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ABSTRACT

This paper reviews the process employed in Pennsylvania to develop, refine, select, and implement educational indicators at the state level as part of a state testing program. The indicators are used to provide meaningful comparative information for analysis and planning, to encourage school employees to make productive curricular or organizational changes, and to provide predicted scores for selected cognitive and affective student measures. Means by which the indicator data are reported to school districts are presented, and whether the indicator data were used at the local level is investigated. The selection and refinement of the indicators has taken place over an 18-year period. Currently, over 60 indicators are in use within the state program. Consideration is given to the alteration or replacement of the indicators for use within a national indicator system. Tabulated data and a descriptive tabular listing of indicator condition variables are appended. (TJH)

SELECTION, DEPLOYMENT, AND USE OF QUALITY INDICATORS IN PENNSYLVANIA

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Abstract

During the past few years the interest in indicators has increased for educators. This paper reviewed the process employed in Pennsylvania to develop, refine, select and implement indicators at the state level as a part of a state testing program. How the indicator data were reported to school districts was presented, and if the indicator data were used at the local level was investigated. At this time over 60 indicators are in use by the state program. If those indicators can be altered or replaced to become part of a national indicator system was considered.

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INTRODUCTION

During the past eighteen years the Pennsylvania Department of Education has collected data on quality indicators from all Pennsylvania school districts. Reports were produced to provide information on the indicators at the school and school district levels Within the reports, comparative information included raw scores, percentile ranks, and correlations. Percentile ranks were used to provide meaningful comparisons on indicators between schools and school districts by grade level. Correlations were employed in analyzing the statistical link between indicators and student achievement on a variety of cognitive measures. Also, correlations were used to analyze the statistical relationship between indicators and student attitudes on several affective measures. In total, indicators were used (1) to provide meaningful comparative information used in analysis and planning functions, (2) to encourage school employees to make make productive curriculum or organizational changes and (3) to provide predicted scores for selected cognitive and affective student measures.

Within the past few years the interest in indicators has increased for educators. An example of that interest includes the publication of the Secretary of Education's "Wall Chart" with the reporting of selected data. Data that were collected and reported include student SAT and ACT scores, graduation rates, teacher salaries, pupil/teacher ratios, expenditures, and student characteristics. Although some educators charged this was not a fair or accurate comparison of states, a need to respond was produced. A second example of the interest in indicators is the work conducted through the State Assessment Center (Selden, 1985) on a wide range of indicators. If that system becomes operational, indicators will be collected across the nation.

This paper will include the following : (1) a review of the indicators employed by the Pennsylvania Department of Education in the state assessment programs, (2) how the indicator data were reported, used in predictions and employed in developing norms, (3) correlations be-

tween indicators and both affective and cognitive scores, (4) stability of the correlational relationships over years, (5) how the indicators were selected and refined over eighteen years, (6) use of the indicator information at the school and school district level by school district staff, and (7) how the indicators could be altered to be part of a national system. The paper is designed not only to review what was completed, but to suggest what could be done to promote better educational practices.

PENNSYLVANIA INDICATORS

For the 1986 Pennsylvania state assessment programs two sets of indicators were in use. First, the Educational Quality Assessment (EQA) program included up to 44 indicators (labeled as "condition variables" in that program) depending upon the grade level assessed. Those indicators were gathered from Pennsylvania Department of Education records, Pennsylvania teachers and students. Indicators from Department of Education records included the following: (1) grade enrollment, (2) percentage of low income students, and (3) tuition rate. Grade enrollment was employed as an indication of the building size. The percentage of low income students was a socioeconomic (SES) variable. Tuition rate or per pupil educational expenditure was considered to be an indication of the local effort to support education.

Indicators gathered from teachers included the following: (4) teacher satisfaction with relationships with parents and parent groups, (5) teacher education, (6) parent attendance at parent-teacher conferences, (7) supervision of building, (8) class size, (9) number of classroom observations (10) perception of the building leadership, (11) teacher-initiated environment, (12) freedom from disruptions to instruction, (13) perception of discipline, (14) involvement in planning functions, and (15) perception of school climate. The teacher satisfaction with relationships with parents was based on teacher perception of the quality of the teacher-parent relationship. Parent attendance at parent-teacher conferences was considered to be an estimate

of the parent interest in the student's school life. Supervision of the building was used to determine if the school had a full-time administrator or if the administrator was assigned more than one school. Teachers reported their average class size which was used to compute a school mean class size. The number of classroom observations was designed to reflect the extent to which teacher work was formally monitored. Indicators 10 through 15 reflected the positive or negative perceptions of teachers on school related factors. Those teacher perceptions were based in part on the school effectiveness research that has been widely publicized including the work of Edmonds (1982), Brookover and Lezotte (1979).

Indicators that employed students as respondents included the following: (16) percentage of girls, (17) parental education, (18) population density, (19) percentage of white students, (20) frequency of residence/school change, (21) student perception of parental interest in school, (22) student time spent watching television, (23) student perception of parental expectations, (24) student educational expectations, (25) reading material in the home, (26) time spent reading at home, (27) frequency of writing assignments, (28) perceived ability to complete school work, (29) perceived quality of study habits, (30) time spent on mathematics assignments, (31) frequency of tests or quizzes, (32) timely return of tests, (33) student perception of classroom discipline, (34) percentage of academic/college prep students, (35) hours of employment per week, (36) perception of direct instruction in mathematics, (37) perception of direct instruction in English, (38) perception of direct instruction in science, (39) perception of direct instruction in social studies, (40) percentage of students taking mathematics, (41) percentage of students taking science, (42) interest in school, (43) parental encouragement, and (44) student perception of teacher expectations. In addition, students provided information on the testing conditions. Data were collected on the student demographics including gender (16), family SES (17), and race (19). Population density was used to describe the school setting in terms of urban to rural. Student change in residence was a measure of the time the school had to work with students as a part of their system. Student change in residence also reflects the mobility of the commu-

nity. A variety of student perceptions were tapped including views on parental interest, parental expectations, educational expectations, ability to complete school work, quality of study habits, classroom discipline, parental encouragement, and teacher expectations. Students estimated the time spent on direct instruction (lecture and classroom discussion) in mathematics, English, science, and social studies. Amount of reading material in the home was reported by students; this may be in part a SES indicator. The amount of time students spent on specific activities, such as reading at home, doing mathematics assignments and working for remuneration was gathered. The frequency with which students were assigned selected activities including writing assignments and tests or quizzes was investigated. Students reported if tests were returned in a timely fashion. The percentage of academic students and the percentage of students taking mathematics and/or science classes was collected. Student interest in school was tapped using 12 to 28 items depending on the grade level assessed. Testing conditions were surveyed to determine if the students took the EQA items seriously. Testing conditions were not considered to be an indicator for the EQA program. Hence, only 44 indicators were considered. For a more detailed review of the indicators that includes the weightings and descriptions see Appendix A (Hertzog et al 1986).

Additional indicator information was gathered from students on a series of cognitive and affective measures (labeled as goal areas or goal scores for the EQA program). Those measures were based on the State Board of Education adopted Goals of Quality Education. The resulting paper and pencil cognitive tests included: reading comprehension, writing skills, mathematics, analytical thinking, citizenship/social studies, arts and humanities, science and technology, environment, health knowledge, and computer literacy. Paper and pencil surveys were employed to tap the student attitudes on the following areas: understanding others, science and technology, environment, and work. A single measure of participation in arts and humanities was used to gather data for that goal area.

A limited number of indicators were included in the other state assessment program Testing for Essential Learning and Literacy Skills (TELLS). Those indicators were not reported nor widely used because they were employed on a trial basis in 1986. As a result this paper will not be concerned with that set of indicators. The TELLS indicators included the following: reading knowledge, mathematics knowledge, gender, race, reading material in the home (regularly receive a newspaper, regularly receive magazines, and have more than 25 books), time spent watching television, time on spent on homework at home, and educational expectations. Funding was provided to school districts on a per pupil basis for each student that scored below Pennsylvania Department of Education established cut scores in reading and mathematics.

REPORTING INDICATORS

School Reports

Indicator information was reported to school district employees through the EQA school reports. This reporting system employs a published 48 page report for each school and school district involved in that year of the assessment. Reports are delivered and interpreted by a Division of Educational Testing and Evaluation staff member at the school district during a two to three hour session with selected school district employees.

In addition to the on-site interpreting of reports, a series of publications were developed as companions to the school and school district reports. The publications included a Commentary Manual (Hertzog et al, 1986) and a Data Manual (Hertzog et al, 1986). The manuals were designed to assist with the interpretation of a rather lengthy school report. For example, the Commentary Manual provided information on the following: history of the testing program, Goals of Quality Education, development of the assessment program, interpreting scores, indicator information, administrative issues, using the data, and making comparisons. The Data

Manual included information on: norms, correlations, samples used, comparability of test forms, and reliability.

In order to provide samples of the reporting employed for indicators, a series of figures were developed. First, the reporting of student performance on cognitive and affective measures was considered. In Figure 1, the school information was presented which included: student forms scored, raw score mean, percentile rank, stanine, and prediction comparison. Second, each of the areas (reading, writing, mathematics, etc.) was reviewed on a two page analysis that included an item by item analysis of the school data along with general information and the distribution of scores. A sample copy of the two page analysis was provided in Figure 2. Figures 1 and 2 provide an example of the information presented on student indicators at the school level.

The remaining indicator information (condition variables) was presented starting on page 29 of the school report. See Figure 3 for a sample of the summary and item data provided to school district employees. In order to examine the data on indicators provided by the summary pages in more detail, several pages of item data were included (see Figure 3). In general, the indicator information was presented in a form that would provide for a comparative analysis of the school results. Raw scores, percentiles, and the number of respondents were included on the summary pages. This design was to encourage educators to analyze their school with respect to the state in total. Educational issues that should be examined were located by selecting areas where the school percentiles indicated a possible educational problem. If teacher attitudes were negative for several of the teacher perception of the building indicators, that area should be investigated. The investigation could include collecting additional data, problem solving on that area or other appropriate activities.

EQA, SPRING, 1986 SAMPLE REPORT GRADE 11 ID= - DATE RUN = 3/16/87

GENERAL SUMMARY OF STUDENT OUTCOMES

AREA	NUMBER STUDENTS	OBTAINED SCHOOL MEAN	STATE COMPARISON %ILE RANK	STATE COMPARISON STA-NINE	PREDICTION COMPARISON
COGNITIVE					
READING COMPRE'	427	27.77	13	3	WITHIN
WRITING SKILLS	432	36.57	14	3	WITHIN
MATHEMATICS	432	34.49	32	4	WITHIN
ANALYTICAL THINKING	432	17.71	30	4	WITHIN
CITIZENSHIP/SOCIAL STUDIES	432	35.02	42	5	WITHIN
ARTS & HUMANITIES	420	23.62	12	3	BELOW
SCIENCE & TECHNOLOGY	432	20.69	18	3	WITHIN
ENVIRONMENT	432	21.03	22	3	WITHIN
HEALTH KNOWLEDGE	Not measured at this grade				
NON-COGNITIVE					
SELF-CONCEPT IN SCHOOL	432	59.36	24	4	WITHIN
HEALTH & SAFETY PRACTICES	432	104.81	57	5	WITHIN

THE FOLLOWING AREAS ARE MEASURED BY BRIEF SETS OF ITEMS WHICH ARE DISPLAYED ON THE PAGES NOTED IN THE TABLE OF CONTENTS:

UNDERSTANDING OTHERS
CITIZENSHIP/SOCIETAL RESPONSIBILITY
ARTS AND HUMANITIES PARTICIPATION
SCIENCE AND TECHNOLOGY ATTITUDES
ENVIRONMENT ATTITUDES
WORK OPPORTUNITIES AND ATTITUDES

Figure 1
Sample EQA School Report
Page 1, Summary

ANALYSIS OF STUDENT OUTCOMES IN THE AREA OF

READING COMPREHENSION

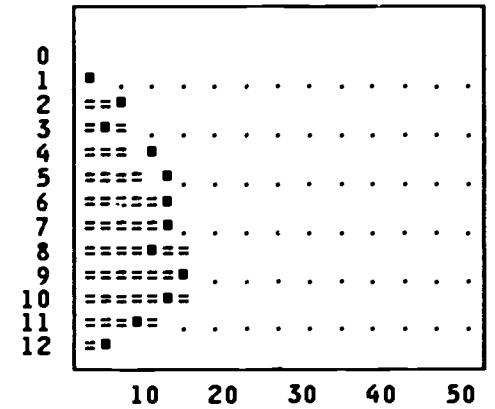
GENERAL ANALYSIS

Number of students scored:	427
Obtained School Mean:	27.77
Percentile Rank:	13 (Within Prediction)
Stanine Achieved:	3
Prediction Band in Mean Scores:	27.70 --- 31.37
Total Scale Reliability Estimate:	0.90
Percentage of Omits:	0.90

Number of students scored by form

A	B	C	D
108	108	106	105

SCORE DISTRIBUTION ANALYSIS LOCAL STATE



PERCENTAGE OF STUDENTS ACHIEVING

The DISTRIBUTION ANALYSIS above shows the possible scores for this outcome area on the left. The percentage of students (Local and Statewide) who achieved each possible score is illustrated in the box; the symbols compare local(■) and state(=) achievement.

SUBSCALES - These letter codes identify subscales on the next page.

L = Literal comprehension: Students must identify main ideas, cause and effect or supporting details explicitly stated in a passage

I = Inferential comprehension: Students must take the meaning of a passage beyond explicit ideas by inferring main ideas, using supporting details, inferring cause and effect, drawing conclusions, predicting outcomes, determining the author's point of view or making judgements

W = Word meaning/contextual analysis: Students must use context clues to infer the (appropriate) meaning of a (multiple-meaning) word

Figure 2
Sample EQA School Report
Page 2, Analysis of Reading

EQA, SPRING, 1986 SAMPLE REPORT GRADE 11 ID= - DATE RUN = 3/16/87

ITEM ANALYSIS FOR READING COMPREHENSION

FORM - ITEM	SUBSCALE	DESCRIPTION	PERCENTAGE CORRECT L*	S*
A 7	L	Identifying supporting details	68	77
A 8	L	Identifying main idea	56	51
A 9	L	Identifying supporting details	60	58
A12	L	Identifying supporting details	14	20
B 1	L	Identifying supporting details	91	88
B 2	L	Identifying supporting details	86	84
B 3	L	Identifying supporting details	83	81
C 2	L	Identifying main idea	75	79
C 6	L	Identifying supporting details	43	50
C10	L	Identifying supporting details	57	70
D 4	L	Identifying main idea	56	58
D 5	L	Identifying supporting details	48	54
D 7	L	Identifying supporting details	44	48
D 8	L	Identifying supporting details	63	74
D11	L	Identifying supporting details	48	60
-- AVERAGE ITEM SCORES FOR SUBSCALE L: L=59.47, S=63.47 --				
A 1	I	Inferring main idea	62	67
A 2	I	Using supporting details	69	69
A 3	I	Drawing conclusions	95	90
A 4	I	Inferring main idea	89	86
A10	I	Inferring main idea	41	62
A11	I	Using supporting details	34	38
B 4	I	Inferring cause and effect	56	53
B 5	I	Inferring cause and effect	73	74
B 6	I	Inferring main idea	62	63
B 7	I	Drawing conclusions	45	51

* L=LOCAL PERCENT CORRECT S=STATE PERCENT CORRECT

FORM - ITEM	SUBSCALE	DESCRIPTION	PERCENTAGE CORRECT L*	S*
B 8	I	Using supporting details	54	57
B 9	I	Drawing conclusions	52	56
B10	I	Determining author's point of view	43	40
C 3	I	Drawing conclusions	49	53
C 4	I	Predicting outcomes	56	63
C 5	I	Drawing conclusions	42	49
C 7	I	Drawing conclusions	57	63
C 8	I	Drawing conclusions	38	47
C11	I	Inferring main idea	48	60
C12	I	Drawing conclusions	32	41
D 1	I	Inferring main idea	45	55
D 2	I	Inferring main idea	62	64
D 3	I	Determining author's point of view	72	76
D 9	I	Drawing conclusions	60	62
D10	I	Using supporting details	52	62
D12	I	Drawing conclusions	59	69
-- AVERAGE ITEM SCORES FOR SUBSCALE I: L=55.65, S=60.38 --				
A 5	W	Inferring meaning/multiple meaning word	91	89
A 6	W	Inferring meaning/multiple meaning word	59	67
B11	W	Inferring meaning/multiple meaning word	60	68
B12	W	Inferring meaning/multiple meaning word	49	61
C 1	W	Inferring meaning/multiple meaning word	73	76
C 9	W	Inferring meaning/multiple meaning word	66	69
D 6	W	Inferring meaning/multiple meaning word	56	70
-- AVERAGE ITEM SCORES FOR SUBSCALE W: L=64.86, S=71.43 --				

Figure 2 Continued
Sample EQA School Report
Page 3, Analysis of Reading

CONDITION VARIABLE INFORMATION

VARIABLE NAME	VAR. NO.	ACRONYM	SCORE	SCHOOL %ILE	NUMBER REPLYING
1. Grade enrollment	1	GRENROLL	432.00	98	0
2. Percentage of low income students	2	PCTLI	28.30	70	0
3. Tuition rate	3	TUITION	225.00	13	0
4. Satisfaction with relationships with parents	4 *	TSATPAR	1.73	19	41
5. Teacher education	5	TEDUC	1.81	63	42
6. Parent attendance at parent-teacher conferences	6	TPARCONF	- Not measured at this grade		
7. Supervision of building	7	SUPVBLDG	- Not measured at this grade		
8. Average class size	8	CLSIZE	24.50	91	42
9. Number of classroom observations	9 *	TOBSERVE	1.31	17	42
10. Teacher perception of building leadership	10 *	LEADER	21.40	43	42
11. Teacher-initiated environment	11 *	TCHRINIT	24.86	31	42
12. Freedom from disruptions to instruction	12 *	DISRUPTN	14.24	6	42
13. Teacher perception of discipline	13 *	DISCIPLN	17.27	31	41
14. Teacher involvement in planning functions	14 *	PLANNING	14.93	44	40
15. Teacher perception of school climate	15 *	SCHLCLIM	11.68	58	41

*Items for this variable are detailed on the next pages.

TEACHER CONDITION VARIABLE INFORMATION

4. TSATPAR Satisfaction with relationships with parents

	Satisfactory		Somewhat		Somewhat		Very	
	L	S	L	S	L	S	L	S
In your teaching situation, how satisfied are you with your relationships with parents and parent groups?	10	22	59	56	27	18	5	4

9. TOBSERVE Number of classroom observations

	Percent Responding	
	L	S
How many formal classroom observations of your instruction are made each year?		
None	0	4
One	74	28
Two	21	48
Three	5	10
Four or more	0	11

Figure 3
Sample EQA School Report
Page 29, Condition Variable Information

TEACHER CONDITION VARIABLE INFORMATION

10. LEADER Teacher perception of building leadership	Strongly Agree		Mostly Agree		Neither		Mostly Disagree		Strongly Disagree	
	L	S	L	S	L	S	L	S	L	S
Teachers and students respect the principal.	19	19	52	52	21	15	7	10	0	4
The principal is knowledgeable about teaching techniques.	29	28	31	47	38	17	2	6	0	2
The principal conveys to the community a positive view of the school and its program, staff and students.	43	41	45	41	10	12	2	5	0	1

	Always		Almost Always		Frequently		Occasionally		Rarely/ Never	
	L	S	L	S	L	S	L	S	L	S
A positive feeling permeates the school.	0	3	29	37	45	32	19	22	7	6
The principal runs effective meetings, that is, he/she has a clear agenda, limits discussion to relevant topics and adheres to the time frame.	19	27	40	40	31	17	5	12	5	4
The principal encourages me to solve my own work problems but is available to advise me if needed.	38	31	33	40	12	15	14	10	2	3
The teachers feel this school is run in an orderly fashion without being overly restrictive.	12	14	38	43	24	22	17	16	10	5
The principal talks with us frankly and openly.	26	31	36	35	19	17	17	13	2	5

11. TCHRINIT Teacher-initiated environment	Strongly Agree		Mostly Agree		Neither		Mostly Disagree		Strongly Disagree	
	L	S	L	S	L	S	L	S	L	S
Teachers in this school hold consistently high expectations for all students.	2	10	40	54	21	22	29	12	7	2
Teachers in this school seek better ways of teaching and learning.	19	16	62	62	10	16	7	5	2	1
Teachers in this school are proud to be teachers.	7	13	55	53	21	23	12	9	5	2
Teachers in this school are knowledgeable about their subject areas.	51	46	41	50	7	3	0	1	0	0

	Always		Almost Always		Frequently		Occasionally		Rarely/ Never	
	L	S	L	S	L	S	L	S	L	S
Teachers handle general student discipline in a reasonable way.	14	15	67	65	14	16	5	3	0	0
Classroom atmosphere in this school is conducive to learning.	19	13	67	60	7	21	7	6	0	1
Teachers praise students for good performance.	10	17	71	59	14	21	2	2	2	0
Teachers are cooperative and supportive of each other.	12	14	55	51	17	24	14	10	2	2
Teachers treat students with respect in this school.	7	12	67	62	19	21	7	5	0	0

Figure 3
Sample EQA School Report
Page 30, Condition Variable Information

STUDENT CONDITION VARIABLE INFORMATION

VARIABLE NAME	VAR. NO.		ACRONYM	SCORE	SCHOOL %ILE	NUMBER REPLYING
16. Percentage of girls	16		PCTGIRLS	51.39	60	432
17. Level of parental education	17		PAREDUC	1.50	14	431
18. Population density of residential community	18		RESIDE	1.41	62	430
19. Percentage of white students	19		PCTWHITE	96.53	54	432
20. Frequency of residence/school change	20		MOBILITY	0.17	43	432
21. Student perception of parental interest in school	21	*	SPARINT	3.98	37	432
22. Student time spent watching television	22	*	TVWATCH	1.70	63	432
23. Student perception of parental expectations	23	*	PAREXP	2.03	22	431
24. Student educational expectations	24	*	EDEXPECT	2.22	22	431
25. Reading material in the home	25		HOMEREAD	2.79	1	429
26. Time spent reading at home	26	*	TIMEREAD	1.98	53	431
27. Frequency of writing assignments	27	*	WRITEPAR	2.44	23	432
28. Perceived ability to complete schoolwork	28		PLANSWRK	- Not measured at this grade		
29. Perceived quality of study habits	29	*	STUDYHAB	2.03	55	432
30. Time spent on mathematics assignments	30	*	TIMEMATH	1.44	29	432
31. Frequency of tests or quizzes	31	*	TESTFREQ	3.00	74	432
32. Timely return of tests	32	*	TESTRETN	2.41	48	432
33. Student perception of classroom discipline	33	*	CLDISCIP	2.45	69	432
34. Percentage of academic/college prep students	34	*	PCTACAD	40.97	27	432
35. Hours of employment per week	35	*	HRSWORK	0.97	22	431
36. Perception of direct instruction in mathematics	36	*	MATHINST	4.22	18	348
37. Perception of direct instruction in English	37	*	ENGLINST	4.66	36	427
38. Perception of direct instruction in science	38	*	SCIINST	5.55	80	223
39. Perception of direct instruction in social studies	39	*	SOCINST	4.97	17	408
40. Percentage of students taking mathematics	40		PCTMATH	82.31	32	40
41. Percentage of students taking science	41		PCTSCI	52.09	11	407
42. Interest in school	42	*	INTSCHL	49.54	64	431

*Items for this variable are detailed on the next pages.

STUDENT CONDITION VARIABLE INFORMATION

21. SPARINT Student perception of parental interest in school	Percent Responding L	S
My parents enjoy hearing about school.		
Almost always	43	48
Usually	27	29
Sometimes	25	19
Almost never	5	4
My parents feel the school is doing a good job.		
Almost always	26	20
Usually	44	49
Sometimes	26	26
Almost never	5	5

Figure 3
Sample EQA School Report
Page 33, Condition Variable Information

Predicted Scores

Predicted scores were provided for the cognitive and affective goal areas based on the 44 condition variable indicators. The predicted scores were derived through a multiple regression approach. A detailed review of the prediction process can be found in the Commentary Manual for 1986. This information was designed to provide an indication of how the school performed based on the unique conditions found in that school setting. Schools that had conditions which in general were statistically associated with lower scores were predicted to score lower. While schools that had conditions which were associated with higher performance were predicted to score higher. All schools received a unique predicted score range for each cognitive and affective goal area. School employees and others found this information to be of value in evaluating how the school was doing when considering the school's advantages and disadvantages. The prediction process was employed as an alternative to identifying similar schools and providing comparative information on the group of similar schools. Because of the large number of indicators used in Pennsylvania, identifying similar schools would be difficult if all of the indicators were employed. If only SES indicators were used in identifying similar schools then the importance of other indicators would be decreased.

Developing Norms

As a part of the services to school districts the norms used to establish the percentiles were published in the Data Manual. Those norms were organized by grade level assessed and listed each indicator. At times the norm tables were of value when interpreting school reports. For example, the class size range in Pennsylvania, when examined using building means, did not vary a great amount. This may have been an influence on the low correlations found between class size and school mean cognitive scores which were presented in a different part of this paper. Hence, norm tables were of value when interpreting the reports. A sample of the norm table information was included in Appendix B. Copies of the norms for 1986 are located in the Data Manual (Hertzog 1986).

Norms were established for each grade level and year using a stratified random sample of school districts from Pennsylvania. As a result, percentiles reflecting a ranking in Pennsylvania were established for schools and school districts. Note, school norms were based on school mean scores while school district norms were based on school district mean scores. The sampling process employed in establishing the norms was reviewed in detail in the Data Manual published each year. In general, the school size and wealth were used to select the norm sample.

CORRELATIONS

Correlations were calculated for the following indicators: (1) among student affective and cognitive scores, (2) between student cognitive and affective scores and indicators labeled as condition variables, and (3) among indicators or condition variables. The condition variables were numbered one through 44 in the Pennsylvania Indicator section of this paper. It should be noted the correlations indicated a statistical relationship not a causal relationship between variables. In calculating the correlations school mean scores were employed.

First, correlations among the student affective and cognitive scores were calculated. A sample of the way this set of correlations was presented to educators was provided in Table 1. Grade seven was selected and data were from the 1986 assessment. In general, this set of correlations provided information on the statistical relationships for this set of indicators. Although school employees often expressed an interest in the rather high correlations among cognitive indicators and the rather low correlations between cognitive and affective indicators, the set of correlations was not extensively used.

Second, correlations between student cognitive scores and condition variables along with correlations between student affective scores and condition variables were provided. The correlations revealed that a statistically significant relationship existed between many of the

TABLE 1

CORRELATION COEFFICIENTS AMONG SCHOOL SCORES
Grade 7
1986 Normative Group
N = 156

		RC	WS	M	AT	SS	AH	ST	EN	SC
Communication Skills: Reading Comprehension	RC									
Communication Skills: Writing Skills	WS	.84								
Mathematics	M	.75	.77							
Analytical Thinking	AT	.87	.81	.71						
Citizenship/Social Studies	SS	.83	.79	.74	.85					
Arts & Humanities	AH	.83	.81	.76	.79	.78				
Science & Technology	ST	.83	.79	.72	.84	.83	.72			
Environment	EN	.74	.68	.57	.73	.71	.68	.80		
Self-Concept in School	SC	.28	.32	.25	.38	.35	.31	.29	.17	
Health & Safety Practices	HP	.25	.19	.08	.30	.29	.19	.16	.16	.57

Note: All correlation coefficients have been rounded to two decimal places.

$r \geq 0.16$ is significant at the .05 level.
$r \geq 0.21$ is significant at the .01 level.

indicators. Again, grade seven was selected as an example, see Table 2, and data for 1986 were used. School employees were most interested in the correlations that revealed school conditions such as teacher perceptions of the school, student perceptions of parental interest, television watching time, educational expectations of students, and parental education level were significantly linked to student cognitive scores.

Some school employees have selected school conditions based on the statistical link with student cognitive performance and worked to improve these conditions. This work was designed to improve student achievement. Many of the school employee efforts were rather straight foreward and were logical ideas. For example, students were encouraged to take more mathematics courses, because the students taking more courses scored higher than students taking fewer courses. Strategies such as these contributed to schools improving the mathematics achievement level.

Third, correlations were provided among the indicators or condition variables. An example of the information provided was illustrated by Table 3. School employees found this type of information of most value when examining the interrelationships among condition variables. For example, the statistical relationship between race and time spent watching television was examined on many occasions when interpreting results to school employees. It could be that the correlations among indicators provide some evidence that as schools improve in one area some positive influence may result in other areas. On the other side of this possibility, schools in decline may have decline in one area with the resulting influence producing declines in other areas.

TABLE 2

CORRELATION COEFFICIENTS BETWEEN
SCHOOL CONDITION VARIABLE SCORES AND SCHOOL SCORES
Grade 7
1986 Normative Group
N = 156

		RC	WS	M	AT	SS	AH	ST	EN	SC	HP*	
1	GRENROLL											1
2	PCTLI	-.55	-.67	-.59	-.54	-.51	-.67	-.50	-.49	-.26		2
3	TUITION									.26		3
4	TSATPAR	.58	.56	.52	.60	.54	.61	.58	.49	.34		4
5	TEDUC		.27		.21		.29					5
8	CLSIZE				.23			.22	.22			8
9	TOBSERVE	.32	.27	.23	.32	.24	.35	.31	.29			9
10	LEADER	.35	.32	.26	.30	.30	.38	.23	.22			10
11	TCHRINIT	.41	.43	.33	.46	.44	.50	.40	.33	.36		11
12	DISRUPTN	.53	.50	.41	.50	.49	.57	.46	.39	.28	.22	12
13	DISCIPLN	.59	.52	.46	.53	.52	.56	.54	.45	.28	.21	13
14	PLANNING	.35	.39	.26	.38	.39	.43	.30	.34	.22		14
15	SCHLCLIM	.54	.46	.44	.49	.44	.53	.44	.41			15
16	PCTGIRLS											16
17	PAREDUC	.45	.55	.54	.45	.45	.58	.41	.32	.35		17
18	RESIDE							-.22	-.23			18
19	PCTWHITE	.54	.47	.45	.47	.49	.42	.56	.54			19
20	MOBILITY	-.31	-.23		-.22	-.30	-.22	-.31	-.36			20
21	SPARINT	.53	.58	.47	.51	.48	.60	.45	.37	.56	.36	21
22	TVWATCH	-.48	-.47	-.47	-.37	-.39	-.52	-.40	-.39			22
23	PAREXP		.27	.26	.24	.24	.27			.42		23
24	EDEXPECT	.23	.34	.31	.29	.31	.36	.21		.48		24
25	HOMEREAD	.67	.66	.63	.60	.63	.65	.65	.56	.25		25
26	TIMEREAD									.28	.32	26
27	WRITEPAR											27
29	STUDYHAB	.36	.42	.36	.41	.39	.40	.29	.23	.65	.43	29
30	TIMEMATH											30
31	TESTFREQ											31
32	TESTRETN	.44	.42	.42	.40	.50	.43	.51	.42			32
33	CLDISCIP	.55	.51	.44	.55	.54	.53	.48	.43	.39	.34	33
36	MATHINST											36
37	ENGLINST											37
38	SCIINST											38
39	SOCINST											39
44	INTSCHL	.26	.21		.31	.32	.25	.26		.75	.62	44

Note: All correlation coefficients have been rounded to two decimal places.
Only correlation coefficients which are significant at the .01 level or better are printed ($r \geq .21$).

*See Table C-7 as key to area identification.

TABLE 3

CORRELATION COEFFICIENTS AMONG
SCHOOL CONDITION VARIABLE SCORES
Grade 7, 1986 Normative Group, N = 156

		1	2	3	4	5	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	GRENROLL																				
2	PCTLI																				
3	TUITION		-.21																		
4	TSATPAR		-.56																		
5	TEDUC		-.34	.69	.22																
8	CLSIZE	.41		-.22																	
9	TOBSERVE				.27																
10	LEADER		-.23		.43			.26													
11	TCHRINIT		-.31		.61		.21	.23	.58												
12	DISRUPTN		-.34		.62			.25	.67	.70											
13	DISCIPLN		-.39		.67			.28	.66	.70	.80										
14	PLANNING		-.37		.58			.31	.63	.59	.54	.55									
15	SCHLCLIM		-.39		.60			.24	.52	.52	.63	.65	.58								
16	PCTG. RLS																				
17	PAREDUC	.26	-.53	.53	.52	.50		.21	.25	.43	.31	.30	.24	.31							
18	RESIDE	.34		.64		.44										.46					
19	PCTWHITE		-.37	-.45	.35						.32	.41		.26			-.54				
20	MOBILITY	.34		.42		.24					-.27	-.32					.55	-.54			
21	SPARINT		-.45	.28	.53	.33			.30	.44	.45	.45	.33	.49		.55	.24	.23			
22	TVWATCH		.42		-.32			-.26			-.26	-.26		-.27		-.23		-.31		-.35	
23	PAREXP		-.26	.53	.31	.38				.32						.81	.54		.34	.47	
24	EDEXPECT	.22	-.35	.55	.39	.38			.22	.39	.23		.23	.22		.84	.53		.27	.53	
25	HOMEREAD		-.61		.56	.25		.24	.33	.43	.41	.46	.36	.45		.58		.34		.46	-.42
26	TIMEREAD														.23	.26				.27	
27	WRITEPAR			.23															.23		
29	STUDYHAB		-.32	.30	.23	.24				.30	.22	.28		.22		.45				.58	
30	TIMEMATH																	-.23			
31	TESTFREQ																				
32	TESTRETN		-.37		.33					.22	.34	.36	.26	.34			-.31	.46	-.37	.25	-.40
33	CLDISCIP		-.34		.42					.25	.35	.46	.23	.29				.48	-.25	.56	-.35
36	MATHINST																				
37	ENGLINST																				
38	SCIINST																				
39	SOCINST					.29															
44	INTSCH				.27					.32	.34	.29	.29	.22						.49	

		23	24	25	26	27	29	30	31	32	35	36	37	38	39
24	EDEXPECT	.94													
25	HOMEREAD	.31	.38												
26	TIMEREAD	.38	.42												
27	WRITEPAR			.22											
29	STUDYHAB	.51	.56	.36	.40	.27									
30	TIMEMATH														
31	TESTFREQ														
32	TESTRETN			.44											
33	CLDISCIP			.28			.40			.34					
36	MATHINST							.23							
37	ENGLINST											.23			
38	SCIINST											.27			
39	SOCINST											.34	.30		
44	INTSCHL				.25		.42			.28	.38				

Note: All correlation coefficients have been rounded to two decimal places.
Only correlation coefficients which are significant at the .01 level or better are printed ($r \geq .21$)

STABILITY OF CORRELATIONS OVER TIME

Data were collected and analyzed over the past 18 years with the testing package revised in 1986, 1985, 1978, 1974, 1972, and 1970. As a result of changes in the testing packages, change over time can most easily be examined by reviewing years where the same package was employed. For this paper, correlations from the most recent testing package were used to examine stability of the correlations. In general, the correlations did vary only slightly from year to year, and those changes were probably a product of having fewer urban school districts in the norm sample used to calculate the correlations.

To illustrate the stability of the correlations, Appendix C was developed. Correlations for 1986 and 1987 at grade seven were included. A review of the correlations revealed some slight changes, but few changes that were dramatic. In fact, the differences between correlations for different grade levels on the same pair of indicators may be of more interest. Selected indicators were used at different grade levels. As a result it is possible to examine the change in statistical relationships between grades. For example, the correlation between the percentage white (race) and the time spent watching television changed from -.24 at grade four, -.28 at grade six, -.31 at grade seven, -.42 at grade nine to -.43 at grade eleven. Illustrating that at higher grade levels the percentage of white students was stronger in the statistical link to television watching time. A higher percentage of white students was associated with less time spent watching television when the school mean data were examined.

SELECTION OF INDICATORS

When the EQA Program was developed school condition variables were used mainly in the prediction process. That is, indicators were employed in the regression model as independent variables and the student cognitive and affective goal area scores were dependent variables.

Each school received a predicted score range as a result. If the indicator had a statistically significant relationship with the cognitive or affective goal scores it was considered to be of greater value. Indicators were not selected just because of a statistical link with goal area scores, they were also selected based on the value of the information that was provided to school employees. In total, the indicators were selected and developed based on first, (1) the value of the information provided to school employees and second, the strength of the statistical relationship with student cognitive and affective goal area scores.

As the EQA Program has changed over several years the process for selecting and developing indicators was modified. At the present, the value of the information provided to school employees is a much more important consideration in the process than just the ability to predict goal area scores. For example, if the indicator information is available from other sources then it does not need to be collected and reported through the EQA Program. If the indicator was linked to school effectiveness, effective instruction or organizational development research or was one of the state adopted goals it was considered as a candidate to be included. If the indicator information will promote productive educational change or will encourage an investigation of a selected area then it was considered. In general, the EQA Program is designed to provide information on a wide range of indicator variables that are of some value in promoting educational change.

USE OF INDICATORS

During the eighteen years that the Pennsylvania EQA program has been in operation, several follow-up surveys were conducted. In one of the follow-up surveys (Blust and Hertzog, 1979) the use of EQA indicators was investigated. In this survey one of the major concerns was that the indicator data be of value and promote educational change.

A question presented in that survey gathered information on the indicators being of use. Table 4 presents the results for the administrators that responded. From 51 percent to 90 percent of the respondents indicated the indicator and statistic employed were of use.

Table 4

Use of the Indicator Information

Options	Percentage Indicating Useful
cognitive and affective scores (percentiles)	88
cognitive and affective scores (item data)	67
predicted scores	90
indicators-condition variables (percentiles)	51
indicators-condition variables (item data)	59

n = 99

If the information ,in Table 1, was of use then the school officials should disseminate the information. A question was presented on to whom the results were disseminated as a part of the follow-up survey. The groups that received the indicator information were listed in Table 5. It may be interesting to review the percentages based on the fact that legislation in Pennsylvania requires EQA data to be reported only to the local school board. It was noted most teachers (84 to 91 percent) and central office administrators did receive the data. Also, some effort was made to inform the public most often through the news media.

Table 5

Groups Receiving the Indicator Information

Options	Percentage
school board members	99
principals	100
central office staff	90
most elementary teachers	91
most middle/junior high teachers	84
most high school teachers	88
PTA, PTO any parent group	47
general public	68

n = 99

As a result of reviewing the data and working with the information some changes were made by school districts. A question on the survey investigated the use made of the results. Table 6 lists the responses for that item. Overall, administrators indicated changes were made and that indicator data were encouraging those changes. In 71 percent of the cases revisions of existing programs were made as a result of the information. New programs were developed in 24 percent of the cases. Also, the data became a basis for planning teacher in-service activities.

Table 6

Use Made of the Information

Options	Percentage
to made building level decisions	89
for teacher in-service plans	67
revise existing programs	71
new programs were planned	24
new programs tried out	13
new programs implemented	10

n = 99

Other changes were noted as part of the survey. Some of those changes were in the areas of course offerings (34 percent), course content (64 percent), and changes in teaching strategies (61 percent). It was noted that greater use of data by teachers would be desirable.

In total, the survey indicated some of educational changes were a product of presenting indicator data. This was encouraging information in that school employees were using data and that change efforts were underway. Each Pennsylvania school district produces a long-range plan every five years that is submitted to the Department of Education. The indicator information for goal scores is considered in formulating the long-range plan.

ALTERING INDICATORS TO BE PART OF A NATIONAL SYSTEM

The Division of Educational Testing and Evaluation has developed, selected and implemented new indicators over the life of the EQA Program. Hence, it would be rather easy to employ most new indicators provided from other sources for use in the Pennsylvania EQA program. The issue of implementation would be easily resolved for most indicators. If a list of indicators was supplied they could be made part of the EQA Program.

A major problem might occur when an indicator supplied from a national system is in conflict with the data collected by other divisions in the Pennsylvania Department of Education. One example would be the way in which attendance data are collected. In Pennsylvania the opportunity to modify the attendance data collection system is rather limited. This is due to the attendance data being part of the school district funding formula which is in state legislation that is rather difficult to change because of political constraints. Another example would be the way drop-out data are collected and reported. In addition, some resistance would be exhibited to altering indicators that had been collected one way over several years. The response would be that it would destroy the longitudinal studies that are underway. A possible response to this concern would be to examine the value of having one system for the nation that would allow longitudinal studies with national data. Thus, both state and national data could be employed in analyzing school and school district indicators.

An alternative to having the state agencies collect indicator data would be to have data collected by sampling schools or school districts from each state as part of a national data collection system. If a national data collection system was employed, then a major concern would be the overlap in data collected by the state and national systems. As a result, two different agencies could be collecting the same data, or the two agencies could be collecting the same data in two different forms. School district administrators could be required to record data in differ-

ent forms and report the data in different forms. This may reduce the enthusiasm for the task by school administrators. Student time on testing and administrator time on record keeping may be negative factors. In order to collect data from all schools selected in a sample from Pennsylvania it may be necessary to mandate the national indicator program. Mandating the program may be the only means to have all school district administrators conduct additional testing and compile additional records, because of the amount of testing conducted in Pennsylvania at this time.

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APPENDIX A

Condition Variable – Weighting and Description

CONDITION VARIABLES

Variable/Title	Measure	Weighting	Description
Data collected from PDE records			
1. GRENROLL Grade enrollment	The number of students participating in the assessment was read from EQA computer records.	The number of students tested in the participating grade	A higher number indicates a larger grade enrollment.
2. PCTLI Percentage of low income students	The percentage of students from low income families attending the school was obtained from PDE Chapter 1 files.	Expressed to the nearest hundredth of a percent	A higher percentage indicates that the school has a higher percentage of students from low income families.
3. TUITION Tuition rate	The tuition rate established for the school district was obtained from PDE records.	Expressed to the nearest whole dollar for the previous school year	A higher number indicates that the district reported spending more money per student.
Data collected from teacher questionnaires			
4. TSATPAR Satisfaction with relationships with parents	The teachers reported how satisfied they are with their relationships with parents and parent groups.	3 = Very satisfied 2 = Somewhat satisfied 1 = Somewhat dissatisfied 0 = Very dissatisfied	A higher score indicates that the teachers have greater satisfaction with their relationships with parents and parent groups.
5. TEDUC Teacher education	The teachers reported the level of formal education they have attained.	4 = Doctor's degree 3 = Master's degree plus 1 year 2 = Master's degree or equivalency 1 = Bachelor's degree 0 = No degree	A higher score indicates that the school's instructional staff reported higher levels of formal education.
6. TPARCONF Parent attendance at parent-teacher conferences (Grades 4 and 6)	The teachers reported the percentages of students' parents who attend scheduled parent-teacher conferences.	4 = 81-100 percent 3 = 61-80 percent 2 = 41-60 percent 1 = 21-40 percent 0 = 0-20 percent	A higher score indicates that the teachers reported a higher percentage of students' parents attend scheduled parent-teacher conferences.
7. SUPVBLDG Supervision of building (Grades 4 and 6)	The teachers indicated the position title of the person in charge of the building in which they teach and the number of buildings that person supervises.	1 = Principal of a single building 0 = All others	A score of 1 indicates that the building is supervised by a principal who is responsible for only that building; a score of 0 indicates the building is supervised by a person other than such a principal.

8. CLSIZE Average class size	The teachers reported their average class size excluding supervisory duties such as study hall.	Expressed as average class size for all teachers	A higher number indicates a larger average class size.
9. TOBSERVE Number of classroom observations	The teachers indicated the number of formal classroom observations made of their instruction each year.	4 = Four or more 3 = Three 2 = Two 1 = One 0 = None	A higher score indicates that the teachers reported having more classroom observations each year.
10. LEADER Teacher perception of building leadership	The teachers indicated the degree to which they agreed with eight positive statements about the leadership in their school.	For positively worded statements: 4 = Strongly Agree 3 = Mostly Agree 2 = Neither Agree nor Disagree 1 = Mostly Disagree 0 = Strongly Disagree or 4 = Always 3 = Almost Always 2 = Frequently 1 = Occasionally 0 = Rarely or Never	A higher score indicates that the teachers are more satisfied with the leadership in their school building.
11. TCHRINIT Teacher-initiated environment	The teachers indicated the degree to which they agreed with nine positive statements about their initiative in and control of school environment factors.		A higher score indicates that the teachers feel they have more control over positive aspects of the school atmosphere.
12. DISRUPTN Freedom from disruptions to instruction	The teachers indicated the degree to which they agreed with two positive and six negative statements about disruptions to classroom instruction.	For negatively worded statements, the scoring is reversed.	A higher score indicates that the teachers reported fewer disruptions to classroom instruction.
13. DISCIPLN Teacher perception of discipline	Teachers indicated the degree to which they agreed with six positive and six negative statements about their perception of discipline in the school.		A higher score indicates that the teachers perceive that discipline is handled better in the school.
14. PLANNING Teacher involvement in planning functions	The teachers indicated the degree to which they agreed with seven positive statements about their involvement in various types of planning activities for the school.		A higher score indicates that the teachers feel that they are more highly involved in planning activities which take place in the school.
15. SCHLCLIM Teacher perception of school climate	The teachers indicated the degree to which they agreed with one negative and three positive statements about the general environment or climate of the school.		A higher score indicates that the teachers feel that the school has a better working environment.

Data collected from student questionnaires

16. PCTGIRLS Percentage of girls	The students indicated either male (or boy) or female (or girl).	Expressed as a percentage	A higher percentage indicates that the school has a greater proportion of girls in the participating grade.
17. PAREDUC Parental education	The higher level of the following was used: (1) The students reported the highest levels of formal education attained by their fathers or male guardians. (2) The students reported the highest levels of formal education attained by their mothers or female guardians.	4 = Advanced college degree 3 = College graduate 2 = Some college, vocational, technical, business school after high school 1 = High school graduate 0 = Not a high school graduate	A higher score indicates that the school draws students from homes in which parents have higher levels of formal education.
18. RESIDE Population density of residential community	The students reported (with the help of the examiner if necessary) the types of communities in which they were living.	7 = In Philadelphia or Pittsburgh 6 = Inside a large city (100,000 to 500,000 people) 5 = Inside a medium size city (10,000 to 100,000 people) 4 = In a suburb of Philadelphia or Pittsburgh 3 = In a suburb of a large city 2 = In a suburb of a medium size city 1 = In a small town (less than 10,000 people) that is not a suburb 0 = In the open country or in a farming community	A higher score indicates that the students reside in areas of more dense population.
19. PCTWHITE Percentage of white students	The students reported which best described them: Black, White, Hispanic, Asian or American Indian	Expressed as a percentage	A higher percentage indicates that the school has a greater proportion of white students in the participating grade.
20. MOBILITY Frequency of residence/school change	The students reported the number of different school buildings they attended within the past three years because they changed residence.	4 = 5 or more school buildings 3 = 4 school buildings 2 = 3 school buildings 1 = 2 school buildings 0 = I have not moved within the past three years.	A higher score indicates that the students have changed residence and schools more often in the past three years.
21. SPARINT Student perception of parental interest in school	The students reported their opinions on two items: (1) My parents enjoy hearing about school. (2) My parents feel the school is doing a good job.	3 = Almost always 2 = Usually 1 = Sometimes 0 = Almost never	A higher score indicates that the students feel that their parents have a greater interest in school and a higher opinion of the job done by the school.

22. TVWATCH Student time spent watching television	The students reported their estimates of time usually spent watching television from the time they get home from school until they go to bed.	5 = About six hours (or more) 4 = About five hours 3 = About four hours 2 = About three hours 1 = About two hours 0 = About one hour (or less)	A higher score indicates that the students report watching more television on school nights.
23. PAREXP Student perception of parental expectations (Grades 7, 9 and 11)	The students reported their perceptions of how much schooling their parents or guardians expected them to complete.	4 = Advanced college degree 3 = Graduation from a four-year college 2 = Two-year college or other post-high school training 1 = Graduation from high school 0 = Quit high school before graduating	A higher score indicates that the students feel that their parents expect them to achieve higher educational levels
24. EDEXPECT Student educational expectations (Grades 7, 9 and 11)	The students reported how much schooling they expect to complete.	4 = Advanced college degree 3 = Graduation from a four-year college 2 = Two-year college or other post-high school training 1 = Graduation from high school 0 = Quit high school before graduating	A higher score indicates that the students have higher educational expectations.
25. HOMEREAD Reading material in the home	The students reported the approximate numbers of magazines and books in the home.	Magazines (per month): 0 = None 1 = 1 or 2 2 = 3 or 4 3 = 5 or more Books: 0 = 0 - 24 1 = 25 - 99 2 = 100 - 249 3 = 250 or more	A higher score indicates that the students report more magazines and books in their homes.
26. TIMEREAD Time spent reading at home	The students reported how much time each day they spend reading at home.	5 = Three hours (or more) 4 = Two hours 3 = One hour 2 = 30 minutes 1 = 15 minutes 0 = None	A higher score indicates that the students report spending more time reading at home.
27. WRITEPAR Frequency of writing assignments	The students reported how often they are required to write a paragraph or more as school assignments.	4 = At least once a day 3 = At least once a week 2 = About once a month 1 = Only once or twice a year 0 = Never	A higher score indicates that the students report being required to write at least a paragraph more often.
28. PLANSWRK Perceived ability to complete schoolwork (Grade 4)	The students reported their perceptions of their ability to plan and carry out school work.	4 = Very good 3 = Good 2 = Satisfactory 1 = Fair 0 = Poor	A higher score indicates that the students perceive they have greater ability to plan and carry out schoolwork.
29. STUDYHAB Perceived quality of study habits	The students reported their perceptions of the quality of their study habits.	4 = Excellent 3 = Good 2 = Satisfactory 1 = Fair 0 = Poor	A higher score indicates that the students perceive they have higher quality study habits.

30. TIMEMATH Time spent on mathematics assignments	The students reported the approximate amounts of time each day outside of math class they spend doing math assignments.	4 = Two hours (or more) 3 = One hour 2 = 30 minutes 1 = 15 minutes 0 = None	A higher score indicates that the students reported spending more time outside of class on math assignments.
31. TESTFREQ Frequency of tests or quizzes	The students reported how often they have a test or quiz in most of their classes.	4 = More than once a week 3 = Once a week 2 = Once every two weeks 1 = Once every three weeks 0 = Once a month (or less)	A higher score indicates that the students reported having more tests or quizzes in most of their classes.
32. TESTRETN Timely return of tests (Grades 7, 9 and 11)	The students reported in how many classes the teachers return tests soon after they take them.	4 = All of my classes 3 = Most of my classes 2 = Some of my classes 1 = Few of my classes 0 = None of my classes	A higher score indicates that students reported that teachers return tests soon after administering them in more of their classes.
33. CLDISCIP Student perception of classroom discipline (Grades 7, 9 and 11)	The students reported their perceptions of discipline as a problem in the classroom.	3 = Never a problem 2 = Sometimes a problem 1 = Usually a problem 0 = Almost always a problem	A higher score indicates that the students perceive their classrooms as more free of discipline problems.
34. PCTACAD Percentage of academic/college prep students (Grade 11)	The students indicated which terms best described their present high school programs: Academic or college preparatory; General; Vocational or technical; Business or commercial	Expressed as a percentage	A higher percentage indicates that the school has a greater percentage of students in an academic or college preparatory program.
35. HRSWORK Hours of employment per week (Grade 11)	The students reported how many hours a week they work to earn money.	4 = More than 20 hours 3 = 16 to 20 hours 2 = More than 8, but less than 16 hours 1 = Some, up to 8 hours 0 = None	A higher score indicates that students reported they work more hours a week to earn money.
36. MATHINST Perception of direct instruction in mathematics (Grades 7, 9 and 11)	The students taking the class reported about how much time is usually spent on lecture and classroom discussion in mathematics class.	4 = More than 30 minutes per class period 3 = 21-30 minutes per class period 2 = 10-20 minutes per class period	A higher score indicates that the students reported receiving more direct mathematics instruction through lecture and/or classroom discussion.
37. ENGLINST Perception of direct instruction in English (Grades 7, 9 and 11)	The students taking the class reported about how much time is usually spent on lecture and classroom discussion in English class.	1 = Less than 10 minutes per class period	A higher score indicates that the students reported receiving more direct English instruction through lecture and/or classroom discussion.

38. SCIINST Perception of direct instruction in science (Grades 7, 9 and 11)	The students taking the class reported about how much time is usually spent on lecture and classroom discussion in science class.	4 = More then 30 minutes per class period 3 = 21-30 minutes per class period 2 = 10-20 minutes per class period 1 = Less than 10 minutes per class period	A higher score indicates that the students reported receiving more direct science instruction through lecture and/or classroom discussion.
39. SOCINST Perception of direct instruction in social studies (Grades 7, 9 and 11)	The students taking the class reported about how much time is usually spent on lecture and classroom discussion in social studies class.		A higher score indicates that the students reported receiving more direct social studies instruction through lecture and/or classroom discussion.
40. PCTMATH Percentage of students taking mathematics (Grade 11)	The percentage of students reporting mathematics class activity.	Expressed as a percentage.	A higher percentage indicates that more students reported that they have mathematics class.
42. PCTSCI Percentage of students taking science (Grade 11)	The percentage of students reporting science class activity.	Expressed as a percentage.	A higher percentage indicates that more students reported that they have science class.
44. INTSCHL Interest in school	The students reported their agreement with questions or statements about their interest in and satisfaction with their school situation. Grades 4,6: 12 positive questions beginning with "How do you feel...?" Grades 7,9: 19 positively-worded and 9 negatively-worded statements Grade 11: 22 positively-worded and 6 negatively-worded statements	Grades 4 and 6: 3 = very happy 2 = A little happy 1 = A little unhappy 0 = Very unhappy For positively worded statements at Grades 7, 9 and 11: 3 = Strongly agree 2 = Mostly agree 1 = Mostly disagree 0 = Strongly disagree For negatively worded statements, the scoring is reversed.	A higher score indicates that the students are more interested in and satisfied with their school situation.
** PARENC Parental encouragement ** STEACHEX Student perception of teacher expectations	The students reported their perceptions of (1) the degree parents or guardians encourage them and (2) what their teachers expect of them.	-To be one of the best students -To be an above-average student -To be at least an average student -To do just well enough to get by (Parents) -To be a below-average student (Teachers) -I don't know	A weight was not placed on the responses, but it is generally considered that more parental encouragement and higher teacher expectations are positive attributes. "I don't know" may be the least favorable condition.
** TESTCOND Conditions at the time of testing	The students reported whether the examiner seemed positive and whether they and other students took the tests seriously.	-Strongly Agree -Mostly Agree -Mostly Disagree -Strongly Disagree	No weights were assigned to the responses. Reports of positive attitudes aid in validation of other results.

**The results for these variables are printed at the end of the school report.

APPENDIX B

Grade Seven Norms for 1986

TABLE A-7

1986 PENNSYLVANIA SCHOOL NORMS
GRADE 7 SCHOOLS
N = 156

PERCENTILE	Reading Comprehension	Writing Skills	Mathematics	Analytical Thinking	Social Studies	Arts & Humanities	Science & Technology	Environment	Self-Concept	Health Practices	PERCENTILE
95	32.50	43.55	34.01	19.42	35.06	30.69	20.89	21.54	64.83	104.75	95
90	31.38	42.96	33.21	19.08	33.81	30.03	20.44	21.07	63.76	103.23	90
85	31.18	42.50	32.78	18.99	33.39	29.60	20.17	20.80	63.36	102.40	85
80	31.03	42.09	32.08	18.83	32.93	28.96	19.88	20.59	62.96	101.50	80
75	30.60	41.76	31.42	18.41	32.67	28.59	19.53	20.44	62.49	100.97	75
70	30.07	41.28	31.13	18.30	32.10	28.09	19.41	20.17	62.28	100.57	70
65	29.81	40.91	30.98	18.01	31.75	27.37	19.28	19.91	61.97	100.23	65
60	29.53	40.55	30.49	17.85	31.58	27.06	19.05	19.76	61.56	99.59	60
55	29.24	40.26	30.25	17.65	31.24	26.70	18.77	19.52	61.30	99.17	55
50	28.99	39.69	29.53	17.35	30.85	26.47	18.54	19.32	60.98	98.77	50
45	28.49	39.48	29.15	17.17	30.46	26.30	18.32	19.21	60.56	98.05	45
40	28.11	39.26	28.68	16.90	29.83	26.16	18.08	18.87	60.22	97.65	40
35	27.87	38.78	28.21	16.73	29.61	25.90	17.88	18.65	60.01	97.25	35
30	27.45	38.22	27.89	16.55	29.30	25.39	17.62	18.30	59.45	96.70	30
25	27.00	37.81	27.59	16.30	28.71	24.98	17.30	18.04	58.91	96.29	25
20	26.57	36.93	27.25	15.96	28.06	24.51	16.93	17.75	58.45	95.36	20
15	25.89	36.29	26.25	15.67	27.72	24.00	16.63	17.33	57.81	95.06	15
10	25.11	35.54	25.37	15.45	26.68	23.38	16.32	16.85	57.48	93.69	10
5	24.50	33.62	24.48	14.73	25.71	22.33	15.59	16.35	56.53	93.13	5
Mean	28.57	39.48	29.47	17.29	30.56	26.62	18.39	19.16	60.79	98.67	Mean
Std Dev	2.67	3.02	3.14	1.59	2.90	2.65	1.75	1.81	2.60	3.76	Std Dev

TABLE B-7

1986 PERCENTILE DISTRIBUTION OF VARIABLES
GRADE 7 SCHOOLS
N = 156

PER-CEN-TILE	1 GRENROLL	2 PCTLI	3 TUITION	4 TSATPAR	5 TEDUC	8 CLSIZE	9 TOBSERVE	10 LEADER	11 TCHRINIT	PER-CEN-TILE
95	300	51.50	3483	2.39	2.10	26.57	3.08	28.26	29.55	95
90	257	44.30	3141	2.32	2.04	25.80	2.61	27.23	29.02	90
85	241	42.20	3062	2.23	1.97	25.36	2.50	26.88	28.75	85
80	217	39.20	2953	2.18	1.90	24.85	2.34	25.82	28.40	80
75	209	36.20	2891	2.15	1.86	24.52	2.19	25.23	28.04	75
70	194	33.40	2756	2.10	1.84	24.04	2.14	24.70	27.62	70
65	181	31.70	2621	2.08	1.80	23.70	2.09	24.14	27.47	65
60	162	30.40	2539	2.05	1.77	23.47	2.04	23.71	27.22	60
55	151	27.60	2453	2.00	1.74	23.34	1.96	22.96	27.00	55
50	139	25.30	2423	1.97	1.69	23.00	1.90	22.30	26.71	50
45	135	23.80	2359	1.94	1.67	22.65	1.80	21.98	26.60	45
40	130	21.00	2309	1.89	1.64	22.40	1.54	21.53	26.33	40
35	119	18.10	2281	1.85	1.61	22.14	1.41	21.14	26.12	35
30	111	15.50	2228	1.82	1.57	21.98	1.33	20.85	25.82	30
25	94	14.90	2211	1.80	1.54	21.73	1.27	20.38	25.49	25
20	90	12.40	2165	1.75	1.50	21.30	1.20	20.12	25.17	20
15	80	10.90	2104	1.70	1.46	20.74	1.12	19.15	24.89	15
10	77	8.70	2085	1.65	1.40	20.20	1.08	17.65	23.93	10
5	63	6.20	1958	1.54	1.35	19.24	1.00	16.12	22.70	5
Mean	159	26.46	2561	1.97	1.72	22.99	1.85	22.49	26.66	Mean
Std Dev	80	14.52	496	0.27	0.24	2.36	0.68	3.92	2.05	Std Dev

TABLE B-7 (Continued)
1986

PERCENTILE	12 DISRUPTN	13 DISCIPLN	14 PLANNING	15 SCHLCLIM	16 PCTGIRLS	17 PAREDUC	18 RESIDE	19 PCTWHITE	20 MOBILITY	21 SPARINT	22 TVWATCH	PERCENTILE
95	21.70	22.53	18.69	13.86	55.32	2.37	4.71	98.99	0.60	4.76	2.79	95
90	21.19	21.95	17.55	13.26	53.47	2.21	4.20	98.73	0.55	4.66	2.68	90
85	20.81	21.42	17.28	13.06	52.52	2.08	3.91	98.50	0.49	4.63	2.58	85
80	20.51	20.75	17.05	12.87	51.69	1.96	3.64	97.92	0.47	4.55	2.52	80
75	20.04	20.39	16.83	12.76	50.57	1.93	2.70	97.65	0.44	4.50	2.49	75
70	19.56	19.97	16.53	12.37	50.00	1.89	2.06	97.39	0.43	4.47	2.46	70
65	19.41	19.69	16.25	12.15	49.70	1.86	1.98	97.28	0.41	4.43	2.42	65
60	18.93	19.44	16.02	11.87	49.32	1.82	1.41	97.06	0.39	4.39	2.38	60
55	18.64	19.12	15.60	11.71	[illegible].91	1.77	1.11	96.[illegible]4	0.37	4.37	2.35	55
50	18.33	18.91	15.39	11.56	48.48	1.74	1.02	96.30	0.36	4.32	2.33	50
45	18.12	18.30	15.22	11.50	47.83	1.69	1.00	96.20	0.34	4.27	2.32	45
40	17.82	17.97	15.00	11.37	47.46	1.63	0.92	95.87	0.33	4.25	2.30	40
35	17.65	17.74	14.75	11.13	46.95	1.59	0.76	95.12	0.31	4.20	2.22	35
30	17.48	17.35	14.33	10.88	46.40	1.54	0.70	94.44	0.29	4.17	2.21	30
25	17.32	17.08	14.00	10.50	45.39	1.52	0.65	93.45	0.26	4.14	2.17	25
20	16.84	16.47	13.64	10.17	44.74	1.50	0.58	92.70	0.24	4.09	2.14	20
15	16.14	16.10	13.10	9.36	43.71	1.46	0.46	91.54	0.21	4.04	2.08	15
10	15.45	15.26	12.52	8.80	43.10	1.40	0.35	84.62	0.19	3.96	2.01	10
5	14.56	13.34	11.84	8.00	41.77	1.37	0.18	70.97	0.16	3.87	1.96	5
Mean	18.47	18.5[illegible]	15.31	11.40	48.33	1.77	1.75	92.49	0.37	4.31	2.34	Mean
Std Dev	2.34	2.86	2.07	1.71	[illegible].27	0.33	1.49	13.06	0.14	0.31	0.26	Std Dev

TABLE B-7 (Continued)
1986

PERCENTILE	23 PAREXP	24 EDEXPECT	25 HOMEREAD	26 TIMEREAD	27 WRITEPAR	29 STUDYHAB	30 TIMEMATH	31 TESTFREQ	32 TESTRETN	33 CLDISCIP	PERCENTILE
95	2.68	2.84	3.95	2.36	3.04	2.46	2.04	3.08	2.74	2.38	95
90	2.57	2.78	3.79	2.31	2.88	2.42	2.01	3.06	2.68	2.33	90
85	2.52	2.70	3.74	2.27	2.84	2.40	1.97	3.01	2.66	2.30	85
80	2.43	2.64	3.68	2.21	2.80	2.37	1.94	2.97	2.60	2.27	80
75	2.41	2.61	3.63	2.19	2.74	2.36	1.91	2.93	2.55	2.24	75
70	2.37	2.56	3.54	2.17	2.70	2.34	1.88	2.90	2.52	2.20	70
65	2.32	2.52	3.52	2.13	2.65	2.31	1.86	2.87	2.47	2.19	65
60	2.29	2.49	3.49	2.11	2.62	2.29	1.84	2.85	2.43	2.17	60
55	2.25	2.44	3.45	2.09	2.60	2.27	1.81	2.81	2.39	2.16	55
50	2.23	2.38	3.41	2.06	2.56	2.25	1.77	2.77	2.36	2.13	50
45	2.19	2.35	3.37	2.04	2.54	2.24	1.76	2.74	2.33	2.12	45
40	2.16	2.33	3.34	2.01	2.51	2.22	1.73	2.71	2.29	2.09	40
35	2.13	2.30	3.30	1.97	2.48	2.21	1.71	2.66	2.27	2.07	35
30	2.09	2.25	3.25	1.95	2.43	2.17	1.69	2.61	2.24	2.05	30
25	2.05	2.22	3.22	1.93	2.39	2.14	1.66	2.59	2.18	2.02	25
20	2.00	2.17	3.15	1.90	2.34	2.11	1.63	2.55	2.14	1.98	20
15	1.92	2.13	3.03	1.87	2.30	2.07	1.59	2.51	2.08	1.96	15
10	1.86	2.06	2.91	1.82	2.26	2.03	1.56	2.40	2.01	1.84	10
5	1.81	2.00	2.79	1.73	2.22	1.98	1.50	2.31	1.98	1.77	5
Mean	2.23	2.41	3.40	2.06	2.58	2.25	1.78	2.76	2.36	2.11	Mean
Std Dev	0.27	0.27	0.35	0.20	0.26	0.15	0.19	0.26	0.26	0.19	Std Dev

TABLE B-7 (Continued)
1986

PER-CEN-TILE	36 MATHINST	37 ENGLINST	38 SCIINST	39 SOCINST	44 INTSCHL	PER-CEN-TILE
95	4.71	4.80	5.29	5.46	55.96	95
90	4.53	4.52	5.16	5.26	54.93	90
85	4.46	4.46	5.07	5.16	54.10	85
80	4.38	4.39	5.01	5.08	53.35	80
75	4.29	4.32	4.89	4.99	53.11	75
70	4.24	4.23	4.82	4.89	52.84	70
65	4.20	4.20	4.77	4.86	52.48	65
60	4.18	4.15	4.72	4.79	52.17	60
55	4.13	4.11	4.65	4.68	51.75	55
50	4.08	4.08	4.57	4.62	51.35	50
45	4.06	4.07	4.52	4.58	51.21	45
40	4.01	4.04	4.41	4.53	50.83	40
35	3.96	3.98	4.35	4.50	50.36	35
30	3.92	3.92	4.27	4.46	49.78	30
25	3.90	3.87	4.22	4.39	49.36	25
20	3.85	3.82	4.10	4.26	48.91	20
15	3.79	3.78	4.00	4.15	47.98	15
10	3.66	3.69	3.89	4.03	47.10	10
5	3.50	3.63	3.64	3.92	46.12	5
Mean	4.10	4.12	4.53	4.67	51.27	Mean
Std Dev	0.35	0.37	0.52	0.47	3.13	Std Dev

APPENDIX C

1986 and 1987 Correlations

TABLE C-7

CORRELATION COEFFICIENTS AMONG SCHOOL SCORES
Grade 7
1986 Normative Group
N = 156

		RC	WS	M	AT	SS	AH	ST	EN	SC
Communication Skills: Reading Comprehension	RC									
Communication Skills: Writing Skills	WS	.84								
Mathematics	M	.75	.77							
Analytical Thinking	AT	.87	.81	.71						
Citizenship/Social Studies	SS	.83	.79	.74	.85					
Arts & Humanities	AH	.85	.81	.76	.79	.78				
Science & Technology	ST	.83	.79	.72	.84	.83	.72			
Environment	EN	.74	.68	.57	.73	.71	.68	.80		
Self-Concept in School	SC	.28	.32	.25	.38	.35	.31	.29	.17	
Health & Safety Practices	HP	.25	.19	.08	.30	.29	.19	.16	.16	.57

Note: All correlation coefficients have been rounded to two decimal places.

$r \geq 0.16$ is significant at the .05 level.
$r \geq 0.21$ is significant at the .01 level.

TABLE D-7

CORRELATION COEFFICIENTS BETWEEN
SCHOOL CONDITION VARIABLE SCORES AND SCHOOL SCORES
Grade 7
1986 Normative Group
N = 156

		RC	WS	M	AT	SS	AH	ST	EN	SC	HP*	
1	GRENROLL											1
2	PCTLI	-.55	-.67	-.59	-.54	-.51	-.67	-.50	-.49	-.26		2
3	TUITION									.26		3
4	TSATPAR	.58	.56	.52	.60	.54	.61	.58	.49	.34		4
5	TEDUC		.27		.21		.29					5
8	CLSIZE				.23			.22	.22			8
9	TOBSERVE	.32	.27	.23	.32	.24	.35	.31	.29			9
10	LEADER	.35	.32	.26	.30	.30	.38	.23	.22			10
11	TCHRINIT	.41	.43	.33	.46	.44	.50	.40	.33	.36		11
12	DISRUPTN	.53	.50	.41	.50	.49	.57	.46	.39	.28	.22	12
13	DISCIPLN	.59	.52	.46	.53	.52	.56	.54	.45	.28	.21	13
14	PLANNING	.35	.39	.26	.38	.39	.43	.30	.34	.22		14
15	SCHLCLIM	.54	.46	.44	.49	.44	.53	.44	.41			15
16	PCTGIRLS											16
17	PAREDUC	.45	.55	.54	.45	.45	.58	.41	.32	.35		17
18	RESIDE							-.22	-.23			18
19	PCTWHITE	.54	.47	.45	.47	.49	.42	.56	.54			19
20	MOBILITY	-.31	-.23		-.22	-.30	-.22	-.31	-.36			20
21	SPARINT	.53	.58	.47	.51	.48	.60	.45	.37	.56	.36	21
22	TVWATCH	-.48	-.47	-.47	-.37	-.39	-.52	-.40	-.39			22
23	PAREXP		.27	.26	.24	.24	.27			.42		23
24	EDEXPECT	.23	.34	.31	.29	.31	.36	.21		.48		24
25	HOMEREAD	.67	.66	.63	.60	.63	.65	.65	.56	.25		25
26	TIMEREAD									.28	.32	26
27	WRITEPAR											27
29	STUDYHAB	.36	.42	.36	.41	.39	.40	.29	.23	.65	.43	29
30	TIMEMATH											30
31	TESTFREQ											31
32	TESTRETN	.44	.42	.42	.40	.50	.43	.51	.42			32
33	CLDISCIP	.55	.51	.44	.55	.54	.53	.48	.43	39	.34	33
36	MATHINST											36
37	ENGLINST											37
38	SCIINST											38
39	SOCINST											39
44	INTSCHL	.26	.21		.31	.32	.25	.26		.75	.62	44

Note: All correlation coefficients have been rounded to two decimal places.
Only correlation coefficients which are significant at the .01 level or better are printed ($r \geq .21$).

*See Table C-7 as key to area identification.

TABLE E-7
CORRELATION COEFFICIENTS AMONG
SCHOOL CONDITION VARIABLE SCORES
Grade 7, 1986 Normative Group, N = 156

		1	2	3	4	5	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	GRENROLL																				
2	PCTLI																				
3	TUITION		-.21																		
4	TSATPAR		-.56																		
5	TEDUC		-.34	.49	.22																
8	CLSIZE	.41		-.22																	
9	TOBSERVE				.27																
10	LEADER		-.23		.43			.26													
11	TCHRINIT		-.31		.61		.21	.23	.58												
12	DISRUPTN		-.34		.62			.25	.67	.70											
13	DISCIPLN		-.39		.67			.28	.66	.70	.80										
14	PLANNING		-.37		.58			.31	.63	.59	.54	.55									
15	SCHLCLIM		-.39		.60			.24	.52	.52	.63	.65	.58								
16	PCTGIRLS																				
17	PAREDUC	.26	-.53	.53	.52	.50		.21	.25	.43	.31	.30	.24	.31							
18	RESIDE	.34		.64		.44										.46					
19	PCTWHITE		-.37	-.45	.35						.32	.41		.26			-.54				
20	MOBILITY	.34		.42		.24					-.27	-.32					.55	-.54			
21	SPARINT		-.45	.28	.53	.33			.30	.44	.45	.45	.33	.49		.55	.24	.23			
22	TVWATCH		.42		-.32			-.26			-.26	-.26		-.27		-.23		-.31		-.35	
23	PAREXP		-.26	.53	.31	.38				.32						.81	.54		.34	.47	
24	EDEXPECT	.22	-.35	.55	.39	.38			.22	.39	.23		.23	.22		.84	.53		.27	.53	
25	HOMEREAD		-.61		.56	.25		.24	.33	.43	.41	.46	.36	.45		.58		.34		.46	-.42
26	TIMEREAD														.23	.26				.27	
27	WRITEPAR			.23															.23		
29	STUDYHAB		-.32	.30	.23	.24				.30	.22	.28		.22		.45				.58	
30	TIMEMATH																	-.23			
31	TESTFREQ																				
32	TESTRETN		-.37		.33					.22	.34	.36	.26	.34			-.31	.46	-.37	.25	-.40
33	CLDISCIP		-.34		.42					.25	.35	.46	.23	.29				.48	-.25	.56	-.35
36	MATHINST																				
37	ENGLINST																				
38	SCIINST																				
39	SOCINST					.29															
44	INTSCH				.27					.32	.34	.29	.29	.22						.49	

		23	24	25	26	27	29	30	31	32	33	36	37	38	39
24	EDEXPECT	.94													
25	HOMEREAD	.31	.38												
26	TIMEREAD	.38	.42												
27	WRITEPAR			.22											
29	STUDYHAB	.51	.56	.36	.40	.27									
30	TIMEMATH														
31	TESTFREQ														
32	TESTRETN			.44											
33	CLDISCIP			.28			.40			.34					
36	MATHINST							.23							
37	ENGLINST											.23			
38	SCIINST											.27			
39	SOCINST											.34	.30		
44	INTSCHL				25		.42			.28	.38				

Note: All correlation coefficients have been rounded to two decimal places.
Only correlation coefficients which are significant at the .01 level or better are printed ($r \geq .21$)