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ABSTRACT

In this report data obtained from the 1975-76 Delaware Educational Assessment Program is aggregated to the state level. Results are presented in two sections: (1) the status report section, and (2) the needs assessment section. The status report section presents state achievement outcomes and state norms at school and district levels for resource variables. The needs assessment section presents comparative data for Delaware and the nation. Both sections present data at three levels: (1) subject area (e.g., reading), (2) category (e.g. reading comprehension) and (3) objective (e.g., reading comprehension-literal). (Author/MV)

STATE OF DELAWARE

DEPARTMENT OF PUBLIC INSTRUCTION

DOVER, DELAWARE 19901

DELAWARE EDUCATIONAL ASSESSMENT PROGRAM
1975-76

REPORT OF SPRING TESTING
AND
NEEDS ASSESSMENT

By PRE-DEAS COMMITTEE

THE DELAWARE DEPARTMENT OF PUBLIC INSTRUCTION

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September 1976

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EXECUTIVE SUMMARY

This report includes information that, in previous years, has been reported annually in the Report of the Testing Program and Educational Needs in Delaware. The first mentioned report is essentially a status report, the latter is comparative in nature. The status of the state is reported in terms of statewide pupil performance in major academic areas, and state and district norms for community and institutional resource variables. Needs are assessed by showing mean percent correct response on tested state objectives (1) on an objective by objective basis, (2) on category and total test basis, and (3) by providing comparative information of the performance of Delaware students and the performance of a national norm group for item groupings and the total tests.

Interpretation of the data has, deliberately, been limited to the identification of apparent academic strengths and weaknesses.

The data indicate the following:

Grade one performance exceeds that of the national sample in all tested areas for which we have national norms. When mean percent correct response on all items is considered, areas of strength appear to be readiness skills, reference skills, numbers/numerals, and geometry. Areas of weakness appear to be reading comprehension skills, mathematical sentences, and mathematical reasoning.

Grade four performance exceeds that of the national sample in only reading and on those science items taken from the STEP II test. When mean percent correct response on all items is considered, grade four areas of strength appear to be study skills, response to literature, numeration, and geometry. Areas of weakness appear to be word recognition, reading comprehension, literature forms, numbers/numerals, probability and statistics, graphing and function and those science items taken from the National Assessment of Educational Program test.

Grade eight performance exceeds that of the national sample only in relation to the set of science items taken from the NAEP tests. When mean percent correct response on all items is considered, areas of strength appear to be composition skills, numeration, operations and properties, and mathematical sentences. Areas of weakness appear to be reading comprehension, written language, mathematical reasonings, and graphing and functions and on those science items taken from the STEP II Science test.

PREFACE

This report presents data obtained from the 1975-76 Delaware Educational Assessment Program aggregated to the state level. Results are presented in two sections; 1) the status report section and 2) the needs assessment section. The status report section presents state achievement outcomes and state norms at school and district levels for resource variables. The needs assessment section presents comparative data for Delaware and the Nation. Both sections present data at three levels:

* subject area (e.g., reading)
* category (e.g., reading-comprehension)
* objective (e.g., reading-comprehension-literal)

The report itself is made possible through the coordinated effort expended by individuals at all levels of the Delaware school system. The DEAS committee, a group within the Planning, Research, and Evaluation Division of the Department of Public Instruction, is the group responsible for coordination of the effort and the preformance of the myriad of technical tasks associated with the assessment project. The DEAS committee members working under the direction of Wilmer E. Wise are: James L. Spartz; Robert A. Bigelow; Chester W. Freed; Janet Wall; and Alice Valdes, who assembled the report.

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INTRODUCTION

This report includes information that, in previous years, has been reported annually in the Report of the Testing Program and Educational Needs in Delaware. In order to establish perspective for the reader, the report also includes a short description of the Delaware Educational Accountability System (DEAS) and of the Delaware Educational Assessment Program (DEAP).

The report is organized in a sequence that presents:

* an overview of the DEAS process
* a description of DEAP as part of the process
* the results of the assessment
* a description of needs assessment as a process
* the results of the needs assessment.

Interpretation of the data has, deliberately, been limited to the identification of strengths and weaknesses apparent from the data analysis. Interpretations of the meaning of strengths and weaknesses and the derivation of implications for the school system are the responsibility of the individual reader. Our reluctance to attach meaning derives from our intention not to impose personal philosophies on what is essentially objective information.

We will point out that various interpretations of the data are possible and are dependent on personal perspectives regarding the relationship between the educational institution and society as a whole, the function and responsibilities of the institution, the nature of and responsibilities of the learner, and what would constitute an optimal relationship between the institution and the learner.

DESCRIPTION OF DEAS: A PROCESS

The Delaware Educational Accountability System (DEAS) is a long-range system for program improvement. System components are structured to enable improvement of education in public schools throughout the state by continually seeking the answers to four basic questions. The relationship between the questions and system components is shown in the schematic drawing below.

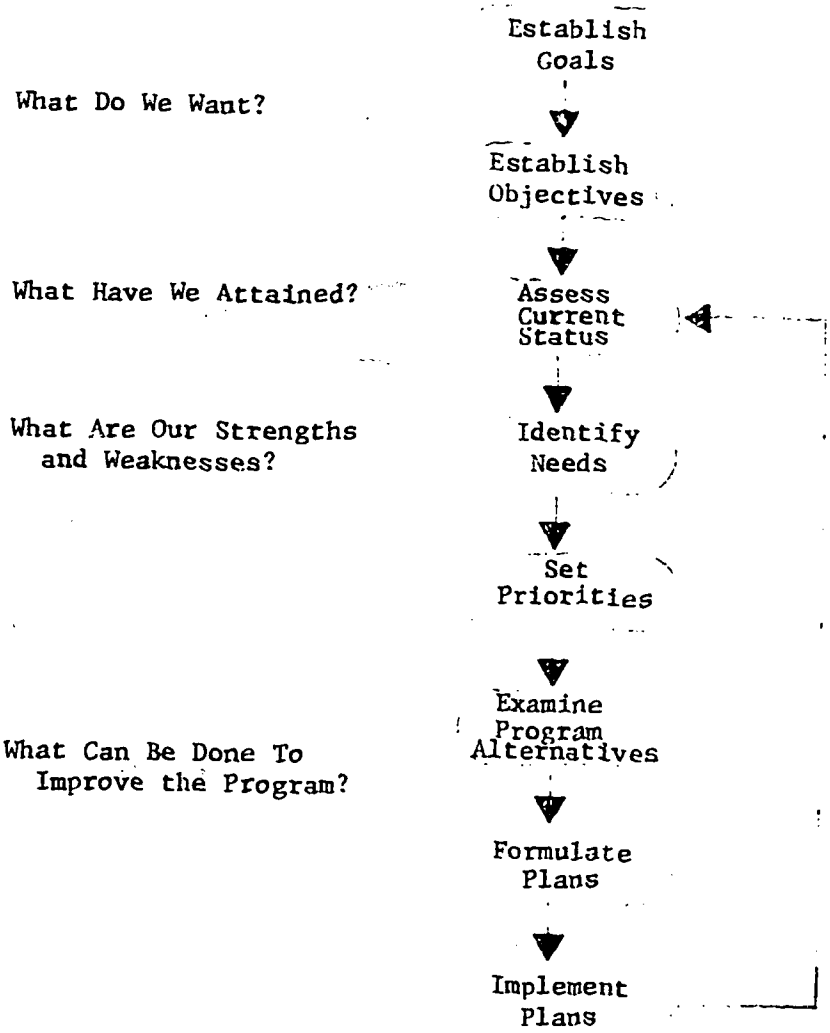

FIGURE 1

SCHEMATIC DIAGRAM OF THE RELATIONSHIP BETWEEN BASIC PROGRAM QUESTIONS AND DEAS COMPONENTS

STATUS OF DEAS

Statewide Goals and Objectives (What Do We Want?)

Beginning in 1972, state and local personnel have been developing, reviewing, and refining objectives related to Goal Statements for Delaware Public School Students for the 70's and 80's. The statewide goals and related objectives are the basic building blocks of the system. Delaware's learner oriented goals are the result of a complex field survey, two statewide public forums, and solicited comments and recommendations from over 400 public and professional organizations. In 1972[1] the State Board of Education adopted the following goals.

> Education in Delaware will provide the opportunity for each learner, to the extent of his individual ability, to:
>
> * Acquire a mastery of basic skills required for obtaining and expressing ideas through the effective use of words, numbers, and symbols.
>
> * Develop attitudes and competencies which facilitate learning.
>
> * Develop vocational or professional competence.
>
> * Acquire habits and attitudes necessary for responsible citizenship.
>
> * Understand the elements necessary for his physical and emotional well being.
>
> * Develop a concern for moral, ethical, and spiritual values.
>
> * Appreciate his own worth as a member of society.
>
> * Develop an understanding and appreciation for humanities and the arts.
>
> * Develop an appreciation of the family.

[1] See Goal Statements for Delaware Public School Students for the 70's and 80's, Department of Public Instruction, September 1972.

In order to determine student attainment in each goal area, it was necessary to develop learner objectives which specify what is to be expected for a student at a particular point in time. To encourage local use, it was determined that statewide objectives should be a point of departure from which district, school, and classroom objectives could be developed in a logical fashion. The statewide objectives are the culmination of four years of state and local efforts. The product of this work, a first draft of educational objectives, was submitted to the State Board of Education in March, 1974. Further revision and refinement of these objectives has continued since that time and an updated version of the objectives was submitted to the State Board at the February, 1975 meeting.

The objectives have been developed as cumulative objectives for grades one, four, and eight. The objectives related to reading, English, mathematics, science, social studies, and health have been specified in a format that is consistent across content areas. Referencing of objectives to current state curriculum guides has been initiated and planning is underway to produce work sheets for cross-referencing local objectives and materials for the statewide objectives. Consideration is also being given to the development of objectives for grade twelve.

What have we attained?
What are our program strengths and weaknesses?

Answers to these two questions for the first of the Delaware goals are being sought through the Delaware Educational Assessment Program (DEAP). Under this program, which was instituted in 1972, a battery of tests is administered to students in all public schools in grades one, four, and eight. Each year the batteries have been revised to make them successively better measures of student achievement of the statewide objectives. Concomitantly with the administration of the tests, data are gathered on school and community resource variables. Analysis and interpretation of the student achievement and resource data are enabling Delaware educators to begin to identify the strengths and weaknesses of educational programs.

Other current DEAP activities include an ongoing longitudinal study, initiated in 1975, that will permit us to identify those schools where students are performing well above or below expected achievement levels. Preliminary testing was conducted, during 1976, of an eleventh grade measure of the application of basic skills to every day situations and in 1976 work was begun on an Objective Referenced Measure (ORM) for grade four mathematics. This development was initiated because the DEAP survey measures are based on a small proportion of statewide objectives. Consequently, the DEAP is being expanded to include the systematic administration of objective referenced measures in specific content areas. The new measures can supply more complete information about student needs in each subject area to support the development of priorities for curriculum improvement in local school districts. Further diagnostic and curriculum revision efforts based on objective referenced test results can thus directly address the fourth major DEAS question, What can be done to improve educational programs?

Objectives and Corrective Action (What Can Be Done To Improve Programs?)

School districts using the state assessment data can identify the strengths of their several schools; when pupils in one school score exceptionally well, other schools may consider adopting that school's approach. Further, schools in other districts that performed especially well can be identified. Successful practices may then be adapted to a school that may have done less well.

At the state level, nee sm alyses can lead to state ar federal programs for correcti n alleviate critical needs. This information can provide the state legislature with a basis for policy action and funding to shore up areas where there are major deficiencies.

The preceding section provided an overview of the current status of the DEAS. The next section will provide a description of DEAP for 1975-76 including:

* identifying and selecting variables
* measuring variables
* reporting the data
* assisting local personnel in the use and interpretation of the data.

DESCRIPTION OF DEAP: ASSESSING ACADEMIC STATUS

The 1975-76 assessment program involved the collection and analyses of information relating to school and community resources and to student performance. Data on 26 school and community resource variables were collected from 148 schools and 23 regular school districts. The student performance data were obtained from the DEAP test batteries, which were administered to approximately 26,400 students. In addition, about 1,075 grade one students in Delaware's Catholic Diocesan schools were tested. The system:

* provides data on the academic achievement of each participating student.

* provides information on the ability and achievement of students in each school, each district, and in the state as a whole.

* measures the degree of relationship between student performance and selected school and community resources.

PROCEDURES

Identifying and Selecting Variables

The DEAP model assumes that test performance of a group of students in a school at some point in time is a function of: their performance at some previous point in time; their background characteristics; the resources expended by the schools; and effectiveness of the school program. The variables selected for inclusion in the DEAP are those that relate to inputs and outputs of the educational system.

School and community resource variables are system input variables. Information about community and school resources known to be related to student achievement was collected so that their influence might be considered in the evaluation of student performance. School and community resource variables for 1975-76 were:

Composite Socio-Economic Status
Father's Educational Level
Mother's Educational Level
Parents' Occupation
Percent Overcrowded Housing
Median Housing Cost
Attendance Rate
AFDC Per 1,000 Pupils
Median Monthly Rent
Percent of Teachers with Master's Degrees or Above
Local Revenue Per Pupil

Financial Effort Index
Average Teacher Salary
Full Value of Real Estate Per Pupil
Average Years Teaching Experience
Current Expense Per Pupil
Student Population Density
Teachers Per 1,000 Pupils
Teacher Starting Salary
State Revenue Per Pupil
Instructional Cost Per Pupil
Percent White Enrollment
Mean Teacher Age
Dropout Rate
Percent Free Lunches
Percent Reduced Lunches

Student performance variables are both system input and system output. Verbal and quantitative ability are considered input to the system, student achievement in the content areas is considered system output.

Measuring Variables

The measurement of school and community resource variables and student performance variables is described in this section.

School and community resource data were assembled from various sources. The description of the measurement of each variable provided here includes a notation indicating whether the data were collected at the school or district level. The data were aggregated to prepare district scores on those variables measured at the school level.

Composite Socio-Economic Status is a scaled score based on responses to the Principal's Questionnaire on parents' education, employment, housing, and income. (School Level)

Father's Educational Level is computed on the basis of the responses to the Principal's Questionnaire to questions dealing with the education of the fathers of students in the school. (School Level)

Mother's Educational Level is computed on the basis of the responses to the Principal's Questionnaire to questions dealing with the education of the mothers of students in the school. (School Level)

Parents' Occupation is a scale score computed on the basis of the responses to the Principal's Questionnaire to questions dealing with parents' employment. (School Level)

Percent Overcrowded Housing is the percent of housing units in which there are housed more than one person per room. Data are from the 1970 United States Census. (District Level)

Median Housing Cost is the median market value of owner occupied housing as reported on the 1970 United States Census. (District Level)

Attendance Rate is the ratio of average daily attendance to average daily membership. The ratio is taken from the End of Year Reports for the 1974-75 school year. (School Level)

A.F.D.C. Per 1000 Pupils is the ratio of the number of youngsters receiving welfare assistance to the total district enrollment. The number receiving welfare assistance was obtained from a special computer printout of a file maintained by the Department of Health and Social Services; the September 30, 1975 enrollment was used as the divisor. (District Level)

Median Monthly Rent is the median rent paid for rental units as reported on the 1970 United States Census. (District Level)

Percent Teachers with Master's Degrees or Above is the total number of classroom teachers with advanced degrees divided by the total number of classroom teachers. The data are taken from the 1975-76 state personnel file for schools participating in DEAP. (School Level)

Local Revenue Per Pupil is the amount of money raised locally per pupil. It is the local revenue receipts 1974-75 divided by the September 30 district enrollment (excluding special schools). The figures are taken from the Report of Educational Statistics 1974-75. (District Level)

Financial Effort Index is the local revenue receipts for 1974-75 divided by the full value of real estate for 1974-75. The effort index can be likened to an equalized tax rate. It gives an indication of how much a district is willing to tax itself. The figures are taken from the Report of Educational Statistics 1974-75. (District Level)

Average Teacher Salary is the total salaries of classroom teachers divided by the total number of classroom teachers. The information is taken from the 1975-76 state personnel file. Only those schools participating in DEAP are included in computing the district value. (School Level)

Full Value of Real Estate Per Pupil is a measure of a district's wealth per pupil since it is based on taxable property. It is found by dividing the full value of real estate for 1974-75 by the September 30, 1974 district enrollment (excluding special schools). The figure for real estate is from the Report of Educational Statistics 1974-75. (District Level)

Average Years Teaching Experience is the total years' experience of classroom teachers divided by the total number of classroom teachers. The information is taken from the 1975-76 state personnel file. Only those schools participating in DEAP are included in the district value. Thus, high schools are generally excluded. (School Level)

Current Expense Per Pupil is the current operating costs of 1974-75 divided by the September 30, 1974 district enrollment (excluding special schools). Table 33 in the Report of Educational Statistics 1974-75 lists the specific variables included in the current expense. Generally, it is the amount of money for day to day expenditures. (District Level)

Student Population Density is the September 30, 1975 district enrollment (excluding special schools) divided by the district area in square miles. The second figure is taken from the Report of Educational Statistics 1974-75. (District Level)

Teachers Per 1000 Pupils is the total number of classroom teachers divided by the "adjusted enrollment" which includes regular, special, and half of the kindergarten enrollments. The first figure was obtained from the 1975-76 state personnel file; the second from the September 30, 1975 enrollment report. Only data from schools participating in DEAP were used in preparing the district value. (School Level)

Teacher Starting Salary is the starting salary for a teacher with a B.A. and no experience. It was obtained by survey of the school districts. Salaries for 1975-76 were used.

State Revenue Per Pupil is a measure of state support per pupil to a district. It is the state revenue receipts, 1974-75, divided by the September 30, 1974 district enrollment (excluding special schools). The figures for the state revenue are taken from the Report of Educational Statistics 1974-75. (District Level)

Instructional Cost Per Pupil is the amount per pupil expended by districts for operating the instructional program. It is the instructional cost, 1974-75, divided by the September 30, 1974 district enrollment (excluding special schools). This generally includes the cost of materials, books, supplies, and principals' and teachers' salaries. The figure for instructional cost is taken from the Report of Educational Statistics 1974-75. (District Level)

Percent White Enrollment is the percent reported in the Racial and Ethnic Report 1975-76. (District and School Level)

Mean Teacher Age is the total ages of classroom teachers divided by the total number of classroom teachers. The information is taken from the 1975-76 state personnel file. (School Level)

Dropout Rate is the number of dropouts in grades 7 through 12 during the 1974-75 school year divided by the district enrollment grades 7 through 12 in September 1974. All data are from the Report of Educational Statistics 1974-75. (District Level)

Percent Free Lunches is the percent of free lunches in a school as reported on the Principal's Questionnaire. (School Level)

Percent Reduced Lunches is the percent of reduced price lunches in a school as reported on the Principal's Questionnaire. (School Level)

Student performance levels at grades one, four, and eight were measured by ability and achievement tests. The test battery for each grade level is based on the appropriate form of standardized tests. For each testing cycle, the achievement tests have been modified to provide successively better measures of the achievement of Delaware's statewide objectives. Test modifications are the result of the work of the DEAS task forces, the Department of Public Instruction, and Educational Testing Service.

The first-grade battery is composed of achievement tests in communications (reading and English) and mathematics. These tests are modifications of the Cooperative Primary Tests. The English test, which places emphasis on the spoken word, measures students' study skills as well as those of critical thinking and listening for evaluation. The reading test measures students' skills in auditory and visual discrimination, word recognition, and comprehension. The mathematics test measures skills and understandings in the areas of: numbers/numerals; numeration; operations and properties; mathematical sentences (equations); geometry; measurement; and mathematical reasoning.

The fourth- and eighth-grade batteries are composed of aptitude and achievement tests; they include tests of verbal ability, quantitative ability, communications (reading and English), mathematics, science, and social studies. The ability tests are reprints of the School and College Ability Tests. The verbal ability tests measure how well the student uses words, and the quantitative ability tests measure the student's understanding of mathematical ideas. The achievement tests are modifications of the Sequential Tests of Educational Progress, Series II, and includes some of the science items from the National Assessment of Educational Progress (NAEP). The reading tests measure skills in word recognition, comprehension, and the use of resource materials. The English tests measure writing and mechanics, language usage, and form of and response to literature. The mathematics tests measure skills and knowledge of basic concepts in the areas of numbers/numerals, numeration, operations and properties, mathematical sentences, geometry, measurement, graphing and functions, probability and statistics, and mathematical reasoning. The science tests measure knowledge of physical and life sciences; the social studies tests, inquiry skills and social understandings.

Types of scores. Each achievement test in the batteries described above yields a score. In addition, a composite achievement score is computed for each student who has completed all the tests in a battery.

The ability test administered at grades four and eight yields three scores: verbal aptitude, quantitative aptitude, and total aptitude. The total aptitude score for each student is the sum of the scores obtained on the verbal and quantitative parts of the test.

To aid in comparing results across tests and between subtests in each battery the raw score scale for each of the achievement and ability tests is transformed to a T-score scale with a mean of 50 and a standard deviation of 10. The composite achievement score is the average of an individual's T-scores on the achievement tests in a given battery.

Reporting to Schools, Districts, and the State

The purpose of this section is to describe the types of reports provided for use at various levels. The entire series of twenty different computer-generated reports was prepared from the data collected in 1975-76. These reports provided information at the student, school, district, and state level.[2]

Student reports. Two types of labels were used to report individual student results: a school label and a parents' label. The school label shows the score achieved on each test and the composite achievement in three forms: T-score; statewide percentile; and district percentile. The parents' label reports the same scores in percentile form only. In addition, both labels report identifying information such as the student's name, sex, birthdate, grade level, and the testing date.

School and district reports. Each school and district participating in the program received several group reports that aggregated the data on individual students. The first of these reports, the Roster of Student Scores, is an alphabetical listing of all students tested at the school with the scores they achieved.

The second group report, the Distribution of Student T-scores, was prepared for each school and district for each test administered. This report provides a count of the number of students achieving each score, the number of students tested, the mean, the standard deviation, and the range of scores attained.

Data similar to that provided by the distribution reports were also displayed in a series of histograms. This third set of group reports was prepared to help simplify the interpretation of the score distributions.

The fourth set of group data reports, Item Response by Objectives, was also prepared for each school and district for each test administered. These reports show the percentage of students in the school or district who chose each of the possible answers to each of the test items. Statewide percentages of students giving the correct answer and complete statements of the educational objectives that the items measure are also reported.

Finally, a Profile was prepared for each school and district. This report presents the school or district values on selected community and resource variables and summary statistics on the achievement measures for each grade tested.

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[2] More complete descriptions of the student, school, and district reports are provided in DEAP Manual 1, August 1975, and DEAP Manual 2, September 1975.

Statewide reports. The student data were aggregated to give statewide information in the same types of reports as were prepared for schools and districts. Several supplementary statewide reports were also produced as part of the basic data analysis. A partial list of these reports follow:

* Statewide Distribution of Raw Scores and Scaling Parameters (prepared for each test administered at each grade tested)

* Statewide Distribution of Student T-scores (prepared for each test administered at each grade tested)

* Item Response by Objectives (prepared for each test administered at each grade tested)

* Correlation of District Scores (provides an intercorrelation matrix of district means on all tests and the community and school resource variables)

* Correlation of School Scores (provides an intercorrelation matrix of school means on all tests and the community and school resource variables)

* Statewide Distribution of Student T-scores for Students enrolled in ESEA Title I programs (prepared for each test administered at each grade tested)

* Distribution of District Scores (a distribution of the district means on all tests administered and on all school and community resource variables)

* Distribution of School Scores (a distribution of the school means on all tests administered and on all school and community variables)

* Test Analysis Reports (three reports that provide detailed psychometric analysis of the test batteries used at each grade tested)

In addition, all data on students, school, and districts have been transcribed to magnetic tape, and a set of equating parameters to relate scores on the 1976 tests to those on the previous forms has been developed.

Assisting in the Use and Interpretation of the Data

The purpose of this section is to describe the means used to facilitate use of the data for program improvement. The two principal means used were field services and interpretive material.

Field services. The use of DEAP results as a basis for local program improvement is encouraged by the department. Specially prepared test interpretation materials are distributed with the annual DEAP reports. PRE Division staff act as field agents in helping local district staff understand and apply

the DEAP results. Test interpretation workshops are conducted throughout the state for school administrators and instructional staff. Frequently, these training sessions involve department curriculum staff as well as measurement specialists. In addition, small grants are awarded to districts for planning and implementing corrective action based upon DEAP objectives and test results. Last year, every district in the state participated in this mini grant program involving over 1,000 local educational practitioners.

Interpretive materials prepared include two manuals to aid local and state educational agency personnel in interpreting the various prepared reports:

> Manual 1, an explanation of individual student scores and technical data on the tests; and
>
> Manual 2, an explanation of school and district scores plus instructions for the construction of a school normative profile and for the use of the Item-Response-by-Objective Report in determining local educational needs.

A summary of the statewide reports described above is contained in the next section of the report.

RESULTS: STATE STATUS

This section presents the results of the status assessment. The data are of three types: statewide performance data; statewide school resource data; and statewide district resource data.

State Status: Student Performance

Tables 1, 2, and 3 of this section provide statistical summaries, for each major test, of the statewide student results for grades one, four, and eight. Each table shows the number of students tested, the number of test items, and reliability coefficients. The mean, standard deviation, and minimum and maximum score are reported for both raw and T-scores. These data are descriptive of the current status of academic performance in Delaware.

Tables 4, 5, and 6 show student performance by category, by tested objective and the number of items testing each item grouping. Item groupings are not mutually exclusive. A category consists of a set of items related to an instructional topic. An objective is measured by a sub-set of items within a category that are related to a statewide objective. Individual items may appear in more than one grouping.

Tables 7, 8 and 9 are school norms tables which provide a summary of the distribution of resource variables and test means for schools enrolling first, fourth and eighth grade students, respectively. Tables 10 and 11 give the distributions of district resource variables and test means. All five tables are limited to those variables reported on the profile reports.

TABLE 1

SUMMARY OF STATEWIDE STATISTICS - INDIVIDUAL STUDENT SCORES

1976 DELAWARE EDUCATIONAL ASSESSMENT PROGRAM

*Grade One**

Test or Score	Number of Students	Number of Items on Test	Raw Scores				T-Scores				Reliability Coefficient
			Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.	
Listening	8128	50	42.58	5.42	11	50	49.99	10.00	-8**	64	.83
Reading	8121	50	38.32	8.66	7	50	49.95	9.95	14	63	.92***
Mathematics	8114	55	42.11	7.64	9	55	50.00	10.01	7	67	.87***
Composite Achievement	8093		-	-	-	-	50.01	8.88	10	65	.95***

* Approximately 1,075 nonpublic school students were also tested. Their results are not included in this table. A similar tabulation of nonpublic school results is included in the appendix.

** Negative T-scores are possible when the transformation from raw to T-scores involves a negative intercept. In the first grade transformations, this occurs where a raw score is equal to a negative T score.

*** Based on data collected in 1974-75. The same form was used in 1975-76.

TABLE 2

SUMMARY OF STATEWIDE STATISTICS - INDIVIDUAL STUDENT SCORES

1976 DELAWARE EDUCATIONAL ASSESSMENT PROGRAM

Grade Four

Test or Score	Number of Students	Number of Items on Test	Raw Scores				T-Scores				Reliability Coefficient
			Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.	
Verbal Aptitude	7538	50	24.70	8.88	0	50	49.98	10.00	22	78	.90*
Quantitative Aptitude	7535	50	27.80	8.13	3	49	49.99	10.01	19	76	.88*
Total Aptitude	7524	100	52.54	15.45	9	96	50.00	10.01	22	78	.93*
Reading	7508	60	40.98	11.97	4	60	50.01	10.04	19	66	.94**
English	7509	100	62.62	18.51	7	100	50.00	10.00	20	70	.96**
Mathematics	7539	75	45.04	15.14	5	75	50.01	10.07	24	70	.95**
Science	7532	50	25.52	9.01	3	48	50.02	10.02	25	75	.88
Composite Achievement	7441		-	-	-	-	50.08	9.19	26	70	.86**
Social Studies	7541	30	17.77	6.28	2	30	50.03	10.03	25	69	.98**

* Data reported are based on data from the 1971-72 test results.

** Data reported are based on data from the 1974-75 test results.

TABLE 3

SUMMARY OF STATEWIDE STATISTICS - INDIVIDUAL STUDENT SCORES

1976 DELAWARE EDUCATIONAL ASSESSMENT PROGRAM

Grade Eight

Test or Score	Number of Students	Number of Items on Test	Raw Scores				T-Scores				Reliability Coefficient
			Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.	
Verbal Aptitude	9199	50	30.47	9.16	1	50	49.97	10.02	18	71	.90*
Quantitative Aptitude	9192	50	28.80	9.78	1	50	49.88	9.93	22	72	.91*
Total Aptitude	9188	100	59.30	17.92	8	99	50.01	10.01	21	72	.95*
Reading	9157	60	37.53	12.16	3	60	49.99	10.00	22	68	.93**
English	9142	100	59.06	17.31	15	98	49.99	10.01	25	72	.94**
Mathematics	9099	75	44.24	16.04	4	75	50.00	9.98	25	69	.95**
Science	9152	50	26.99	9.20	1	49	49.98	9.99	22	74	.88**
Composite Achievement	8928		-	-	-	-	50.20	9.10	27	69	.89**
Social Studies	9138	35	23.36	7.14	1	35	49.91	9.99	19	66	.98**

* Data reported are based on data from 1971-72 test administration.

** Data reported are based on data from the 1974-75 test administration.

TABLE 4

GRADE ONE: STUDENT PERFORMANCE BY OBJECTIVE

1976 Delaware Educational Assessment Program

Category	Objective	Number of Items	Mean Percent Correct
	READING		
A. Readiness		13	88.00
	A3. Auditory Discrimination	10	86.40
	A4. Visual Discrimination	3	93.33
B. Word Recognition		26	80.69
	B2. Sight Vocabulary	11	80.18
	B3. Phonic Analysis	11	84.36
	B4. Structural Analysis	4	72.00
C. Comprehension		19	66.63
	C1. Literal	13	68.62
	C2. Interpretive	6	62.33
	C3. Critical	5	63.00
	ENGLISH		
LISTENING			
A. Listen for Information		23	87.74
	A1. Follow simple oral directions for a given task and		
	A3. Listen for the purpose of answering basic questions about content.		
B. Listen for Evaluation		4	88.00
	B1. Analyze an oral presentation.		
STUDY SKILLS			
B. Reference Skills		19	85.74
	B1. Recognize and use letters of the alphabet.	3	94.33
	B3. Derive information from audio-visual materials.	12	85.83
	B4. Use various printed materials.	4	79.00

TABLE 4 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
	C1. State a reason for a given response.	5	73.60
	C2. Arrange pictures and/or topics in sequence.	5	80.40
	MATHEMATICS		
A. Numbers/ Numerals		19	84.11
	A1. Use qualitative terms to compare sets of objects.	3	80.33
	A8. Recognize simple fractional parts of a unit.	3	73.33
	A10. Name the cardinal number of any illustrated set of up to 100 elements.	3	91.67
B. Numeration		7	73.29
C. Operations and Properties		10	71.20
	C2. Use the addition facts and corresponding subtraction facts with whole numbers.	3	73.00
	C3. Illustrate the relationship between joining two disjoint sets and the addition of whole numbers.	3	75.00
D. Mathematical Sentences		6	68.33
	D1. Write a number phrase or sentence.	3	69.67
E. Geometry		5	82.60
	E1. Identify basic geometric shapes.	4	90.50
F. Measurement		6	73.67
	F2. Demonstrate simple measurements with nonstandard and standard units.	3	66.00
I. Mathematical Reasoning		13	65.00
	I3. Interpret picture problems for quantitative situations.	9	66.22

TABLE 5

GRADE FOUR: STUDENT PERFORMANCE BY OBJECTIVE

1976 Delaware Educational Assessment Program

Category		Objective	Number of Items	Mean Percent Correct
		READING		
B. Word Recognition			2	68.50
C. Comprehension			51	67.61
	C1.	Literal	15	63.00
	C2.	Interpretive	36	69.53
D. Study Skills			8	71.25
	D2.	Reference Skills	4	69.25
		ENGLISH		
WRITING				
A. Handwriting and Mechanics			50	63.96
	A2.	Capitalization	22	63.27
	A3.	Punctuation	24	59.63
	A4.	Spelling	24	68.58
B. Language			40	61.28
	B1.	Recognize and use appropriate grammatical units.	24	63.79
	B2.	Use parts of speech appropriately.	18	59.11
LITERATURE				
A. Form of Literature			8	59.75
	A2.	Know selected literary elements.	5	59.60
	A4.	Identify various forms.	4	58.50
B. Response to Literature			2	65.50
		MATHEMATICS		
A. Numbers/ Numerals			5	52.60

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
B. Numeration		5	70.40
	B1. Interpret the place value for whole numbers.	3	69.00
C. Operations and Properties		22	61.86
	C1. Compute sums and differences of whole numbers.	9	74.00
	C2. Multiply whole numbers up to a three-digit factor by a two-digit factor.	3	72.67
	C3. Divide whole numbers with a one-digit divisor and a four-digit dividend.	4	51.75
	C9. Add and subtract a pair of like fractions.	3	46.33
D. Mathematical Sentences		10	60.60
	D1. Solve simple open sentences.	6	60.50
	D3. Identify correct relations symbols.	3	56.67
E. Geometry		6	72.17
F. Measurement		14	58.43
	F2. Convert a simple measure from one unit to another within the same system.	6	51.67
	F4. Add and subtract measurements that do not involve converting from one unit to another.	6	68.17
G. Graphing and Functions		1	43.00
H. Probability and Statistics		4	52.00
	H1. Construct and interpret bar and line graphs.	3	61.67
I. Mathematical Reasoning		14	58.93
	I1. Estimate solutions in problem solving situations.	3	41.67
	I2. Read, interpret, and solve word/picture problems.	9	69.56

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
	SCIENCE		
BIOLOGICAL SCIENCE		12	53.50
B. Each part of a plant performs a specific function and is responsive to its environment.			
	B1. Describe and demonstrate the functions of roots, stems, leaves, and flowers of plants.	3	57.67
	B2. Describe the effect of soil, water, and light on the parts of plants.	3	56.33
C. An organism can be described by using its attributes and thus be distinguished from other organisms.			
	C1. Classify organisms into various categories based on characteristics.	3	55.00
	C2. Distinguish between vertebrate and invertebrate animals.	4	52.75
D. Organisms interact with each other and their environment.			
	D3. Describe a simple food chain and/or web.	3	38.00
	D4. Identify and describe animal and plant responses to changes in their environment.	3	61.33
PHYSICAL SCIENCE		14	48.07
A. Heat is caused by the motion of molecules in matter and transfer of heat may result in change of state.			
	A1. Describe and demonstrate how a substance can change from solid, liquid, or gas.	3	46.33

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
	A2. Demonstrate examples of the fact that heat is transferred from warmer to cooler areas or objects.	3	56.33
B. All bodies are subjected to forces which may cause a change or motion.			
	B1. Describe the effect of gravity on objects.	3	57.33
C. Energy exists in many identifiable forms and can be transferred from one form to another.			
	C1. Identify, describe, and demonstrate sound, heat, solar energy, and electricity as forms of energy.	3	29.00
	C4. Name and identify various sources of energy, and give examples of how each is used by man.	3	63.67
EARTH SCIENCE		16	50.13
A. The movements and positions of the elements of the solar system are systematic and predictable.			
	A1. Compare the sun, moon, stars, planets, and their relation to earth.	4	56.75
	A2. Describe and demonstrate the movement of the earth with respect to rotation, revolution, inclination.	3	52.33
C. Physical characteristics of the environment effect the occurrence and survival of organisms.			
	C1. Describe interdependencies between living things and the environment.	5	60.00

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
D. Energy of the sun is transferred to the atmosphere and in reacting to the physical environment, results in changes in weather and climate.			
	D3. Identify, describe, and demonstrate sound, heat, solar energy, and electricity as a form of energy.	1	29.00
	D4. Describe the inter-relationships of clouds, fog, rain, wind, and temperature.	3	47.00
OPERATIONS		19	52.79
A. Objects have attributes that make possible their identification in a collection of similar objects.			
	A1. Define an object using its physical properties.	4	51.00
	A2. Use the metric system to describe and/or distinguish objects in terms of mass, length, area, and volume.	5	51.20
B. The components of scientific investigations can be identified and described.			
	B1. Distinguish observations from inferences.	3	45.00
	B2. Distinguish between hypotheses, predictions, and guesses, based on student observed data.	4	55.25
	B3. Identify and name variables related to an investigation.	3	64.67
	B4. Describe the relationship of variables in an investigation.	8	59.13
	B5. Describe and interpret raw data and comparisons of events using student observation.	4	50.50

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
	SOCIAL STUDIES		
A. Inquiry Skills		25	58.77
	A3. Determine distance on a map.	3	62.67
	A6. Note significant details needed to draw conclusions from pictorial material.	7	64.14
	A7. Draw inferences based on data found in a graph or table.	7	58.57
B. Social Studies Understandings		18	59.17
	B1. Social interaction. Recognize behavior that promotes effective social interaction.	4	58.25
	B2. Scarcity. Describe how limited resources and increasing demands require conservation of human and natural resources.	3	63.67
	B4. Cultural variation. Recognize that while people everywhere have similar needs, their ways of meeting them differ according to their cultures.	5	55.20
	B5. Land-man interaction. Identify ways the natural environment affects man's ways of living.	5	65.80

TABLE

GRADE EIGHT: STUDENT PERFORMANCE BY OBJECTIVE

1976 Delaware Educational Assessment Program

Category	Objective	Number of Items	Mean Percent Correct
	READING		
C. Comprehension		54	62.15
	C1. Literal	26	66.69
	C2. Interpretive	28	57.93
	C3. Critical	3	61.67
D. Study Skills		6	66.33
	D1. Basic Book Skills	3	62.67
	D2. Reference Skills	3	70.00
	ENGLISH		
WRITING			
A. Handwriting and Mechanics		49	58.86
	A2. Capitalization	13	57.38
	A3. Punctuation	17	52.71
	A4. Spelling	24	62.96
B. Language		34	55.56
	B1. Structure appropriate grammatical units.	8	60.63
	B2. Use language properly.	3	54.87
C. Composition		5	69.20
	C2. Communicate thoughts and ideas in writing.	3	76.00
LITERATURE			
A. Form of Literature		11	66.64
	A2. Know selected literary elements.	3	66.33
	A4. Understand structure.	4	56.75
B. Response to Literature		4	67.25
	B4. Recognize inter-relationship of literature, society, and the individual.	3	67.67

TABLE 6 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
C. Critical Thinking		5	64.80
	C1. Support reason(s) for a given response.	3	68.67
	MATHEMATICS		
A. Numbers/ Numerals		6	57.17
B. Numeration		5	61.40
	B2. Express a positive rational number in its equivalent forms.	2	57.00
C. Operations and Properties		25	62.40
	C1. Solve addition, subtraction, multiplication, and division problems using whole numbers.	7	70.00
	C3. Compute the sum, product, difference, and quotient of any two positive rational numbers.	13	59.62
D. Mathematical Sentences		15	60.87
	D1. Solve simple linear equations.	4	74.25
	D3. Solve percentage problems.	4	41.25
	D4. Solve problems using proportions.	5	63.40
E. Geometry		9	53.89
F. Measurement		2	48.00
G. Graphing and Functions		1	47.00
H. Probability and Statistics		6	58.33
	H1. Construct and interpret bar, circle, and line graphs.	3	66.00
	H3. Determine an average and median for a given set of data.	3	50.67
I. Mathematical Reasoning		11	54.47
	I1. Simplify an expression or solve an equation.	3	60.67
	I2. Round off rational numbers from thousandths to millions.	3	50.67

TABLE 5 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
	I3. Read, interpret, and solve picture/word problems.	9	53.00
	I4. Estimate solutions in problem solving situations.	3	52.33
	SCIENCE		
BIOLOGICAL SCIENCE		11	50.36
C. Structural units of living organisms are reflected in life functions.		4	45.25
D. Organisms respond to, interact with, and depend upon environmental conditions.			
	D1. Identify physical and biological factors in an environment and the response of living things to these stimuli.	5	53.00
E. Man's potential to induce change in the environment can result in a positive or negative effect on himself and other organisms.		3	54.00
PHYSICAL SCIENCE		15	55.87
A. Matter is distinguishable by its characteristics and properties.			
	A3. Define element, compound, and mixture, and state properties that distinguish them from one another.	3	50.67
B. The quantity of energy and matter in the universe is constant and unchangeable.		3	56.33

TABLE 6 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
C. An unbalancing force must be exerted on a mass to change its motion.		4	53.00
D. Light is subjected to observable changes dependent upon media encountered.		3	59.67
E. The relationships between molecules and atoms explain physical and chemical properties.			
	E2. Define element, compound, and mixture, and state properties that distinguish them from one another.	3	50.67
	E4. Distinguish between physical and chemical changes.	3	64.33
EARTH SCIENCE		18	51.06
A. Space exploration affects our knowledge of the solar system.			
	A2. Describe conditions necessary for eclipse of the sun and moon.	3	44.67
	A3. Make inferences concerning the present feasibility of interplanetary travel.	3	53.67
B. Physical and chemical techniques are used to identify rocks, minerals, and fossils.		1	69.00
	B6. Demonstrate the ability to reocgnize and to collect specimens of rocks, minerals, and fossils.	3	59.00
C. Man's expanding knowledge of his environment has encouraged better land use practices.		7	48.29

TABLE 6 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
D. Knowledge of the factors involved in weather and climatic conditions increases man's ability to predict, interpret, and adjust to natural phenomena.		2	32.00
OPERATIONS		15	58.07
A. The procedure for conducting a scientific investigation provides for planning, implementing, and interpreting scientific experimentation and literature.		3	70.67
	A6. Demonstrate the ability to properly identify relevant information and interpret a data table or graph using that information.	4	52.00
	A7. Describe what a model is and how models can be helpful.	3	53.00
	A11. Interpret an hypothesis from a set of observations.	3	60.00
	A12. Distinguish between statements that are hypotheses and those that are not.	3	63.33
	SOCIAL STUDIES		
A. Inquiry Skills		29	64.31
	A4. Identify reliable and unreliable sources of information pertinent to a given problem or question.	3	57.00
	A5. Distinguish relevant from irrelevant information when given a particular situation.	10	60.60
	A6. Use charts to compare sizes and quantities.	8	72.00
	A8. Arrange events in sequential order.	3	63.00

TABLE 6 (Continued)

Category	Objective	Number of Items	Mean Percent Correct
B. Social Studies Understandings		15	70.67
	B1. Cultural pluralism. Recognize that the development of culture results from the contributions of many individuals and groups.	6	69.50
	B5. Land-man interaction. Illustrate how cultural development is shaped by the natural environment.	4	71.25

TABLE 7

DISTRIBUTION OF SCHOOL SCORES - 1976 DEAP

(SCHOOL NORMS - GRADE 1)

	COMMUNITY & SCHOOL CHARACTERISTICS							STUDENT INPUTS & ACHIEVEMENT				
	SES	% FREE* LUNCHES	% REDUCED* PRICE LUNCHES	ATTENDANCE RATE	AVE TCHR EXPERIENCE	AVE TCHR SALARY	% TCHRS WITH MASTERS	READING	LISTENING	MATH	COMPOSITE	
90	57.9	2.1	0.3	96.0	15.6	14,190.0	40.8	55.4	55.6	56.6	55.6	90
80	55.0	5.4	0.8	95.6	14.2	13,692.5	31.8	54.3	54.2	54.6	54.2	80
70	53.3	8.2	1.2	95.2	13.2	13,178.7	26.9	53.5	52.2	52.7	52.9	70
60	51.1	12.3	1.7	94.9	12.4	12,772.5	22.3	51.3	51.2	51.3	51.5	60
50	49.7	20.1	2.4	94.3	11.2	12,181.3	17.5	50.4	50.2	50.7	50.1	50
40	49.0	25.2	3.3	94.1	10.2	11,820.0	14.6	49.2	49.1	49.1	48.9	40
30	48.3	30.1	4.1	93.8	9.9	11,371.2	12.1	47.1	48.0	47.7	48.0	30
20	46.6	39.8	4.9	93.1	9.2	11,007.5	9.1	45.3	46.8	45.8	46.2	20
10	45.2	51.6	6.1	91.9	8.0	10,610.0	6.2	44.3	43.5	42.6	43.7	10
MEAN OF ALL SCHOOLS	50.7	25.5	3.0	94.1	11.7	12,351.7	20.6	50.0	50.0	50.1	50.0	MEAN OF ALL SCHOOLS
STD DEV OF SCHOOLS	4.5	24.1	2.5	2.0	3.1	1,348.2	13.3	4.5	4.5	4.9	4.4	STD DEV OF SCHOOLS
NUMBER OF SCHOOLS	99	99	99	99	99	99	99	99	99	99	99	NUMBER OF SCHOOLS
CORRELATION WITH COMP ACHIEVEMENT	0.65	-0.61	-0.08	0.29	-0.18	-0.03	0.31					CORRELATION WITH COMP ACHIEVEMENT

PERCENTILE

* Scale is inverted due to negative correlation with achievement.

TABLE 8

DISTRIBUTION OF SCHOOL SCORES - 1976 DEAP

(SCHOOL NORMS - GRADE 4)

PERCENTILE	COMMUNITY & SCHOOL CHARACTERISTICS							STUDENT INPUTS & ACHIEVEMENT									
	SES	% FREE LUNCHES *	% REDUCED PRICE LUNCH *	ATTEN-DANCE RATE	AVE TCHR EXP	AVE TCHR SALARY	% TCHR WITH MASTERS	VERB APT	QUANT APT	TOTAL APT	READ	ENG	MATH	SCIENCE	SOC STD	COMP ACHIEVE	
90	57.9	2.1	0.3	95.9	15.6	14,190.0	41.3	56.6	56.1	56.6	56.3	56.6	56.0	55.7	56.3	56.3	90
80	55.0	5.4	0.8	95.6	14.5	13,667.5	33.3	53.9	53.6	53.9	53.9	53.8	54.3	54.3	53.7	53.8	80
70	53.3	8.2	1.3	95.2	13.2	13,178.7	26.9	52.3	52.3	52.3	52.7	52.9	52.6	52.8	52.6	52.7	70
60	51.0	12.4	1.8	95.0	12.1	12,755.0	22.3	50.7	50.5	50.8	51.8	51.7	51.4	51.0	51.3	51.3	60
50	49.7	20.3	2.4	94.3	11.3	12,200.0	17.6	49.6	49.7	49.7	50.7	50.5	50.5	50.5	50.3	50.6	50
40	48.9	25.2	3.3	94.2	10.3	11,832.5	14.7	48.5	49.0	48.5	48.8	49.5	49.1	49.5	48.9	49.4	40
30	48.3	30.1	4.1	94.0	9.9	11,396.2	12.0	47.7	47.7	47.6	48.2	48.0	48.0	47.9	48.1	48.1	30
20	46.8	39.9	5.0	93.5	9.2	11,007.5	8.9	46.8	46.1	46.5	46.5	46.6	46.0	46.2	46.6	46.7	20
10	45.2	51.6	6.2	92.4	8.1	10,610.0	4.2	43.6	43.4	43.3	43.2	43.2	41.5	42.9	43.7	43.5	10
MEAN OF ALL SCHOOLS	50.7	25.7	3.1	94.2	11.8	12,359.5	20.7	49.9	49.9	49.9	50.0	50.1	49.9	50.0	50.0	50.1	MEAN OF ALL SCHOOLS
STD DEV OF SCHOOLS	4.5	24.1	2.6	1.9	3.1	1,337.5	13.5	4.6	4.6	5.0	5.0	5.0	5.2	4.8	4.6	4.8	STD DEV OF SCHOOLS
NUMBER OF SCHOOLS	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	NUMBER OF SCHOOLS
CORRELATION WITH COMP ACHIEVEMENT	0.73	-0.79	-0.13	0.41	0.04	0.01	0.39										CORRELATION WITH COMP ACHIEVEMENT

* Scale inverted due to negative correlation with achievement.

TABLE 9

DISTRIBUTION OF SCHOOL SCORES - 1976 DEAP

(SCHOOL NORMS - GRADE 8)

PERCENTILE	COMMUNITY & SCHOOL CHARACTERISTICS							STUDENT INPUTS & ACHIEVEMENT									PERCENTILE
	SES	% FREE LUNCHES *	% REDUCED PRICE LUNCH *	ATTEN-DANCE RATE	AVE TCHR EXP	AVE TCHR SALARY	% TCHR WITH MASTERS	VERB APT	QUANT APT	TOTAL APT	READ	ENG	MATH	SCIENCE	SOC STD	COMP ACHIEVE	
90	58.3	1.3	0.0	95.7	13.6	14,132.5	49.2	55.8	56.1	56.3	55.6	55.7	55.9	56.1	55.5	55.8	90
80	55.4	5.7	0.4	95.1	12.5	13,877.5	47.5	55.5	54.4	55.4	55.1	54.9	54.1	54.6	54.1	55.0	80
70	52.5	8.4	1.0	94.4	11.5	13,622.5	36.4	52.3	51.9	52.3	51.7	52.4	52.7	52.0	51.9	52.0	70
60	51.0	12.9	1.7	94.0	11.3	13,142.5	25.8	50.8	51.1	51.1	50.9	51.1	51.6	50.8	50.8	51.1	60
50	49.8	15.5	2.5	93.8	10.6	12,312.5	24.2	49.8	49.8	49.9	50.2	50.5	49.6	49.8	50.3	50.0	50
40	48.2	20.2	3.1	93.1	10.0	11,910.0	21.9	49.0	49.3	49.4	48.9	49.0	49.1	49.0	49.0	49.4	40
30	47.7	24.7	3.8	92.9	9.0	11,252.5	19.4	48.6	48.9	48.5	48.5	48.4	48.5	48.7	48.5	48.5	30
20	47.0	33.1	4.6	92.0	8.3	10,947.5	14.1	47.3	47.9	47.8	47.7	47.5	47.2	47.9	47.0	47.8	20
10	46.2	45.3	5.7	91.2	7.0	10,567.5	8.9	42.3	40.0	40.6	43.9	42.9	41.5	42.2	41.1	41.6	10
MEAN OF ALL SCHOOLS	50.8	21.5	2.7	93.2	10.5	12,446.7	27.9	50.0	49.9	50.0	50.0	50.1	50.0	50.0	50.0	50.1	MEAN OF ALL SCHOOLS
STD DEV OF SCHOOLS	4.3	20.0	2.3	2.6	2.4	1,470.5	15.6	5.0	5.1	5.3	4.7	4.7	5.1	4.7	4.7	4.6	STD DEV OF SCHOOLS
NUMBER OF SCHOOLS	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	NUMBER OF SCHOOLS
CORRELATION WITH COMP ACHIEVEMENT	0.86	-0.90	-0.25	0.85	0.23	0.25	0.47										CORRELATION WITH COMP ACHIEVEMENT

* Scale inverted due to negative correlation with achievement.

TABLE 10

DISTRIBUTION OF DISTRICT SCORES

(DISTRICT NORMS - 1976 OEAP)

COMMUNITY & SCHOOL CHARACTERISTICS

	SES	% FREE LUNCHES *	% REDUCED PRICE LUNCH *	AFDC PER 1000 PUPILS *	EFFORT INDEX	REAL ESTATE PER PUPIL	ATTEN-DANCE RATE	DROP-OUT RATE *	AVE TCHR EXP	AVE TCHR SALARY	% TCHRS WITH MASTERS	LOCAL REVENUE PER PUPIL	CURRENT EXPEND PER PUPIL	INSTR COST PER PUPIL	
PERCENTILE 75	52.3	10.3	1.1	28.8	1.1	38,925	94.1	2.3	12.4	13,244	33.0	431	1180	843	75 PERCENTILE
50	48.8	23.8	3.1	60.0	0.9	34,800	93.1	3.8	11.3	11,875	17.3	312	1092	760	50
25	47.9	32.1	3.9	79.5	0.8	23,475	92.1	4.9	9.3	10,781	12.7	169	997	685	25
MEAN	50.2	23.8	2.9	72.0	0.9	34,231	92.7	3.6	11.2	11,983	20.3	328	1131	785	MEAN
STD DEV	3.4	16.4	1.7	76.8	0.2	15,151	2.1	1.6	1.7	1,298	10.8	179	179	133	STD DEV
NUMBER	23	23	23	23	23	23	23	23	23	23	23	23	23	23	NUMBER
CORRELATIONS															CORRELATIONS
GRADE 1	0.71	-0.70	-0.25	-0.57	0.03	0.44	0.62	-0.22	-0.12	0.32	0.61	0.34	-0.11	-0.01	GRADE 1
GRADE 4	0.85	-0.90	-0.17	-0.83	-0.11	0.44	0.79	-0.50	0.04	0.32	0.62	0.27	-0.16	-0.13	GRADE 4
GRADE 8	0.89	-0.93	-0.19	-0.80	-0.06	0.48	0.90	-0.49	0.15	0.35	0.62	0.33	-0.07	-0.07	GRADE 8

* Scales inverted due to relatively large negative correlations with achievement.

TABLE 11

DISTRIBUTION OF DISTRICT SCORES

(DISTRICT NORMS - 1976 DEAP)

STUDENT INPUT & ACHIEVEMENT MEANS

	GRADE 1				GRADE 4									GRADE 8								
	READ	LSTNG	MATH	COMP	VERB	QUANT	APT	READ	ENG	MATH	SCI	SOC STD	COMP	VERB	QUANT	APT	READ	ENG	MATH	SCI	SOC STD	COMP
PERCENTILE 75	51.8	51.3	51.5	51.6	51.5	51.9	51.7	51.8	51.7	52.1	52.4	51.8	52.3	52.3	52.0	52.4	51.7	52.4	52.1	51.6	52.6	52.2
50	48.8	49.1	49.3	49.3	49.0	49.0	48.9	49.7	50.0	49.9	49.4	49.8	49.6	49.8	49.6	50.0	49.1	49.2	49.5	49.3	49.5	49.9
25	47.0	46.7	47.6	46.7	47.5	47.9	47.5	48.3	47.9	47.6	47.9	47.5	47.8	48.0	48.4	48.2	48.2	48.0	47.3	48.0	47.6	48.1
MEAN	49.1	49.2	49.0	49.1	49.5	49.6	49.6	49.9	50.0	49.7	49.6	49.8	49.8	49.9	49.7	49.8	49.9	49.9	49.6	49.9	49.7	49.9
STD DEV	3.2	3.1	3.7	3.2	3.4	3.2	3.6	3.6	3.6	3.9	3.5	3.6	3.6	4.0	4.2	4.4	3.7	3.8	4.3	3.9	3.9	3.8
NUMBER	22	22	22	22	22	22	22	22	22	22	22	22	22	23	23	23	23	23	23	23	23	23

DESCRIPTION OF NEEDS ASSESSMENT: MAKING JUDGEMENTS

Overview

The Delaware Department of Public Instruction is both legally and administratively required to identify the educational needs of students. Title III of the Elementary and Secondary Act of 1965 provides funds for innovative and exemplary programs in local school districts, and requires an annual assessment of educational needs at the state and at the local level. In their annual Title III plan, state educational agencies must submit evidence that a statewide needs assessment has been conducted, and that the critical educational needs of both the state and of various population groups and geographic areas have been identified.

In addition to being a legal requirement for participation in the Elementary and Secondary Education Act, a statewide assessment of educational needs is a necessary administrative prerequisite for providing meaningful educational programs for the young people of Delaware. The development of school programs should be related to the educational needs of the state. Specifically, findings from a needs assessment might indicate priorities for both legislative and educational action. Test data can point the way in such an undertaking, but professional judgement is an essential ingredient for completing the needs assessment. Beyond the initial step of comparing system output or student performance with system expectancies for student performance for the purpose of identifying discrepancies, a judgemental matter in itself, there are at least two remaining steps to be made where discrepancies are found to exist. The first of these is the task of examining school inputs relative to outcomes for the identification of possible remedial reallocations of resources. The last task, usually performed by the operations group, is that of examining the educational process relative to outcomes for the identification of needed program changes. Neither of these judgemental activities is within the province of the assessment program.

Definition of an Educational Need

Whenever what is required is greater, in some sense, than what is obtained, a need exists. In education, goals and objectives express the required status, while current levels of attainment indicate the obtained status. Hence, when the current level of attainment falls short of the performance specified by a goal or objective, an educational need exists.

RESULTS: STATE NEEDS

For purposes of this report, educational needs will be determined for grades one, four, and eight:

* In relation to statewide objectives in reading, English, and mathematics.

* By comparison of current student achievement levels with those of appropriate national samples in reading, English, mathematics, and science.

Both approaches focus on system output or student performance and are intended to provide the means for judgement to be made about the fit between system expectancies and actual accomplishments.

Performance in Relation to Statewide Objectives

This section presents a summary of selected data shown in Tables 4, 5, and 6. The graphic presentation (see Figure 2) shows mean percent correct response for each tested item category for grades one, four, and eight reading, English and mathematics.

Grade one areas of strength appear to be readiness skills, word recognition, listening skills, reference skills, numbers/numerals, and geometry. Areas of weakness appear to be reading comprehension skills, mathematical sentences, and mathematical reasoning.

Grade four areas of strength appear to be study skills, response to literature, numeration, and geometry. Areas of weakness appear to be word recognition, reading comprehension, literature forms, numbers/numerals, probability and statistics, and graphing and functions.

Grade eight areas of strength appear to be composition skills, numeration, operations and properties, and mathematical sentences. Areas of weakness appear to be reading comprehension, written language, mathematical reasoning, and graphing and functions.

Delaware and the Nation: Student Performance on Objectives Compared to the Nation

This section presents comparative data in terms of part scores for Delaware and the nation in 1976. Part scores are based on responses to the items in the 1976 assessment batteries for which national statistics are available (common items), and a part score is the average percent of the students in either group who answered the questions in a given item-grouping correctly. Item-groupings are not mutually exclusive, and they are of two types, categories and objectives. A category consists of a set of three or more items related to an instructional topic, e.g., "word analysis" in reading. An objective is measured by a sub-set of three or more items within a category that are related to a statewide objective. Individual items may appear in more than one item-grouping. Because the data are restricted to groups of three or more items, not all of the common items in a given test are necessarily represented in a particular table.

For the given grade, each table shows the name of the test and of the category under consideration, a shortened statement of the objective(s) to which the item-cluster refers, the number of items in the cluster/category,

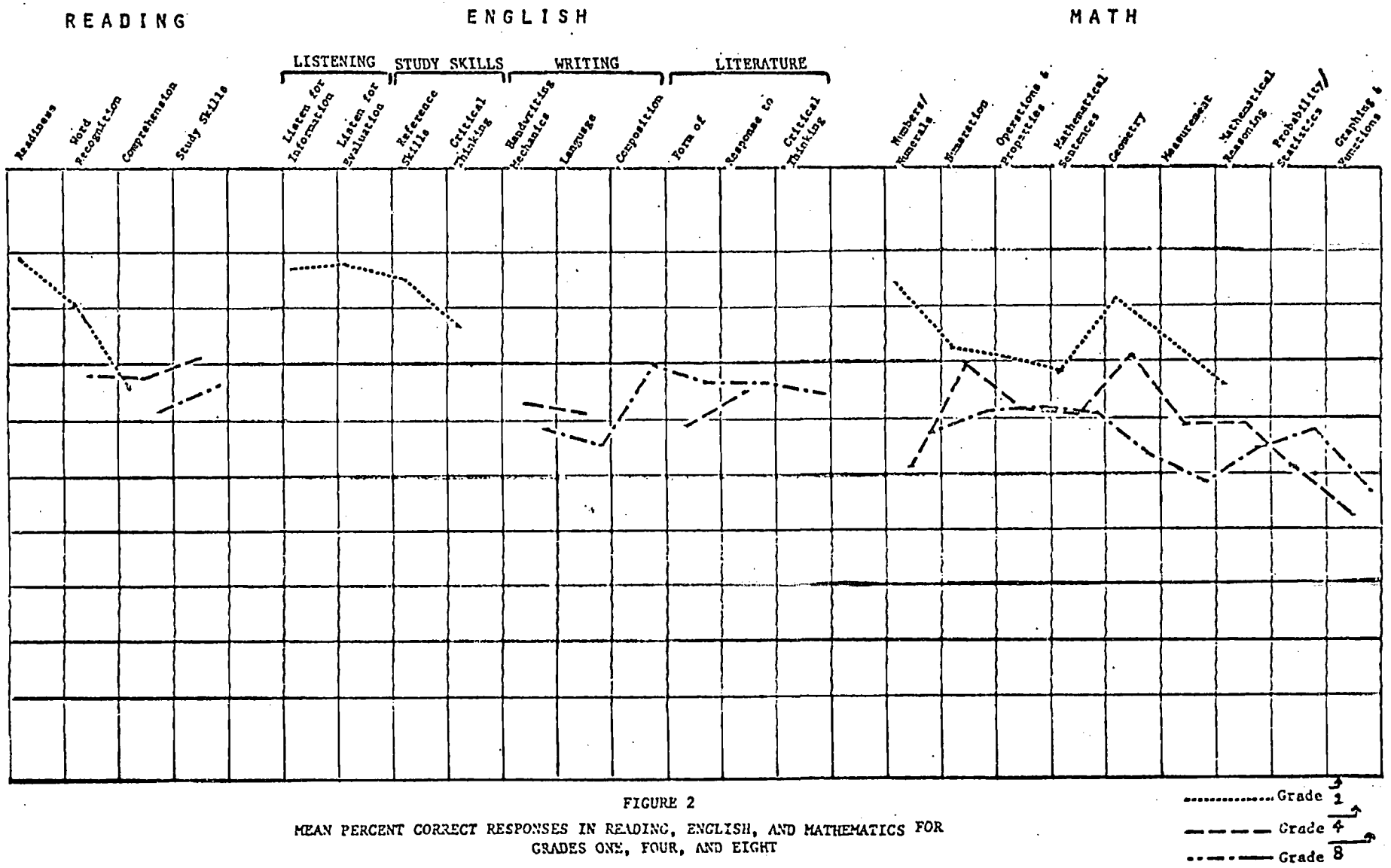

FIGURE 2

MEAN PERCENT CORRECT RESPONSES IN READING, ENGLISH, AND MATHEMATICS FOR GRADES ONE, FOUR, AND EIGHT

the average percent of the students in Delaware and the nation who answered the items correctly, and the difference between the two percents. The direction of the difference is shown by a plus or minus sign. A plus sign indicates that, on the average, the percent of Delaware students answering the items correctly was greater than the percent of national-sample students answering the same items correctly. A minus sign indicates the reverse, i.e., the percent of Delaware students answering the items correctly was less than the percentage of national-sample students answering the same items correctly.

The data in Tables 12, 13, and 14 indicate that grade one performance exceeds that of the national sample in all item groupings for which data are available. Grade four performance in comparison to the national sample is strongest in the areas of biological science and probability and statistics and weakest in the areas of mechanics of writing, operations with whole numbers, measurement, and physical science. Grade eight performance in comparison to the national sample is poorer in all measured areas with the exception of physical science.

Delaware and the Nation: Total Score Comparisons

Tables 15, 16, and 17 present comparative total test data for Delaware and the nation for grades one, four, and eight in 1976. These data are based on those items in the 1976 assessment batteries for which national statistics are available (common items). Each table presents the names of the tests in the battery for the given grade, the total number of items in each test, the number of items for which national statistics are available, the average percent of the common items answered correctly by students in Delaware and by students in the national sample, and the difference between the two average percents. The direction of the difference is shown by either a plus sign or a minus sign. A plus sign indicates that the average percent of the common items answered correctly by the Delaware students was greater than the average percent of the same items answered correctly by students in the national sample; a minus sign indicates that the average percent of the common items answered correctly by Delaware students was less than the average percent of the same items answered correctly by the national-sample students.

TABLE 12

GRADE ONE: DELAWARE AND THE NATION,
STUDENT PERFORMANCE BY OBJECTIVES

1976 Delaware Educational Assessment Program

Category	Objective	No. of Items	Mean % Correct Del.	Nation	Diff.
	READING				
Readiness	Auditory discrimination	9	86.3	76.6	+ 9.7
	Visual discrimination	3	93.3	87.7	+ 5.6
Word Recognition	Sight vocabulary	11	80.2	75.5	+ 4.7
	Phonic analysis	8	82.1	69.9	+12.2
	Structural analysis	4	72.0	63.5	+ 8.5
Comprehension	Literal	4	61.2	55.5	+ 5.7
	Interpretive	6	62.3	55.2	+ 7.1
	Critical	4	65.8	58.5	+ 7.3
	ENGLISH (Study Skills)				
Classification	Recognize similarities and differences	17	88.6	82.7	+ 5.9
Reference	Derive information from audio-visual materials	7	83.3	71.9	+11.4
Critical Thinking	State reason for response	4	70.0	56.5	+13.5
	Arrange things in sequence	5	80.4	76.4	+ 4.0
	ENGLISH (Listening)				
Listen for Evaluation	Follow simple oral directions and Listen for the purpose of answering questions	17	88.6	82.7	+ 5.9
	MATHEMATICS				
Numbers/ Numerals	Name the cardinal number of an illustrated set	6	84.0	79.5	+ 4.5
		3	91.7	87.3	+ 4.4
Numeration		3	69.7	58.0	+11.7
Geometry	Identify basic geometric shapes	4	90.5	83.3	+ 7.2

TABLE 12 (Continued)

Category	Objective	No. of Items	Mean % Correct Del.	Nation	Diff.
Mathematical Reasoning		4	64.0	56.3	+ 7.7
	Interpret quantitative picture problems	5	69.0	58.2	+10.8

TABLE 13

GRADE FOUR: DELAWARE AND THE NATION,
STUDENT PERFORMANCE BY OBJECTIVES

1976 Delaware Educational Assessment Program

Category	Objective	No. of Items	Mean % Correct Del.	Nation	Diff.
	READING				
Comprehension	Literal	3	65.3	63.3	+ 2.0
	Interpretive	14	68.8	66.2	+ 2.6
	ENGLISH (Writing)				
Handwriting & Mechanics	Capitalization	14	68.5	67.6	+ 0.9
	Punctuation	3	46.7	52.0	- 5.3
	Spelling	16	70.2	73.8	- 3.6
Language	Appropriate grammatical units	21	63.8	61.0	+ 2.8
	Parts of speech	16	59.5	60.9	- 1.4
	MATHEMATICS				
Operations & Properties	Add and subtract whole numbers	8	74.0	77.0	- 3.0
	Divide whole numbers	4	51.8	58.5	- 6.7
Measurement	Convert measures from one unit to another within the same system	5	56.4	62.6	- 6.2
	Add and subtract measurements	3	66.3	70.3	- 4.0
Probability & Statistics	Interpret bar and line graphs	3	61.7	58.7	+ 3.0
Mathematical Reasoning	Solve picture and word problems	6	67.7	68.3	- 0.6
	SCIENCE				
	Biological Science	5	64.6	60.8	+ 3.8
	Physical Science	4	55.2	60.2	- 5.0
	Earth Science	4	72.5	75.0	- 2.5
	Operations	15	55.9	56.9	- 1.0

TABLE 14

GRADE EIGHT: DELAWARE AND THE NATION,
STUDENT PERFORMANCE BY OBJECTIVES

1976 Delaware Educational Assessment Program

Category	Objective	No. of Items	Mean % Correct Del.	Nation	Diff.
	READING				
Comprehension	Literal	15	62.5	70.5	- 8.0
	Interpretive	19	57.8	62.7	- 4.9
	Critical	3	61.7	65.3	- 3.6
	ENGLISH (Writing)				
Handwriting & Mechanics	Capitalization	8	66.2	72.4	- 6.2
	Internal punctuation	12	59.6	68.9	- 9.3
	Spelling	18	60.1	65.1	- 5.0
Language	Appropriate grammatical units	6	59.2	68.3	- 9.1
	Proper language usage	23	56.6	64.1	- 7.5
	MATHEMATICS				
Numeration		4	65.0	72.0	- 7.0
Operations & Properties	Add, subtract, multiply, and divide whole numbers	5	67.2	75.8	- 8.6
	Add, subtract, multiply, and divide two non-negative rational numbers	10	59.6	62.1	- 2.5
Mathematical Sentences		5	60.0	66.8	- 6.8
	Proportions	4	67.0	77.0	-10.0
Geometry		6	53.5	61.2	- 7.7
Probability & Statistics	Interpret bar, line, and circle graphs	3	66.0	73.0	- 7.0
Mathematical Reasoning	Simplify an expression or solve an equation	3	60.7	74.0	-13.3
	Solve picture/word problems	7	57.1	63.0	- 5.9
	SCIENCE				
	Biological Science	5	52.0	62.6	-10.6
	Physical Science	5	56.6	57.4	- 0.8
	Earth Science	3	62.7	63.0	- 0.3
	Operations	9	59.4	66.0	- 6.6

TABLE 15

GRADE ONE: DELAWARE AND THE NATION,
TOTAL SCORE COMPARISONS

1976 Delaware Educational Assessment Program

Test	Number of Items on Test	Number with National Norms	Mean % Correct		Difference
			Delaware	Nation	
Reading	50	40	77.5	70.0	+ 7.5
English	50	29	84.2	76.9	+ 7.3
Mathematics	55	30	77.6	68.7	+ 8.9

TABLE 16

GRADE FOUR: DELAWARE AND THE NATION,
TOTAL SCORE COMPARISONS

1976 Delaware Educational Assessment Program

Test	Number of Items on Test	Number with National Norms	Mean % Correct		Difference
			Delaware	Nation	
Verbal Ability	50	50	49.4	51.0	- 1.6
Quantitative Ability	50	50	55.6	58.8	- 3.2
Total Ability	100	100	52.5	54.9	- 2.4
Reading	60	17	68.2	65.7	+ 2.5
English	100	68	64.3	64.8	- 0.5
Mathematics	75	42	62.1	63.2	- 1.1
Science	50	22			
STEP, II		12	57.9	56.8	+ 1.1
NAEP		10	61.0	67.4	- 6.4

TABLE 17

GRADE EIGHT: DELAWARE AND THE NATION,
TOTAL SCORE COMPARISONS

1976 Delaware Educational Assessment Program

Test	Number of Items on Test	Number with National Norms	Mean % Correct		Difference
			Delaware	Nation	
Verbal Ability	50	50	60.9	66.8	- 5.9
Quantitative Ability	50	50	57.6	58.2	- 0.6
Total Ability	100	100	59.3	62.5	- 2.2
Reading	60	34	59.8	66.1	- 6.3
English	100	60	58.9	66.0	- 7.1
Mathematics	75	49	59.3	65.4	- 6.1
Science	50	18			
STEP, II		12	54.3	61.6	- 7.3
NAEP		6	65.8	64.0	+ 1.8

APPENDIX

GRADE ONE, CATHOLIC DIOCESAN SCHOOLS:
SUMMARY OF STATEWIDE STATISTICS

1976 DELAWARE EDUCATIONAL ASSESSMENT PROGRAM

GRADE ONE, CATHOLIC DIOCESAN SCHOOLS:
SUMMARY OF STATEWIDE STATISTICS

1976 DELAWARE EDUCATIONAL ASSESSMENT PROGRAM

Test or Score	Number of Students	Number of Items on Test	T-scores			
			Mean	S.D.	Min.	Max.
Reading	1079	50	52.2	8.8	21	- 63
English	1076	50	49.7	9.0	1	- 64
Mathematics	1077	55	50.3	9.3	13	- 67
Composite Achievement	1075	-	50.8	7.9	21	- 65