Developing daily teaching schedules	0	11	5	73 (23)	5 (21)	82
21. Assessing students in terms of their learning characteristics	2	11	2	73 (24)	5 (24)	78
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	2	18	7	55 (19)	11 (20)	76
23. Communicating student information to state agencies	2	16	5	53 (18)	9 (22)	71

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	22	44	15	11 (4)	62 (1)	31
25. Marking or scoring tests	2	7	5	78 (25)	11 (21)	80
26. Determining rate of progress of individual students	13	35	4	42 (13)	24 (13)	67
27. Determining students' readiness for the next instructional step	15	44	4	35 (8)	38 (8)	58

TABLE XLV

RANK ORDER OF TASKS AND ROLES AFFECTED BY WIS-SIM 1975-76

Tasks ranked in order of most affected by WIS-SIM	Tasks ranked by order of perceived role changes	
1	5	Grouping Students for Instructional Purposes
2	2	Maintaining IPP
3	2	Maintaining UPP
4	6	Identifying Individual Student Instructional Needs
5	2	Updating Student Performance Information
6	8	Determining Students' Readiness for the Next Instructional Step
7.5	4	Maintaining Permanent School Records of Students' Progress
7.5	9.5	Assessing the Attainment of Individual Student Goals
9	9.5	Reporting Student Progress to Parents
10	11	Assessing the Status of Entering Students
11	13	Determining Rate of Progress of Individual Students
12.5	7	Assessing Student Learning Outcomes
12.5	12	Assessing the Attainment of Unit Goals
14	16.5	Formulating Unit Goals
15	16.5	Evaluating Learning Activities With Respect to Unit Goals
16	14.5	Developing Instructional Objectives for Each Child in the Unit
17.5	14.5	Reporting School's Progress to Central Administration
17.5	22.5	Evaluating Unit Operations
19	18.5	Comparing the Status of Students in Unit to School, System, or Other Norms
20	20.5	Evaluating Instructional Programs
21.5	22.5	Communicating Student Information to State Agencies
21.5	18.5	Counseling Students About Their Progress and Future Schooling
23	25	Assessing Students in Terms of Their Learning Characteristics
24	25	Developing Daily Teaching Schedules
25.5	20.5	Marking or Scoring Tests
25.5	25	Selecting Appropriate Materials, Media, and Supplies for Instruction
27	27	Maintaining School's Inventory of Instructional Materials

7. Assessing attainment of individual student goals (56).

11. Grouping students for instructional purposes (77).

15. Assessing status of entering students (51).

18. Reporting student progress to parents (54).

19. Maintaining permanent school records of students' progress (56).

24. Updating student performance information (66).

26. Determining rate of progress of individual students (48).

27. Determining students' readiness for the next instructional step (59).

Tasks Anticipated Not to be Substantially Affected by WIS-SIM

5. Comparing the status of students in unit to school, system, or other norms (56).

8. Formulating unit goals (56).

9. Developing instructional objectives for each child in the unit (47).

10. Evaluating learning activities with respect to unit goals (49).

12. Counseling students about their progress and future schooling (62).

13. Selecting appropriate materials, media, and supplies for instruction (80).

14. Evaluating unit operations (53).

16. Maintaining school's inventory of instructional materials (80).

17. Reporting school's progress to central administration (40).

20. Developing daily teaching schedules (73).

21. Assessing students in terms of their learning characteristics (73).

22. Evaluating instructional programs (58).

23. Communicating student information to state agencies (53).

25. Marking or scoring tests (78).

A design goal was that the system would not create extra tasks for teachers. The low percentage of teachers responding that tasks were extra because of WIS-SIM suggests that this design goal was achieved. An additional observation may be made concerning the relationship between extent of system use and the number of tasks affected by WIS-SIM. High usage schools report more expected tasks as being replaced by WIS-SIM than do low usage schools and, conversely, high usage schools report fewer tasks as being extra because of WIS-SIM.

Analysis of the 1976-77 Survey

Tables summarizing school tasks perceived to be affected by McFarland teachers and Thoreau teachers are summarized in Tables XLIX and L. A composite of these summaries is presented in Table LI. As indicated in column 3 of Table LI, only one task, "Comparing the status of students in unit to school, system, or other norm", task 3, was considered by 10 percent or more of the respondents from the user schools as being extra because of WIS-SIM. This response is not considered significant, as it represents only one of the six respondents from Henry David Thoreau. A total of nine of the 27 tasks were considered as new in the cumulative survey, but these tasks reflect the response from only one of the total 21 respondents. Since McFarland is in its third consecutive year of WIS-SIM usage and Thoreau is in its second consecutive year of usage, it is not surprising that only a few tasks were considered extra, by only a few of the staff members surveyed.

Those tasks considered replaced either completely or partially by WIS-SIM are addressed in columns 1 and 2 of Tables XLVI through SLVIII. Column 4 refers to those tasks not affected by usage of WIS-SIM. All of the 27 tasks in the 1977 survey were considered by some percentage of the respondents as being either completely or partially replaced by WIS-SIM. Likewise, some percentage of the respondents considered all 27 tasks as not being affected by WIS-SIM. In both cases, however, the response may reflect the perception of only one individual. The tasks perceived by more than half of the respondents as being completely or partially replaced by WIS-SIM are:

1. Identifying individual student instructional needs (1).

2. Assessing student learning outcomes (2).

3. Maintaining unit performance profiles (3).

4. Maintaining individual profiles (4).

5. Assessing attainment of unit goals (6).

TABLE XLVI

SCHOOL TASKS AFFECTED BY WIS-SIM

MCFARLAND SCHOOLS

Percentage Responses

1976-1977

N = 15

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	0	100	0	0	67	33
2. Assessing student learning outcomes	0	53	7	40	40	60
3. Maintaining unit performance profiles	73	20	7	0	93	7
4. Maintaining individual profiles	47	53	0	0	87	13
5. Comparing the status of students in unit to school, system or other norms	13	40	7	40	53	47
6. Assessing the attainment of unit goals	7	67	7	20	60	40
7. Assessing the attainment of individual student goals	0	67	0	33	47	53

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
8. Formulating unit goals	13	47	7	33	53	47
9. Developing instructional objectives for each child in the unit	0	53	0	47	40	60
10. Evaluating learning activities with respect to unit goals	0	60	7	33	40	60
11. Grouping students for instructional purposes	0	100	0	0	60	40
12. Counseling students about their progress and future schooling	0	40	0	53	20	73
13. Selecting appropriate materials, media, and supplies for instruction	0	7	0	93	0	100
14. Evaluating unit operation	0	60	0	40	40	60
15. Assessing the status of entering students	0	60	7	27	33	60

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
16. Maintaining school's inventory of instructional materials	0	7	0	87	0	93
17. Reporting school's progress to central administration	0	40	0	33	27	47
18. Reporting student progress to parents	13	60	7	20	67	33
19. Maintaining permanent school records of students' progress	33	67	0	0	67	33
20. Developing daily teaching schedules	0	33	0	67	27	60
21. Assessing students in terms of their learning characteristics	0	20	0	73	7	80
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	13	47	0	27	47	33
23. Communicating student information to state agencies	0	7	0	33	7	33

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	33	53	0	20	67	33
25. Marking or scoring tests	7	27	0	67	33	67
26. Determining rate of progress of individual students	27	47	0	27	67	33
27. Determining students' readiness for the next instructional step	20	67	7	7	73	27

TABLE XLVII

SCHOOL TASKS AFFECTED BY WIS-SIM

HENRY DAVID THOREAU

Percentage Responses

1976-1977

N = 6

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	17	67	0	17	50	50
2. Assessing student learning outcomes	0	67	0	33	17	83
3. Maintaining unit performance profiles	33	50	0	17	33	67
4. Maintaining individual profiles	33	50	0	17	33	67
5. Comparing the status of students in unit to school, system or other norms	0	33	17	50	0	100
6. Assessing the attainment of unit goals	0	50	0	33	0	83
7. Assessing the attainment of individual student goals	17	33	0	67	0	83

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
8. Formulating unit goals	0	33	0	67	0	67
9. Developing instructional objectives for each child in the unit	0	33	0	67	0	67
10. Evaluating learning activities with respect to unit goals	0	17	0	67	0	83
11. Grouping students for instructional purposes	17	67	0	17	17	83
12. Counseling students about their progress and future schooling	17	17	0	67	17	83
13. Selecting appropriate materials, media, and supplies for instruction	0	17	0	83	17	67
14. Evaluating unit operation	0	33	0	50	0	83
15. Assessing the status of entering students	0	17	0	67	17	67

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
16. Maintaining school's inventory of instructional materials	0	0	0	83	0	83
17. Reporting school's progress to central administration	0	33	0	50	17	67
18. Reporting student progress to parents	0	50	0	33	17	67
19. Maintaining permanent school records of students' progress	0	50	0	33	0	83
20. Developing daily teaching schedules	0	0	0	83	0	83
21. Assessing students in terms of their learning characteristics	0	0	0	83	0	83
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	0	17	0	67	0	83
23. Communicating student information to state agencies	0	0	0	67	0	67

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	0	67	0	17	17	67
25. Marking or scoring tests	0	17	0	67	17	67
26. Determining rate of progress of individual students	0	17	0	50	17	83
27. Determining students' readiness for the next instructional step	0	0	0	67	17	83

TABLE XLVIII

SCHOOL TASKS AFFECTED BY WIS-SIM

N = 21

ALL SCHOOLS

Percentage Responses

1976-1977

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
1. Identifying individual student instructional needs	5	90	0	5	62	38
2. Assessing student learning outcomes	0	57	5	38	33	67
3. Maintaining unit performance profiles	52	29	5	5	76	24
4. Maintaining individual profiles	43	52	0	5	71	29
5. Comparing the status of students in unit to school, system or other norms	10	38	10	43	38	62
6. Assessing the attainment of unit goals	5	62	5	24	43	52
7. Assessing the attainment of individual student goals	5	57	0	43	33	62

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
8. Formulating unit goals	10	43	5	43	38	52
9. Developing instructional objectives for each child in the unit	0	48	0	52	29	62
10. Evaluating learning activities with respect to unit goals	0	48	5	43	29	67
11. Grouping students for instructional purposes	5	90	0	5	48	52
12. Counseling students about their progress and future schooling	5	33	0	57	19	76
13. Selecting appropriate materials, media, and supplies for instruction	0	5	0	90	5	90
14. Evaluating unit operation	5	52	0	43	29	67
15. Assessing the status of entering students	0	48	5	38	29	62

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed Yes	6 Your Role Changed No
16. Maintaining school's inventory of instructional materials	0	5	0	86	0	90
17. Reporting school's progress to central administration	0	38	0	38	24	52
18. Reporting student progress to parents	10	57	5	24	52	43
19. Maintaining permanent school records of students' progress	24	62	0	10	48	43
20. Developing daily teaching schedules	0	24	0	71	19	67
21. Assessing students in terms of their learning characteristics	0	14	0	76	5	81
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	10	38	0	38	33	48
23. Communicating student information to state agencies	0	5	0	43	5	43

Task	1 Completely Replaced by WIS-SIM	2 Partially Replaced by WIS-SIM	3 Extra Because of WIS-SIM	4 Not Affected by WIS-SIM	5 Your Role Changed: Yes	6 Your Role Changed: No
24. Updating student performance information	24	57	0	19	52	43
25. Marking or scoring tests	5	24	0	67	29	67
26. Determining rate of progress of individual students	19	38	0	33	52	48
27. Determining students' readiness for the next instructional step	14	48	5	24	57	43

6. Grouping students for instructional purposes (11).

7. Evaluating unit operations (14).

8. Reporting student progress to parents (18).

9. Maintaining permanent records of students' progress (19).

10. Updating student performance information (24).

The tasks perceived by more than half of the respondents as not being affected by the use of WIS-SIM are:

1. Developing instructional objectives for each child in the unit (9).

2. Counseling students about their progress and future schooling (12).

3. Selecting appropriate materials, media, and supplies for instruction (13).

4. Maintaining school's inventory of instructional materials (16).

5. Developing daily teaching schedules (20).

6. Assessing students in terms of their learning characteristics (21).

7. Marking or scoring tests (25).

As in the 1976 survey, proportionately few respondents reported the perception that usage of WIS-SIM had completely replaced a manual task or procedure (column 1). Also as in 1976, two tasks were considered by 25 percent or more of the respondents as completely replaced--maintaining unit performance profiles and maintaining individual performance profiles. Of interest is the fact that no respondent reported task 2, assessing student outcomes, as completely replaced by WIS-SIM (and this would appear to be a logical response) while in 1976, there were some responses to indicate that perception. This may be interpreted as a sign of more complete understanding of WIS-SIM as well as its integration into the overall instructional system. All of the tasks reported above as being affected by WIS-SIM, except for evaluating unit operation, were expected to do so, and all those reported by 50 percent of the respondents as not being affected by WIS-SIM were those expected.

The perception of role change or responsibility change as a result of WIS-SIM appears to closely parallel the perception of tasks affected by WIS-SIM. Table XLIX, column 1, provides a rank

TABLE XLIX

RANK ORDER OF TASKS AND ROLES AFFECTED BY

WIS-SIM 1976-77

Tasks ranked in order of most affected by WIS-SIM	Tasks ranked by order of perceived role changes	
1.5	3	Identifying Individual Student Instructional Needs
1.5	2	Maintaining IPP
3.0	8.5	Grouping Students for Instructional Purposes
4.0	8.5	Maintaining Permanent School Records of Students' Progress
5.5	6	Updating Student Performance Information
5.5	1	Maintaining UPP
7.5	10	Assessing the Attainment of Unit Goals
7.5	6	Reporting Student Progress to Parents
9.5	14.0	Assessing the Attainment of Individual Student Goals
9.5	4	Determining Students' Readiness for the Next Instructional Step
11.5	6	Determining Rate of Progress of Individual Students
11.5	18	Evaluating Unit Operations
13	11.5	Comparing the Status of Students in Unit to School, System, or Other Norms
14	11.5	Formulating Unit Goals
17.0	18.0	Developing Instructional Objectives for Each Child in the Unit
17.0	18.0	Evaluating Learning Activities With Respect to Unit Goals
17.0	18.0	Assessing the Status of Entering Students
17.0	14.0	Evaluating Instructional Programs
17.0	14.0	Assessing Student Learning Outcomes
20.5	22.5	Counselling Students About Their Progress and Future Schooling
20.5	21	Reporting School's Progress to Central Administration
22.0	18	Marking or Scoring Tests
23.0	22.5	Developing Daily Teaching Schedules
24.0	25	Assessing Students in Terms of Their Learning Characteristics
26.0	25	Communicating Student Information to State Agencies
26.0	25	Selecting Appropriate Materials, Media, and Supplies for Instruction
26.0	27	Maintaining School's Inventory of Instructional Materials

order listing of the tasks considered by the respondents as most affected by WIS-SIM. Column 2 provides a rank ordering of the tasks in which role changes were perceived by the respondents. The Spearman Rank Correlation Coefficient is calculated to be .92, indicating that agreement between the two rankings is quite high. This correlation is significant beyond the .01 level.

The effect of WIS-SIM use on school tasks and on user roles as perceived by teachers appears to be significant, according to the results of the 1977 survey. The effects are more obvious in the McFarland schools as their usage is considerably higher than in Thoreau, and the McFarland system operates in three curricular areas. The effects are found in the areas anticipated.

IV

SYSTEM EFFECTS

In this chapter, the answers to the following questions are sought: What results are achieved from the utilization of WIS-SIM, and are the objectives of the system being accomplished? The information analyzed in this chapter includes a survey of teacher time use, student achievement, system costs, changes in school operations and staff attitudes toward WIS-SIM.

TIME USAGE SURVEY

One of the design objectives of the Computer Applications in IGE project is to provide a management information system that enhances the educational process through increased efficient use of time. It is assumed that efficient teacher time usage will be reflected in improved instruction and learning.

In order to evaluate the changes in time usage, the user schools participated in a survey designed to determine what effect WIS-SIM is having on the proportion of time school personnel spend in planning, instructing, and performing clerical tasks.

School year 1975-76 time usage data were collected from all six user schools during April-May 1976. All administrators, teachers, and aides who were using the computer services of WIS-SIM were asked to complete a time usage form that was the same as that used in the earlier surveys. The data were collected over a two-week period; the principal of each school selected half of the staff to complete the form the first week and the remainder of the staff the following week. Principals were asked to use their discretion as to which two weeks in April and early May to select so as to ensure that the particular weeks chosen would be "normal" school times, i.e., times that would produce information representative of general school activities and give a fair indication of the time spent by the staff on planning tasks, instructional tasks, and clerical tasks.

School year 1976-77 time usage data were collected from Conrad Elvehjem and McFarland Elementary during November-December, 1976. Those staff members using WIS-SIM were asked to complete a time usage form identical to that used in both 1974 and 1975. The data were collected during the weeks of November 14-20, and November 28-December 4, 1976. These time periods were chosen because they were representative of "normal" school times and coincided (within a few days) with the time usage data period of the initial comparison in 1974.

Two previous surveys had been conducted in November-December 1974 and April-May 1975 at the McFarland Schools (McFarland Elementary and Conrad Elvehjem) and at the Waukesha Schools (Barstow and Northview). The data collected in these previous surveys will be compared to the data collected in the April-May 1976 survey. The Stevens Point Schools (Jackson and Plover-Whiting) and the Milwaukee School (Henry David Thoreau) were not user schools in 1974, and no data is presented for these schools.

Two points should be considered concerning the respondents to the study. First, the respondents at the two McFarland schools do not include either the CMI project director or the terminal operator, both of whom are full-time staff members engaged exclusively in the WIS-SIM implementation. Although mean and aggregate usage data for these schools will be deflated--and this is important when making inter-school comparisons--they are not a problem in making intra-school comparisons over time because these two individuals have been constantly omitted from each of the surveys.

Second, the Jackson Elementary School did not submit separate survey forms for individual teachers, aides, and administrators. Rather, the school presented a single form, allegedly representative of the time allocations of all staff. Therefore, the only information available from the Jackson school is that relating to the proportions of time spent in planning, instructional, and clerical activities by all staff.

For each of the categories: teachers, aides, and administrators, the mean hours per week per respondent, and the percentage of time spent in each of the areas of planning, instructional, and clerical tasks were collected. These data were collected from four user schools and are displayed in Tables L through LV.

Changes in the amounts and the proportions of time spent on planning, instruction, and clerical tasks by school staff can, of course, be influenced by factors other than the introductions of a management information system such as WIS-SIM. Most obviously, policy changes as reflected in the hiring of additional clerical help or in a reallocation of duties could have significant effects on time allocations as well. In an attempt to control for these and other potential influences, principals of the four schools involved when the 1975 time usage surveys were taken were asked to indicate whether there had been any attempts to increase or decrease the percentages of time spent on planning, instructional, and clerical tasks by administrators, teachers, and aides since the last survey. None of the principals indicated that any such attempts had been made. Nevertheless, a school staffing profile for each school is provided in Table L. This profile, which includes number of students and staff of various categories in each of the school years 1974-75, 1975-76, and 1976-77, should be referred to when interpreting the results of the survey.

Despite the hazardous task of ascribing any change in the times spent by various staff on planning, instructional, and clerical activities, it seems that by requesting principals to select normal school times for the survey, by attempting to identify deliberate policy changes, and by taking into account different student-staff profiles from year to year, we will ensure a more accurate assessment. The reliability and validity of teacher self-reportings remains questionable. This difficulty specifically concerns the distinctions between planning, instructional, and clerical tasks; such distinctions may not always be clear.

A basic difficulty concerns shifts in time spent on the various tasks. It may be the case that an organizational innovation may reduce time spent on some clerical tasks, but that this slack time may be filled by staff substituting other clerical tasks not previously attempted. The very basic question of quality of work is not examined in this survey report, but it is likely that changes in quality of work as well as quantity of performance can occur. It is often the case that changes over time in the quantity of work done is substituted for by changes in the quality of work performed, and vice versa. It is recommended that one be mindful of these difficulties when interpreting the information in Tables LIII through LVIII.

Implicit in the WIS-SIM objective of increasing time usage efficiency is the reduction of time required for clerical duties. Tables LI through LV assess the extent to which this aim is being met. Tables LIV and LV provide a comparison of time usage, including percent of time spent on the tasks of planning, instruction, and clerical, over four time periods at the two McFarland schools. The percentage of time spent on clerical tasks decreased from 15.5 percent in 1974 to 14.3 percent in the same 1976 time period at Conrad Elvehjem. A decrease from 11.0 to 8.5 percent was observed at McFarland Elementary during this time period. Tables LIII and LIV reflect similar decreases in the proportion of time spent on clerical duties at Barstow and Northview. A corresponding increase in instructional time may also be observed in the time usage data of these two schools.

A composite of the time usage data from McFarland, Conrad Elvehjem, Barstow, and Northview is included in Table LV. A decrease of 3.3 percent of time for clerical duties, or an average of 2.2 hours per week, is indicated.

Analysis of the time usage data revealed an obstacle that had been foreseen, but underestimated: the reliability of self-reporting techniques. The variability associated with the raw data created some concern about the overall accuracy of the data. The variability also made a statistical test involving the equality of means of the respective years not rejectable at the .05 level. Nevertheless, it appears the trend is toward increasing time usage efficiency. The data for the McFarland schools are given below.

TABLE L

STAFFING PROFILES BY SCHOOL IN TIME USAGE STUDIES 1974 THROUGH 1977

	McFarland			Conrad Elvehjem			Barstow		Northview	
	'75	'76	'77	'75	'76	'77	'75	'76	'75	'76
Number of students	371	379	403	315	321	342	177	136	451	453
Number of Teachers	12	12	13	14	14	12	6	6	14	14
Number of Aides	3	3	4	2	2	3	4	4	8	7
Number of Aides Using Computers	.5	.5	.5	.5	.5	.5	1	1	1	3
Number of School Administrators	1	1	1	1	.5	1	1	1	1	1

TABLE LI

TIME USAGE DATA ELVEHJEM

Position	November-December 1974 Mean Hours/ Week Per Respondent	% Time	April-May 1975 Mean Hours/ Week Per Respondent	% Time	April-May 1976 Mean Hours/ Week Per Respondent	% Time	November-December 1976 Mean Hours/ Week Per Respondent	% Time
TEACHER								
Planning	15.3	32.5	17.4	35.4	16.3	36.0	14.80	33.0
Instructional	24.52	52.0	23.0	46.8	23.1	51.0	23.65	52.7
Clerical	7.29	15.5	8.0	17.8	6.0	13.0	6.39	14.3
All Tasks	47.11	100.0	49.2	100.0	45.3	100.0	44.84	100.0

TABLE LII

TIME USAGE DATA MCFARLAND.

Position	November-December 1974 Mean Hours/ Week Per Respondent	% Time	April-May 1975 Mean Hours/ Week Per Respondent	% Time	April-May 1976 Mean Hours/ Week Per Respondent	% Time	November-December 1976 Mean Hours/ Week Per Respondent	% Time
TEACHER								
Planning	14.90	32.0	14.0	32.4	16.0	38.4	18.36	41.4
Instructional	24.42	52.5	26.2	60.4	22.0	52.8	22.25	50.1
Clerical	7.20	11.0	3.1	7.2	3.6	8.8	3.78	8.5
All Tasks	46.52	100.0	43.3	100.0	41.6	100.0	44.39	100.0

TABLE LIII

TIME USAGE DATA BARSTOW

Position	November-December 1974 Mean Hours/ Week Per Respondent	November-December 1974 % Time	April-May 1975 Mean Hours/ Week Per Respondent	April-May 1975 % Time	April-May 1976 Mean Hours/ Week Per Respondent	April-May 1976 % Time
TEACHER						
Planning	15.4	36.3	14.6	29.8	13.4	33.0
Instructional	23.6	55.4	29.8	60.8	24.4	60.2
Clerical	3.9	8.6	4.6	9.4	2.75	6.8
All Tasks	42.9	100.0	49.0	100.0	40.55	100.0

TABLE LIV

TIME USAGE DATA NORTHVIEW

Position	November-December 1974 Mean Hours/ Week Per Respondent	November-December 1974 % Time	April-May 1975 Mean Hours/ Week Per Respondent	April-May 1975 % Time	April-May 1976 Mean Hours/ Week Per Respondent	April-May 1976 % Time
TEACHER						
Planning	13.5	32.2	14.6	31.7	14.4	33.3
Instructional	22.9	53.8	25.6	55.9	23.8	55.1
Clerical	6.0	14.0	5.7	12.4	5.0	11.6
All Tasks	42.4	100.0	45.9	100.0	43.2	100.0

TABLE LV

TIME USAGE DATA--MCFARLAND, CONRAD ELVEHJEM, BARSTOW, NORTHVIEW, COMBINED

	November-December 1974		April-May 1975		April-May 1976	
Position	Mean Hours/ Week Per Respondent	% Time	Mean Hours/ Week Per Respondent	% Time	Mean Hours/ Week Per Respondent	% Time
TEACHER						
Planning	11.5	26.8	12.5	29.4	10.9	25.0
Instructional	24.4	54.8	23.5	55.5	26.1	59.9
Clerical	8.4	18.4	6.4	15.1	6.6	15.1
All Tasks	44.3	100.0	42.4	100.0	43.6	100.0

POOLED T-TEST ANALYSIS BETWEEN 1974 and 1976 DATA

McFarland Elementary

Planning:	t = 1.398	Significant at .1784	Cannot reject at .05 level (df=19)
Instructing:	t = 1.538	Significant at .1406	
Clerical:	t = 1.641	Significant at .1172	

Conrad Elvehjem

Planning:	t = .228	Significant at .8220 (df=20)	Cannot reject at .05 level
Instructing:	t = .478	Significant at .6377 (df=20)	
Clerical:	t = .522	Significant at .6075 (df=19)	

STUDENT ACHIEVEMENT

There exist at least three, seemingly contradictory, avenues of approach to the inclusion of student achievement as an effect of computer managed instruction. One may contend that student achievement is not a justifiable criterion on which to judge CMI. Support for this contention is that there are too many intervening variables, nuisances, and statistical "noises." These include changes in instructional staff, school administration, and curricular methods, and materials as well as home and community factors and other social variables. Given these factors, the relative impracticality of a good experimental design may rule out the use of student achievement data.

One may argue, also, that certain a priori assumptions may be made with regard to usage of a CMI system. If it is assumed more efficient use of time, more effective instructional organization and planning, and better management of resources contribute to improved learning (i.e., student achievement), then it is that which should be evaluated and not the latter. Stated another way, student achievement should be evaluated indirectly through the dimensions of functioning and utilization and not effect.

A third approach to this question assumes that, if the objectives of the CMI are achieved, a corresponding increase in student achievement should be reflected and that therein lies the justification for implementation and usage of CMI. A longitudinal study of achievement based on some objective measure should reflect a positive trend.

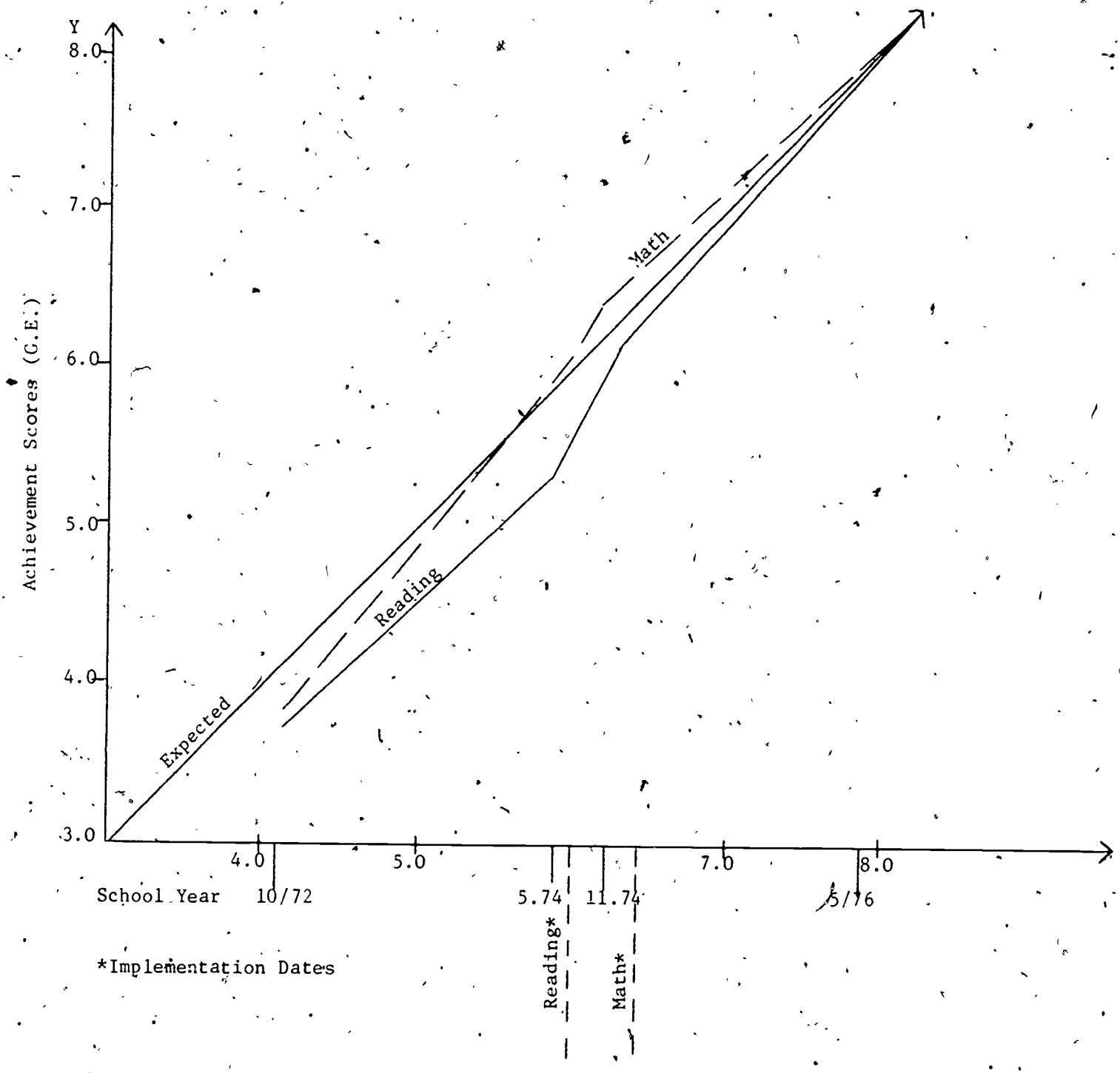


Figure 2. Student Achievement

In an effort to address the question of student achievement while satisfying the last assumption, the availability of different objective data sources was examined. The two most promising sources were number of DMP objectives mastered per student per semester and school-wide standardized achievement test scores.

Number of DMP objectives mastered was rejected primarily because of the inability of the system to fix exact dates of mastery. Actually, this relates to the student data base being updated at once, for objectives mastered over some length of time, such as for initial placement of new students. Although there appears to be a positive trend in this data, it is not possible to draw strong conclusions from the evidence.

The McFarland schools administer the Metropolitan Achievement Tests to the students once per year. Given below are the grade equivalency scores for grade four through seven for four consecutive years. The scores represent the testing of approximately the same group of students each year.

Grade	Grade Equivalency (Reading)	Grade Equivalency (Mathematics)	Date of Testing
4	3.65	3.75	October, 1972
5	5.33	5.93	May, 1974
6	5.98	6.45	November, 1974
7	7.80	8.00	May, 1976

Figure 2 displays the above information graphically. The school year is measured along the horizontal axis on a ten-month scale, e.g., 4.0 represents the first month or September of the 4th grade. The calendar dates, e.g., 10/72, 5/74, indicate the testing dates. A scale of the same proportion is measured along the vertical axis for achievement scores.

One would expect, based on national norms, that achievement correspond to the school year. This correspondence is shown as the 45° line labeled expected. Reading achievement vs. time is shown as a solid line while math is represented by the dashed line.

Although student achievement did tend to approach the expectation, sound inferences cannot be made with respect to the direct causes. It may be hypothesized that two factors simultaneously contributed to this effect: (1) the faculty and staff preparation for initiating CMI implementation requiring, in itself, some amount of self-study and curriculum analysis and (2) the actual effects associated with the implementation of WIS-SIM.

It is recommended that, as new WIS-SIM implementation sites are developed, the question of effect evaluation be addressed in the beginning, so that complete and sufficient data is available upon which to reach some conclusion. It is also recommended, however, that if student achievement is addressed as a system effect, the arguments stated earlier in this section be weighed.

COSTS OF WIS-SIM

Assessment of the costs of WIS-SIM or any system of computer managed instruction is not easy. Factors affecting costs associated with CMI include the overall extent of school use of the system, number of curricula or subject areas supported by the system, the computer system employed, and the turn-around time demanded. Additionally, cost figures associated with the implementation of CMI, as well as the on-going operation and maintenance of system hardware, software, and personnel, may vary widely.

In this section, costs associated with WIS-SIM during the 1975-76 and the 1976-77 years are presented separately. The 1975-76 section includes real costs, including implementation, inservice, and computer costs, but not teacher and aide time spent in learning the system. The 1976-77 section includes costs associated with the Madison Academic Computing Center (MACC) UNIVAC computer for the McFarland and Thoreau (WDRSD) schools. It is not possible to provide exact cost figures associated with the interactive front-end on the R & D Center's computer, but these costs were estimated using approximate MACC rates. Charges include computer costs (hardware and maintenance) and associated support personnel costs. The costs of facilities and facilities maintenance are not included.

In addition to the above analysis, costs of WIS-SIM operations are estimated under two simulated conditions and for two levels of use. The two conditions are the machine configurations of the UNIVAC 1110 alone and the UNIVAC 1110 with the Harris computer as a front-end. The usages explored were normal and high.

1975-76 Costs

In an attempt to estimate real costs associated with the implementation of WIS-SIM in a school, a comprehensive cost analysis was carried out in the Thoreau School, Milwaukee. Costs were prepared for school initialization (Table LVI), inservice (Table LVII), and computer costs (Table LVIII). Within each of these three categories, both base costs and total costs are given, total costs being 170 percent of base costs, thus reflecting overhead costs associated with the provision of computer services such as clerical assistance, stationery and equipment. Base costs for each category are realistic estimates based on actual 1975-76 salaries and costs.

The total first year cost of WIS-SIM for Henry David Thoreau School was $5814.52. This cost assumes a school of 600 students, located 100 miles from the central processing site, and running one curricular program. This total cost is equivalent to a cost of $9.69 per student.

TABLE LVI

COSTS FOR SCHOOL IDENTIFICATION AND INITIALIZATION

	Item	Base Cost	Total Cost	Notes
1.	Field Coordinator: two one-day visits to arrange for data collection school and one day at R & D.	$156.33	$265.76	Total includes overhead (70%)
2.	Travel for above: two trips POV, 200 miles each.	34.00	34.00	$.085/mile
3.	Computer Programmer: two days setting and initializing files and recompiling programs.	156.33	265.76	Total includes overhead (70%)
4.	Project Assistants: One day working at Center.	25.00	42.50	Total includes overhead (70%)
5.	Keypunch: 30.5 hours @ $4.00/hour	122.00	207.40	Total includes overhead (70%)

TABLE LVII

COSTS FOR INSERVICE

	Item	Base Cost	Total Cost	Notes
1.	Inservice Booklets: 40 copies @ .77 each	$ 30.80	$ 30.80	Cost figured from standard Copy Shop charges.
2.	Inservice pre, post, and attitude tests: 40 copies of 3 tests, 2 pages each and 4 pages answer sheets.	10.40	10.40	Cost figured from standard Copy Shop charges.
3.	Staff: Field Coordinator for one day and two person days of Project Assistants.	102.00	173.40	Total includes overhead (70%)
4.	Inservice travel: POV for 200 miles and 3 lunches.	17.00	17.00	$.085/mile and $3.00/lunch used
5.	School staff: 40 staff members for 1/2 day inservice.	800.00	800.00	No overhead figures used.
6.	Follow-up inservices: 15 person trips, 200 miles each for 1 day each.	675.00	937.50	Total includes overhead (70%) on salaries.

TABLE LVIII

COMPUTER COSTS

	Item	Base Cost	Total Cost	Notes
1.	Initiate System: Create files and recompile programs.	$ 50.00	$ 50.00	An approximation from the Thoreau School initialization.
2.	WIS-SIM Operating: file charge $38/month report generation $.35/student/month.	2480.00	2480.00	Based on 600 students over a 10-month school year, for one curricular area. (Note: the $.35 student/month now seems a little high, but let's err on that side.)
3.	Telephone charges: $50.00 line installation and clearing, $45/month toll charges.	500.00	500.00	DAIN or local service would reduce these costs.

TABLE LIX

COMPUTER COSTS FOR WDRSD

Category	Waukesha		McFarland		Jackson		Thoreau	
	Least Demand Month	Greatest Demand Month	Least Demand Month	Greatest Demand Month	Least Demand Month	Greatest Demand Month	Least Demand Month	Greatest Demand Month
	May 1976	Apr. 1976	Oct. 1975	May 1976	Dec. 1975	Mar. 1976	May 1976	Mar. 1976
Number of Runs	22	107	149	362	24	183	67	128
Express	0 (0%)	0 (0%)	6 (4%)	1 (.3%)	0 (0%)	6 (3%)	0 (0%)	2 (1%)
Normal	8 (36%)	21 (20%)	104 (70%)	248 (69%)	14 (58%)	5 (3%)	45 (67%)	87 (68%)
Overnight	14 (64%)	68 (63%)	28 (19%)	76 (21%)	10 (42%)	148 (81%)	20 (30%)	35 (27%)
Weekend	0 (0%)	18 (17%)	11 (7%)	37 (10%)	0 (0%)	24 (13%)	2 (3%)	4 (3%)
Total Costs	$60.10	$102.21	$302.64	$350.81	$63.68	$113.81	$99.48	$155.37
File Storage	40.30 (67%)	42.01	48.86 (10%)	49.03 (14%)	28.02	30.80	40.92 (41%)	41.09 (26%)
Express	0.00 (0%)	0.00	13.94 (5%)	2.19 (.6%)	0.00	13.90	0.00 (0%)	4.29 (3%)
Normal	12.13 (20%)	26.18	214.72 (71%)	254.60 (72%)	27.26	4.27	49.41 (49%)	89.07 (57%)
Overnight	7.66 (13%)	29.56	22.00 (7%)	36.30 (10%)	8.40	60.35	8.31 (8%)	19.15 (12%)
Weekend	0.00 (0%)	4.46	3.12 (1%)	8.69 (2%)	0.00	4.49	0.84 (0.8%)	1.78 (1%)
Students Enrolled	573	510	680	701	450	451	620	630
Total Costs/Student	0.10	0.18	0.45	0.50	0.14	0.25	0.16	0.22
File Storage	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.06
Express	0.00	0.00	0.02	0.003	0.00	0.03	0.00	0.007
Normal	0.02	0.05	0.32	0.36	0.06	0.01	0.08	0.14
Overnight	0.01	0.05	0.03	0.05	0.02	0.13	0.01	0.03
Weekend	0.00	0.01	0.005	0.01	0.00	0.01	0.001	0.003
Costs/Report	2.73	0.95	2.03	0.97	2.65	0.62	1.48	1.21
File Storage	1.83	0.39	0.32	0.13	1.17	0.17	0.61	0.37
Express	0.00	0.00	2.32	2.19	0.00	2.31	0.00	2.14
Normal	1.51	1.24	2.06	1.02	1.94	0.85	1.10	1.02
Overnight	0.54	0.43	0.78	0.47	0.84	0.40	0.41	0.54
Weekend	0.00	0.24	0.28	0.23	0.00	0.19	0.42	0.44

TABLE LX

COMPUTER COSTS FOR WDRSD BY REPORT TYPE

Two Weeks in December 1975

Schools \ Reports	IPP	Grading	IGR	SSF	UPP	Total
McFarland	16.81 / 18 = 0.93	26.54 / 32 = 0.83	8.43 / 4 = 2.11	0 / 0	4.18 / 3 = 1.39	55.96 / 58 = 0.96
Jackson	0 / 0	3.97 / 4 = 0.99	5.02 / 3 = 1.67	0 / 0	1.42 / 1 = 1.42	10.41 / 8 = 1.30
Waukesha	0 / 0	9.04 / 11 = 0.82	1.74 / 1 = 1.74	.71 / 1 = .71	3.09 / 2 = 1.55	14.58 / 15 = 0.99
Thoreau	.35 / 1 = .35	0 / 0	8.62 / 2 = 4.31	1.02 / 1 = 1.02	13.24 / 5 = 2.65	22.88 / 8 = 2.86
TOTAL	17.16 / 19 = 0.90	33.55 / 47 = 0.71	23.81 / 10 = 2.38	1.73 / 2 = .87	18.93 / 11 = 1.72	104.18 / 89 = 1.17

Data on total costs per terminal site, costs per student, costs per report, and costs per program were logged at the R & D Center for each of the months, September 1975 to May 1976, for both McFarland and Waukesha and from January 1976 to May 1976, for each of the four terminal sites. The costs analysis presented in Table LXIII summarizes this monthly data by presenting the data for both the month of smallest demand and the month of greatest demand for each terminal site. Because the costs reported are based exclusively on computer time, they are directly dependent upon computer usage. Also, because users can request different speeds of receiving reports (express, normal, overnight, and weekend rates), the total costs to users will reflect these different types of delivery service, each of which have different costs. Therefore, costs have been broken down in terms of these four categories.

Costs reflect system usage, with the cost per student of the highest usage school, McFarland, being several times that of the smallest usage school, Waukesha. A cost per student estimate for WIS-SIM/WDRSD of between $.25 and $.40 would seem approximately correct.

Table LXIV shows costs for WDRSD reports tabulated by report type. The data for this table were collected during the first two weeks of December 1975. Mean costs, number of requests, and total costs for each report and for each school are shown. For example, the McFarland Schools made 18 requests for Individual Performance Profiles (IPP's) for a total cost of $16.81 and an average cost of $.93. Total and average costs for the 89 reports requested during this period were $104.18 and $1.17 respectively.

A similar cost analysis to that of Table LX was not available for DMP and SAPA because of the different accounting system used by the R & D Computer Center, which processes the DMP and SAPA programs.

1976-77 Costs

Little exact information regarding the total 1976-77 costs of WIS-SIM as utilized in the McFarland schools and at Henry David Thoreau is available. This is due, in part, to the difficulties in discerning what costs are associated or can be directly attributed to CMI usage, as opposed to activities that would normally exist in the school without CMI and, also, what costs are related to the development of the system.

At Thoreau, the CMI activities are coordinated by the reading specialist. This person both directs the reading program of the school, in conjunction with the unit leaders and teachers, and manages the use of CMI. The reading specialist is assisted by a teacher aide who operates the computer terminal. Because of the multiplicity of their respective responsibilities, it is difficult to assign a percentage of personnel costs resulting from CMI usage.

Both positions existed prior to CMI implementation and were, therefore, not created as a result of system personnel requirements. Other costs at Thoreau associated with the system are for the computer terminal, which is presently supplied by the R & D Center, for dedicated telephone line charges, and for long distance.

The McFarland Schools employ a full-time CMI project director and a full-time aide to operate the computer terminal. McFarland is somewhat unique, and an even more difficult site at which to decipher costs, for several reasons. McFarland operates CMI through funds provided under Title IV in addition to support provided from the R & D Center. Associated with this program are extra tasks including developmental activities, planning, and evaluation. Many of these activities would not necessarily be existent under typical conditions.

Because of McFarland's high use of the system that supports three separate curriculums (WDRSD, DMP, and SAPA), and because of physical separation of the school's two main buildings, two terminals and a sheet scanner are used. Presently, one terminal is leased, while the other terminal and sheet scanner are provided by the R & D Center. Necessary telephone service and dedicated lines are also associated expenses.

At both McFarland and Thoreau, it is felt that at least a part-time (25-50 percent) coordinator for CMI activities is both desirable and necessary. Also, some personnel are required for terminal operation. Depending on the level of use, the personnel requirement may range from a half-time to full-time aide position. The computing costs for the two schools are given in Table XV, which reflects costs associated with high and low usage months. These figures represent only a portion of the computing cost, however. Since they include only the MACC costs for WDRSD, one must assign a cost for the interactive front-end, which operates on the R & D Center computer. This may, in some cases, approximate the given MACC charge, depending on the nature of computing demand. Costs for other curriculum support, i.e., DMP and SAPA, would result in additional computer costs.

As reflected in Table LXV, the demands at the two schools vary considerably as do the costs per student and the costs per report. The number of runs at McFarland is approximately three to four times that of Thoreau school, while McFarland's student population is only one-and-one-half times larger. Total costs reflect the number of runs and this is, also, three to four times as large for McFarland as for Thoreau. Cost per student, reflecting the larger combined size of the McFarland schools, is only two to three times higher for McFarland. The cost per report is greater for Thoreau than for McFarland, almost double for the high demand month. As noted, the variation in use makes it difficult to fix system costs, but the approximate figure would be between $.20 and $.45 per student per month for the costs included in this estimate.

TABLE LXI

COMPUTER COSTS FOR WDRSD (1976-77)

Category	McFarland		Thoreau	
	Low Demand Month	High Demand Month	Low Demand Month	High Demand Month
	October, 1976	November, 1976	November, 1976	October, 1976
Number of Runs	230 (100%)	377 (100%)	83 (100%)	65* (100%)
Express	3 (1%)	9 (2%)	0 (0%)	0 (0%)
Normal	167 (73%)	253 (67%)	26 (31%)	26 (40%)
Overnight	38 (16%)	94 (25%)	37 (45%)	20 (31%)
Weekend	22 (10%)	21 (6%)	20 (24%)	19 (29%)
Total Costs	$300.99 (100%)	$355.24 (100%)	$85.63 (100%)	$144.74 (100%)
File Storage	50.49 (17%)	49.47 (14%)	37.48 (44%)	24.28 (17%)
Express	5.77 (2%)	24.94 (7%)	0.00 (0%)	0.00 (0%)
Normal	219.19 (73%)	238.99 (67%)	25.45 (30%)	96.24 (66%)
Overnight	21.46 (7%)	37.49 (11%)	15.64 (18%)	9.03 (6%)
Weekend	4.08 (1%)	4.35 (1%)	7.06 (8%)	15.19 (10%)
Students Enrolled	737	745	553	549
Total Costs/Students	.41	.48	.15	.26
File Storage	.07	.07	.07	.04
Express	.01	.03	.00	.00
Normal	.30	.32	.05	.17
Overnight	.03	.05	.03	.02
Weekend	.005	.006	.01	.03
Costs/Report	$1.31	$ .94	$1.03	$2.23
File Storage	.22	.13	.45	.37
Express	1.92	2.77	.00	.00
Normal	1.31	.94	.98	3.70
Overnight	.56	.40	.42	.45
Weekend	.19	.21	.35	.80

* Although fewer reports were processed, the costs for normal and weekend processing were considerably higher, indicating larger run sizes and greater demand for system resources.

In an effort to project anticipated computing costs, Table LXVI provides estimates of charges associated with each of the three curricula (WDRSD, DMP, and SAPA) presently supported by WIS-SIM individually, as a total, and as a total per student. These costs are figured at a high level of use such as that at McFarland. Costs are given for the five levels of turn-around priority: DEMAND, EXPRESS, NORMAL, DEFERRED, and CONVENIENCE, and at a mixture of priorities, XNDC. The XNDC mixture is a percentage combination based on a sample of priorities requested during a typical month. Costs listed under the heading 1110 are for the entire system running at MACC on the Univac 1110. Those costs listed under 1110-H are for using the R & D Center's Harris computer as a front-end to the Univac 1110. A total cost of $3.75 per student per month for the XNDC mix is noted for the three programs. When using the 1110 with the Harris front-end, the cost is $2.15 per student per month for a high usage school.

Table LXVII reflects costs associated with WDRSD support at a normal use level, such as that at Thoreau. The same levels of priority are given as in the previous projection. All costs in both tables are on a monthly basis. To compute yearly costs, a multiple of nine should be used. The number in parentheses after the curricular program indicate the number of runs used in the calculations; in this case, 90 runs.

As would be anticipated, the costs for normal use are considerably less than those for high use. A comparison for WDRSD in Tables LXVI and LXVII shows normal use cost to be about .4 to .6 of high use cost.

Table LXVIII provides a graphic representation of costs per student under normal and high use, for three curricular programs, and for various school sizes. Costs are fairly stable as school size grows beyond 400 students.

As has been noted, the assessment of cost of the operation of a computer system such as WIS-SIM is an extremely complex undertaking. One major issue is what costs are to be included in the estimate. These costs could include computer use, system support personnel, hardware maintenance, facilities, environmental control, facilities maintenance, training personnel, inservice materials, equipment located in the schools, and teacher and aide time for training. Second, it is important to distinguish between additional costs and replacement costs. Some costs are offset by existing expenses. Many of the operations supported by WIS-SIM were, presumably, carried out manually prior to the implementation of the system. Previous expenses would offset a major portion of system costs. Still, the implementation of the system appears to result in an increased school expenditure. The question is whether this increased school expenditure is offset by increased student learning. This report does not permit the direct assessment of cost-benefit, and only a local school district can determine whether a given benefit per cost is possible and desirable for them.

TABLE LXII

COMPUTING COSTS FOR WIS-SIM (HIGH USAGE)

	DMP (220)			SAPA (180)			WDRSD (300)			COMB (700)		
1110	*RC	TOT	TOT/STU	RC	TOT	TOT/STU	RC	TOT	TOT/STU	RC	TOT	TOT/STU
DEMAND	$1204	$1633	$2.30	$909	$1349	$1.90	$1521	$1961	$2.80	$3634	$4524	$6.45
EXPRESS	$ 904	$1333	$1.90	$682	$1097	$1.55	$1141	$1581	$2.25	$2726	$3616	$5.15
NORMAL	$ 602	$1031	$1.50	$455	$ 870	$1.25	$ 761	$1201	$1.70	$2024	$2914	$4.15
DEFERRED	$ 512	$ 941	$1.35	$387	$ 800	$1.15	$ 646	$1086	$1.55	$1545	$2435	$3.50
CONVENIENCE	$ 422	$ 851	$1.20	$318	$ 733	$1.05	$ 532	$ 972	$1.40	$1272	$2162	$3.10
XNDC	$ 572	$1001	$1.40	$432	$ 847	$1.20	$ 722	$1162	$1.65	$1727	$2617	$3.75
1110-H												
DEMAND	$ 904	$1254	$1.80	$682	$1032	$1.45	$1141	$1473	$2.10	$2727	$3365	$4.80
EXPRESS	$ 602	$ 952	$1.35	$454	$ 804	$1.15	$ 760	$1092	$1.55	$1816	$2454	$3.50
NORMAL	$ 301	$ 651	$ .95	$227	$ 577	$ .80	$ 380	$ 712	$1.00	$ 908	$1546	$2.20
DEFERRED	$ 211	$ 561	$ .80	$159	$ 509	$ .75	$ 266	$ 598	$ .85	$ 636	$1274	$1.80
CONVENIENCE	$ 120	$ 470	$ .65	$ 91	$ 441	$ .65	$ 152	$ 484	$ .70	$ 363	$1001	$1.45
XNDC	$ 286	$ 636	$ .90	$216	$ 566	$ .80	$ 361	$ 693	$1.00	$ 863	$1501	$2.15

*RC = Run Charges
TOT = Run Charges Plus File Charges
TOT/STU = TOT Charges Per Student on a Basis of 700 Students

TABLE LXIII

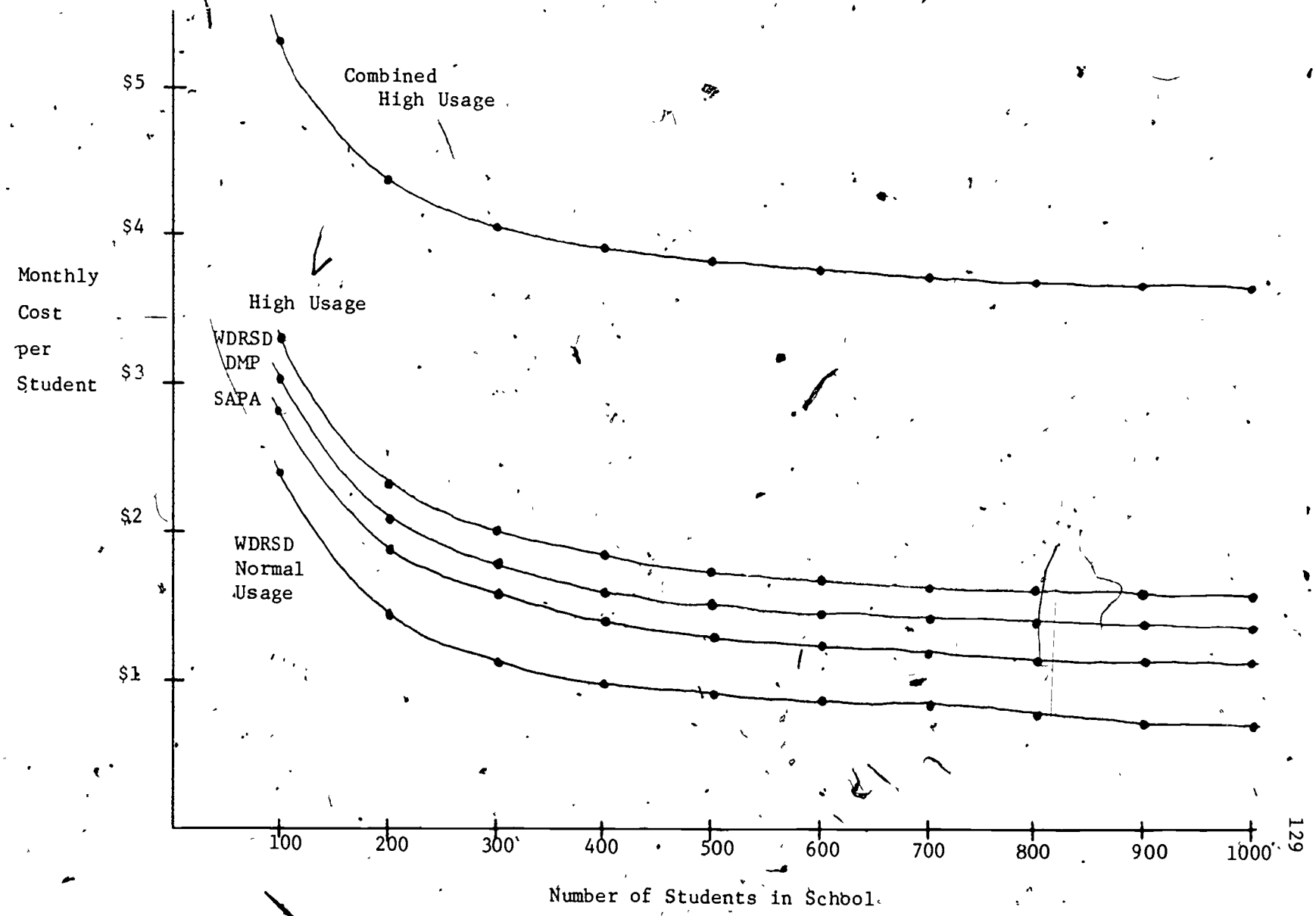
COMPUTING COSTS FOR WIS-SIM (NORMAL USE)

	WDRSD (90)		
1110	RC *	TOT	TOT/STU
DEMAND	$414	$778	$1.10
EXPRESS	$310	$674	$ .95
NORMAL	$207	$571	$ .80
DEFERRED	$176	$540	$ .75
CONVENIENCE	$145	$509	$ .70
XNDC	$197	$561	$ .80
1110-H			
DEMAND	$310	$642	$ .90
EXPRESS	$207	$539	$ .75
NORMAL	$104	$436	$ .60
DEFERRED	$ 72	$404	$ .58
CONVENIENCE	$ 41	$373	$ .53
XNDC	$ 99	$431	$ .60

*RC=Run Charges TOT=Run Charges Plus File Charges TOT/STU=TOT Charges Per Student on Basis of 700 Students

TABLE LXIV

COSTS OF WIS-SIM



CHANGES IN SCHOOL OPERATIONS

School Operations Summary

In May 1976 and April 1977, administrators and unit leaders at each of the user schools were surveyed to determine the extent of changes in school operations made as a result of implementing WIS-SIM. Operational changes were taken to include new activities introduced as a result of WIS-SIM, activities deleted as a result of WIS-SIM, and activities modified as a result of WIS-SIM. Respondents were asked to list such activities under the headings of inservices, meetings, consultations with project staff, changes in the school schedules, changes in communication procedures, and other changes in school operations. The questionnaire used in this survey is shown in Appendix C.

Respondents were asked to describe in a sentence each such change, noting the length in time and frequency of the activity where this was relevant. The number of respondents to the May 1976 survey is shown in Table LXV.

TABLE LXV

NUMBERS OF RESPONDENTS TO CHANGES IN SCHOOL OPERATIONS SURVEY-1976

School	Unit Leaders	Administrators
McFarland	4	1
Jackson	1	1
Plover-Whiting	-	2
Barstow	2	1
Northview	2	1
Henry David Thoreau	6	1
Total	15	7

The respondents at both Barstow and Plover-Whiting indicated no changes other than an initial inservice and meetings with project staff approximately once per month, or when requested. Generally, the 22 respondents reported little in the way of changes to school operations as a result of WIS-SIM, and it can be concluded that WIS-SIM has not resulted in any significant operational changes. Typical responses are outlined below.

Inservice. All schools reported the half-day inservice at the commencement of the 1975-76 school year.

Meetings. Besides the usual unit meetings for grouping purposes, McFarland found a need for units to meet with the CMI project director a few times each semester for the purpose of disseminating current CMI information and modifications. The principal of the McFarland schools also reported meetings with WIS-SIM project staff several times per year. The Thoreau School reading specialist, who has primary responsibility for implementing WIS-SIM procedures in that school, reported meetings with teachers and the principal once every two weeks.

Consultations. Because of the full-time appointment of a CMI project director at McFarland, unit leaders reported daily consultations with the director. Consultations with R & D staff were reported at 1-3 per year, in addition to an occasional telephone consultation. The principal at McFarland reported a weekly, 30-minute consultation with the project director. All schools reported 2-3 consultations per year with the R & D Center staff. More often than not, respondents--mostly administrators--noted these consultations as helpful.

Changes in Schedules. The Northview principal noted that unit leaders were now spending more time in the classroom. McFarland reported some changes in schedule to facilitate inter-unit groupings. No other schedule changes were reported.

Communication Procedures. Three schools, McFarland, Northview, and Plover-Whiting, reported using IPP's for parent conferences. McFarland reported that there was a need for more inter-teacher communication to ensure the proper and timely submission of scores and requests. One McFarland unit reported the use of IPP's by students for their own record keeping.

There appears to have been little or no change in school operations because of the implementation of WIS-SIM. More meetings, consultations, and communication generally seem to have occurred as a result of implementing WIS-SIM in McFarland, where there are a full-time project director and project assistant, and all units are using WIS-SIM for at least two instructional programs. It, therefore, appears that changes in school operations may be related to the amount of usage made of the system. Considering the limited use made of WIS-SIM by most of the other user schools, it can be concluded that these schools did not experience any significant operational changes when implementing WIS-SIM. This may be a trend for future user schools that begin to use WIS-SIM on a limited basis.

Analysis of 1977 Survey

Table LXVI lists the number of persons responding to the changes in school operations questionnaire in the April 1977 evaluation.

TABLE LXVI

NUMBER OF RESPONDENTS TO CHANGES IN

SCHOOL OPERATIONS QUESTIONNAIRE-1977

School	Unit Leaders	Administrators	
McFarland	5	1 (principal)	
Henry David Thoreau	5	2 (principal & reading specialist)	
Total	10	3	13

The respondents at Henry David Thoreau indicated no changes in school operations other than those associated with student reports and record-keeping. As in 1976, little change in operations was reported by staff members surveyed. This may be, in part, due to Thoreau's use of CMI for the second consecutive year and McFarland's use for the third consecutive year. Most changes resulting from CMI use would likely be incorporated into the routine activities and operations by this time. Responses to the survey are summarized below.

Inservice. The inservice for staff members of the user schools in the fall of 1976 was reported. Two respondents indicated the need for more inservice and a review session.

Meetings. Thoreau indicated no change in meetings. McFarland reported that the need for unit meetings for the purpose of grouping is rare, due to CMI and to teachers sharing grouping responsibilities. Unit meetings are held once each semester with the CMI coordinator for the purpose of clarifying needs and explanation of new services. The McFarland principal indicated much time was spent writing the proposals and pointed out the need for periodic meetings with R & D Center staff. The McFarland project director reported regular meetings were necessary for evaluation purposes associated with the project activities.

Consultations with Curriculum Specialists. The reading specialist at Thoreau reported that consultations had increased considerably. Contact was made during the year every two to three weeks. The Thoreau principal indicated an increase in consultations regarding

evaluation. The McFarland staff reported consultations of varying frequencies. Two units held formal, scheduled meetings once per semester while one unit met once a month. Informal consultations with McFarland's CMI project director were held as needed. The McFarland principal indicated the need for occasional meetings with representatives of the Department of Public Instruction. Several respondents reported a decrease in the frequency of consultations as compared with last year.

Changes in School Schedule. All of the McFarland respondents, except one, indicated there had been no schedule changes. One unit leader, however, reported that students began using IPP's to plan individual schedules in Study Skills and Comprehension and that this saved some scheduling of classes. Also, the same respondent reported that, occasionally, the schedule was changed because groupings were not available. Thoreau reported no changes in school schedule.

Changes in Communication Procedures. The Thoreau reading specialist noted no great changes except for communication with parents who requested information. Several McFarland respondents also pointed to better communication with parents regarding skills accomplished by students. One McFarland unit reported the use of CMI for math progress reports, thus reducing teacher preparation of these reports (academic portion); the teachers continue to prepare the personal development portion of reports.

Other Changes in School Operations. McFarland noted the use of individual checks on homeroom students' progress twice monthly in each area. The McFarland principal indicated much time spent with visitors to the school. Thoreau reported that record-keeping tasks had been shortened with the use of CMI reports that replaced the manual methods.

As in the 1975-76 school year, there appear to have been few changes in the overall operations of the user schools as a result of the implementation of WIS-SIM. McFarland reports more change than Thoreau, which is to be expected, given their high level of CMI usage in three curricular areas and, also, the presence of a full-time CMI project director. Even there, however, little change was reported except at the classroom level. Since CMI assists in the management of an existing organizational structure with existing curricula, little change would be predicted.

STAFF ATTITUDES TOWARD WIS-SIM

Administrators, unit leaders, and teachers in each of the seven user schools were surveyed in May 1976 to ascertain user perceptions of WIS-SIM's effects (1) on improving the quality of instructional decision making, (2) in providing better use of time, and (3) in providing better information to parents. Comparable information was not collected as a part of the 1977 evaluation.

The results from the two McFarland schools were considered jointly because separate school identities were not coded onto the questionnaire forms and because these two schools operate as one, in many respects. The number of respondents is shown in Table LXXI below. Only those staff who had used WIS-SIM services were asked to complete the questionnaire.

TABLE LXVII

RESPONDENTS TO QUESTIONNAIRE ON ADVANTAGES OF WIS-SIM

	Administrators	Unit Leaders	Teachers	Total
McFarland	1	4	6	11
Jackson	1	1	2	4
Plover-Whiting	1	1	4	6
Barstow	1	2	5	8
Northview	1	2	10	13
Thoreau	1	4	6	11
All Schools	6	14	33	53

Tables XXVIII to LXXX give the proportion of respondents by staff category, within each school, and across all schools for each possible response. Each of the first six questions (11 parts in all) was presented in the form of a 5-point rating scale, and the responses are shown as frequencies and proportions under each of the five possible responses. A summary of the mean, overall ratings is presented in Table LXXXV.

The ratings of the responsiveness and utility of WIS-SIM is, on the average across all ratings, are at about the mid-point of the five-point scale. This is not a very positive finding. Several of the forms, as indicated by the summary in Table LXXXI, were rated below the mean (i.e., more responsive and useful): quality of decisions regarding instructional planning and student groupings, effect on comprehensiveness of instructional program, effect on the sequencing of skills of instructional programs, effect on meeting individual student needs, effect on student achievement, and effect on quality of information. One item questioned the extent to which WIS-SIM had replaced the teacher as an instructional decision maker. The response, not at all, was as anticipated.

TABLE XXVIII

RESPONSIVENESS OF WIS-SIM TO NEEDS FOR INFORMATION MANAGEMENT

School	N	Very Responsive 1	2	Not at all Responsive 3	4	5	Mean
McFarland	11	3	7	1			1.82
Jackson	4	1	2	1			2.00
Plover-Whiting	6	1	1	1	1	2	3.33
Barstow	8					8	5.00
Northview	12		1	7	1	3	3.50
Thoreau	11	1	3	6		1	2.73
All Schools	52	6 (11%)	14 (27%)	16 (31%)	2 (4%)	14 (27%)	3.08

TABLE LXIX

RESPONSIVENESS OF WIS-SIM TO NEEDS FOR INSTRUCTIONAL DECISION MAKING

School	N	Very Responsive 1	2	Not at all Responsive 3	4	5	Mean
McFarland	11	3	7	1			1.82
Jackson	4		1	3			2.75
Plover-Whiting	6		1	1	1	3	4.00
Barstow	8					8	5.00
Northview	12		2	5	2	3	3.50
Thoreau	11		3	7		1	2.36
All Schools	52	3 (6%)	14 (27%)	17 (33%)	3 (6%)	15 (28%)	3.25

TABLE LXX

RESPONSIVENESS OF WIS-SIM TO NEEDS FOR INSTRUCTIONAL PLANNING

School	N	Very Responsive 1	2	3	4	Not at all Responsive 5	Mean
McFarland	11	3	6	2			1.91
Jackson	4		1	2	1		3.00
Plover-Whiting	6		1	1	2	2	3.83
Barstow	8					8	5.00
Northview	12		1	6	2	3	3.58
Thoreau	11	2	2	6		1	2.27
All Schools	52	5 (10%)	11 (21%)	17 (33%)	5 (10%)	14 (27%)	3.23

TABLE LXXI

CHANGE IN AMOUNT OF TIME SPENT IN INSTRUCTIONAL PLANNING

AND GROUPING STUDENTS

School	N	Much Less Time 1	2	3	4	Much More Time 5	Mean
McFarland	10	3	3	2	1	1	2.40
Jackson	4	1		2	1		2.75
Plover-Whiting	6			3	1	2	2.87
Barstow	8			8			3.00
Northview	11		1	4	4	2	3.64
Thoreau	9			8	1		3.11
All Schools	48	4 (8 1/2%)	4 (8 1/2%)	27 (56%)	8 (16 2/3%)	5 (10%)	3.12

TABLE LXXII

QUALITY OF DECISIONS RE INSTRUCTIONAL PLANNING AND STUDENT GROUPINGS

School	N	Much Higher Quality 1	2	3	4	Much Lower Quality 5	Mean
McFarland	11	4	6	1			1.73
Jackson	4		1	3			2.75
Plover-Whiting	6		1	3		2	3.50
Barstow	8			6		2	3.50
Northview	12		2	8	2		3.00
Thoreau	11		4	4	2	1	3.00
All Schools	52	4 (8%)	14 (27%)	25 (48%)	4 (8%)	5 (9%)	2.85

TABLE LXXIII

EXTENT THAT COMPUTER HAS REPLACED TEACHER AS INSTRUCTIONAL DECISION MAKER

School	N	Very Much 1	2	3	4	Not at all 5	Mean
McFarland	11	1	1	4	1	4	3.54
Jackson	4			1	1	2	4.25
Plover-Whiting	6			1		5	4.67
Barstow	8					8	5.00
Northview	13		1	3	2	7	4.15
Thoreau	11				1	10	4.91
All Schools	53	1 (2%)	2 (4%)	9 (17%)	5 (10%)	36 (68%)	4.38

TABLE LXXIV

HELPFULNESS OF WIS-SIM OVERALL

School	N	Very Helpful 1	2	3	4	Not at all Helpful 5	Mean
McFarland	11	5	4	2			1.73
Jackson	4	1	1	2			2.25
Plover-Whiting	6		2		2	2	3.67
Barstow	8			3	1	4	4.12
Northview	13			5	7	1	3.69
Thoreau	11	1	1	7	1	1	3.00
All Schools	53	1 (4%)	8 (15%)	19 (36%)	11 (21%)	8 (15%)	3.09

TABLE LXXV

CHANGE IN PROPORTION OF TIME SPENT TEACHING

School	N	Much Larger Proportion 1	2	3	4	Small Proportion 5	Mean
McFarland	10	1	2	6	1		2.70
Jackson	4			3	1		3.25
Plover-Whiting	6			4	1	1	3.50
Barstow	7			6		1	3.28
Northview	12		1	8	2	1	3.25
Thoreau	11			11			3.00
All Schools	50	1 (2%)	3 (6%)	38 (76%)	5 (10%)	3 (6%)	3.12

TABLE LXXVI

WIS-SIM'S EFFECT ON COMPREHENSIVENESS OF INSTRUCTIONAL PROGRAM

School	N	Much More Comprehensive 1	2	3	4	Much Less Compreh. 5	Mean
McFarland	11	3	6	1	1		2.00
Jackson	4	1		3			2.50
Plover-Whiting	6	1	1		3	1	3.33
Barstow	7			6		1	3.28
Northview	11		2	5	3	1	3.27
Thoreau	11	1	1	9			2.73
All Schools	50	6 (12%)	10 (20%)	24 (48%)	7 (14%)	3 (6%)	2.82

TABLE LXXVII

WIS-SIM'S EFFECT ON SEQUENCING OF

SKILLS OF INSTRUCTIONAL PROGRAMS

School	N	Much Higher Quality 1	2	3	4	Much Lower Quality 5	Mean
McFarland	11	4	2	4		1	2.18
Jackson	4		1	2	1		3.00
Plover-Whiting	6	2		1	2	1	3.00
Barstow	6			6			3.00
Northview	11		2	6	2	1	3.18
Thoreau	11		2	9			2.82
All Schools	49	6 (12%)	7 (14%)	28 (57%)	5 (10%)	3 (6%)	2.84

TABLE LXXVIII

WIS-SIM'S EFFECT ON MEETING INDIVIDUAL STUDENT NEEDS

School	N	Much Higher Quality 1	2	3	Much Lower Quality 4	5	Mean
McFarland	11	4	5	1	1		1.91
Jackson	4		2	2			2.50
Plover-Whiting	6	1		1	3	1	3.50
Barstow	8			8			3.00
Northview	12		2	6	3	1	3.25
Thoreau	11	3	6	2			1.91
All Schools	52	8 (15%)	15 (29%)	20 (38%)	7 (13%)	2 (4%)	2.61

TABLE LXXVIX

WIS-SIM'S EFFECT ON STUDENT ACHIEVEMENT

School	N	Much Higher Quality 1	2	3	Much Lower Quality 4	5	Mean
McFarland	11	4	5	1	1		1.91
Jackson	4		2	2			2.50
Plover-Whiting	6	1		1	3	1	3.50
Barstow	8			8			3.00
Northview	12		2	6	3	1	3.25
Thoreau	11	1	4	6			2.45
All Schools	52	6 (12%)	13 (25%)	24 (46%)	7 (13%)	2 (4%)	2.73

TABLE LXXX

WIS-SIM'S EFFECT ON QUALITY OF INFORMATION

School	N	Much Higher Quality 1	2	3	4	Much Less Quality 5	Mean
McFarland	11		4	7			2.64
Jackson	4			4			3.00
Plover-Whiting	6	1		4		1	3.00
Barstow	8			8			3.00
Northview	12		1	9	1	1	3.17
Thoreau	11		3	8			2.73
All Schools	52	1 (2%)	8 (15%)	40 (77%)	1 (2%)	2 (4%)	2.90

TABLE LXXXI

MEAN RATINGS OVER ALL RESPONDENTS AND ON

ALL ITEMS OF SECTION A: ATTITUDES TOWARD WIS-SIM

1	(a)	160/52 = 3.08	Responsiveness to Needs for Information Management
	(b)	169/52 = 3.25	Responsiveness to Needs for Instructional Decision Making
	(c)	168/52 = 3.23	Responsiveness to Needs for Instructional Planning
2	(a)	150/48 = 3.12	Amount of Time Spent in Instructional Planning
	(b)	148/52 = 2.85	Quality of Decisions of Instructional Planning
3	(a)	232/53 = 4.38	Replaced Teacher as Instructional Decision Maker
	(b)	164/53 = 3.09	Helpfulness of WIS-SIM Overall
4		156/50 = 3.12	Proportion of Time Spent Teaching
5	(a)	141/50 = 2.82	Comprehensiveness of Instructional Program
	(b)	139/49 = 2.84	Sequencing Skills of Instructional Programs
	(c)	136/52 = 2.61	Meeting Individual Student Needs
	(d)	142/52 = 2.73	Student Achievement
6		151/52 = 2.90	Quality of Information

The variation in school responses should also be noted. McFarland, the system's largest user, is consistently the most positive about the usefulness and effects of the system. Barstow, essentially a non-user of the system, is least positive, having not a single rating less than 3.0 and several at 5.0. Thoreau had the second most positive ratings, on the average, and they were the system's second largest user near the end of the 1975-76 school year. Positive response appears to be directly related to frequent use.

Given that McFarland was the most frequent and most stable user of the system over the 1975-76 pilot test year, an analysis of their responses would seem appropriate. All of McFarland's responses, except for the item concerning the replacement of the teacher as the decision maker were less than 3.0. Seven of their responses averaged 2.0 or less and the remaining four were between 2.0 and 3.0. McFarland teachers were most positive about the effects of WIS-SIM on the quality of instructional decision making for instructional planning and grouping, overall helpfulness, responsiveness to needs for instructional decision making, responsiveness to needs for instructional planning, effect on meeting individual student needs, and effect on student achievement. This user school reflects a very positive picture of the usefulness and effects of WIS-SIM in the primary areas the system was designed to impact.

Eight suggestions were received from users: one from Thoreau, one from Northview, and six from the McFarland schools. The main recurring suggestion from the three schools referred to using other bases for grouping. Some data suggested as being useful when forming groups included:

1. Pretest scores
2. Learning-style information
3. Rates of learning.

Other suggestions included: (1) changing the skill prerequisites at some levels (program not mentioned); (2) improving WIS-SIM's capability for reporting to parents; (3) inclusion in the student data base of other data such as number of reading books read, music marks, and art marks.

The results indicate that positive attitudes vary directly with frequency of use. Schools that use the system tend to have more positive attitudes. It should not be inferred that use causes positive attitudes, however, because many factors may affect both use and attitudes. Attitudes may very well affect use. Overall attitudes were somewhat positive in several of the areas expected. Attitudes of high use schools were positive in most, and at McFarland in all, areas anticipated. It is concluded that, in schools where the system is used frequently, teachers perceive it as having the anticipated effects on decision making and educational outcomes.

V

SUMMARY AND CONCLUSIONS

General

The Wisconsin System for Instructional Management (WIS-SIM) is a computer-based management information system designed to assist teachers with the instructional management functions as well as provide the requisite record keeping and clerical tasks involved when instruction is individualized. WIS-SIM is not a curricular program, as are programs within computer assisted instruction (CAI), but has as its objectives the collecting and processing of student information, and supplying this information at appropriate times and places so that it is directly applicable for instructional decision making. When the appropriate information is supplied to instructional decision makers in a usable format, efficiency and quality of decision making improves. Teachers, students, and administrators continuously need information through which they can evaluate instructional decision making.

The aims of computer managed instruction (CMI) concepts and practices go beyond traditional student accounting. This results from the growing evidence that indicates the strength of a management information system lies in its helping school systems adapt their instructional programs to meet individual needs while maintaining necessary control. It is, then, the purpose of a CMI system to optimize the learning environment and to maximize the educational progress for each child, while making efficient use of school resources: human, financial, and material. The system is designed so that it becomes a human and machine interaction, focused upon individualized instruction.

The purpose of this report is to evaluate the results of a two-year pilot test of WIS-SIM. This evaluation is primarily formative, i.e., it is directed toward the collection of information useful in improving the design and implementation of the system, rather than in making final judgements about its worth. In a broader sense, this evaluation provides a test of proof of concept, that is, an assessment of whether or not it is possible to design a CMI system capable of supporting information and decision processes of individualized programs of instruction, such as Individually Guided Education.

The six primary design goals that guided the development of WIS-SIM are:

1. To facilitate the learning environment for each child in terms of the instructional and organizational requirements of IGE.

2. To provide information that is useful to educational decision makers at the unit, school, and district levels.

3. To improve communications with parents and upgrade the quality of reporting to them about student achievement.

4. To make minimal demands on teachers to learn the system.

5. To make minimal demands on teachers to perform tasks that are different from normal classroom activities and, where possible, to reduce the paper work requirements of school personnel.

6. To make computer management of instruction available to a large number of IGE schools.

A framework for the evaluation of management information systems was developed; it contains two major dimensions of three levels each. The dimension of formative evaluation processes: functioning, utilization, and effects; and the dimension of information type: actual, perceptual and judgemental. Together, these two dimensions form a nine-cell matrix within which the information collected in this formative assessment of WIS-SIM may be placed. The report was organized according to the three formative evaluation processes. Functioning focuses on whether the various components of the management information system, both human and physical, are capable of operating in accordance with design expectations. Utilization is concerned with those management processes with which the system is being employed and whether these processes are consistent with those identified in the system design. Effects are those results achieved from utilization of the system. In this section, the extent to which the objectives of the system are being attained is examined.

Seven schools located in four Wisconsin school districts participated in the pilot test. All seven of these schools participated during the first year of the study, and three of those schools continued participation during the second year. The pilot test period began in August, 1975, and ended in June, 1977. The participating schools varied widely in size and structure, from the small Barstow Elementary School in Waukesha with 136 students, to Thoreau School in Milwaukee with 650 students. The McFarland Schools, McFarland Elementary School and Elvehjem School, located next to each

other, operated in many respects as a single school with 700 students. McFarland was the first school brought up on WIS-SIM and was the largest user of the system over the pilot test period, using it in support of three curricula: Developing Mathematical Processes (DMP), the Wisconsin Design for Reading Skill Development (WDRSD), and Science...A Process Approach (SAPA).

The schools participating in the pilot test used different organizational arrangements. McFarland had a full-time project director for WIS-SIM, supported through a supplemental ESEA Title III grant. Thoreau used a reading coordinator at the school to supervise the implementation of WIS-SIM. The other schools did not have a specifically designated person to coordinate WIS-SIM, and the principal assumed these additional responsibilities. All schools identified aides to operate the computer terminal. In some cases, these aides were assigned other responsibilities in the school; in other cases, work with WIS-SIM was their only responsibility. Barstow did not have a computer terminal located in the school, but shared one with neighboring Northview School. Jackson and Plover-Whiting shared a terminal for one-half year, until a terminal was also located in Jackson School. The McFarland Schools shared a terminal for most of the pilot test period, but in March 1977, a second terminal was added to ease the load on the first one.

Prior to proceeding to a review of the findings in the sections on functioning, utilization, and effects, a discussion of the reasons for several schools not participating in the second year of the pilot test is included.

Schools Not Participating in the Second Year of the Pilot Test

Waukesha. As mentioned, during the two-year pilot test, seven Wisconsin schools in four Wisconsin school districts were included in the study. Only two of those schools, in only one school district, continued for the duration of the pilot test; another, Thoreau School in Milwaukee, was added mid-first year and continued for the remainder of the pilot test. It might be added that all three of these schools will continue to utilize WIS-SIM for the 1977-78 school year. Four schools, however, were using WIS-SIM in 1975-76, but did not continue through the second year of the pilot test, these being the schools in Waukesha and Stevens Point. All four schools were not continued by mutual agreement and, in the case of the Stevens Point Schools, reductions in both the project's budget and the district's CMI budget was a major reason. This evaluation of WIS-SIM would be incomplete without some reference to the schools that did not continue. Interviews were conducted with the staff of all these schools before and after the decision was made to terminate, in an attempt to identify factors that may have been associated with the decision.

The two schools in Waukesha are located in close proximity to each other, within two miles. One school, Barstow, was quite small and the other, Northview, was of medium size with 453 students. These two schools shared a terminal located in Northview Elementary School. The invitation to include these schools in the pilot test was initiated through a district-level supervisor to the principals. A district-wide meeting was held with elementary principals, in order to describe WIS-SIM and ask for volunteer schools. Little direct contact was made with teachers prior to the principals' decision to participate and, consequently, the school staff lacked an understanding and commitment to the study. Most teachers in the Waukesha Schools never appeared to trust the system to a point where they felt they could dispense with their manual record system; consequently, they saw the system as making more, rather than less, work for them.

At the same time as the pilot test was proceeding, the two Waukesha Schools were implementing a commercial form of the DMP curriculum. Materials for this program did not arrive on time and the math program could not be properly implemented in the IGE format. Two conditions affecting the success of WIS-SIM occurred. First, a reverse halo effect occurred; WIS-SIM was linked with the negative feeling toward the DMP curriculum and the problems with its implementation. Second, since the cirriculum could not be properly implemented, that is, grouping could not or did not take place, the management system was not seen as essential to the teachers' needs. Little or no use was made of the DMP system by Waukesha teachers, especially at Barstow School, during the year of the pilot test in which they participated. The size of Barstow School may, itself, have been a factor in its disuse of WIS-SIM. Since it was a very small school, its management problems may not have been as pressing as those of larger schools.

No one in the Waukesha Schools, at the school level, took responsibility for implementing WIS-SIM. While the principal was knowledgeable about the system, having been the primary point of contact and having completed the inservice course, he was not knowledgeable enough to deal with the many teacher questions and concerns, and lacked an enthusiasm for the system. In any event, he did not have sufficient time to devote to the implementation of WIS-SIM. Additionally, the R & D Center did not provide sufficient support to these schools during the early part of the pilot test. The development of new systems and training materials and the support of a large number of schools in proportion to project staff size led to minimal field support for these schools. Finally, the computer-terminal aide in Waukesha was not allocated any fixed time for work at the terminal. The aide's time was shared between this responsibility and other classroom responsibilities. Teachers wanted the aide to spend time on classroom responsibilities at the cost of less time spent in work on the terminal.

These factors, then, are believed to have affected the decision of the Waukesha Schools to terminate their participation in the pilot test at the end of the first year: lack of complete understanding and commitment on the part of teachers; concurrent problems with the implementation of a new curriculum which was to be supported by WIS-SIM; not following the instructional model around which the system was designed; sharing a computer terminal; lack of a coordinator at the school level for the implementation of the system; inadequate field support from the R & D Center; conflict in the allocation of aide's time for computer-terminal operation; and, in the case of Barstow School, restricted access to the shared computer terminal as well as the small size of the school.

Stevens Point. The Stevens Point schools entered the pilot test early in the 1975-76 school year. Teacher and principal consent was secured prior to their agreement to participate, and they were enthusiastic about the potential of the system. A single terminal was located in the Plover-Whiting School, which was to be used by both schools. Since the distance between the two schools was several miles, Jackson School did not make frequent use of the system. A terminal was added in the Jackson School about mid-first year and their usage increased greatly. The computer-terminal aides in Stevens Point were quite good, felt at ease with their work, and were allocated time for it. No coordinator for WIS-SIM, other than the principal, was present in either school. Some early concerns were raised by teachers about errors in the student data base. These errors resulted from improper coding of past student achievement information by teachers, which may in turn have been a result of inadequate instructions during the training sessions. Field support was also insufficient for these schools. Still, at the end of the first pilot test year, both Plover-Whiting and Jackson appeared to be, and were, successful users of the system.

The second year was a different story. The experienced aides had left; no one was coordinating the implementation at the school level; the data bases needed to be updated; a teacher strike was looming; and a date for an inservice could not be agreed upon. Also, it was becoming clear to the R & D Center that the project's budget would not support the continuation of all pilot test schools. Additionally, the future of the project was uncertain. As time went on, the situation worsened. No inservice was held. The R & D Center did not want to encourage Stevens Point's participation, only to possibly have to withdraw support in a month or two; so nothing was done. The Stevens Point Schools continued to have the terminals available, but made little or no use of them during the second pilot test year. They were, as it turned out, non-participants in the pilot test during that year.

The major factors associated with non-participation in the second year of the pilot test in the Stevens Point schools were: departure of knowledgeable computer-terminal aides; lack of school-level coordination; lack of field support from the R & D Center, resulting from uncertainty in budget; failure to hold an inservice; and instability in the school district leading to a strike by teachers.

SUMMARY OF THE FINDINGS

The evidence collected as a part of this two-year pilot study has been reported in detail in Chapters II, III, and IV of this report. These discussions are summarized in the following sections on system functioning, utilization, and effects.

System Functioning

System functioning is concerned with the capabilities of both the human and physical elements of the system and their ability to perform in accordance with design expectations. In order to train and to assess whether or not system users were knowledgeable about and able to use the system, inservice sessions were held. The inservice program held in the fall of 1975 was comprehensive and lasted for about three hours. The sessions held in the fall of 1976 were much shorter, since participating schools had completed at least a year of prior use. The 1976 sessions were refresher courses.

Inservice results for 1975 were successful in changing participants' knowledge about and understanding of WIS-SIM. Scores, on the average, increased about four points or 20 percent to a mean score of about 17 out of 20. These differences between the pretest and posttest are statistically significant. Respondents' attitudes toward CMI and its usefulness were generally positive pre-inservice and were significantly more positive following the inservice. Inservice sessions for the aides operating the computer terminals were also held, although some aides did not have supervised training on the terminal. Aides receiving supervised training successfully completed a checklist designed to assess their ability to operate the terminal and carry out WIS-SIM operations.

Attitudes toward the inservice were positive as well. Participants generally felt that the sessions were useful and emphasized important points. Some additional emphasis might have been placed on requesting and interpreting reports and less time spent in the work sessions on school data.

The 1976 inservice was assessed only in terms of general attitudes toward CMI at the end of the sessions. These assessments proved to be quite positive, as they were the previous year.

Testing of system software components was conducted by project staff as they were finalized, and a test of the complete system was conducted prior to implementation in the schools. A year-long developmental tryout was conducted in four schools during the 1974-75 school year, resulting in system design changes and improvements prior to the beginning of the two-year pilot test.

The ability of the system to respond to users' need for information within a reasonable time was also examined. Turn-around requirements were determined to be typically overnight, occasionally within a few hours, and rarely within an hour. WIS-SIM was designed, however, to be capable of responding to all requests within one-half hour. Turn-around time was defined as the time between the entering of a request at the terminal and the receipt of the report back at the terminal. No assessment was made of the processing of the request at the school level between the teacher and the computer terminal aide, nor of the return of the report from the terminal aide to the requesting teacher. In 1976, turn-around times averaged 21.7 and 69.3 minutes for DMP/SAPA and WDRSD, respectively. In 1977, these times were reduced to 18.4 and 13.8 minutes, respectively. The latter years' results were within the specified thirty-minute criteria.

The functioning of the system in the areas investigated appears to be according to design expectations. Still, there are areas of needed improvement and these will be addressed in a later section on recommendations.

System Utilization

The system utilization dimension of the evaluation design relates to the management processes for which the system is being employed and the consistency of those processes with those identified in the system design. The dimension of WIS-SIM utilization was evaluated by addressing the following issues:

1. Actual level:

   a. Number and type of system accesses.

2. Perceptual level:

   a. Usage of reports.

   b. Appropriateness of reports.

   c. Usefulness of reports.

   d. School tasks supported by WIS-SIM.

Number and type of system accesses by WIS-SIM users were estimated by tabulation of system logs during selected periods. The McFarland Schools were, by far, the most frequent users of the system, averaging 74.0 accesses per week in 1975-76 and 124.75 accesses per week in 1976-77. Most of the accesses by all users were for the purpose of grading. The other most frequently used WIS-SIM functions were the Individual Performance Profiles (IPP's) and Instructional Grouping Recommendations (IGR's).

Unit leaders, teachers, and aides in each of the user schools were surveyed to determine what uses were being made of WIS-SIM reports. The majority of respondents did not indicate uses of reports other than those for which the reports were designed. However, many of the uses reported represented creative, additional applications.

Respondents rated the WIS-SIM reports quite high with respect to appropriateness. The only exception to this high rating was the Prerequisite Deficiency Report (PDR). Suggestions for modification of reports were also obtained and will be considered in future revisions and updates of the system.

The WIS-SIM users also evaluated the usefulness of the reports or, more specifically, the usefulness of the information contained in the reports when making decisions about the instruction of students. The respondents consistently rated the reports quite high with regard to usefulness. The consistency of the ratings obtained in 1977 with those obtained in 1976 appears to indicate an on-going satisfaction with the reports.

The utilization of WIS-SIM is assumed to affect certain tasks in the school. Users were surveyed to identify those tasks supported by the CMI system. The questionnaire administered contained twenty-seven tasks typical for IGE schools for which the respondents indicated whether their role or responsibilities had changed because of WIS-SIM.

Proportionately few respondents reported the perception that the usage of WIS-SIM had completely replaced a manual task or procedure. Likewise, few tasks were considered extra because of WIS-SIM. Tasks considered most affected by WIS-SIM included:

1. Identifying individual student instructional needs.

2. Maintaining individual performance profiles.

3. Grouping students for instructional purposes.

The tasks in which the users considered their role to be changed included:

1. Maintaining individual performance profiles.

2. Maintaining unit performance profiles.

It is of interest and significance that perception of role change or responsibility change as a result of WIS-SIM appears to closely parallel the perception of tasks affected by WIS-SIM.

System Effects

The system effects dimension of the evaluation design addresses the question of the results achieved from utilization of the system and the extent to which objectives of the system are being achieved. The five issues discussed as system effects are:

1. Actual level:

   a. Teacher time usage.

   b. Student achievement.

   c. System costs.

2. Perceptual level:

   a. Change in school operations.

3. Judgemental level:

   a. Desirability of system effects.

The data related to the allocation of time to the areas of planning, instruction, and clerical tasks appear to indicate a reduction of amount or percent of time required for clerical tasks. Subjective comments by the teachers tend to confirm this conclusion. However, due to a large variance in the data, statistically significant findings cannot be reported. Subjective teacher comments regarding planning time indicate that, although the actual hours involved have not changed appreciably, the planning process is more effective and more is accomplished during the time.

Student achievement subsequent to the implementation and use of WIS-SIM at the McFarland Schools can be shown to exhibit a positive trend. As discussed in the section dealing with this topic, achievement effects must be interpreted with some caution, as they are subject to the influence of a large number of factors in the school environment.

The cost of WIS-SIM may vary widely depending on factors such as level of usage, curricular areas supported by the system, computer services costs, staff development, hardware used, and personnel. An illustrative example of WIS-SIM cost may be drawn from Table XVIII. Support for 700 students for WDRSD using a normal turn-around mode on a Univac 1110 computer would cost approximately $.80 per student per month, or about $5600 total cost per year. It should be noted that the cost for instructional support may not increase by this total amount in that the management system originally used would have been replaced.

Computer managed instruction is not prohibitively expensive for all school systems, especially those having access to an appropriate computer facility. It probably would not be cost-effective for all schools, however, depending on the size of the school, its organizational structure, and the degree of its IGE implementation. Cost-effectiveness of WIS-SIM rests on its potential as a management instrument, not as a record keeping device.

With the exception of some increase in the frequency of meetings and consultations between teachers and staff closely associated with actual system usage, there appear to have been few changes in school operations. Any significant changes that do occur are likely to take place early in the implementation phase.

Teachers and administrators indicate quite positive attitudes toward the desirability of WIS-SIM effects. This is supported by the objective rating analysis as well as by the more subjective teacher interviews. A number of teachers have become so emphatic in their support of WIS-SIM that they indicate the feeling that a true IGE instructional environment cannot function properly without the system.

SITE SELECTION

The criteria for selection of a school or school district in which to implement WIS-SIM are not defined explicitly by the results of this evaluation. There are, however, several areas to which the findings do indicate attention should be given. Although these areas may not contribute individually to the success or failure of implementation, collectively they may be important determinants.

The decision on the part of the teachers to utilize CMI, rather than its implementation being imposed on them, appears to be an important consideration. The sites at which WIS-SIM has been most successful are those at which the teachers, themselves, perceived a need for assistance in the requisite record keeping and decision making associated with individualized schooling. When this need is not perceived first, the implementation of CMI may be viewed as additional work or another time-consuming procedure.

Since WIS-SIM was originally conceived to be a support system for the management functions associated with individualized schooling, the site should have an organizational structure similar in some respects to the IGE model. The real potential and value of WIS-SIM is its ability to enhance decision making and not simply reduce clerical and record keeping tasks. If the latter are viewed as its primary function, the likelihood of success is reduced.

The size of the school is, clearly, an important aspect to consider. Although it is not possible at this time to offer rigid guidelines or parameters, the evaluation would appear to indicate that a school with a minimum of about 400 students would be a reasonable inside parameter. A small school will not possess the record keeping or instructional decision requirements that require computer support.

Closely related to the concern of teacher support is that of administrative support. It is unlikely that an unsupportive administration would provide an environment for a successful implementation, even though the faculty may perceive a strong need for the system. On-going success requires appropriate allocation of personnel, e.g., terminal operators, attention to problems that may arise, and time allocation to staff training, e.g., inservice. These are functions within the administrative domain over which teachers may have no control.

The availability of the required computer hardware and software is an obvious requirement in site selection. Presently, the WIS-SIM is operable only on computer systems such as the UNIVAC 1110. The conversion to other systems is possible, but may require considerable time and expense. Future WIS-SIM efforts will focus on the development of microprocessor hardware and software, hopefully eliminating this constraint, but this is presently unavailable.

For reasons discussed in more detail in Chapter IV, costs and budgetary considerations are difficult to address. Also, these requirements are in a constant state of flux because of evolving technology. Since the associated costs will be unique for different sites, close attention should be given to the district's ability to meet the expenses associated with the system including actual computer costs, personnel, consultive support, training, and on-going maintenance.

It should be apparent that it is difficult, if not impossible, to generate a profile by which one may determine an appropriate site for WIS-SIM implementation. This evaluation, however, does indicate that the areas summarized below should be given careful consideration:

1. Perceived need on the part of the teacher for computer support for instructional management, decision making, and record keeping.

2. Support by administration within the school as well as in the central office.

3. Instructional and organizational structure consistent with the system design objectives.

4. Availability of computer hardware and software.

5. Adequate funding.

6. School size sufficient to require computer support.

STAFFING AND INSERVICE

The introduction of a computer-supported system such as WIS-SIM may represent a totally new experience to the faculty and staff of a school. Associated with the introduction of the system, there may be evidenced behavioral characteristics such as apprehension and anxiety about the system; varying levels of confidence and perceptions of its usefulness, and a general lack of understanding. Therefore, the importance of staff preparation cannot be understated.

Closely akin to this need for staff development is the need for a facilitator or coordinator. A staff member who is given the time and training to be an active resource person can be extremely functional and is, possibly, essential. The evaluation appears to indicate that the most successful implementation sites have designated such a person to be responsible for coordinating the CMI efforts. This coordination may include overall supervision of CMI activities, trouble-shooting, planning and evaluation, and acting as a liason between the school and the consultive support personnel. The evaluation also indicates that the principal may not be the person best suited for this position because of his or her time obligations in performing necessary, existing functions.

The total inservice and staff development program should be carefully planned and executed. This program should include two dimensions--one focused on the needs of the computer-terminal operator and the other on the needs of the teachers and classroom aides. The terminal operator must feel completely comfortable with the processes associated with communicating with the computer. The teachers must understand the design concepts of the system as they relate to instructional management and record keeping procedures. An effective program should, therefore, develop in addition to understanding, feelings of confidence and positive user attitudes.

Sufficient documentation and manuals should be made available to the staff to enhance their utilization of the system as well as to provide day-to-day answers to questions that may arise. As new documents appear, adequate time for explanation and discussion should be provided.

In summary, a necessity for successful WIS-SIM implementation and utilization is developing an adequate understanding of the system on the part of all personnel involved. This requires a carefully planned program of staff development, both in the initial

stages and in the on-going phases of use. This may be enhanced considerably by the designation of a coordinator responsible for the development and distribution of materials, for the facilitating and scheduling system activities, and for exercising overall responsibility for the total CMI program.

SYSTEM IMPLEMENTATION

This pilot test has underscored the importance of several factors in implementing WIS-SIM. First, the essential value of a school-level coordinator was identified. This individual should be a professional educator and should develop an in-depth understanding of the system. Positive attitudes and knowledge of system purposes and procedures on the part of a school-level coordinator can go far to ensure effective system implementation and use; this person acts as an ambassador for the system in the school. Careful identification and training of this coordinator is essential.

The training of teachers and aides is also critical. Teachers who do not understand the system's purposes or how to use information provided will not be satisfied users. Since the great majority of communication between the users of the system and the system data bases is through the aide, the importance of this role is crucial. Back-up, or cross training, for this position is essential. Finally, the training of all associated personnel is of vital importance to effective system implementation and utilization.

Many system users do not think of themselves as decision makers. A part of the users' training program should emphasize the decisions that teachers make and demonstrate the relationship between information delivered by the CMI system and teachers' decision making. Users should recognize the relationship between system responsiveness and its related costs. Generally, the more responsive the system, the more costly the generation of information will be. Planning in advance for instructional decision making can greatly reduce system operating costs. Additionally, teachers should recognize the difference between the information they desire to make a decision and the information they need to make the decision. Teachers frequently request information they do not use in decision making.

Efficient and prudent use of CMI capabilities is a difficult matter to address, but must be in order to have a system operable within the typical operational and budgetary constraints of most schools, perhaps making the costs of system operation more visible to teachers would assist in resolving some of these concerns. During the period of the pilot test, considerable misuse of the system (over responsiveness and extraneous information) was tolerated to encourage system use and to demonstrate system capabilities.

Users of the system will not perceive the system to be useful unless it supports decisions actually made by teachers at that school. The instructional management information system is based

upon assumptions about the information needs in support of individualized instructional programs. As mentioned previously, as a criterion for site selection, the compatability of system assumptions and designs with school information and decision needs is essential to successful system implementation.

As also pointed out in the section on site selection, stability in the school and the school district can also be a critical factor in successful implementation. If the school district is involved in major conflict, such as might result from court-ordered desegregation or a teacher strike, the effectiveness of implementation will likely be affected negatively.

FRAMEWORK FOR EVALUATION OF MANAGEMENT INFORMATION SYSTEMS

While the primary concern of this report is to provide an investigation of the implementation of a system of computer managed instruction, it also provides a vehicle for the design and testing of an evaluation framework to be used in carrying out this investigation. With the rapid expansion of information technology in education, as in other fields, designs and procedures for the evaluation of management information systems are seen as critically important. This is particularly true when one considers the cost of developing and operating such systems.

The framework used in this study consists of a nine-celled matrix created by considering three types of information and three aspects of information system implementation. The evaluation was seen as primarily formative, in that its objective was to provide information useful in improving the design of the system, rather than to make summative judgements about its worth. Although some judgements can be made about system value and effects, the design utilized is not capable of providing a strong link between system implementation and the effects noted. Such summative assessments are seen as desirable, but difficult to make in light of the complexity of most management information systems, their evolutionary nature, and time constraints. Information systems must respond to changing decision and information needs in the system they serve.

As a result of the testing of the evaluation framework in this pilot test, some conclusions can be drawn about the evaluation of management information systems. The three types of information collected, actual, perceptual and judgemental, provided for a more complete assessment of the system than would have been provided if fewer types were considered. While actual data may be viewed as preferable to perceptual data, it is not always possible to collect actual data, and, additionally, the comparison of actual data with perceptual data affords an important check on those perceptions. This information may be useful in assessing whether or not users are accurately perceiving system effects. Discrepancies between

actual and perceptual data may be explained in part by the attitudes system users have toward the system or, alternatively, these attitudes may be explained by those differences. Difficulties encountered in the placement of information elements in the categories of actual, perceptual and judgemental information may suggest that these constructs are not as well-defined as they were thought to be. Additional effort needs to be spent on clarifying these terms.

The trichotomy of system functioning, utilization and effects also provided a useful way of analyzing system implementation. Those three categories are cumulative, in that categories two and three are dependent upon the preceding stages; that is, system utilization is dependent on system functioning, and system effects are dependent upon system utilization. Problems identified at one level may be traced to difficulties encountered at the previous level.

Information elements included in the framework were all useful in evaluating the implementation of the system. Considerable refinement in the specification and classification of information elements is needed, however. The listing of information elements included in this analysis is incomplete, and a more systematic format for delineating these elements is needed. Presumably classes of elements could be generated for each implementation category, with the same elements repeated under the actual, perceptual and judgemental types of information. Whether or not it would be desirable or possible to collect the specified information would be a decision made when considering the design for the evaluation of a particular implementation of a management information system.

The definition of management information system used in this study included the humans as elements of the total system; that is, the system was not reviewed totally as a machine system. Assessment of the functioning of the human elements of the system, in a way analogous to the way the machine components are tested, is extremely important to understanding system operation and assessing system implementation.

The evaluation framework generated for this study evolved as the management system, itself, evolved during the period of the pilot test. Had the framework been conceptualized in its present form at the time the evaluation was planned, there is little doubt that a more comprehensive and useful evaluation of the system implementation would have taken place. This conclusion supports the value of this framework to the design of evaluations for management information systems.

One problem external to the evaluation framework was the failure to collect adequate pre-implementation data and to identify suitable comparison schools. Unfortunately, the principal school in which data were collected did not have a stable, standardized testing

program and had been involved in the pilot testing of several curricular programs and (structural) organizational changes for several years preceding the implementation of WIS-SIM. Additional changes continued during the WIS-SIM implementation, as well. In any event, the inability to have pre-implementation and comparison data greatly limited the information available to assess the changes and effects associated with system implementation.

GENERAL CONCLUSIONS

The pilot test of WIS-SIM is important as a proof of concept, but does not provide strong evidence that this system is cost effective in improving educational outcomes. The test demonstrates that a system supportive to an individualized system of education can be designed, developed and implemented successfully. Teachers can be trained to use the system and these teachers describe the system as useful in the management of instruction. The evidence of system effects is based on teacher perceptions more than on hard data. The distribution of teacher's time does appear to be changing in the direction predicted; that is, teachers are spending less time on clerical activities and more time on planning and instruction. System costs, while high at present, are not so extreme that it would be impossible for a school district to implement the system. Off-setting costs, such as reduced aide time for performing record keeping, need to be taken into account when weighing the costs and benefits of adopting the system.

In the first chapter of this report, six WIS-SIM objectives and six design goals were presented. On the basis of the evidence presented, it is concluded that the six objectives have been achieved. While additional investigation is required in the areas of classifying instructional decisions and providing useful information to instructional decision makers at appropriate times, this project did have significant impact in these areas.

Most of the six design goals have also been achieved. Design goal six has not yet been achieved, as the system is just now in the process of being implemented beyond the original pilot test schools. The current work of the project on the use of microprocessors for CMI support could have a significant, beneficial impact on this goal. Evidence presented in this report suggests that the remaining design goals were achieved. Design goal four, making minimal demands on teachers to learn the system, is an important one, but the time required for teachers to learn the system well enough to use it effectively is substantial; yet learning the system is critical to its successful implementation.

The system, as pilot tested, may need to be scaled down, to be run more efficiently and economically on smaller computers. Strategies

for more cost-effective utilization of the system need to be explored. On-line report generation, for example, may not be essential or, if it is necessary, it would appear to be so for only a very small percentage of information requests. The utilization of over-night report generation would reduce costs, with little sacrifice in system utility. Perhaps some reports can be produced at regular intervals, rather than generating all reports in direct response to teacher requests.

Further study of the implementation of instructional management information systems would be of considerable value. Teachers participating in the pilot test of WIS-SIM were involved to a considerable extent in the design and refinement of the system. When this system is implemented in other schools, teachers in these schools will not have so much involvement in the system design. Information is needed on strategies for effective system implementation under such circumstances. The importance of training these personnel has been emphasized, but the effects of their involvement in system design on successful implementation are not known.

It should be clear from the findings of this report that, although considerable progress has been achieved in the application of computer technology to education, we still have much to learn. The two years of WIS-SIM pilot test efforts reviewed in this report, however, should provide a framework and foundation for continuing research and development.

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APPENDIX A

SYSTEM FUNCTIONING EVALUATION INSTRUMENTS

Appendix A

WIS-SIM INSERVICE

FALL, 1975

POST-TEST

I. Part of a Unit Performance Profile for DMP is reproduced below. Use the information in this report to answer the questions below.

DEVELOPING MATHEMATICAL PROCESSES

UNIT PERFORMANCE PROFILE — PAGE 1
UNIT.A R&D DEMONSTRATION SCHOOL — AS OF 07-29-75

NAME	TOPIC: 12	13	14				15		
OBJECTIVE:	1	1	1	2	3	4	1	2	3
ADAMS ALAN	M	M	M	M	M	M			
ANDERSON ANDY	M	M	N	N	N	N	M	P	P
BAILEY BRIAN	M	M	M	M	M	M			
BECK BARBARA	M	N	M	M	M	M			

1. How many students have mastered Topic 14, Objective 1?
2. What was Andy Anderson's latest rating on Topic 15, Objective 3?

II. Part of an Individual Performance Profile for WDRSD is reproduced below. Use the information in this report to answer the questions below.

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

INDIVIDUAL PERFORMANCE PROFILE PAGE 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 05-27-75

STUDENT NAME : SCHMIDT, SUSAN
STUDENT NO. : 9000

AREA : WORD ATTACK

	SKILL	ATTEMPTS	LAST SCORE	DATE
A-01	RHYMING WORDS	3	47	02-01-75
A-02	RHYMING PHRASES	1	M	08-01-74
A-03	SHAPES	1	M	08-01-74
A-04	LETTERS, NUMBERS	1	M	08-01-74
A-05	WORDS, PHRASES	1	M	08-01-74
A-06	COLORS	1	M	08-01-74
A-07	INITIAL CONSONANTS	2	M	12-01-74

1. When was Susan Schmidt last assessed on Level A, Skill 2?

2. How many Level A skills has Susan Schmidt mastered?

III. Part of an Instructional Grouping Recommendation-Group report for DMP is reproduced below. Use the information in this report to answer the questions below.

DEVELOPING MATHEMATICAL PROCESSES

INSTRUCTIONAL GROUPING RECOMMENDATION - GROUP PAGE 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 08-21-75

TOPIC 23 : ORDER SENTENCES

PREREQUISITE : M OR P RATING ON OBJECTIVES 1 THRU 5 OF TOPIC 21. FOR ACTIVITIES 23C AND 23F, M OR P RATING ON OBJECTIVES OF TOPIC 22.

INDEX#	NAME	OBJECTIVE: 1	2	3	4	5	ATTEMPTS
1	*1 CHRISTENSEN CHRIS	P	P	P	N	M	9
2	GOLDSTEIN GINA	M	M	M	P	M	5
3	HUBBARD HOPE						0
4	KOCH KENNETH	N	N	N	N	N	16
5	KRUEGER KEVIN	P	P	M	N	N	9

1. How many times has Kenneth Koch been assessed on the objectives of Topic 23?
2. What rating did Gina Goldstein receive the last time she was assessed on Topic 23, Objective 5?
3. Which student has never been assessed on the objectives of this topic?

IV. A Prerequisite Deficiency Report for DMP is reproduced below.

Use the information in this report to answer the question below.

DEVELOPING MATHEMATICAL PROCESSES

PREREQUISITE DEFICIENCY REPORT PAGE 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 07-29-75

TOPIC 15 : TWO-DIMENSIONAL SHAPE

PREREQUISITE : M OR P RATING ON OBJECTIVE 1 OF TOPIC 8 AND ON OBJECTIVES 1 THRU 4 OF TOPIC 14. IF NEW TO DMP, RECOGNITION OF PRINTED NUMERALS LESS THAN AND INCLUDING 10 AND UNDERSTANDING OF SPOKEN NUMBER WORDS.

THE FOLLOWING PUPILS ARE NOT READY FOR TOPIC 15 BECAUSE ACHIEVEMENT NOT ASSESSED (NA) OR INSUFFICIENT (I). NO MARK INDICATES SUFFICIENT ACHIEVEMENT (N, P, OR M).

	TOPIC:	8	14			
NAME	OBJECTIVE:	1	1	2	3	4
ANDERSON ANDY			I	I	I	I
ELLIOTT ELMA			NA		NA	I
FREY FRANK					NA	
KAISER KARL				I		
PALMER PETER			NA	NA	NA	NA
PUTNAM PATTY				I		

How many students have received assessments on Topic 14, Objective 4 which are <u>not</u> sufficient to meet the prerequisite for Topic 15?

V. Identify the meaning of the following symbols:

1. NM
2. P
3. TC

VI. On your answer sheet, circle the letter of the one best response.

1. Your principal has requested a report on the achievement status of students in your unit on skills in all three areas of WDRSD. Which report would you request?

A. Unit Performance Profile
B. Individual Performance Profile
C. Grouping Recommendations
D. Prerequisite Deficiency Report
E. Score Submission Form
F. Objective Checklist Card

2. From your DMP resource manual, you have identified several geometric topics. You would like to form new instructional groups to work on these topics. Which report would you request?

A. Unit Performance Profile
B. Individual Performance Profile
C. Grouping Recommendations
D. Prerequisite Deficiency Report
E. Score Submission Form
F. Objective Checklist Card

3. The primary role of the computer in WIS-SIM is to:

A. provide instruction for students in WDRSD and DMP.

B. process information for instructional decision-makers.

C. make decisions for teachers.

D. score test data.

VII. Assume that you are Chris Jones, a teacher in Unit C at Abraham Lincoln Elementary School You are preparing to form new instructional groups in math. After studying your unit performance profile, you decide to request groupings for topics 10, 12, 13, 17, 18, and 19. Complete the Report Request Form attached to the answer sheet to show this request.

CHECKLIST OF TERMINAL COMPETENCIES FOR COMPUTER AIDES

1. Ability to dial the computer, place telephone in modem and log on. ☐
2. Ability to read and interpret report request forms. ☐
3. Ability to request all WIS-SIM reports in WDRSD and DMP. ☐
4. Ability to submit student achievement information through the card reader. ☐
5. Ability to submit student achievement information through the terminal. ☐
6. Ability to log-off the computer and turn off the terminal and modem. ☐

Name: _____

School: _____

REVIEW INSERVICE EVALUATION

Fall, 1976

The questions on this page ask for your attitudes about using WIS-SIM. There are no right or wrong answers to these questions.

1. How are you feeling about CMI?

Very Favorable				Very Unfavorable
1	2	3	4	5

2. Do you think that CMI will be helpful to you in making instructional decisions?

Very Helpful				Not at all Helpful
1	2	3	4	5

3. In the space below, write a word, phrase or sentence that summarizes the feelings that you have about CMI at this time. What suggestions might you have?

4. Do you anticipate any problems using WIS-SIM during the coming school year?

5. Was this one-hour WIS-SIM review and inservice sufficient to refresh your knowledge of the system?

6. Please indicate suggestions for future review inservices (e.g., scope of inservice, length of time, materials, method of presentation, etc.).

(If more space is needed, use the back of this sheet.)

APPENDIX B

SYSTEM UTILIZATION EVALUATION INSTRUMENTS

SECTION C: USAGE OF REPORTS (To be completed by unit leaders, teachers, and aides.)

For each of the following forms, indicate the various uses you have made of the form and the frequency of these uses. It is assumed that forms have been used for their stated purposes and hence their uses need not be reported. The emphasis in this section is on the other uses of WIS-SIM reports made by users. Also indicate the frequency of these other uses.

Report	Purpose	Other Uses	Frequency of Use Per Semester
Unit Performance Profile	To determine the achievement status of students in a unit.		
Individual Performance Profile	To provide achievement information for an individual student.		
Instructional Grouping Recommendation - Summary	To identify students who need instruction in the skill requested.		
Instructional Grouping Recommendation - Omissions	To identify students who were not placed in any group for the skills requested.		
Prerequisite Deficiency Report	To show the prerequisite achievement status of students ineligible for a requested topic.		

Please indicate any other uses who have found for WIS-SIM reports:

USER EVALUATION OF CMI FORMS

Appropriateness of the Format of CMI Report and Request Forms

Rate the appropriateness of the format of each of the following forms by circling the number on each scale which you consider best indicates your assessment.

As you assess each form, examine its format in the Teacher's Guide For Decision Making Using a Computer Managed Instruction System for IGE. Some aspects of format or design include its arrangement, spacing, size, inclusion of all essential data, inclusion of unessential data. Your assessments should focus on aspects of format and not on the usefulness of the reports themselves in educational decision making. The usefulness of the reports will be assessed at a later date.

ONLY ASSESS FORMS WHICH YOU HAVE PREVIOUSLY USED. OTHERWISE LEAVE BLANK.

Form	Appropriate				Inappropriate
	1	2	3	4	5
Unit Performance Profile					
DMP	1	2	3	4	5
WDRSD	1	2	3	4	5

Suggestions for Improvement

Individual Performance Profile

DMP	1	2	3	4	5
WDRSD	1	2	3	4	5

Suggestions for Improvement

Instructional Grouping Recommendation - Group

DMP	1	2	3	4	5
WDRSD	1	2	3	4	5

Suggestions for Improvement

Instructional Grouping Recommendation - Summary

DMP	1	2	3	4	5
WDRSD	1	2	3	4	5

Suggestions for Improvement

Instructional Grouping Recommendation - Omission

DMP	1	2	3	4	5
WDRSD	1	2	3	4	5

Suggestions for Improvement

Score Submission Form

WDRSD

1 2 3 4 5

Suggestions for Improvement

DMP Instructional Group Roster - Card Inserts

1 2 3 4 5

Suggestions for Improvement

DMP Objective Checklist Cards

1 2 3 4 5

Suggestions for Improvement

DMP Grading Update Report - Group

1 2 3 4 5

Suggestions for Improvement

DMP Prerequisite Deficiency Report

1 2 3 4 5

Suggestions for Improvement

CMI Report Request Form
(N.B. Illustration in Teacher's Guide has been superseded)

1 2 3 4 5

Student Status Report Form

1 2 3 4 5

Suggestions for Improvement

UNDERLINE ONE OF THE FOLLOWING TO INDICATE YOUR POSITION:

ADMINISTRATOR COMPUTER AIDE TEACHER

SECTION B: USEFULNESS OF REPORTS (To be completed by unit leaders, teachers, and aides)

Rate the usefulness of the information contained in each of the following reports by circling the number on each scale which you consider best indicates your assessment. Aspects of informational utility include the relevance of the information to the decisions you make about the instruction of students, the adequacy of the amount of information, and the accuracy of the information.

ONLY ASSESS REPORTS WHICH YOU HAVE PREVIOUSLY USED. OTHERWISE LEAVE BLANK.

Report	Very Useful 1 2 3 4 5 Not Useful	Suggestions for Improvement
Unit Performance Profile	1 2 3 4 5	
Individual Performance Profile	1 2 3 4 5	
Instructional Grouping Recommendation - Summary	1 2 3 4 5	
Instructional Grouping Recommendation - Omissions	1 2 3 4 5	
Prerequisite Deficiency Report	1 2 3 4 5	

COMPUTER APPLICATIONS IN IGE EVALUATION

1976-1977

Included in this form are examples of the seven WIS-SIM forms:

1. Unit Performance Profile
2. Individual Performance Profile
3. Instructional Grouping Recommendation-Summary
4. Instructional Grouping Recommendation-Omission
5. Prerequisite Deficiency Report
6. Skill Eligibility Profile
7. Instructional Grouping Recommendation-Group

The purpose of this form is to assist in determining (a) the usefulness of WIS-SIM reports, (b) suggestions for improving the reports, and (c) the frequency of use of each of the reports.

DIRECTIONS

A. Rate the usefulness of the information contained in each of the following reports by circling the number on each scale which you consider best indicates your assessment. Aspects of informational utility include the relevance of the information to the decisions you make about the instruction of students, the adequacy of the amount of information, and the accuracy of the information.

B. Indicate any suggestions you might have for improving the report (addition or deletion of information, format, clarity, etc.).

C. If you have found additional uses of this report other than the usage stated by the given purpose, please indicate these uses.

D. How often do you use this report each week (estimate)?

1. UNIT PERFORMANCE PROFILE

PURPOSE: To determine the achievement status of students in a unit.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

UNIT PERFORMANCE PROFILE
UNIT A R&D DEMONSTRATION SCHOOL

AS OF 04-20-77

NAME	TOPIC: 24 OBJECTIVE: 1	2	3	4	5	25 1	2	26 1	2
ADAMS ALAN	M	M	M	M	M	M	P		
BAILEY BRIAN	MP	MP	MP	MP	MP	P	M	M	M
BERG BECKY	M	M	M	M	M	M	M	M	M
BRIGGS BRUCE	M	M	M	M	M			M	N
CARLSON CARL	M	M	M	M	M	M	M	M	M
COHEN CATHY	M	M	M	M	M	N	P	M	P
DAVIS DAVID	M2	M	M	M	M	M	M	M	M
DOYLE DIANE	M	M	M	M	P	M	M	M	M
FARMER FRED	M	M	M	M	M	M	M	M	M
FREY FRANK									
HALL HARRY	M2								
HENDERSON HARVEY	M2								
KRUEGER KEVIN									
LEWIS LINDA	M	M	M	M	M	M	M	M	M
MALONEY MARY	M	M	M	M	P	M		M	P
MCGUIRE MIKE	M	M	M	M	M	P		M	M
MOORE MICHAEL	M	M	M	M	M	M	M	M	M
OLSEN OTTO	M	M	M	M	P	P	P		
PERRY PAMELA	M	M	M	M	M	P	P	M	P
PUTNAM PATTY	M	M	N	P	M	P	M	M	M
ROBERTS RICHARD	M	M	M	M	M	M	M	M	M
SCHAMFER SAMUEL	MP	MP	MP	MP	NP	P	MP		
SCOTT STEVEN	M2								
SMITH SHARON	M2								
TAYLOR TIMOTHY	M2								

2. INDIVIDUAL PERFORMANCE PROFILE

PURPOSE: To provide achievement information for an individual student.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

INDIVIDUAL PERFORMANCE PROFILE
UNIT A R&D DEMONSTRATION SCHOOL

AS OF 04-20-77

COHEN CATHY

TOPIC 24 : THE NUMBERS 0-20

OBJECTIVE 1 : STATES NUMBER FOR SET 11-20
9- 8-76 M 1- 1-76 N

OBJECTIVE 2 : READS NUMBER 11-20
9- 8-76 M 5-24-76 M

OBJECTIVE 3 : WRITES NUMBER 11-20
9- 8-76 M 5-24-76 P

OBJECTIVE 4 : REPRESENTS NUMBER 11-20
9- 8-76 M 5-24-76 M

OBJECTIVE 5 : ORDERS NUMBERS 0-20
9- 8-76 M 5-24-76 M

TOPIC 25 : REPRESENTING EQUALIZING SITUATIONS

OBJECTIVE 1 : WRITES EQUALIZATION SENTENCE
4-30-76 N

OBJECTIVE 2 : CHOOSES EQUALIZATION SENTENCE
4-30-76 P

TOPIC 26 : MOVEMENT AND DIRECTION

OBJECTIVE 1 : CONSTRUCTS PATH GIVEN POINTS
4-14-76 M

OBJECTIVE 2 : STATES POINTS
4-14-76 P

TOPIC 27 : OTHER EQUALIZING SITUATIONS
NOT YET ASSESSED ON ANY OBJECTIVE

TOPIC 28 : SYMMETRY, FRACTIONS, AND SHAPE
NOT YET ASSESSED ON ANY OBJECTIVE

TOPIC 29 : JOINING AND SEPARATING SITUATIONS
NOT YET ASSESSED ON ANY OBJECTIVE

3. INSTRUCTIONAL GROUPING RECOMMENDATION-SUMMARY

PURPOSE: To identify students who need instruction in the skill requested.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

INSTRUCTIONAL GROUPING RECOMMENDATION - SUMMARY
UNIT A R&D DEMONSTRATION SCHOOL

AS OF 04-20-77

STUDENTS RECOMMENDED FOR ONE OR MORE OF THE FOLLOWING TOPICS :

TOPIC 25 : REPRESENTING EQUALIZING SITUATIONS
TOPIC 26 : MOVEMENT AND DIRECTION
TOPIC 27 : OTHER EQUALIZING SITUATIONS
TOPIC 28 : SYMMETRY, FRACTIONS, AND SHAPE

*** THE NUMBER PRECEDING "X" INDICATES NUMBER OF OBJECTIVES IN THE TOPIC NOT YET MASTERED ***

STUDENT NO.	NAME	25	26	27	28	
60	ADAMS ALAN		2X			1
170	BRIGGS BRUCE	2X	1X		2X	3
205	CARLSON CARL			3X	2X	2
230	COHEN CATHY	2X			2X	2
310	DAVIS DAVID				2X	1
330	DOYLE DIANE			3X	2X	2
360	FARMER FRED				2X	1
430	HALL HARRY		2X			1
470	HENDERSON HARVEY		2X			1
630	KRUEGER KEVIN		2X			1
650	LEWIS LINDA			3X	2X	2
670	MALONEY MARY	1X			2X	2
690	MCGUIRE MIKE	2X			2X	2
710	MOORE MICHAEL			2X		1
730	OLSEN OTTO		2X	3X		2
750	PERRY PAMELA			3X	2X	2
790	ROBERTS RICHARD			3X	2X	2
805	SCHAMFER SAMUEL			2X		1
830	SCOTT STEVEN		2X			1

4. INSTRUCTIONAL GROUPING RECOMMENDATION-OMISSIONS

PURPOSE: To identify students who were not placed in any group for the skills requested.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

INSTRUCTIONAL GROUPING RECOMMENDATION - OMISSION PAGE 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 04-20-77

STUDENTS NOT INCLUDED IN THE GROUPING RECOMMENDATIONS FOR THE FOLLOWING TOPICS :

TOPIC 25 : REPRESENTING EQUALIZING SITUATIONS
TOPIC 26 : MOVEMENT AND DIRECTION
TOPIC 27 : OTHER EQUALIZING SITUATIONS
TOPIC 28 : SYMMETRY, FRACTIONS, AND SHAPE

NAME	TOPICS RECOMMENDED		
BAILEY BRIAN	29	30	34
BERG BECKY	29	30	34
FREY FRANK	1	2	16
PUTNAM PATTY	24	29	34

5. PREREQUISITE DEFICIENCY REPORT

PURPOSE: To show the prerequisite achievement status of students ineligible for a requested topic.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

PREREQUISITE DEFICIENCY REPORT PAGE # 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 04-20-77

TOPIC 27 : OTHER EQUALIZING SITUATIONS

PREREQUISITE : M OR P-RATING ON OBJECTIVES 1 AND 2 OF TOPIC 25.

THE FOLLOWING PUPILS ARE NOT READY FOR TOPIC 27 BECAUSE ACHIEVEMENT NOT ASSESSED (NA) OR INSUFFICIENT (I). NO MARK INDICATES SUFFICIENT ACHIEVEMENT.

NAME	TOPIC: 25 OBJECTIVE: 1	2
BRIGGS BRUCE	NA	NA
COHEN CATHY	I	
FREY FRANK	NA	NA
HAUL HARRY	NA	NA
HENDERSON HARVEY	NA	NA
KRUEGER KEVIN	NA	NA
MALONEY MARY		NA
MCGUIRE MIKE		NA
SCOTT STEVEN	NA	NA
SMITH SHARON	NA	NA
TAYLOR TIMOTHY	NA	NA

NUMBER OF PUPILS DEFICIENT IN THIS TOPIC = 11

6. SKILL ELIGIBILITY PROFILE

PURPOSE: To show how many students have mastered a particular skill, how many are eligible, and how many are not eligible because of prerequisities.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

SKILL ELIGIBILITY PROFILE
UNIT A RND DEMONSTRATION ELEMENTARY SCHOOL

PAGE 1
AS OF 04-20-77

SKILL	MASTERED	ELIGIBLE	NOT ELIGIBLE
WA-B-01	14	8	3
WA-B-02	13	9	3
WA-B-03	13	8	4
WA-B-04	10	4	11
WA-B-05	10	1	14
WA-B-06	7	14	4
WA-B-07	6	15	4
WA-B-08	5	6	14
WA-B-09	8	13	4
WA-B-10	5	16	4
WA-B-11	4	17	4
WA-B-12	8	0	17
WA-B-13	6	2	17
SS-B-01	9	9	7
SS-B-02	5	11	9
SS-B-03	9	9	7
SS-B-04	7	15	3

NO. OF STUDENTS IN UNIT = 25

7. INSTRUCTIONAL GROUPING RECOMMENDATION-GROUP

PURPOSE: To recommend students who have met prerequisites for objectives but not yet mastered it.

A. User Rating:

Very Useful — 1 2 3 4 5 — Not Useful

(circle one)

B. Suggestions for Improvement of Report:

C. Uses of This Report Other Than Above Purpose:

D. Estimated Frequency of Use Per Week:

DEVELOPING MATHEMATICAL PROCESSES

INSTRUCTIONAL GROUPING RECOMMENDATION - GROUP PAGE 1
UNIT A R&D DEMONSTRATION SCHOOL AS OF 04-20-77

TOPIC 27 : OTHER EQUALIZING SITUATIONS

PREREQUISITE : M OR P RATING ON OBJECTIVES 1 AND 2 OF TOPIC 25.

INDEX#	NAME	OBJECTIVE: 1	2	3	ATTEMPTS
1	CARLSON CARL				0
2	DOYLE DIANE				0
3	LEWIS LINDA				0
4	MOORE MICHAEL	M	N	N	3
5 *1	OLSEN OTTO				0
6	PERRY PAMELA				0
7	ROBERTS RICHARD				0
8	SCHAMFER SAMUEL	N	P	M	3

NUMBER OF STUDENTS NOT ELIGIBLE DUE TO :
(1) TOPIC ALREADY MASTERED OR IN PROGRESS = 6
(2) ENROLLMENT IN A GROUP TEACHING THE TOPIC = 0
(3) FAILURE TO SATISFY PREREQUISITES = 11

USER IDENTIFICATION OF SCHOOL TASKS AFFECTED BY CMI

This questionnaire is designed to identify those school tasks which are supported by computerized procedures; that is, by CMI. To be considered computer supported, a task should involve the use of computer printouts in carrying out the task.

For each task listed below, two responses are required.

A. First, select from the following four descriptions that one which best describes the involvement of CMI in the task.

(1) The task involves a CMI procedure which has completely replaced a manual procedure.

(2) The task involves a CMI procedure which has partially replaced a manual procedure.

(3) The task is new and extra because of CMI.

(4) The task has not been affected by CMI.

TO INDICATE YOUR CHOICE CIRCLE THE APPROPRIATE NUMBER

B. Second, respond YES or NO to the following question about each task.

Has your role or responsibilities in the task changed because of CMI?

TO INDICATE YOUR CHOICE CIRCLE EITHER "YES" OR "NO"

EXAMPLE

TASK		RESPONSES
Evaluating Individual Student Progress	A B	1 (2) 3 4 (Yes) No

The above illustrative responses indicate that the respondent considers the task referred to involves a CMI procedure which has partially

replaced a manual procedure and that her role in the task has been changed because of CMI.

TASK		RESPONSE
1. Identifying individual student instructional needs	A B	1 2 3 4 Yes No
2. Assessing student learning outcomes	A B	1 2 3 4 Yes No
3. Maintaining unit performance profiles	A B	1 2 3 4 Yes No
4. Maintaining individual profiles	A B	1 2 3 4 Yes No
5. Comparing the status of students in unit to school, system or other norms	A B	1 2 3 4 Yes No
6. Assessing the attainment of unit goals	A B	1 2 3 4 Yes No
7. Assessing the attainment of individual student goals	A B	1 2 3 4 Yes No
8. Formulating unit goals	A B	1 2 3 4 Yes No
9. Developing instructional objectives for each child in the unit	A B	1 2 3 4 Yes No
10. Evaluating learning activities with respect to unit goals	A B	1 2 3 4 Yes No

TASK		RESPONSE
11. Grouping students for instructional purposes	A B	1 2 3 4 Yes No
12. Counseling students about their progress and future schooling	A B	1 2 3 4 Yes No
13. Selecting appropriate materials, media, and supplies for instruction.	A B	1 2 3 4 Yes No
14. Evaluating unit operation	A B	1 2 3 4 Yes No
15. Assessing the status of entering students	A B	1 2 3 4 Yes No
16. Maintaining school's inventory of instructional materials	A B	1 2 3 4 Yes No
17. Reporting school's progress to central administration.	A B	1 2 3 4 Yes No
18. Reporting student progress to parents	A B	1 2 3 4 Yes No
19. Maintaining permanent school records of students' progress	A B	1 2 3 4 Yes No
20. Developing daily teaching schedules	A B	1 2 3 4 Yes No
21. Assessing students in terms of their learning characteristics	A B	1 2 3 4 Yes No

TASK		RESPONSE
22. Evaluating instructional programs (e.g., SAPA, WDRSD, DMP)	A B	1 2 3 4 Yes No
23. Communicating student information to state agencies	A B	1 2 3 4 Yes No
24. Updating student performance information	A B	1 2 3 4 Yes No
25. Marking or scoring tests	A B	1 2 3 4 Yes No
26. Determining rate of progress of individual students	A B	1 2 3 4 Yes No
27. Determining students' readiness for the next instructional step	A B	1 2 3 4 Yes No
IT IS IMPORTANT THAT YOU LIST BELOW ANY COMPUTER SUPPORTED TASKS NOT MENTIONED ABOVE AND ALSO TO COMPLETE THE RESPONSES.		
28.	A B	1 2 3 4 Yes No
29.	A B	1 2 3 4 Yes No
30.	A B	1 2 3 4 Yes No

APPENDIX C

SYSTEM EFFECTS EVALUATION INSTRUMENTS

Appendix C

the Wisconsin Research and Development Center for Cognitive Learning

the University of Wisconsin, 1025 West Johnson Street, Madison, Wisconsin 53706 (608) 262-4901

April 8, 1976

Re: Time Usage Survey

As part of the evaluation of CMI, we are asking user schools to participate in a survey designed to determine what affect CMI is having on the proportion of time school personnel spend on planning, instructional and clerical tasks.

Please find enclosed Time Usage Forms. Directions for completing the forms are on their reverse sides. If you feel the need to break the one hour time blocks down into smaller segments, please do not do so with less than 15 minute blocks. Attached is a used form which may be of help in interpreting the directions.

We are asking all administrators, teachers, and aides who are using the computer services of CMI to complete a time usage form. Please select any half of these staff to complete the form for any one week and the other half of the staff for the following week. The particular weeks chosen should be "normal" school times; that is, times which will produce information representative of general school activities and give a fair indication of the times spent by staff on planning tasks, instructional tasks, and clerical tasks. In cases where teachers are absent, please ask the substitute teacher to complete the form as far as is possible for that day(s).

The selection of the weeks in which the survey is to be conducted and the selection of the staff to be surveyed during each of the two different weeks is at the discretion of the principal. However, the forms should be returned to me at the Research and Development Center during the first week of May. If you have any questions about the Time Usage Survey, please contact me at (608) 263-3099.

Thank you for your cooperation.

Yours sincerely,

Brian Lawrence

Brian Lawrence
Evaluator, WIS-SHM Project

QUESTIONNAIRE TO BE

COMPLETED BY THE PRINCIPAL

As an aid to interpreting the data collected as part of the present Time Usage Survey and as an aid in its comparison with data collected in earlier surveys, please provide the following information.

A.

	1975	1976
1. Number of students	_____	_____
2. Number of teachers (F.T.E.)	_____	_____
3. Number of aides	_____	_____
4. Number of aides using computers	_____	_____
5. Number of school administrators	_____	_____

B. For the period of the present Time Usage Survey, are there any school related activities which may have unusually pronounced affects on the times allocated to clerical, planning and instructional activities by teachers, administrators or aides and which may give misleading estimates of the various times?

(a) TEACHERS: (including unit leaders) Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

(b) ADMINISTRATORS: Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

(c) AIDES: Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

C. Only to be completed for schools which participated in the 1975 CMI Time Usage Survey.

Percentage Changes In Times Spent in Different Tasks By Different Personnel Since the Last Time Usage Survey

Please indicate whether there have been any attempts to increase or decrease the percentages of time spent on planning, instructional, and clerical tasks by administrators, teachers, and aides since the last Time Usage Survey in 1975. (For example, these changes may have been attempted by hiring additional clerical help or reallocation of duties.)

Complete the table on the following page indicating your estimate of an increase as + and decreases as -.

	% Change in Planning Time	% Change in Instructional Time	% Change in Clerical Time
Administrators			
Teachers			
Aides			

TIME USAGE FORM

The CMI Project now being used by your school has several goals. One of the primary aims is to aid staff members by reducing the amount of time spent doing clerical work. We hope to reach this goal by having the computer do some of the clerical work and provide you with information that will facilitate the decisions made in planning. In order to evaluate the progress towards these ends we need to collect data on how your time is spent at several stages of the project. This form will provide us with information regarding your current time usage and will be used for comparison with your time usage later on.

Please fill out this chart on a daily basis, writing in P, I, or C in each hour block during the day and adding an estimate of any hours after the work day spent on any of these activities. Please indicate your position by circling the appropriate title or writing in your position if you have any question as to which category you fall into.

The more accurate and candid your information is, the better CMI will be able to evaluate how well we are assisting you and where we can improve our efforts. Thank you for your cooperation.

TIME USAGE FORM

P - Planning Hours: attending staff meetings, organizing instruction and materials, etc.

I - Instructing Hours: teaching, other activities directly interfacing students.

C - Clerical Hours: filling out forms, writing reports, grading, etc.

Week: _____ - _____ Position: Teacher, Unit Leader, Administrator, Secretary, Aide, etc. _____

HOURS OF THE DAY

DAY	7	8	9	10	11	12	1	2	3	4	5	6	Other
Sunday (If applicable)													
Monday													
Tuesday													
Wednesday													
Thursday													
Friday													
Saturday (If applicable)													

SCHOOL _____

DATE _____

CHANGES IN SCHOOL OPERATIONS

To be completed by administrators and unit leaders.

Indicate below any changes in the activities of the school which you consider have been the result of implementing the WIS-SIM CMI system. Please provide a sentence description of each activity. Changes include new activities introduced as a result of CMI, activities deleted as a result of CMI, and activities modified as a result of CMI. Please list such activities under the headings of:

In-Services (Indicate length and frequency)

Meetings (Indicate length and frequency)

Consultations With Curriculum Specialists (Indicate frequency)

Changes in the School Schedule

Changes in Communication Procedures

Other Changes in School Operations

QUESTIONNAIRE TO BE

COMPLETED BY THE PRINCIPAL

As an aid to interpreting the data collected as part of the present Time Usage Survey and as an aid in its comparison with data collected in earlier surveys, please provide the following information.

A.

	1975	1976
1. Number of students	_____	_____
2. Number of teachers (F.T.E.)	_____	_____
3. Number of aides	_____	_____
4. Number of aides using computers	_____	_____
5. Number of school administrators	_____	_____

B. For the period of the present Time Usage Survey, are there any school related activities which may have unusually pronounced affects on the times allocated to clerical, planning and instructional activities by teachers, administrators or aides and which may give misleading estimates of the various times?

(a) TEACHERS: (including unit leaders) Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

(b) ADMINISTRATORS: Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

(c) AIDES: Yes _____ No _____

Description of Unusual Activities: _____

_____

_____

C. Only to be completed for schools which participated in the 1975 CMI Time Usage Survey.

Percentage Changes in Times Spent in Different Tasks By Different Personnel Since the Last Time Usage Survey

Please indicate whether there have been any attempts to increase or decrease the percentages of time spent on planning, instructional, and clerical tasks by administrators, teachers, and aides since the last Time Usage Survey in 1975. (For example, these changes may have been attempted by hiring additional clerical help or reallocation of duties.)

Complete the table on the following page indicating your estimate of an increase as + and decreases as -.

	% Change in Planning Time	% Change in Instructional Time	% Change in Clerical Time
Administrators			
Teachers			
Aides			

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Wayne Otto
Center Co-directors

Wayne Otto
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Marvin J. Fruth
Area Chairperson
Studies of Implementation of Individualized Schooling

Herbert J. Klausmeier
Area Chairperson
Studies of Instructional Programming for the Individual Student

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