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ABSTRACT

Summarized are evaluation activities and results for the first year of an accountability study for trainable mentally retarded (TMR) children and youth carried out by the Duval County School Board of Jacksonville, Florida. It is explained that the evaluation design included the construction and implementation of criterion measures, statistical analysis of resulting data, development of a management information system, and development of a suitable cost-benefit model. It is reported that tests (administered three times during the school year) dealt with 398 formulated objectives in three areas (social adequacy, language, vocational readiness) at six levels (from Primary I to pre occupational). Provided are statistics on percentages of pupils by sex and race, IQ levels of pupils, and attendance of pupils. Findings indicate that language objectives were generally the most difficult for pupils to master; that Primary I objectives had the highest achievement rates; that low correlations were found with pupil achievement of objectives and school, sex, race, physical disabilities, enrollment, attendance, and teacher; and that strong correlations existed between total score and year within level, and between total score and most recent IQ. Overall results of the cost-effectiveness analysis are said to have shown an average cost of $96 per objective achieved per student. Recommendations included the continued development of the accountability model and its application to other TMR programs. (DB)

Summary Evaluation Report
1971-72

Accountability Study of the Program for Trainable Mentally Retarded Children and Youth

Prepared for

The Duval County School Board
Jacksonville, Florida

by

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C O N T E N T S

INTRODUCTION

The purpose of this report is to provide a summary of the project evaluation activities and their results for the first year of an "Accountability Study of the Program for Trainable Mentally Retarded Children and Youth".

The Accountability Study is being carried out by the Duval County School Board (DCSB), Jacksonville, Florida. Financial support was obtained under Title VI of the Elementary and Secondary Education Act.

The Institute for Development of Educational Auditing (the Institute) has prepared this summary report as a part of our program evaluation activities.

For additional information concerning this program, the reader is referred to Mr. William L. Geiger, Project Coordinator, or Mr. Keith Brown, Project Evaluator, Duval County School Board, Jacksonville, Florida.

BACKGROUND

In March, 1971, the Duval County School Board submitted a proposal for Federal assistance under Title VI of the Elementary and Secondary Education Act to conduct an Accountability Study of the Duval County Program for Trainable Mentally Retarded Children and Youth.

The project subsequently was funded, with an overall stated project objective "To develop, implement and audit an evaluational design based on systems analysis, which will measure the cost effectiveness of the Duval County Program for Trainable Mentally Retarded Children and Youth in achieving its stated goals in the areas of Language Development, Social Adequacy and Vocational Readiness."

There are over 200 children enrolled in the Program, grouped into six levels: Primary I, Primary II, Intermediate I, Intermediate II, Family Living and Pre-Occupational Training.

The existing curriculum of the program had been established from sequentially designed task skills which led to the accomplishment of stated program goals for each level. These task skills and program goals were refined into acceptable behavioral objectives stating minimum levels of success as a part of the Accountability Project.

Based on performance objectives developed by the Program staff, specifications for the "Evaluation Design and Implementation" and an "Audit Component" were written and submitted for bid in accordance with Duval County and Consolidated City of Jacksonville procedures.

The Institute for Development of Educational Auditing was selected as the Evaluation Design and Implementation Contractor and the Planar Corporation was selected as the Auditor.

EVALUATION DESIGN

The Institute was contracted to perform the following major functions:

- Construct and implement the criterion measures, including pre, post, and interim testing, based directly on the Performance Objectives.
- Conduct necessary statistical analysis of the data, to include a method for determining the interrelationships of the interim and terminal Performance Objectives.
- Design, develop and implement a management information system which will report student

progress toward the objectives and will report program costs to be used for cost-benefit analysis.

- Design, develop and implement a cost-benefit model which will provide for analysis of the program and its success in developing the maximum potential of trainable children in Duval County, and provide a basis for program modification if warranted, in meeting the Performance Objectives.

- Prepare and submit appropriate reports presenting the results.

Because of the immediate requirement for a "pre-test" based on the performance objectives, the design of the test construction and administration procedures was the first task undertaken by the Institute.

The first test session was held during the first half of December. Based upon the results, a number of design decisions were made. It was found that questions regarding effects of such pupil variables as IQ, age, physical handicaps, sex, and past training history could not be answered with data from the first administration. The same situation applied to such variables as teacher experience, education and attitude; school facilities; program level and subject area. Therefore, it was decided to structure the design of the second test administration to insure a more comprehensive data base of performance measures and to provide answers to such evaluation questions as the following:

- To what extent are the TMR Program Objectives, as defined, being achieved by the target pupils, as measured by the

results of the criterion-referenced testing?

- To what extent is pupil performance on the Program Objectives related to pupil factors including sex, age, IQ, physical handicaps, training history, attendance and family-related factors, as analyzed by appropriate statistical techniques?

- To what extent is pupil performance on the Program Objectives related to instructional factors including type of facility, program level, year within program, subject area and teacher-related factors, as analyzed by appropriate statistical techniques?

- What are the various costs involved in providing training to target pupils at each program level within each facility, as measured by the application of a preliminary cost-effectiveness model?

- What modifications in the instructional program will occur as the result of pupil performance "feedback" to Program teachers?

The second test administration was held during February and March and provided much of the performance data needed to answer the principal evaluation questions. The third test administration was held at the end of the school year and represented the final measure of pupil performance for the first year of the project.

A number of statistical analyses were carried out to obtain a "picture" of the objective structure relative to the pupils' performance and to estimate objective validity, reliability and degree of difficulty.

To provide an indication of the attitudes of teachers and parents toward the Program, the Institute developed survey instruments which were mailed to teachers and parents in June. Both instruments contained statements to which respondents indicated their opinions on scales ranging from "strongly agree" to "strongly disagree". In addition, both parents and teachers had the opportunity to list likes and dislikes regarding the TMR Program.

The overall objective for the first project year called for a determination of the cost-effectiveness of the TMR Program in achieving its goals.

There are many approaches to and models for cost-effectiveness analysis. The model developed for this program is based upon the time and budget constraints for the first project year and upon the nature of the cost and performance data available from DCSB records.

Both direct and indirect program costs are determined or estimated from DCSB records. Cost allocation levels are identified as system, program, school center and classroom.

It was decided that Program effectiveness would be measured in terms of numbers of objectives mastered by Program pupils during the project year.

It is possible to assign each objective a value based on its relative importance. Such a value could be determined through teacher, parent and community involvement. For the present measurement, each objective was assigned a value of one. Overall Program attainment then is measured by the total estimated value points gained during the project year.

SUMMARY OF EVALUATION FINDINGS

In carrying out the evaluation activities for the first project year, it was essential to collect and maintain a great deal of Program data which either was required for immediate analysis, was needed for future purposes or was information with a high "expected value" which would be lost if not captured as it was generated.

A total of 398 objectives were written and distributed among the six program levels by the Program staff, as follows:

Program Level	Program Area			
	Social Adequacy	Language	Vocational Readiness	Totals
Pre Occupational/Family Living	24	29	12	65
Pre Occupational (boys only)	0	0	18	18
Family Living (girls only)	0	0	31	31
Intermediate II	25	29	32	86
Intermediate I	24	23	28	75
Primary II	24	16	28	68
Primary I	24	14	17	55
Totals	121	111	166	398

The numbers of Program pupils, by Center and by Program Level, in the first project year data base are as follows:

	Center		
Program Level	#170	#201	TOTAL
Pre Occupational	34	11	45
Family Living	28	10	38
Intermediate II	35	13	48
Intermediate I	20	10	30
Primary II	32	8	40
Primary I	2	2	4
Reinforcement and Adaptive Behavior*	18	4	22
	169	58	227

* The "Reinforcement Program" and "Adaptive Behavior" levels are classes for students who require special treatment.

The percentages of Program pupils, by sex, for each Program Level are shown in the following graph.

Program Level	Sex	
Pre Occupational/ Family Living	Boys 54%	Girls 46%
Intermediate II	Boys 52%	Girls 48%
Intermediate I	Boys 57%	Girls 43%
Primary II	Boys 58%	Girls 42%
Primary I	Boys 75%	Girls 25%
Reinforcement and Adaptive Behavior	Boys 64%	Girls 36%

The percentages of Program pupils, by race, for each Program Level are as follows:

Program Level	Race	
Pre Occupational/ Family Living	White 48%	Black 52%
Intermediate II	White 62%	Black 38%
Intermediate I	White 53%	Black 47%
Primary II	White 55%	Black 45%
Primary I	White 100%	
Reinforcement and Adaptive Behavior	White 62%	Black 38%

The minimum, average and maximum IQ's of Program pupils, by Program Level, are shown below:

Program Level	IQ Minimum	IQ Average	IQ Maximum
Pre Occupational/ Family Living	30	46	77
Intermediate II	30	44	65
Intermediate I	30	43	78
Primary II	30	45	70
Primary I	45	47	51
Reinforcement and Adaptive Behavior	30	44	62

Enrollment and attendance of Program pupils, by Program Level, is summarized here as average numbers of days and as rate of attendance:

Program Level	Average Days Enrollment	Average Days Attendance	Average Attendance Rate
Pre Occupational/ Family Living	160	151	94%
Intermediate II	154	134	87%
Intermediate I	164	144	88%
Primary II	161	138	86%
Primary I	173	159	92%
Reinforcement and Adaptive Behavior	167	152	91%

The following factors summarize the extent to which the overall structure of Program Performance Objectives, as developed for the first project year, was found to reflect the TMR instructional program.

- The Language objectives generally were the most difficult for pupils to master and were placed too high to serve as realistic terminal objectives for each Program Level. The Social Adequacy objectives were the easiest to master and, with some exceptions, were reasonably placed as terminal objectives for each Program Level. The Vocational Readiness objectives fell between the other two Program Areas in terms of difficulty.

- In terms of Program Levels, Primary I objectives generally had the highest achievement rates and were set somewhat low to serve as terminal Program Level objectives. Pre Occupational/Family Living objectives were the most difficult and generally were set much too high relative to pupil ability. The other Program Levels (Primary II, Intermediate I and Intermediate II) fell between these two extremes, in increasing order of difficulty.

- An analysis using the point biserial correlation coefficient revealed a generally strong relationship among objectives but also indicated, for further analysis, those objectives which did not correlate strongly with the overall structure.

- Reliability coefficients (calculated by the Kuder-Richardson technique) showed very high reliability levels for the objective structures at each Program Level.

- The estimation of numbers of objectives gained between the first and last test sessions shows that even at the lower Program Levels pupils gained relatively few objectives on the average, and that the gains were more or less consistent across levels. Therefore, the higher the Program Level, the larger was the proportion of year-end achieved objectives actually gained during the period between the first and last testing sessions.

- To measure the effects of demographic and Program factors on pupil performance, a "total score" for each pupil was computed. This score represented the total number of objectives achieved by the end of the year.

  With this total score as the dependent variable, a stepwise regression analysis was run for each Program Level using the following 12 variables: school, birth year, sex, race, most recent I.Q., visual disability, cerebral palsy, hearing disability, other physical disabilities, days enrolled, days in attendance, teacher.

  The correlation matrices generated by the regression analyses revealed a number of significant relationships.

Perhaps the most interesting are the relationships which do not show strong correlations. The following variables revealed very low (positive or negative) correlations with pupil's total objective "score": school, sex, race, physical disabilities, enrollment, attendance and teacher!

Strong correlations existed between "score" and "year within level" and between "score" and "most recent I.Q.". Also, enrollment and attendance were, as expected, highly correlated with each other.

The results of the regression analyses can be summarized in terms of a ranking of the variables relative to their overall contribution to the multiple "r" coefficients. Of the 12 variables available for inclusion, three were never utilized (teacher, visual disability, cerebral palsy.) The remaining variables are ranked here in descending order of their overall contribution to the multiple "r" coefficients:

- most recent I.Q.
- year within Program Level
- enrollment/attendance
- race
- sex
- school
- "other" physical disabilities (not visual, hearing or cerebral palsy)
- hearing disability

An analysis of available cost and performance data indicated that it would not be reasonable to carry the cost-effectiveness study for the first year beyond the "center" level; the "classroom" level data simply was not accurate or complete enough.

The estimated numbers of objectives achieved by Program pupils during the first project year are as follows:

	Center		Totals
	#170	#201	
Estimated Total Number of Objectives Achieved	2325	975	3300
Number of Pupils	169	58	227
Estimated Number of Objectives Achieved per Pupil	14	17	15

The results of the cost analysis are summarized here as follows:

Cost Category	Center		Totals
	#170	#201	
• Center/Classroom Level Costs	$207,020	$ 79,700	$286,720
• System/Program Level Costs	$ 29,448	$ 10,107	$ 39,555
• Total Estimated Costs	$236,468	$ 89,807	$326,275
• Total Estimated Costs per Pupil	$ 1,399	$ 1,548	$ 1,437

The overall results of the cost-effectiveness analysis of the first project year are given by the following table:

	Center		Overall Program
	# 170	# 201	
Estimated Average Cost per Pupil	$1,399	$1,548	$1,437
Estimated Average Number of Objectives Achieved per Pupil	14	17	15
Estimated Average Cost per Objective Achieved	$ 100	$ 91	$ 96

The teacher and parent surveys taken in June showed generally positive attitudes toward the first year of the project.

Positive comments from teachers related to the effectiveness of the accountability model in prescriptive planning and in creating in the pupils a sense of accomplishment. In general, the teachers did not like the testing procedures used during the first year and they felt that there were some weaknesses in the definition and structure of the objectives.

In general, most parents felt they were adequately informed about the TMR Program during the past year,

yet they were not familiar with new methods, procedures, and techniques used in the program. Also, there was an indication on the part of many parents that more parental involvement was needed.

IMPLICATIONS AND RECOMMENDATIONS

The following implications and recommendations are based on our evaluation of the first year of the Accountability Study.

- The overall objective for the first year of the project, "To develop, implement and audit an evaluational design based on systems analysis, which will measure the cost-effectiveness of the Duval County Program for Trainable Mentally Retarded Children and Youth in achieving its stated goals in the areas of Language Development, Social Adequacy and Vocational Readiness", was not fully achieved. The procedures utilized did not result in a reliable estimate of the cost-effectiveness of the program. However, considering the limited budget available for the first project year, the results reflect a highly productive allocation of project resources. Despite a number of faulty design assumptions made early in the development of the project, a large amount of relevant data was generated and analyzed. The results are a potentially effective Accountability Model and the procedures essential to its implementation.

- Major weaknesses in the first year's design related to 1) a lack of specificity in the pupil performance objectives and the procedures for assessment, 2) inadequate inservice training for Program teachers in the application and measurement of the objectives, 3) subjective and unnecessarily rigid structuring of objectives relative to Program Levels and 4) the limitations of our own evaluation design.

- Major achievements of the first project year include 1) the development of a comprehensive picture of the objective structure in terms of validity, reliability and degree of difficulty of individual objectives, 2) the determination of significant relationships among pupil and program factors and pupil performance, 3) procedures for and collection of preliminary cost and performance data, and 4) development of the Accountability Model and the procedures for its implementation.

- Our recommendations for the continuing development and implementation of the Accountability Model have been discussed with the DCSB Project Director and, where budget constraints allowed, incorporated into the design of the second year of the project.

Major elements of the second project year include 1) development of an overall organizing model for all performance objectives, 2) revision of objectives so that they meet realistic requirements of specificity, 3) writing of criterion-referenced items for each objective, specifying procedures to be used in assessing pupil performance, 4) revision of assessment procedures so that a pupil is assessed on objectives appropriate for his individual skills rather than his chronological age, and 5) extensive training of teachers in the objective assessment of trainable pupil performance.

- The Accountability Model developed through this project has application to most TMR programs. Based on the assessment of pupil needs and the application of performance objectives to the instructional process, the model provides for the effective allocation of resources and the communication of results to pupils, teachers, parents and community. Although validation and implementation of the model are continuing through the second project year, a description of the model and supporting documentation can be obtained from the DCSB Project Coordinator.