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ABSTRACT

This study investigated time allocated to instruction as a function of the specific type of mild handicap and as a function of setting and subject matter content. Subjects were 122 elementary students categorized as learning-disabled, emotionally/behaviorally disturbed, educable mentally retarded, and nonhandicapped. Subjects were in mainstreamed, resource room, and self-contained programs. A modified version of the CISSAR (Code for Instructional Structure and Student Academic Response) observation system was used. Twelve specific activities were coded (8 academic; 4 nonacademic); activities were coded every 10 seconds; and each student was observed on a whole-day basis. Results showed that few significant differences existed among the student categories in the amount of time allocated to various activities--the act of differential classification did not result in quantitative differences in the ways in which students spent their time in school. Compared to time spent in regular classes, a greater proportion of the time that students spent in special education classes was allocated to academic instruction. Mentally retarded students in self-contained classes spent significantly less time on academic instruction than mentally retarded students in resource rooms or regular education classes. (JDD)

University of Minnesota

RESEARCH REPORT NO. 1

TIME ALLOCATED TO INSTRUCTION OF MENTALLY RETARDED, LEARNING DISABLED, EMOTIONALLY DISTURBED, AND NONHANDICAPPED ELEMENTARY STUDENTS

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INSTRUCTIONAL ALTERNATIVES PROJECT

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Time Allocated to Instruction of Mentally Retarded, Learning Disabled, Emotionally Disturbed, and Nonhandicapped Elementary Students

The National Commission on Excellence in Education, in its report entitled A Nation at Risk (1983), raised concerns about the amount of time spent on instruction in U.S. schools. The Commission pointed out that American youth spend an average of six hours a day, 180 days a year in school, an amount of time significantly lower than the eight hour day, 220 day school year of other industrialized countries.

Concern about time allocated to instruction is not new; researchers have studied the topic for nearly 100 years. Between 1887 and 1898, for example, Joseph Rice conducted an investigation of spelling achievement as a function of the type and amount of instruction offered to students. In 1915, Holmes investigated time allocated to instruction in multiple curricular areas. He studied time allocation in 50 cities, and concluded that there was a significant disparity between official lists of allocated time and actual allocated time. And, Holmes noted significant variance across school districts in amount of time allocated to instruction in various subject areas. Variance in allocated time exists both within and across districts. And, it exists despite the fact that school districts have been attempting to regulate time allocated to instruction in specific subject matter areas.

The descriptive data collected and reported by Holmes probably would have been of little consequence had it not been for more recent models of instruction and studies linking allocated time to pupil achievement. Nearly all models of instruction (e.g., Anderson, 1985; Carroll, 1963; Harnischfeger & Wiley, 1976, 1985) include opportunity

to learn as an important determinant of learning outcomes. In Carroll's model, achievement is seen as a function of time spent in instruction and time needed to learn. Anderson views instructional outcomes as a function of the interaction between student characteristics, task requirements, and time spent in instruction.

We know much about how time is allocated to instruction for nonhandicapped elementary age children. The Beginning Teacher Evaluation Study (BTES) included considerable research on both allocated time and students' engaged times. And, the BTES is unique in that specific topics (e.g., time allocated to decoding vowel sounds) were investigated within the broad subject matter areas of math and reading. Fourteen overall findings were reported by the BTES (Fisher, Filby, Marliave, Cahen, Dishaw, Moore, & Berliner, 1985). With respect to allocated time, it was reported that: (a) amount of time allocated to instruction in specific content areas is positively correlated with achievement in those areas, (b) an increase in allocated time results in an increase in academic engaged time, and (c) there is significant variance among settings in time allocated to instruction. Results of the BTES investigation revealed that only about 58% of the school day was allocated to academic instruction for second and fifth graders, 23% of the school day was allocated to nonacademic subjects, and 19% to noninstructional activities (Rosenshine, 1980).

Another study of allocated time in regular education classrooms (Roehler, Schmidt, & Buchman, 1979) reported strikingly similar

results. These investigators found that an average of 63% of the school day was allocated to instructional activities and 37% to recess, lunch, and other non-instructional tasks. Teachers allocated the greatest percentage of time (approximately 29%) to reading and language arts instruction, followed by 10.5% of the day devoted to math instruction and 10.2% allocated to instruction in music, art, and physical education combined.

The Fisher et al. (1985) study reported mean percentage scores across classrooms whereas the Roehler et al. (1979) data represent individual class percentage scores. Analysis of inter-classroom comparisons within grade level, available in the Roehler et al. investigation, provides additional insights into the variability of allocated time at the elementary level. For instance, a 10% difference in teacher controlled non-instructional time between two second grade classrooms was found; this translated to a 108 hour yearly difference (Burns, 1984). Obviously, the type of specific information that can be derived from these allocated time studies is a function of research design, data collection, and data analysis methodology.

In studies of allocated time, the method used to collect data is a critical variable. Some projects (BTES, Guthrie, Martuza, & Seifert, 1976; Jacobsen, 1980; Kiesling, 1977) used teacher reports to collect information on allocated time. Others used direct classroom observation measures (Cooley & Leinhardt, 1980; Leinhardt, 1977). Several researchers have noted the discrepancy between time allocated

to instruction and the time actually spent in instruction (Felsenthal & Kirsch, 1978; Jacobsen, 1980). Given that teacher reports involve considerable margin of error, it is not surprising that the source of data may significantly affect results (Graden, Thurlow, & Ysseldyke, 1982). In fact, a few studies using teacher reports have failed to find a significant relationship between allocated time and pupil achievement (Harris & Serwer, 1966; Roehler et al., 1979). However, overall, the research results based on direct classroom observations support a positive association between time devoted to instruction and measures of student learning in those curricular areas.

We know little about how time is allocated to instruction for mildly handicapped students. State Departments of Education typically recommend specific time allocations for specific subject areas in elementary classrooms; but there are no guidelines for special education. In Minnesota, for example, prior to 1986 it was suggested that in primary grades teachers spend 34% of the day teaching language arts, 20% teaching reading, 14% in nonverbal communication tasks, and 13% of the day in mathematics instruction (Operations Division, 1980). Currently, allocated time requirements are broadly defined as follows:

> A reasonable balance among required curriculum offerings shall consist of the following distribution at a minimum, yearly: one-third for communications/language arts, one-third for mathematics, art, and music; one-third for science, social studies, physical education, and health; provided that the curriculum balance may be adjusted to accommodate the needs of individual students. Optional curriculum offerings shall not alter the balance among required curriculum offerings (Minnesota Department of Education, 1986, p. 5)

In 1983, Thurlow, Graden, Greener, and Ysseldyke looked at time allocated to various subject areas for LD students. They found that

about three hours of the 6½ hour school day were allocated to academic subjects. Most time was allocated to reading ($\bar{X}$ = 61 minutes), followed by math ($\bar{X}$ = 42 minutes). The allocated times were not statistically different from those found for nonhandicapped students. Still, we know little about the amount of time allocated to instruction in specific content areas for handicapped students who have been served under different categorical labels. And, we know little about the amount of time they are instructed in regular classes, special education classes, or other settings. In this study we investigated time allocated to instruction for different categories of mildly handicapped students, and allocated time as a function of setting and subject matter content. The following research questions were addressed:

1. To what extent are there differences in the amount of time allocated to instruction in specific subject matter areas for learning disabled (LD), emotionally/behaviorally disturbed (EBD), educable mentally retarded (EMR), and nonhandicapped students?

2. To what extent do different categories of students spend differing amounts of time being instructed in regular classes, resource rooms, and self-contained special education classes?

3. To what extent are there differences in the proportion of time allocated to specific subject matter instruction in different settings (regular classes, resource rooms, etc.)?

Method

Subjects

Subjects were 122 students (F = 67, M = 55) from 10 schools in two school districts (one urban, one suburban); 92 were school-

identified handicapped students (30 LD, 32 EBD, 30 EMR), and 30 were regular education students who received no extra services. Two additional EBD students were included because of data collection problems (e.g., delays due to suspension of students) encountered with this group. Distributions of students within districts were: suburban - 50 special education (17 LD, 18 EBD, 15 EMR), 20 regular education; urban - 42 special education (13 LD, 14 EBD, 15 EMR), 10 regular education. In both districts, LD students received Level 3 resource room services and EBD students received special education consultation and resource room services. EMR students received self-contained services in the suburban district and resource room and self-contained services in the urban district.

All students were in grades 2 (n = 36), 3 (n = 38), and 4 (n = 47), with the exception of one grade 5 EMR student in a 4/5 split grade classroom in the urban district. The students ranged in age from 91 to 146 months ($\bar{X}$ = 113 months). For LD students the age range was 91 to 136 months; for EBD students the age range was 97 to 137 months ($\bar{X}$ = 115 months); for EMR students the age range was 99 to 146 months ($\bar{X}$ = 119 months); and for regular education students the age range was 91 to 128 months ($\bar{X}$ = 109 months). Students were randomly selected within category from the special education teachers' caseloads, excluding those for whom parent permission had not been obtained. In addition two restrictions were applied: no mainstream teacher would have more than two students and no special education teacher would have more than four students involved in the study.

Observation System

A modified version of the CISSAR (Code for Instructional Structure and Student Academic Response) observation system was used in this study to obtain data on the quantity of instructional time. The original CISSAR system, developed by the Juniper Gardens Children's Project in Kansas City, Kansas (Greenwood, Delquadri, & Hall, 1978; Stanley & Greenwood, 1980), focuses the observation on the behavior of one target student (rather than sampling behaviors of several students). For this study, we were interested specifically in the activity in which the student was involved. This was recorded every 10 seconds. Twelve specific activities were coded: reading, math, spelling, handwriting, language, science, social studies, computer training, arts and crafts, free time, business management, and transition. The first eight activities were considered to be academic and the last four were considered to be nonacademic. An auditory electronic timer attached to a clipboard was used to signal the 10-second intervals. The timer was equipped with an earplug so that only the observer could hear the signal (a short beep sound).

Observers were trained in the observation system by project directors, and then required to reach mastery (100%) on training tests. Two days of classroom practice with adequate reliability was required before observations began. Adequate reliability was defined as 90% agreement.

Reliability checks were conducted 12 times during the study, with varying pairs of observers. During a reliability check, two observers

coded the same target student for 15 minutes. The range of inter-rater agreement levels during the 12 actual reliability checks was from 93% to 100%, with the average being 99.4%.

Procedure

Each student was observed on a whole-day (one observer all day) basis. Observations were not conducted during breaks, such as those for lunch, recess, and bathroom. Also, observers did not code during physical education, music, or special assembly programs since the observation system did not apply to these situations. Typically, observers did not code continuously for a period of more than two hours because of natural breaks within the school day. Observers did follow target students when they left their homerooms to go to other classrooms for other subjects (typically reading and/or mathematics), or when they went to the resource teacher for special instruction. Coding was conducted in these other classrooms in the same manner as in homerooms. Regardless of the physical setting, observers attempted to position themselves to be unobtrusive and to avoid revealing the identity of target students to the target students themselves or to other students. All observations were scheduled at the teacher's convenience; the student's name was revealed to the classroom teacher at the time of scheduling.

Teachers were instructed to respond typically and were not asked to do anything different or unusual during the classroom observations. They were told that we were interested in how different kinds of students respond to instruction and that we wanted to understand what

goes on in classrooms. Teachers accepted this willingly; several volunteered that we would see a typical day. Although the observers were never told the student's classification or level of service, they did follow them when they went to special settings. Thus, it is reasonable to assume they were able to differentiate handicapped and nonhandicapped students on this basis. All observations were completed between November and May.

Data Analysis and Design

In order to convert the observational data to estimates of total minutes spent in each activity, the number of 10-second intervals was summed over the entire day and divided by six. In addition, two composites were constructed from individual codes: Academic activities = reading, math, spelling, handwriting, language, science, social studies, computer training; Non-academic activities = arts/crafts, free time, class business/management, transition.

One-way analysis of variance was used to test differences among categories of students over the entire school day. Repeated measures ANOVAs were used to compare time within settings for the composite variables and for selected individual codes.

Results

Data on the average amount of time allocated to specific activities over one entire school day for each of the four groups of students are listed in Table 1. Also shown are the amounts of time allocated to academic and to nonacademic composite activities. For

Table 1

Time Allocated to Different Instructional Activities for Four Categories of Students

Activity	Category[a] LD (N=30)	EBD (N=32)	EMR (N=30)	NH (N=30)
Academic Composite				
$\bar{X}$	170.18	163.15	143.18	167.52
SD	33.6	31.1	34.3	28.1
Range	106-243	90-236	85-223	103-217
Nonacademic Composite				
$\bar{X}$	43.62	51.08	62.12	48.00
SD	21.5	22.7	28.8	23.5
Range	8-95	22-103	15-122	19-104
Reading				
$\bar{X}$	63.60	66.25	62.96	66.41
SD	26.5	29.3	20.2	26.5
Range	28-138	0-127	28-105	14-127
Math				
$\bar{X}$	45.26	36.76	27.77	38.76
SD	19.9	19.0	20.9	15.7
Range	18-96	0-75	0-85	0-72
Spelling				
$\bar{X}$	10.03	11.23	10.92	10.44
SD	10.1	9.8	15.4	10.1
Range	0-31	0-33	0-66	0-32
Handwriting				
$\bar{X}$	4.63	5.36	6.17	6.02
SD	7.9	10.2	10.7	15.1
Range	0-28	0-36	0-49	0-68
Language				
$\bar{X}$	19.68	15.02	16.03	11.57
SD	22.2	20.4	20.9	19.0
Range	0-101	0-80	0-72	0-65

Table 1 (Continued)

Science				
$\bar{X}$	9.62	3.70	3.89	12.37
SD	15.3	6.9	7.7	16.7
Range	0-54	0-25	0-27	0-64
Social Studies				
$\bar{X}$	14.60	21.18	13.11	21.66
SD	18.4	22.4	16.7	18.3
Range	0-61	0-80	0-67	0-58
Computer Training				
$\bar{X}$	2.77	3.66	2.34	.29
SD	7.2	7.4	6.5	1.3
Range	0-30	0-26	0-24	0-7
Arts and Crafts				
$\bar{X}$	2.21	2.78	6.01	6.19
SD	6.8	8.3	11.1	12.3
Range	0-24	0-34	0-37	0-40
Free time				
$\bar{X}$	3.77	4.42	9.29	2.72
SD	6.9	6.8	12.3	5.2
Range	0-27	0-30	0-56	0-17
Business Management				
$\bar{X}$	21.66	25.15	26.88	21.02
SD	14.3	18.6	16.3	15.6
Range	3-74	0-88	5-66	1-77
Transition				
$\bar{X}$	15.99	18.73	19.94	18.05
SD	10.8	9.9	11.9	9.4
Range	2-34	1-37	3-59	4-40

[a]Categories are: LD = learning disabled, EBD = emotionally/behaviorally disturbed, EMR = educable mentally retarded, NH = nonhandicapped

each category, we have shown the average, standard deviation, and range in allocated times for each of the content areas and the composites. Forall groups there is a considerable range in the amount of time allocated to each of the activities. For example, the range in time allocated to academic instruction for EMR students is from 85 minutes per day to 223 minutes per day. For at least one EBD student, no time was allocated to instruction in reading, and for at least one nonhandicapped student, one EMR student, and one EBD student, no time was allocated to math. In fact, for every activity except reading, math, business management, and transition, at least one student in each category had no allocated time.

One-way analyses of variance were used to address the extent to which there were differences among categories in the amount of time allocated to specific activities. There was a significant difference among groups in amount of time allocated to academic activities, $F(3,118) = 4.42$, $p = .006$, amount of time allocated to mathematics instruction, $F(3,118) = 4.35$, $p = .006$, time allocated to science instruction, $F(3,118) = 3.69$, $p = .01$, and time allocated to free time, $F(3,118) = 3.77$, $p = .01$. Follow-up Student-Newman-Keuls tests indicated that significantly less time was allocated to academic activities overall for EMR students ($\bar{X}$ = 143.19 minutes) than for students in the other three groups. The significant difference in math was between LD students ($\bar{X}$ = 45.2 minutes) and EMR students ($\bar{X}$ = 27.8 minutes). Significantly more time was allocated to science instruction for nonhandicapped students than for any of the groups of

handicapped students. And, significantly more time was allocated to free time activities for EMR students than for any of the other groups. There were no other significant differences among groups in the amount of time allocated to instruction in the various content areas.

Data on average amounts of time spent by the three categories of handicapped students in regular and special education settings are shown in Table 2. Again, in each cell we have shown the average amount of time, the standard deviation, and the range. We report data only for regular and special education, though data were recorded on time spent in other settings. Time in special education is not differentiated by specific setting for the students; it includes time in either resource or self-contained settings.

There was a considerable range, within groups, in the amount of time spent in various settings. For example, some LD students spent nearly five hours per day in regular education settings. Others spent as little as 44 minutes in regular education. A two-way repeated measures analysis of variance was conducted to ascertain the extent to which there were differences among categories in the time they spent in regular and special education. There was a highly significant category by setting interaction, $F(2,89) = 57.37$, $p = .000$. Follow-up one-way analyses of variance showed that EMR students spent significantly less time than the other two groups in regular education settings. And, EBD students spent significantly more time in regular education settings than did LD students. The inverse of this, of

Table 2

Amounts of Time During One School Day That Different Groups of Handicapped Students Spend in Regular and Special Education

Group	Setting	
	Regular Education	Special Education
LD		
$\bar{X}$	158.76	47.10
SD	47.64	32.68
Range	44-296	0-164
EBD		
$\bar{X}$	190.28	22.76
SD	45.10	24.32
Range	88-273	0-90
EMR		
$\bar{X}$	58.31	135.25
SD	70.21	65.68
Range	0-183	23-238

course, was found for special education settings. The EMR students spent far more time than the other groups of handicapped students in special education settings; LD students spent more time than EBD students in special education settings. These results are shown graphically in Figure 1.

The third research question addresses specifically where students are receiving specific content instruction. Since students spend differing amounts of time in different settings, and since this limits the amount of time instruction can occur, data were converted to proportions of the day for purposes of this analysis. In Table 3 we have shown the proportion of time allocated to specific activities as a function of handicapping condition and setting. Note that the Ns for the categories vary. This is because only some students in each of the categories received instruction in both regular and special education settings. Data are reported for four individual codes (reading, mathematics, transition, and business management), and for the academic composite (representing time allocated to instruction in reading, mathematics, spelling, language, science, social studies, handwriting, and computer training).

A one between, one within repeated measures analysis of variance was used to analyze the difference in mean proportions. The between groups factor was handicapping condition (LD, ED, EMR-resource, and EMR-self-contained); the within groups factor was setting (regular vs. special). The dependent measure for all analyses was proportion of time in the setting allocated to a specific activity.

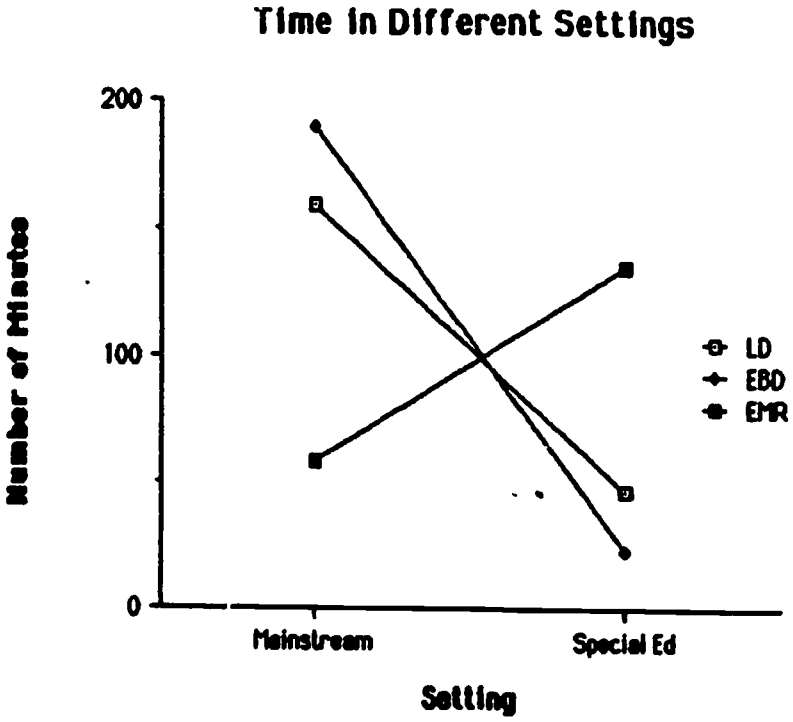

Figure 1. Time Spent in Different Settings by LD, EBD, and EMR students.

Table 3

Proportion of Time Allocated to Activities as a Function of Handicapping Condition and Setting

	Regular Education				Special Education			
	LD	EBD	EMR-R[a]	EMR-S[b]	LD	EBD	EMR-R	EMR-S
N =	28	21	10	5	28	21	10	5
Academic Allocated Time[c]								
$\bar{X}$	.744	.737	.686	.512	.919	.824	.890	.856
SD	.14	.10	.12	.36	.08	.29	.12	.18
Reading								
$\bar{X}$	.28	.28	.29	.17	.25	.41	.57	.16
SD	.14	.15	.13	.19	.02	.39	.22	.14
Mathematics								
$\bar{X}$	.21	.17	.11	.34	.20	.15	.12	.11
SD	.13	.09	.14	.34	.25	.24	.13	.08
Business Management								
$\bar{X}$	.13	.13	.21	.02	.03	.13	.07	.11
SD	.08	.10	.12	.04	.04	.29	.12	.10
Transition								
$\bar{X}$	.09	.10	.09	.12	.03	.02	.02	.16
SD	.07	.06	.06	.07	.04	.04	.03	.06

[a]EMR students who received all of their special education service in the resource room

[b]EMR students who received all of their special education service in the self-contained classroom

[c]Academic Time Allocated to eight academic subjects (reading, math, science, social studies, handwriting, computer training, spelling, language)

There was a significant difference among groups in the proportion of time allocated to academic activities, $F(3,60) = 8.26$, $p = .0001$. Post hoc analysis using the Student-Newman-Keuls procedure indicated that the difference was due to significantly less time allocated to academic instruction for EMR students in self-contained classes than to any other group, including EMR students in resource rooms. There were no other differences among groups.

A second major finding was that for all groups a significantly greater proportion of time was allocated to academic activities in special education classes than in regular education classes, $F(1,60) = 12.61$, $p = .0008$. And, there was a significant category by setting interaction effect for the variable of transition only, $F(3,60) = 5.67$, $p = .0017$. Post hoc contrasts indicated that EMR students in self-contained classes received proportionately more time allocated to transition in the special education setting than did the other three groups.

Discussion

Two issues can be addressed on the basis of the obtained results. First, a greater proportion of the time that students spend in special education classes is allocated to academic instruction than of the time they spend in regular classes. This may, of course, be an artifact of the fact that mildly handicapped students often receive academic instruction in basic skill areas in special education rather than regular education settings.

A second issue is the failure to find differences, for the most part, among categories in time allocated to various activities. The

act of differential classification does not result in differences in the ways in which students spend their time in school. We must stress that this finding is a quantitative one only. That is, while there are no differences in the amounts of time LD, EBD, and EMR students spend in various activities, there may be qualitative differences; they may be doing different kinds of things. Yet, this finding does raise a major challenge to the commonly held notion that differential classification has instructional implications. We have shown that there are not implications for the amount of time allocated to different activities.

One additional finding emerged. There are differences in the amounts of time allocated to academic activities and in the amounts of time spent in transitions for mentally retarded students who are placed in resource rooms and for those who are placed in self-contained classes. Significantly less time is allocated to academic instruction for EMR students in self-contained classes than for EMR students in resource rooms or regular education classes. While this may be a setting effect, it may also be due to differences in the severity of condition for those placed in the two settings.

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Research Reports

No. 1 Time allocated to instruction of mentally retarded, learning disabled, emotionally disturbed, and nonhandicapped elementary students by J. E. Ysseldyke, M. L. Thurlow, S. L. Christenson, & J. Weiss (March, 1987).

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