DOCUMENT RESUME

ED 367 695 TM 021 155

TITLE	Factors Affecting School Division Performance. Final Report.
INSTITUTION	Virginia State Dept. of Education, Richmond.
PUB DATE	Jan 93
NOTE	101p.
AVAILABLE FROM	Virginia Department of Education, Office of Public Affairs, 25th Floor, P.O. Box 2120, Richmond, VA 23216-2120 ($3.10).
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Academic Achievement; Accountability; *Community Characteristics; Correlation; Databases; Economic Impact; Educational Attainment; *Educational Finance; Elementary Secondary Education; Expenditures; Income; Literature Reviews; *Outcomes of Education; Performance; *School Districts; *Socioeconomic Status; *Student Characteristics
IDENTIFIERS	*Virginia

ABSTRACT

This report provides information on the relationships among students and community characteristics, fiscal and educational resources, and student outcomes at the school-division level. Data from the 1989-90 Outcome Accountability Project include 50 indicators of division-level student outcomes. The factors related to these outcomes were examined through background studies, a literature review, a database of division-level data, and a variety of statistical analyses. Eight categories of variables were hypothesized to represent the educational process. Results of the correlation analysis involving these eight constructs are summarized as follows: (1) socioeconomic status and student characteristics are moderately correlated with student attainment; (2) socioeconomic status and student characteristics are highly correlated with student achievement; (3) community and division fiscal resources are weakly correlated with student attainment; (4) community and division fiscal resources are moderately correlated with student achievement; and (5) class size and teacher characteristics are weakly correlated with student attainment and achievement. Two tables and two figures present analysis results. Five appendixes provide associated documents, such as definitions and survey results. (SLD)

TM

a Vision FOR EDUCATION

January 1993

Factors Affecting School Division Performance

RFP #91-34

Virginia Department of Education

FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE

RFP #91-34

FINAL REPORT

Virginia Department of Education
Richmond, Virginia
October, 1992

PREFACE

The availability of division level outcome indicator data through the Outcome Accountability Project (OAP) presents new opportunities to explore the relationships between student outcomes and factors hypothesized to influence them. Recognizing the potential of the OAP data for such analysis, the Factors Affecting School Division Performance project was conducted within the Department of Education's Request for Proposal (RFP) process (see Appendix A). The project team statistically analyzed relationships between the 1989-90 division level OAP outcome indicator data and various educational (e.g., teacher salary) and non-educational (e.g., students eligible for free or reduced price lunch) variables. A major product of the project is this report, which provides information on the relationships between community and student characteristics, fiscal and educational resources, and student outcomes at the division level. Other team products appended to this report include an annotated bibliography of literature on factors affecting student outcomes, a catalog of the extensive data base used in the project analysis, and survey results of stakeholder perceptions of "high priority" OAP outcome indicators.

The Division Factors Project was directed by Cameron M. Harris, Division Chief, Division of Information Systems. The project was conducted from May 1991 to September 1992.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF EDUCATION

Division Factors Project Team

TEAM LEADER

Kent C. Dickey
Associate Specialist, Quantitative Analysis

TEAM MEMBERS

Sharon L. Bryant
Associate Specialist,
Mathematics

Winfred Fitzgerald
Assistant Specialist,
Information Systems

Virginia A. Hettinger
Associate Specialist,
Quantitative Analysis

R. Dan Keeling, II
Associate Specialist,
Evaluation Research

Dr. David E. W. Mott
Associate Specialist,
Educational Measurement

Dr. Emmett L. Ridley
Associate Specialist,
Policy Analysis

ACKNOWLEDGEMENTS

The project team wishes to thank Gary T. Henry, Georgia State University, and Lee M. Wolfle, Virginia Polytechnic Institute and State University, for serving as consultants on this project.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

BACKGROUND

Data from the 1989-90 Outcome Accountability Project (OAP) include 50 indicators of division level student outcomes. These outcome indicators consist of student academic achievement measures, such as test scores and type of diploma earned, which represent endpoint results of the schooling process. The indicators also contain student attainment measures, such as attendance and dropout rates, which represent intermediate results of the schooling process. The Department of Education's Factors Affecting School Division Performance project was conducted to explore the influence of educational and non-educational factors on division level student outcomes. A goal of the project was to identify, for potential further examination, factors that are both under the control of educators and related to student outcomes in the form of attainment and achievement.

Many factors are believed to affect student outcomes; in addition, such factors are believed to affect each other prior to affecting student outcomes. Therefore, the project analysis focused on relationships among measures of community socioeconomic and fiscal characteristics; student characteristics; school division fiscal resources; school division educational resources represented by class size or teacher characteristics; student attainment measures; and student academic achievement measures.

STUDY APPROACH

The team used the following approach to conduct this project:

- Obtained background knowledge of high priority outcome indicators through a survey of educational stakeholders;
- Conducted a review of the literature on factors affecting student outcomes;
- Developed a data base of division level data for use in the project analysis;
- Developed three theoretical models of factors affecting the educational process;
- Used various statistical methods to analyze the data and to test the theoretical models; and
- Interpreted the findings of the analysis and made recommendations based on the findings and conclusions.

Eight categories of variables hypothesized to represent the educational process were identified:

- Socioeconomic Status (e.g., median adjusted gross income)
- Community Fiscal Resources (e.g., revenue capacity per capita)
- Student Characteristics (e.g., percent of students eligible for free or reduced price lunch)
- School Division Fiscal Resources (e.g., per pupil expenditures)
- Class Size (e.g., pupil-instructor ratio)
- Teacher Characteristics (e.g., average years of teaching experience)
- Student Attainment (e.g., attendance)
- Student Achievement (e.g., test scores)

Each of these variable categories represents different theoretical concepts that cannot be measured fully by a single variable. Therefore, variables within each of the categories were combined to develop a single "construct" representing aspects of the variable category.

The team used information from the literature review to identify theoretical relationships among constructs. The team developed three theoretical models to depict hypothesized relationships among factors in the educational process. Three major questions were addressed in the data analysis phase of the project. These questions examined the relationships between the constructs both within and across the three models:

- What educational or non-educational resources affect student attainment or student achievement?

- Do division educational resources that can be manipulated by educators, such as class size or teacher characteristics, affect student attainment or student achievement?

- What model best reflects the way in which educational resources and student attainment affect student achievement? In other words, do educational resources affect intermediate outcomes of the schooling process (student attainment), which then affect later outcomes of the schooling process (student achievement)? Or do educational resources and student attainment affect student achievement concurrently?

Correlation statistics were calculated for each pair of constructs. These correlations provided some preliminary feedback on the validity of the theoretical relationships hypothesized in the three models.

Another statistical method applied to the three theoretical models uses a system of regression models called seemingly unrelated regression. This method was applied to the 18 statistical models tested in the analysis: the three conceptual models using either the class size construct or the teacher characteristics construct at the three levels of student attainment and student achievement. The 18 models were examined for overall explanatory ability, as well as the statistical significance and explanatory ability of the individual hypothesized effects (i.e., statistical relationships) among the constructs.

FINDINGS

Results of the correlation analysis involving the eight constructs are summarized below:

- Socioeconomic status and student characteristics are moderately correlated with student attainment at each of the three school levels (i.e., elementary, middle, and high school).
- Socioeconomic status and student characteristics are highly correlated with student achievement at each school level.
- Community fiscal resources and division fiscal resources are weakly correlated with student attainment at each school level.
- Community fiscal resources and division fiscal resources are moderately correlated with student achievement at each school level.
- Class size and teacher characteristics are weakly correlated with student attainment and student achievement at each school level.

These correlation results did not provide a clear indication of whether educational resources such as class size and teacher characteristics affect both student attainment and student achievement, or only student achievement; therefore, the differences between the three theoretical models remained worthy of further examination using statistical modelling methods.

It is hypothesized in model 1 that only student characteristics affect student attainment, with both student attainment and class size or teacher characteristics then affecting student achievement. The results using the class size construct to represent division educational resources in model 1 were similar to the results using the teacher characteristics construct: their effect on student achievement was statistically significant at the elementary and middle school levels, but not at the high school

level. All other hypothesized effects were significant at each school level.

It is hypothesized in model 2 that both student characteristics and class size or teacher characteristics affect student attainment, with student attainment then affecting student achievement. Model 2 yielded different results using the class size construct to represent educational resources than with using the teacher characteristics construct. The hypothesized effect of class size on student attainment is statistically insignificant at each school level. However, the hypothesized effect of teacher characteristics on student attainment is statistically significant at each school level. All other hypothesized effects were significant at each school level.

Model 3 tests whether the direct or indirect effect of class size or teacher characteristics on student achievement is eliminated when the student attainment construct is removed from the model. Model 3 also yielded different results using the class size construct versus the teacher characteristics construct. The hypothesized effect of class size on student achievement is statistically insignificant at each school level. However, the hypothesized effect of teacher characteristics on student achievement is statistically significant at each school level. All other hypothesized effects were significant at each school level.

CONCLUSIONS

The results from the class size models suggest that the system of hypothesized effects in model 1 is the best representation of factors affecting student achievement. The results of model 2 suggest that class size does not affect intermediate outcomes of the schooling process (student attainment), which then affect later outcomes of the schooling process (student achievement). The results of models 2 and 3 lend little support to conclusions that class size has a statistically significant effect on student attainment or student achievement.

The results from all three teacher characteristics models indicate that the teacher characteristics construct is related to student attainment or student achievement regardless of which system of hypothesized effects is tested. As with class size, model 1 using teacher characteristics produces statistically significant results at the elementary and middle school levels. The results of model 2 suggest that teacher characteristics do affect intermediate outcomes of the schooling process (student attainment), which then affect later outcomes of the schooling process (student achievement). Unlike class size model 3, the presence of the student attainment construct is not necessary for the teacher characteristics construct to have a statistically significant effect on student achievement.

The results from the correlation analysis and models 1 - 3 suggest three overall conclusions related to the questions asked on page ii. The first is that factors such as socioeconomic status and student background are related to student attainment and student achievement at the elementary, middle, and high school levels. These relationships were consistently found both in the correlation statistics and in all of the models tested. In addition, this finding confirms those of many other studies using socioeconomic status as a control variable in the analysis of student outcomes. The demonstrated relationships between socioeconomic status/student background and student attainment/student achievement have important implications for educators since socioeconomic status and student background are factors typically beyond their immediate control.

The second conclusion is that educational resources in the form of class size and teacher characteristics do not have consistently significant effects on student attainment and student achievement across models 1 - 3. This conclusion is similar to those of other studies examining the effect of educational resources on student outcomes. However, the project findings indicate that the teacher characteristics construct has a statistically significant effect on student attainment or student achievement regardless of the model hypothesized, while the significance of the class size effect on student attainment or student achievement is dependent on the model hypothesized.

The third conclusion flows directly from the second conclusion. The model that best represents the educational process appears to be model 1. Except at the high school level, model 1 produced statistically significant results regardless of whether the class size or teacher characteristics construct was used. The statistical significance of models 2 and 3 depended on whether the class size or teacher characteristics construct was used.

The project findings raise as many questions as they answer. Few measures of educational resources were available to the team, and the ones used perhaps were not optimal measures of this concept as it relates to student attainment or student achievement. In addition, all of the data analyzed are division level measures, yet the delivery of educational resources and the characteristics and interaction of teachers and students vary by school as well by division. Data were not available at each of the three school levels for all of the variables comprising the class size and teacher characteristics constructs. Thus, are the project results an accurate reflection of the educational process -- especially the ability of educational resources such as class size and teacher characteristics to influence student outcomes -- or are the results more a product of the quality and quantity of data available for the analysis?

The analysis team feels that the optimal level for examining

student attainment and student achievement is the school. Analysis of such school level information would perhaps provide a better picture of the effect of educational resources in the face of differing community and student characteristics. Future study of factors affecting student attainment and student achievement should include school level analysis, emphasizing the increased availability of school level socioeconomic, fiscal, and educational resource data. However, the cost implications of such school level data collection should be carefully considered.

PROJECT RECOMMENDATIONS

The project findings provide information on various relationships that occur in the educational process, particularly between educational resources and student attainment or student achievement. The findings should not be viewed as definitive evidence of the relationships, or lack thereof, that exist in the educational process. The team feels that the findings do not support any recommendations regarding changes in educational resource allocations. Most of the recommendations that follow propose steps for future data collection and analysis that may address some of the analytical limitations raised above.

1. Continue analysis of the OAP outcome data by making data analysis a regular component of the OAP Project RFP. Future analysis of OAP data should include the school level indicators available following the May 1992 reporting cycle. School level analysis may allow variation that is masked in division level analysis to be examined and allow use of findings at the point of educational service delivery and change.

2. Explore collecting at the school level educational resource data (for example, teacher salary, pupil teacher ratio, etc.) currently reported to the Department of Education only at the division level. Collect, at least biennially, school level contextual information such as parental education level and student mobility. This contextual information would be collected at the same level as the OAP school level indicators, allowing analysis of the effects of such variables at the point of service delivery.

3. Disseminate the executive summary of this report and the report on the "high priority outcomes" survey to the Regional Representatives for use in the field.

CHAPTER 1

INTRODUCTION

THE DIVISION FACTORS PROJECT

Data from the 1989-90 Outcome Accountability Project (OAP) include 50 indicators of division level student outcomes. These outcome indicators consist of student academic achievement measures, such as test scores and type of diploma earned, which represent endpoint results of the schooling process. The OAP indicators also include student attainment measures. Student attainment indicators represent intermediate results of the schooling process, such as attendance and dropout rates. The Department of Education's Factors Affecting School Division Performance project was conducted to explore the influence of educational and non-educational factors on division level student outcomes. A goal of the project was to identify, for potential further examination, factors that are both under the control of educators and related to student outcomes in the form of attainment and achievement.

The specific objectives of the Division Factors Project stated in the Department's Request for Proposal (RFP) were to:

(a) analyze student outcome data using the OAP pilot data and existing data on school divisions;

(b) produce and disseminate materials on correlates of successful student performance; and

(c) identify school divisions performing above expectations with respect to high priority outcomes.

Many factors are believed to affect student outcomes; in addition, such factors are believed to affect each other prior to affecting student outcomes. Therefore, the project analysis focused on relationships among measures of community socioeconomic and fiscal characteristics; student characteristics; school division fiscal resources; school division educational resources represented by class size or teacher characteristics; and student outcome measures (both attainment and achievement).

The Division Factors Project team was comprised of seven Department of Education staff having expertise in quantitative analysis, educational measurement, evaluation, policy analysis, mathematics, and information systems. Two university consultants provided expertise during the data modeling and analysis stages of the project.

STUDY APPROACH

The team used the following methods to conduct the Factors Affecting School Division Performance project:

- Obtained background knowledge of high priority outcome indicators through a survey of educational stakeholders;
- Conducted a review of the literature on factors affecting student outcomes;
- Developed a data base of division level data for use in the project analysis;
- Developed three theoretical models of factors affecting the educational process;
- Used various statistical methods to analyze the data and to test the theoretical models; and
- Interpreted the findings of the analysis and made recommendations based on the findings and conclusions.

OVERVIEW OF FINAL REPORT

The analysis process, findings, conclusions, and recommendations are presented in the following chapters:

In Chapter 2, the process of developing the data base used in the project analysis is described.

In Chapter 3, the processes of variable reduction, model development, and interpretation of statistical relationships among constructs are discussed. Conclusions based on the findings are also presented.

In Chapter 4, recommendations are presented based on project findings and conclusions.

In Chapter 5, the Division Factors Project evaluation is presented based on various short- and long-term qualitative criteria. The evaluation component discusses project timelines, products and deliverables, project resources, and exportability of methodology and findings to other settings.

CHAPTER 2

DATA BASE DEVELOPMENT

The first step in the study approach was to increase the team's understanding of prior research on factors affecting student outcomes and the data available for conducting such analysis. The project called for analysis of the division level OAP indicator data, and the OAP data were used as a starting point. The large number of indicators in the OAP data base made it necessary to reduce the number that would be analyzed for the project. To help target the indicators to be analyzed, the team surveyed various educational stakeholders on the OAP indicators they viewed as most important (see Appendix E).

The team also reviewed the educational literature and developed an annotated bibliography of research on factors affecting student outcomes (see Appendix B). From this review, the team identified several categories of variables hypothesized to represent the stages in the educational process. Based on these categories, the team developed an extensive computerized data base containing 140 variables, each corresponding to one of eight categories (see Appendix C). The eight variable categories included:

- Socioeconomic Status (e.g., median adjusted gross income)
- Community Fiscal Resources (e.g., revenue capacity per capita)
- Student Characteristics (e.g., percent of students eligible for free or reduced price lunch)
- School Division Fiscal Resources (e.g., per pupil expenditures)
- Class Size (e.g., pupil-instructor ratio)
- Teacher Characteristics (e.g., average years of teaching experience)
- Student Attainment (e.g., attendance)
- Student Achievement (e.g., test scores)

The class size and teacher characteristics categories represent educational resources available to a school division. The student attainment and student achievement categories included variables measured at the elementary, middle, and high school levels.

Data for this project were drawn from a variety of secondary sources. Data located within the Department of Education included the OAP indicator data, division fiscal and educational resource data from the Superintendent's Annual Report, and student characteristics data from several other internal sources. External data sources included the 1980 and 1990 U. S. Census, the Center for Public Service, the Commission on Local Government, the

Department of Social Services, and the Department of Health. These external sources provided data on socioeconomic status and community fiscal resource variables. Data were collected as close as possible to 1989-90 school year to match the 1989-90 OAP indicator data.

The primary criteria used to assess each variable for inclusion in the project data base included the following questions:

- Did the variable fall under one of th categories identified in the literature review?
- Were variable data available at the division level and for all or most divisions?
- Were there any known reliability problems with the variable data?

The project data base was developed on two personal computers in a series of spreadsheets using data obtained from both electronic and paper sources. This method was the most direct route for data storage and retrieval since the project analysis plan called for the use of personal computer statistical packages.

CHAPTER 3

DATA ANALYSIS, FINDINGS, AND CONCLUSIONS

ANALYTICAL OBJECTIVES

The educational process, which culminates in various forms of student achievement, is affected by many factors. A primary objective of the Division Factors Project was to analyze the interrelationships among the eight variable categories listed in Chapter 2: socioeconomic status; community fiscal resources; student characteristics; division fiscal resources; class size or teacher characteristics; student attainment; and student achievement.

These variable categories represent theoretical concepts which are not measured fully by a single variable. Multiple variables are necessary to capture different facets of the entire theoretical concept. For example, community socioeconomic status is commonly defined by measures of income, education, and occupation. A single variable representing any of these three measures provides substantial information about socioeconomic status since income, education, and occupation tend to be related. However, knowing the educational level in a community does not provide complete information about the income or wealth in the community. A better representation of socioeconomic status as a concept would combine several of the measured variables contributing to socioeconomic status.

Thus, for the project analysis, variables within each of the eight categories were combined to develop a "construct" representing aspects of the variable category. Constructs are measures of abstract, multifaceted theoretical concepts. They are typically given a descriptive label (e.g., socioeconomic status) and are developed by statistically combining multiple variables into a single measure. The team conducted statistical analyses to determine each variable's relationship to a construct. The variables used to represent each construct were those that were most related to the identified constructs.

Separate constructs were developed for student attainment and student achievement at the elementary, middle, and high school levels using variables measured at these three levels. The student attainment and student achievement constructs were separated at the three levels of schooling to explore whether the other five constructs affect the three levels differently. Two different constructs were developed for educational resources, class size and teacher characteristics. The theoretical constructs developed for the modeling phase of the analysis and the variables comprising them are shown in Table 1.

TABLE 1

CONSTRUCTS AND CONTRIBUTING VARIABLES USED IN ANALYSIS PHASE

SOCIOECONOMIC STATUS

- Median Adjusted Gross Income
- High School Graduates as Percent of Population
- Median Value of Owner Occupied Housing

STUDENT CHARACTERISTICS

- Percent Eligible for Free and Reduced Price Lunch
- Average of CogAT Scaled Scores
- Percent Scoring in Lower Quartile on any CogAT Test

CLASS SIZE (representing division educational resources)

- Instructional Positions per 1000 Students
- Pupil instructor Ratio K-6
- Average Class Size K-5

TEACHER CHARACTERISTICS (representing division educational resources)

- Percent of Teachers with Advanced Degrees
- Average Years of Teaching Experience

STUDENT ATTAINMENT:

ELEMENTARY SCHOOL STUDENT ATTAINMENT

- Percent in Grade 4 Over Age 11
- Percent in Grades K-5 Absent 10 Days or Fewer

MIDDLE SCHOOL STUDENT ATTAINMENT

- Percent in Grade 8 Over Age 15
- Percent in Grades 6-8 Absent 10 Days or Fewer
- Percent Taking Foreign Language by Grade 9

HIGH SCHOOL STUDENT ATTAINMENT

- Dropout Rate Grades 9-12
- Percent in Grades 9-12 Absent 10 Days or Fewer
- Percent Taking Advanced Placement or College Courses

COMMUNITY FISCAL RESOURCES

- Revenue Capacity Per Capita
- Composite Index
- Fiscal Stress

DIVISION FISCAL RESOURCES

- Per Pupil Disbursements
- Per Pupil Expenditures for Operations
- Percent Total Spending Exceeding Total SOQ Requirements
- Average Elementary Teacher's Salary
- Average Secondary Teacher's Salary

STUDENT ACHIEVEMENT:

ELEMENTARY SCHOOL STUDENT ACHIEVEMENT

- Percent Grade 4 ITBS Scores Above 50th Percentile
- Percent Grade 4 ITBS Scores Above 25th Percentile
- Percent Grade 6 Passing LPT on First Attempt

MIDDLE SCHOOL STUDENT ACHIEVEMENT

- Percent Grade 6 Passing LPT on First Attempt
- Percent Grade 8 ITBS Scores Above 25th Percentile
- Percent Grade 8 ITBS Scores Above 50th Percentile
- Percent Grade 8 ITBS Scores Above 75th Percentile

HIGH SCHOOL STUDENT ACHIEVEMENT

- Percent Grade 11 TAP Scores Above 50th Percentile
- Percent Grade 11 TAP Scores Above 75th Percentile
- Percent Grade 11 TAP Math Scores Above 25th Percentile
- Percent Grade 11 TAP Reading Scores Above 25th Percentile
- Percent Receiving Advanced Studies Diploma
- Percent Grades 11 and 12 Scoring 1100 or Above on SAT
- Percent Grades 11 and 12 Taking SAT

DATA ANALYSIS

Three major questions were addressed in the data analysis phase of the project. These questions examined the relationships between the constructs both within and across the three models:

- What educational or non-educational resources affect student attainment or student achievement?
- Do division educational resources that can be manipulated by educators, such as class size or teacher characteristics, affect student attainment or student achievement? The team analyzed the class size and teacher characteristics constructs independently to explore this question.
- What model best reflects the way in which educational resources and student attainment affect student achievement? In other words, do educational resources affect intermediate outcomes of the schooling process (student attainment), which then affect later outcomes of the schooling process (student achievement)? Or do educational resources and student attainment affect student achievement concurrently?

The effects (i.e., statistical relationships) of educational resources such as class size or teacher characteristics on student attainment and student achievement are viewed as particularly important; this is because educational resources are an area of the schooling process that can be controlled or manipulated by educators. Measures of class size and teacher characteristics are two of the very few measures related to educational resources currently available for Virginia's public schools. If either area of educational resources is found to be related to higher student outcomes, then further analysis may be warranted toward modifying budgetary or programmatic allocations.

The team used information from the literature review to identify theoretical relationships among variable constructs. Such hypothesized relationships are commonly organized into models that provide a graphical representation of how the constructs interact to affect student achievement. In general, the models begin with factors outside the educational system, then reflect factors that are within the control of the educational system, and finally reflect outcomes of the educational process.

The team developed three models to depict the theoretical relationships among the constructs used for the analysis. Visual representations of the three models appear in Figure 1. An arrow indicates that one construct is hypothesized to have an effect on the construct to which the arrow points.

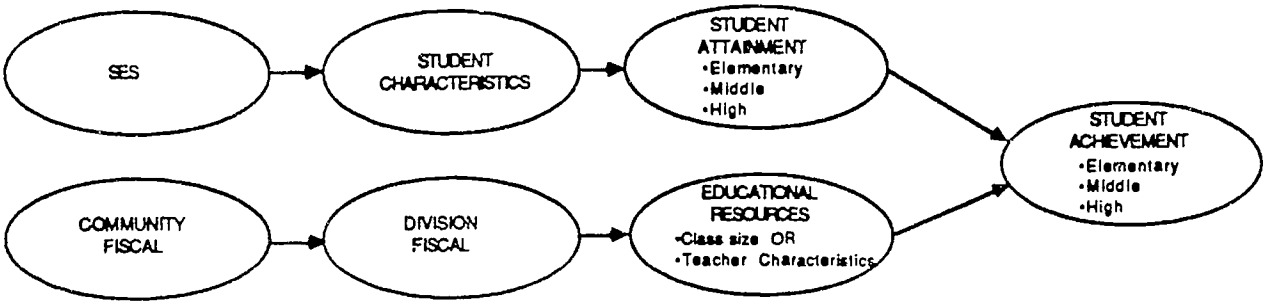
When models 1 and 2 are compared, there is no difference in the hypothesized effects until the point at which the student attainment construct enters the model. The difference between these two models stems from an interest in examining whether educational resources affect both student attainment and student achievement, or only student achievement. If educational resources such as class size or teacher characteristics affect student attainment, this may represent an intermediate point in the education process which can be influenced by educators.

It is hypothesized in model 1 that division educational resources such as class size or teacher characteristics do not affect student attainment, but that student attainment and educational resources concurrently affect student achievement. In model 2, both student characteristics and educational resources affect student attainment, and then student attainment affects student achievement.

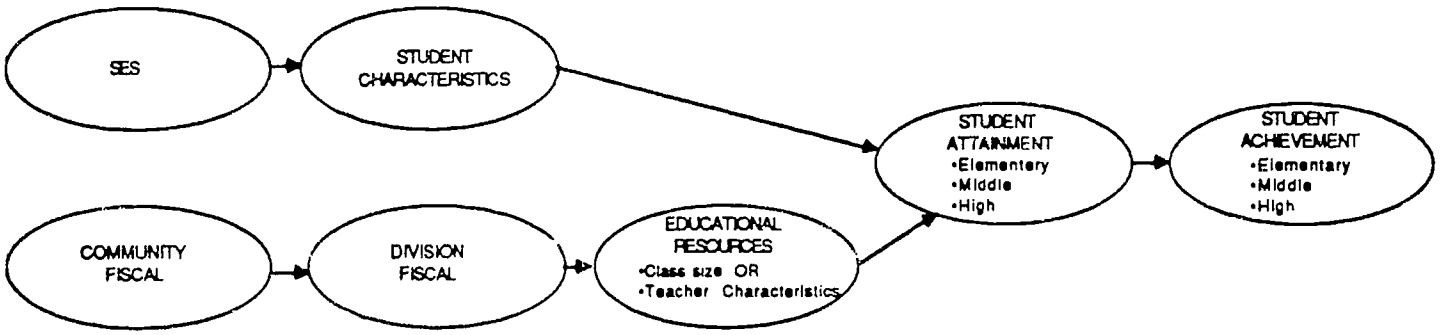
Model 3 is hypothesized to test whether the direct or indirect effect of class size or teacher characteristics on student achievement is eliminated when the student attainment construct is removed from the model.

Figure 1

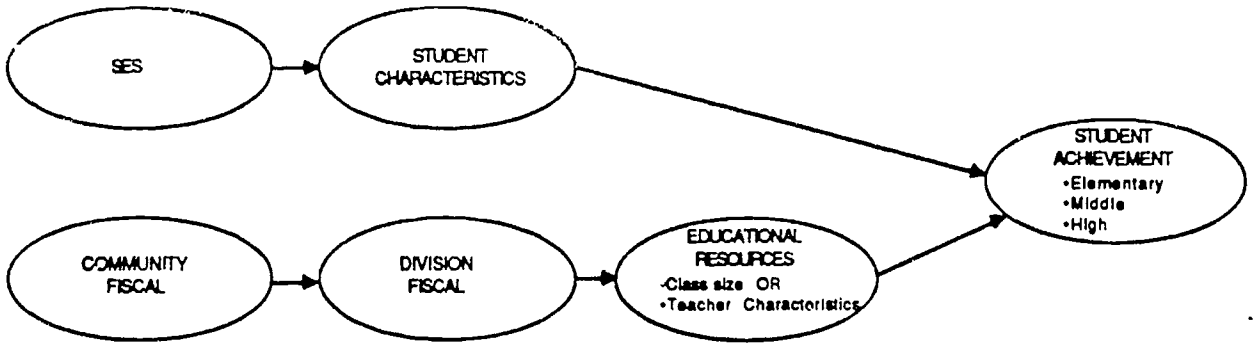
Three Baseline Theoretical Models of Factors Affecting School Division Performance



Model 1



Model 2



Model 3

FINDINGS

Correlation Analysis

Prior to statistically testing the three hypothesized models, correlation statistics were calculated for each pair of constructs. The results are shown in Table 2. The correlations between the constructs provided information on the strength of the relationships between them, and some preliminary feedback on the validity of the theoretical relationships hypothesized in the three models. The pairs of constructs are correlated in isolation, thus the information from the correlation statistics is limited because the influence of the other constructs in the models is not reflected. However, none of the relationships between the constructs occurs in isolation. As a result, the correlation between two constructs may be overstated because of their mutual relationship with a third, external construct.

With that caution noted, some findings of the correlation analysis are summarized:

- Socioeconomic status is highly correlated with student achievement at each of the three school levels (i.e., elementary, middle, and high school). (.604 to .698)
- Socioeconomic status is moderately correlated with student attainment at all school levels. (.352 to .489)
- Student characteristics are highly correlated with student achievement at all school levels. (-.660 to -.801)
- Student characteristics are moderately correlated with student attainment at all school levels. (-.454 to -.558)
- Community fiscal resources are weakly correlated with student attainment at all school levels. (.194 to .266)
- Community fiscal resources are moderately correlated with student achievement at all school levels. (.391 to .502)
- Division fiscal resources are weakly correlated with student attainment at all school levels. (.117 to .227)
- Division fiscal resources are moderately correlated with student achievement at all school levels. (.360 to .476)
- Class size is weakly correlated with student attainment and student achievement at all school levels. (-.182 to -.241)

- Teacher characteristics are weakly correlated with student attainment and student achievement at all school levels. (.125 to .232)

Two constructs, socioeconomic status and student characteristics, have statistically significant relationships with student attainment and student achievement, consistent with the relationships hypothesized in the models in Figure 1. The educational resource constructs, class size and teacher characteristics, do not have strong relationships with either student attainment or student achievement; thus, whether educational resources such as class size and teacher characteristics affect student attainment or student achievement within the models is not as clear. Further, these correlations do not provide a clear indication of whether educational resources affect both student attainment and student achievement, or only student achievement. Therefore, the differences between models 1 - 3 remained worthy of examination.

Two other constructs, community fiscal resources and division fiscal resources, are more highly correlated with student achievement than with student attainment. This result may support model 1, in which constructs appearing in the lower part of the model are hypothesized to affect only student achievement. Again, these findings are not sufficient to support any of the hypothesized models, but suggest that they warrant further analysis.

TABLE 2

PAIRED CORRELATION RESULTS AMONG THE MODEL CONSTRUCTS

	SES	STUDENT CHAR.	COMMUNITY FISCAL	DIVISION FISCAL	CLASS SIZE	TEACHER CHAR.	ELEM. ATTAIN.	ELEM. ACHIEVE.	MIDDLE ATTAIN.	MIDDLE ACHIEVE.	SEC ATTAIN.*	SEC ACHIEVE.*
SES	1.0	-.561	.593	.674	-.147	.154	.436	.604	.489	.698	.352	.696
STUDENT CHARACTERISTICS	-.561	1.0	-.344	-.202	.227	.000	-.508	-.801	-.558	-.725	-.454	-.660
COMMUNITY FISCAL	.593	-.344	1.0	.564	-.366	-.025	.241	.391	.194	.502	.266	.415
DIVISION FISCAL	.674	-.202	.564	1.0	-.354	.463	.117	.360	.227	.466	.145	.476
CLASS SIZE	-.147	.227	-.366	-.354	1.0	-.027	-.182	-.241	-.194	-.208	-.227	-.239
TEACHER CHARACTERISTICS	.154	.000	-.025	.463	-.027	1.0	.136	.210	.232	.170	.184	.125
ELEMENTARY ATTAINMENT	.436	-.508	.241	.117	-.182	.136	1.0	.496	.708	.391	-.481	-.319
ELEMENTARY ACHIEVEMENT	.604	-.801	.391	.360	-.241	.210	.496	1.0	.527	.782	.465	.704
MIDDLE ATTAINMENT	.489	-.558	.194	.227	-.194	.232	.708	.527	1.0	.534	.512	.465
MIDDLE ACHIEVEMENT	.698	-.725	.502	.466	-.208	.170	.391	.782	.534	1.0	.416	.758
SECONDARY ATTAINMENT*	.352	-.454	.266	.145	-.227	.184	-.481	.465	.512	.416	1.0	.479
SECONDARY ACHIEVEMENT*	.696	-.660	.415	.476	-.239	.125	-.319	.704	.465	.758	.479	1.0

*The correlation statistics reported for high school attainment and achievement are based on a slightly different data set that excludes the two divisions that do not directly provide services at the high school level.

LISREL Analysis

Linear Structural Relationships (LISREL) is a statistical method for analyzing interrelationships among complex systems of variables and constructs. The RFP specifically called for LISREL analysis, but this method did not provide statistically stable solutions for the models tested. The analysis team tested various modifications to the originally hypothesized models. However, none of these alternative models provided results that met the statistical requirements of the LISREL method. Thus, the results of this analysis are not presented.

Seemingly Unrelated Regression

Another statistical method applied to models 1 - 3 uses a system of regression models called seemingly unrelated regression. This method was applied to the 18 statistical models tested in the analysis: the three conceptual models using either the class size construct or the teacher characteristics construct at the three levels of student attainment and student achievement. The 18 models were examined for overall explanatory ability, as well as the statistical significance and explanatory ability of the individual hypothesized effects among the constructs.

The remainder of this chapter presents the results of the statistical models and the conclusions drawn from the results. The reader may find referring to the graphical models in Figure 1 helpful in reviewing the results section below.

Results from Statistical Models

Models Using Class Size to Reflect Division Educational Resources

Class Size Model 1

It is hypothesized in model 1 that student attainment and class size affect student achievement at the same stage. The overall models at each level of schooling explain 35, 37, and 32 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing moderate overall explanatory power. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student attainment
- Community fiscal resources on division fiscal resources
- Division fiscal resources on class size
- Elementary, middle, and high school student attainment on elementary, middle, and high school student achievement

- Class size on elementary and middle school student achievement

In summary, all hypothesized effects in model 1 are statistically significant at each school level, except for the effect of class size on high school student achievement, which is nearly significant ($p = .0576$).

Class Size Model 2

It is hypothesized in model 2 that class size affects student achievement indirectly through student attainment (i.e., class size → student attainment → student achievement). The overall models at each level of schooling explain 35, 36, and 32 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing moderate overall explanatory power. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student attainment
- Community fiscal resources on division fiscal resources
- Division fiscal resources on class size
- Elementary, middle, and high school student attainment on elementary, middle, and high school student achievement

In summary, all hypothesized effects in model 2 are statistically significant at each school level, except for the effect of class size on elementary, middle, and high school student attainment.

Class Size Model 3

In model 3, no student attainment effect on student achievement is hypothesized. This model was tested to examine whether the statistically significant effect of class size on student achievement found in model 1 is removed when the student attainment construct is not present in the model. The overall models at each level of schooling explain 49, 47, and 44 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing stronger overall explanatory power than models 1 or 2. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student achievement
- Community fiscal resources on division fiscal resources
- Division fiscal resources on class size

In summary, all hypothesized effects in model 3 are statistically significant at each school level, except for the

effect of class size on elementary, middle, and high school student achievement.

Models Using Teacher Characteristics to Reflect Division Educational Resources

Teacher Characteristics Model 1

It is hypothesized in model 1 that student attainment and teacher characteristics affect student achievement at the same stage. The overall models at each level of schooling explain 36, 36, and 32 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing moderate overall explanatory power. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student attainment
- Community fiscal resources on division fiscal resources
- Division fiscal resources on teacher characteristics
- Elementary, middle, and high school student attainment on elementary, middle, and high school student achievement
- Teacher characteristics on elementary and middle school student achievement

In summary, all hypothesized effects in model 1 are statistically significant at each school level, except for the effect of teacher characteristics on high school student achievement.

Teacher Characteristics Model 2

It is hypothesized in model 2 that teacher characteristics affect student achievement indirectly through student attainment. The overall models at each level of schooling explain 36, 39, and 33 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing moderate overall explanatory power. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student attainment
- Community fiscal resources on division fiscal resources
- Division fiscal resources on teacher characteristics
- Teacher characteristics on elementary, middle, and high school student attainment
- Elementary, middle, and high school student attainment on elementary, middle, and high school student achievement

In summary, all hypothesized effects in model 2 are statistically significant at each school level.

Teacher Characteristics Model 3

In model 3, no student attainment effect on student achievement is hypothesized. This model was tested to examine whether the statistically significant effect of teacher characteristics on student achievement found in model 1 is removed when the student attainment construct is not present in the model. The overall models at each level of schooling explain 52, 50, and 44 percent, respectively, of the variation in elementary, middle, and high school student achievement, providing stronger overall explanatory power than models 1 or 2. The following effects are statistically significant:

- Socioeconomic status on student characteristics
- Student characteristics on elementary, middle, and high school student achievement
- Community fiscal resources on division fiscal resources
- Division fiscal resources on teacher characteristics
- Teacher characteristics on elementary, middle, and high school student achievement

In summary, all hypothesized effects in model 3 are statistically significant at each school level.

CONCLUSIONS

Conclusions for Class Size Models 1 - 3

It is hypothesized in model 1 that only student characteristics affect student attainment, with both student attainment and class size then affecting student achievement. The effects hypothesized in the upper part of the model are statistically significant at each school level. The effects hypothesized in the lower part of model 1 are statistically significant at the elementary and middle school levels. However, the effect of class size on high school student achievement is not statistically significant, although the effect is nearly significant.

It is hypothesized in model 2 that both student characteristics and class size affect student attainment, with student attainment then affecting student achievement. The effects hypothesized in the upper part of the model are statistically significant at each school level. Unlike model 1, the hypothesized effect involving class size in the lower part of model 2 is not statistically significant any school level.

In model 3, the student attainment construct is removed. Model 3 explains more variation in student achievement at the three

school levels than models 1 or 2. The effects hypothesized in the upper part of model 3 are statistically significant at each school level. However, the effect of class size on student achievement is not statistically significant at any school level; thus, model 3 lends support to model 1 by showing that the effect of class size on student achievement is removed when the student attainment construct is not present in the model.

The results from class size models 1 - 3 suggest that the system of hypothesized effects in model 1 is the best representation of factors affecting student achievement. The results of models 2 and 3 lend little support to conclusions that class size has a statistically significant effect on student attainment or student achievement. Only in model 1 is the effect of class size on student achievement significant at the elementary and middle school levels, and nearly significant at the high school level. The results of model 2 suggest that class size does not affect intermediate outcomes of the schooling process (student attainment) which then affect later outcomes of the schooling process (student achievement). The insignificant effects of class size on student attainment in model 2 may indicate that the variables representing the student attainment construct (e.g., over age, attendance, drop outs, etc.) are influenced by social factors at a level where they are difficult to affect with educational resources such as smaller class size. The lack of significance between class size and student achievement in model 3 suggests that student attainment is an important factor in the educational process.

Conclusions for Teacher Characteristics Models 1 - 3

It is hypothesized in model 1 that only student characteristics affect student attainment, with both student attainment and teacher characteristics then affecting student achievement. The effects hypothesized in the upper part of the model are statistically significant at each school level. The effects hypothesized in the lower part of model 1 are statistically significant at the elementary and middle school levels. However, the effect of teacher characteristics on high school student achievement is not statistically significant.

It is hypothesized in model 2 that both student characteristics and teacher characteristics affect student attainment, with student attainment then affecting student achievement. The effects hypothesized in this model are statistically significant at each school level.

In model 3, the student attainment construct is removed. Model 3 explains more variation in student achievement at the three school levels than models 1 or 2. The effects hypothesized in model 3 are statistically significant at each school level.

The results from all three teacher characteristics models indicate that the teacher characteristics construct is related to student attainment or student achievement regardless of which system of hypothesized effects is tested. As with class size, model 1 using teacher characteristics produces statistically significant results at the elementary and middle school levels. The results of model 2 suggest that teacher characteristics do affect intermediate outcomes of the schooling process (student attainment), which then affect later outcomes of the schooling process (student achievement). Unlike class size model 3, the presence of the student attainment construct is not necessary for the teacher characteristics construct to have a statistically significant effect on student achievement.

Conclusions of Overall Analysis

The results from the correlation analysis and models 1 - 3 suggest three main conclusions related to the questions asked on page 7. The first is that factors such as socioeconomic status and student background are related to student attainment and student achievement at the elementary, middle, and high school levels. These relationships were consistently found both in the correlation statistics and in all of the models tested. This finding confirms those of many other studies using socioeconomic status as a control variable in the analysis of student outcomes. The demonstrated relationships between socioeconomic status/student background and student attainment/student achievement have important implications for educators since socioeconomic status and student background are factors typically beyond their immediate control.

The second conclusion is that educational resources in the form of class size and teacher characteristics do not have consistently significant effects on student attainment and student achievement across models 1 - 3. This conclusion is similar to those of other studies examining the effect of educational resources on student outcomes. The project findings indicate that the teacher characteristics construct has a statistically significant effect on student attainment or student achievement regardless of the model hypothesized, while the significance of the class size effect on student attainment or student achievement is dependent on the model hypothesized.

The third conclusion flows directly from the second conclusion. The model that best represents the educational process appears to be model 1. Except at the high school level, model 1 produced statistically significant results regardless of whether the class size or teacher characteristics construct was used. The statistical significance of models 2 and 3 depended on whether the class size or teacher characteristics construct was used.

The project findings, regarding which model best reflects the educational process and whether class size or teacher

characteristics have any effect on student attainment or student achievement, raise as many questions as they answer. Are the findings evidence that model 1 best reflects the educational process at the elementary and middle school levels, since class size and teacher characteristics are statistically significant factors on student achievement at the elementary and middle school levels (i.e., 2 of the 3 school levels analyzed)? Are the insignificant effects of class size on student attainment found in model 2 and class size on student achievement in model 3 indications that class size is one educational resource that does not consistently affect student outcomes in the form of student attainment and student achievement? Are the significant effects of teacher characteristics in all models an indication that teacher characteristics consistently affect student outcomes at the elementary, middle, and high school levels? Or are the inconsistent findings simply a product of the amount or quality of data available at the three school levels analyzed?

Stemming from these questions, the team would like to stress some limitations of the project analysis in areas such as data availability and quality. Particular attention is paid to the concept of educational resources and how well the questions we have analyzed reflect current concepts of the educational process.

Analytical Limitations

The data base used in the project analysis included relatively few types of variables measuring the concept of educational resources, although this was one of the factors of most theoretical interest to the analysis team. Two constructs representing the concept of educational resources, class size and teacher characteristics, were tested in the models. Yet, few measures of class size and teacher characteristics were available to the team. As a result, highly valid measures of these constructs as they relate to student attainment or student achievement may not have been derived, although several significant relationships were found in the analysis of the models.

For example, are the available measures of class size such as instructional positions per 1000 students and teacher characteristics such as teachers with advanced degrees valid indicators of classroom teaching practices and behavior that affect student attainment or student achievement, or are they just indicators of resource availability? Further, the class size measures represented allocations of instructional staff across the general student population. Would a class size measure that reflects staff allocations to difficult to educate student populations show more consistent relationships to student attainment and student achievement in models 1 - 3?

In addition, all of the data analyzed are division level measures, yet the delivery of educational resources and the

characteristics and interaction of teachers and students varies by school as well by division. Are the division level variables analyzed just too far removed from the dynamics of the school building? Also, data were not available at each of the three school levels for all of the variables comprising the class size and teacher characteristics constructs. If these measures of educational resources were measured separately for each school level, would they show more consistent relationships to corresponding measures of student attainment and student achievement?

The effective schools research and approaches such as the World Class Education initiative pose that the real unit of change and effect is the school, the level at which educational resources -- such as class size and teacher characteristics -- can best be applied and manipulated. Thus, the analysis team feels that the optimal level for examining student attainment and student achievement is the school, with data available that measures the types and levels of services provided to students, teacher instructional techniques and behaviors, and the manner in which instructional materials are used. Analysis of such school level information would perhaps provide a better picture of the effect of educational resources in the face of differing community and student characteristics. Future study of factors affecting student attainment and student achievement should include school level analysis, emphasizing the increased availability of school level socioeconomic, fiscal, and educational resource data. However, the cost implications of such school level data collection should be carefully considered.

CHAPTER 4

RECOMMENDATIONS

The project findings indicate inconsistent relationships between educational resources -- as represented by class size and teacher characteristics -- and student attainment or student achievement. These findings should not be viewed as definitive evidence of the relationships or, lack thereof, that exist in the educational process. The team feels that the findings do not support any recommendations regarding changes in educational resource allocations. Most of the recommendations that follow propose steps for future data collection and analysis that may address some of the analytical limitations raised above.

1. Continue the annual analysis of the OAP outcome data by making data analysis a regular component of the OAP Project RFP. Future analysis of OAP data should include the school level indicators available following the May 1992 reporting cycle. School level analysis may allow variation that is masked in division level analysis to be examined and allow use of findings at the point of educational service delivery and change.

2. Explore collecting at the school level educational resource data (for example: teacher salary, pupil teacher ratio, etc.) currently reported to the Department of Education only at the division level. Collect, at least biennially, school level contextual information such as parental education level and student mobility. This contextual information would be collected at the same level as the OAP school level indicators, allowing analysis of the effects of such variables at the point of service delivery.

3. Disseminate the executive summary of this report and the report on the "high priority outcomes" survey to the Regional Representatives for use in the field.

CHAPTER 5

PROJECT EVALUATION

The Division Factors Project evaluation addresses the following areas: project timelines, products and deliverables, applicability/dissemination of methodology and findings to other settings, and project resources. Specific short- and long-term qualitative evaluation criteria contained in the workplan (see Appendix A) are used to assess these areas and are discussed below. Information demonstrating that these criteria were met is based largely on self-report perceptions of members of the full project team or of members of the analysis sub-team.

SHORT-TERM CRITERIA

A. Was the literature review exhaustive and did it stimulate the development of the project?

The literature review involved a comprehensive, computerized ERIC search of articles on student outcomes research. A manual library search of such articles was also conducted at Virginia Commonwealth University. The final annotated bibliography (see Appendix B) includes over 500 annotated book and article citations on factors affecting student outcomes and analytical methods used in such analysis. The analysis team felt that the literature review expedited the identification of statistical methods used in student outcomes research, variables shown to be related to student outcomes, and theoretical relationships in models of factors affecting student outcomes.

B. Did the annotated data catalog assist team members in their use of the data?

The analysis team felt that the annotated data catalog (see Appendix C) was most helpful during the data development stage in that it served as an organizational "check list." In this way, the analysis team was able to "check off" variables that had been identified from the literature review as they were included into the proper data files on the computers. The analysis team also found the catalog to be a helpful organizational tool during the development of the constructs. The catalog provided a ready list of variables to represent a given construct and allowed the analysis team to better keep track of which variables were analyzed during the iterative analysis process.

C. Was the software and hardware included in the project sufficient to meet the research needs?

The analysis team felt that the project software and hardware resources were generally adequate to carry out the research activities of the project; however, there were procurement delays early in the project in obtaining necessary software and hardware resources. Also, analysis team members encountered technical problems on the personal computers in the analysis stages of the project, resulting in some additional delays.

D. How realistic were the projected time-lines related to the actual time expended to complete the project?

The project team felt that initial project time-lines (see project workplan in Appendix A) were unrealistic compared to the actual time required to complete the project. This occurred, in part, due to: delays in obtaining necessary software and hardware resources; the volume of secondary data required to be located, collected, input into data files, and cleaned and verified by team members; and the start-up time and learning curves associated with using new analytical methods and software. In addition, extensive time commitments of some team members to OAP resulted in delays in project completion.

E. Did the statistical iterations yield a statistically sound and intuitively reasonable set of correlates of successful factors?

The final models (i.e., models 1 - 3 discussed in Chapter 3 of the report) yielded inconsistent results on factors affecting student attainment and student achievement in terms of statistical significance; this result is consistent with many past studies. Although inconsistencies exist in the significance of the results, the models were theoretically and statistically sound. This judgement is based on computer program statistical diagnostics, theoretical relationships found in the literature, and consultant review.

F. Did the dissemination materials meet the needs of the intended audiences?

Prior to dissemination stage; this criterion is not applicable at this time.

G. Was the feedback on the "high priority" outcomes valuable?

The analysis team felt that the pattern of responses from the survey (see Appendix E), with indicators addressing both high and low student attainment and student achievement identified, provided information that was moderately useful for targeting

a smaller set of indicators to be analyzed. Nine of the 13 indicators most frequently identified as "high priority" on the survey were included in the project analysis. However, the primary means for targeting indicators for further analysis was through the literature review and statistical analysis that identified indicators representing concepts of student attainment and student achievement. The team feels that the survey results may also assist in the assessment and further development of OAP indicators, as well as provide information to the Common Core project team and technical assistance providers in the Department.

H. Was the list of divisions exceeding expectations accepted as statistically sound and intuitively reasonable?

Not applicable. This list was not produced as a project deliverable due to the lack of consistent models in which to generate such reliable and valid information.

I. Did the data base serve the needs of the project?

The analysis team and external consultants felt that the data base (see Appendix C) provided a source of division level data sufficient to represent the various factors cited in the literature as related to student outcomes. Approximately 140 variables representing socioeconomic status, community fiscal resources, student characteristics, division fiscal and educational resources, and student attainment and student achievement are contained in the data base, available to Department users.

LONG-TERM CRITERIA

A. Was the work of the project transferrable to other initiatives in the Department?

The analysis team feels that the project findings on factors affecting student attainment and student achievement at the elementary, middle, and high school levels have potential application in such areas as the World Class Education initiative, provision of technical assistance, strategic planning, and the development of OAP criteria. However, this use should be informational only pending the results of replication studies, particularly those using school level data. The analysis team views the technical expertise gained in using the analytical methods of this project as being replicable in future departmental projects. The analysis team also feels that the project bibliography, data catalog, and high priority outcomes survey results contained in the report appendix are usable by a large cross-section of Department staff.

B. To what extent were the products of the project generalizable to the division level in promoting and transferring successful practices?

The analysis team feels that the project findings on factors affecting student achievement may be exportable at the division level in terms of raising awareness and understanding of research in this area, short of recommending changes in practice. The analysis team believes the findings should be described as preliminary and as requiring additional analysis, particularly at the school level. School divisions should be informed that this project represents the beginning of an on-going research effort of the Department in this area. The analysis team believes that the project methodology, annotated bibliography, data base, and high priority outcomes survey results (see Appendices B, C, and E) would be more helpful to those divisions actively examining factors affecting student achievement in their division.

C. To what extent was the work of the project applicable to the school level analysis of the data?

The analysis team views the theoretical models developed and the various analytical methods learned as directly applicable to future analysis of school level OAP outcome data. The analysis team also feels that the project bibliography and high priority outcomes survey results will facilitate future analysis of school level OAP data, available for the first time in May 1992.

D. Did these initial research activities facilitate research activities using school level data?

The project team acknowledges that the Division Factors Project contained inherent learning curves consistent with any research and development process. However, the analysis team feels that the analytical methods learned can be applied to future school level analysis, reducing project start-up and learning curve time.

REFERENCES

Berry, W. D. (1984). Nonrecursive causal models. Beverly Hills, CA: Sage Publications.

Dillon, W. R., & Goldstein, M. (1984). Multivariate analysis: Methods and applications. New York: John Wiley & Sons.

Joreskog, K. G., & Sorbom, D. (1989). LISREL 7 user's reference guide. Mooresville, IN: Scientific Software, Inc.

SAS Institute, Inc. (1988). SAS/ETS user's guide, version 6.03, first edition. Cary, NC: SAS Institute, Inc.

SAS Institute, Inc. (1988). SAS/STAT user's guide, version 6.03, first edition. Cary, NC: SAS Institute, Inc.

Wolfle, L. M. (1982). Causal models with unmeasured variables: An introduction of LISREL. Multiple Linear Regression Viewpoints, 11(2), 9-54.

APPENDIX A

RFP #91-34 & PROJECT TEAM RESPONSE/WORKPLAN

TITLE: FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE

BACKGROUND: Should the state fund more classroom teachers or higher teachers' salaries? Does expenditure per pupil relate to student outcomes? How much do our school divisions do to overcome the effects of economically and educationally disadvantaged pupils? Which divisions are registering outcomes higher than expected and may provide models of successful practice?

The division outcome indicators recently collected through the EPR pilot project provide a cornucopia of data. To understand and use the data, it must be analyzed using multivariate regression and LISREL techniques. Then exceptionally high performers can be detected and through more intensive on-site observation, effective practices at the division level identified.

STATEMENT OF NEED/PROBLEM:

Understanding the programs and initiatives at the division level that are causing higher student outcomes requires a sophisticated analysis of the relationships between student characteristics, teacher characteristics, division inputs, and division process variables. The analysis could contribute to state and division initiatives, both programmatic and budgetary, to improve the delivery of essential educational services.

SPECIFIC OBJECTIVE:

Analyze the student outcome data using the EPR pilot data and existing data on school divisions;

Produce and disseminate materials on correlates of successful student performance;

Identify school divisions performing above expectations with respect to high priority outcomes.

REQUIRED DELIVERABLES/PRODUCTS:

A report and other dissemination materials by September 15, 1991.

RESPONSES ARE DUE TO DEBBIE ELLISON ON 5/2/91

AWARD WILL BE MADE ON 5/ 6 /91

INFORMATION SYSTEMS RESPONSE
TO
RFP #91-34: Factors Affecting School Division Performance

SUMMARY OF APPROACH PROPOSED:

The Information Systems' response team for RFP #91-34 heartily welcomes the opportunity to delve into the *cornucopia* of data generated by the Outcome Indicator Project(OIP) pilot project. We see this opportunity as the real crux of the project. It is not enough to simply display the data. Using the data to explore successful practices, identify factors related to student performance, identify areas of need and establishing a foundation for promoting increased student achievement approach the raison d'etre for the entire accountability process.

The Information Systems' approach is straightforward. We first want to review the data collected through the OIP. This will allow the team to become familiar with the data, catalog any data limitations and proceed appropriately in their use. We also propose linking the response to RFP #91-34 to the Fiscal Equity RFP(#91-23). The database to be developed under the fiscal equity project will serve as one of the databases for our response. In doing so we will review the annotated data catalog of the fiscal data elements and seek any updates to the data warranted.

A large amount of work was done in the early years of the OIP to explore the literature on school effectiveness. The team proposes to review that bibliography and expand it. The bibliography would become a deliverable of this RFP. This review will also cover non-school factors.

The RFP calls for the response to "Identify school divisions performing above expectations with respect to high priority outcomes." The team suspects that there is a degree of variance among stakeholder groups as to what they consider high priority outcomes of the education process. The research will be limited to the variables in the data collection cornucopia. However, the team proposes to conduct limited activity to assess the perceptions of the degree of priority held by Department and LEAs related to the OIP indicators. This would give the project team a barometer of the "high priority outcomes" as well as be a source of feedback for any revisions to the OIP.

All of these activities lead to the development of a plan to statistically establish the linkages between the outcomes and the other variables. A variety of statistical techniques will be used to establish the correlates. These will include multivariate regression and LISREL techniques as well as any

others the team feels appropriate. The objective in the use of the statistical techniques will be to determine which provide the most information in establishing the relationships between the variables.

A deliverable of the project will be the documentation of the techniques employed and the resultant correlates isolated. The team hopes that this documentation will serve as a starting point for the eventual manipulation of school level data. The team firmly feels that the better level of analysis is that of the school. Division level analysis serves a purpose in establishing gross level relationships. Variations between schools is masked when using division level averages. However, the real changes in educational practice occur at the building and the classroom level. The closer analysis moves to the classroom, the higher the probability that truly effective practices will be isolated. The school level analysis also offers the most promise in isolating practices and their environmental parameters which will aid in the export and replication activities. One would then know not only the successful practice but the type of school, type of students, and instructional environment in which the practice was successful.

As the data on the school level become available, these models will need to be revised and adapted to this level of disaggregation. At this point the impact of the research reaches a peak in its potential to identify and impact successful practices leading to increased student achievement.

This RFP offers the Department an opportunity to disseminate not only the research on factors affecting student success but an opportunity to disseminate research techniques. The Information Systems' proposal offers a seminar on the use of the statistical techniques employed in the research as a deliverable. This will serve to broaden the level of knowledge within the Department with respect to statistical techniques and their applications.

IMPLEMENTATION PLAN/METHODOLOGY:

RFP #91-34 calls for the development of a process to identify factors affecting school division performance. The data available for the project primarily come from the OIP collection effort and the fiscal equity analysis. Few states have the luxury of such a data rich environment. By the same token there are few areas that researches can draw upon for determining the factors affecting division performance. This will literally be new territory. The RFP response has been left somewhat vague. Every opportunity will be explored to use different techniques, test individual variables or clusters of variables and be creative in the search for a sound, acceptable, valid process for establishing the correlates of successful student performance. In leaving this level of latitude to the team, the implementation plan outlines the gross level procedural steps that will be followed.

By having documentation of the process as a deliverable, replication possibilities will exist. There will also be a record of the efforts of the team that did not "pan out". While these would not comprise the final utilized process, the benefit of the trial and error process will be available to other researchers as the search for further correlates continues.

The outline of the proposed methodology is as follows:

A. Review the OIP background literature and augment that with more recent readings and information. This will be organized into a formal deliverable.
B. The existing OIP data elements will be reviewed and annotated as to their utility and data collection "quirks". Again, this would be a deliverable.
C. The input variables available within the Department and external sources will be reviewed and similarly catalogued. If these can be updated with more recent information and such is advisable, it will be done.
D. The Fiscal Equity database developed under another RFP will be utilized as the source for those data elements.
E. A small sample of Department and LEA stakeholders will be convened to ascertain their perception of the "high priority outcomes". This information will be incorporated into the analysis of the data.
F. Various statistical techniques will be employed to determine the correlates of successful student performance. This will require iterative testing of various indicators or clusters of indicators. All steps in the process will be documented and prepared as a deliverable.
G. A final product will be produced displaying the correlates of successful student performance as derived through the statistical procedures. This final product will take the form of a full report outlining data tested, statistical methodology and results. A second, more compact product, will abstract the full work and be prepared for general dissemination.
H. For Departmental purposes a listing of school divisions performing above expectations as established in F above will be compiled. This report and documentation materials will be submitted to the Management Group by September 15, 1991.
I. A seminar will be offered within the Department discussing statistical techniques used in the analysis.

DELIVERABLES:

#	DELIVERABLE	BEYOND REQUIREMENTS?
1.	Literature review	YES
2.	Compendium of OIP data elements	YES
3.	Annotated catalog of data used in the model	YES
4.	Validation of perceived "high priority outcomes"	YES
5.	Statistical model	NO
6.	Recommendations for refinement for use with school level data	YES
7.	Two stage dissemination materials	NO
8.	Seminar on statistical techniques	YES

TIMELINES:

Task	Date
1. Literature review completed	6/16/91
2. OIP and Fiscal Equity Database completed	7/15/91
3. Software purchased	7/15/91
4. Convene stakeholder groups to identify "high priority outcomes"	7/15/91
5. Complete annotated catalog of data	9/1/91
6. Statistical iterations completed and model developed	9/1/91
7. Dissemination reports and division listing	9/15/91
8. Recommendations regarding school level data utilization	9/15/91
9. Seminar on statistical techniques	9/15/91

BUDGET:

ITEM	COST	HOURS ESTIMATION	STAFF
1. Literature Review printing	$ 50.00	20	Sharon Bryant Kent Dickey
2. Database development		60 total	Virginia Hettinger Kent Dickey Fitz Fitzgerald Dan Keeling
3. Data element catalog	$ 50.00	30 total	Kent Dickey Emmett Ridley Virginia Hettinger
4. Software procurement	$1,500.00	20 total	Virginia Hettinger Kent Dickey David Mott
5. Microcomputer hardware upgrades to accommodate software	@$5,000.00		
6. Iteration of statistical procedures and development of final model		160 total	Virginia Hettinger Kent Dickey
7. Final Report	$ 50.00	80 total	Virginia Hettinger Kent Dickey Emmett Ridley David Mott Sharon Bryant Dan Keeling
8. University consultation related to statistical procedures	$2,000		

Budget Note: This budget includes items to establish two microcomputer stations equipped to handle small to medium databases. Presently equipment exists that potentially meets the requirements for such stations. They are not currently assigned in a manner available to the project. It is possible that these costs could be reduced through re-allocation of equipment. The team will explore this option together with the LAN team. If cost savings can be accrued, such will be done.

STAKEHOLDERS AND INTENDED AUDIENCES

The stakeholder group for this RFP is closely aligned with that of RFP #91-23 on Fiscal Equity. However, the implications of this RFP for identifying "best practices" expands the #91-23 group to include more impact at the local level. Among the primary stakeholders are:

A. Policy and Planning staff
B. Legislative staffs
C. LEA personnel
D. Special interest groups
E. Secretary of Education
F. Board of Education
G. Other states pursuing outcome indicator models
H. Pre-service education providers

EVALUATION ACTIVITIES:

The evaluation activities for this project are both short and long term. Specific evaluation activities will be developed by the team to address them as noted below:

SHORT TERM

A. Was the literature review exhaustive and did it stimulate the development of the project?
B. Did the annotated data catalog assist the researchers in their use of the data?
C. Was the software and hardware included in the project sufficient to meet the research needs?
D. How realistic were the projected timelines related to the actual time expended to complete the project?
E. Did the statistical iterations yield an statistically sound and intuitively reasonable set of correlates of successful factors?
F. Did the dissemination materials meet the needs of the intended audiences?
G. Was the feedback on the "high priority outcomes" valuable?
H. Was the list of divisions exceeding expectations accepted as statistically sound and intuitively reasonable?
I. Did the database serve the needs of the project?

LONG TERM

A. Was the work of the project transferrable to other initiatives in the Department?

B. To what extent were the products of the project generalizable to the division level in promoting and transferring successful practices?
C. To what extent was the work of the project applicable to the school level analysis of the data?
D. Did these initial research activities facilitate research activities using school level data?

Editorial Footnote: Members of the team appreciated the phrasing "cornucopia of data". It afforded us an opportunity to review our Latin skills, most of which were truly rusty. Our concern was whether cornucopia was singular or plural. With the vast amount of data available to this project we wanted to emphasize the concept that there was more than one cornucopia of data— the fiscal cornucopia, the OIP cornucopia, etc. The team could not, in the limited time available, confirm the singular and plural of the term. We did determine:

A. Cornucopia translated is horn of plenty
B. The term we suggest is *horns* of plenty- the bring proper emphasis to the plethora of data available
C. The plural of horn, horns, in Latin is cornua.
D. There is no team consensus as to the appropriate pluralization of the word given the above facts.

We wish to express our appreciation to the Management Group for allowing us this exercise in intellectual expansion. In return, we offer an additional deliverable: a full statement as to the pluralization of cornucopia. We will use E.D. Hirsch, author of Cultural Literacy, as a consultant. I'm sure we should all know this but suffer from a modicum of cultural illiteracy. Again, we thank you for this added dimension.

APPENDIX B

FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE PROJECT

ANNOTATED BIBLIOGRAPHY

(NOTE: Copies of the annotated bibliography are available from Kent Dickey (5-2807) or the DOE Professional Library, 18th floor, for short-term reference or reproduction.)

APPENDIX C

FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE

DATA BASE CATALOG

(NOTE: project data base is available in whole or part from Kent Dickey (5-2807) or Virginia Hettinger (5-2685).
Data is available in LOTUS 1-2-3 or ASCII format.)

FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE PROJECT (RFP #91-34)

APPENDIX C: ANNOTATED DATA BASE CATALOG

Variable Categories:

I. Socioeconomic Status (by VA locality):

1. Income Variables
2. Population Variables
3. Occupation/Education Variables
4. Poverty Variables
5. Household Size/Value Variables

II. Community Fiscal Resources Variables (by VA locality)

III. Student Characteri ics Variables (by VA school division)

IV. School Division Fiscal Resources Variables

V. School Division Educational Resources Variables

VI. Elementary, Middle, and High School Student Attainment Variables (1989-90 School Year; by VA school division)

VII. Elementary, Middle, and High School Student Achievement Variables (1989-90 School Year; by VA school division)

VIII. Miscellaneous Denominator Data (by VA locality)

FACTORS AFFECTING SCHOOL DIVISION PERFORMANCE PROJECT (RFP #91-34)

ANNOTATED DATA BASE CATALOG

I. Socioeconomic Status

1. Income Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Projected Median Family Income 1990	MDFMINCM	*1990 U. S. Census
Projected Median Household Income 1990	MDHOUINC	*1990 U. S. Census
Per Capita Personal Income 1989	PERCPINC	*1990 U. S. Census
% Growth in Per Capita Personal Income 1980-89	PCAPINCG	*1990 U. S. Census
Median Adjusted Gross Income (Married Couple Returns) 1989	MDAGIMAR	*VA Department of Taxation
Median Adjusted Gross Income (All Returns) 1989	MDAGIALL	*VA Department of Taxation
Median Adjusted Gross Income (Individual Returns) 1989	MDAGIIND	*VA Department of Taxation
Resident Income Subindex Score 1987-88	INCSUBIN	*VA Commission on Local Government
Average Wage Per Job 1989	AVGJWAGE	*1990 U. S. Census
Average Annual Wage Growth 1980-89	WAGEGROW	*1990 U. S. Census
1989 Wage Index (VA=100)	WAGEINDX	*1990 U. S. Census

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

2. Population Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Total Persons 1990	POP90	*1990 U. S. Census
Total Population Rank 1990	POPRANK	*1990 U. S. Census
% Change in Total Population 1980 to 1990	POPCHNG	*1990 U. S. Census
% Minority Population 1990	MINORPOP	*1990 U. S. Census
Population per Square Mile 1990	POPDENS	*1990 U. S. Census (pop. data) & Center for Public Service, UVA (sq. mileage data)
Net Population Migration % 1980-88	NETMIGRA	*1990 U. S. Census
% of Population Speaking English as a Second Language 1980	ESLPOP	1980 U. S. Census

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

3. Occupation/Education Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% High School Graduates 1980 (persons 25 years old and over)	HSGRADS	1980 U. S. Census
% Persons Completing 4 or more Years of College 1980 (persons 25 years old and over)	COLLGRAD	1980 U. S. Census
Median Years of School Completed 1980 (persons 25 years old and over)	MDYRSSCH	1980 U. S. Census
% Professional/Managerial Employees 1980	PROFMANG	1980 U. S. Census

4. Poverty Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% Persons below Federal Poverty Level 1980	POVLEVPS	1980 U. S. Census
% Families below Federal Poverty Level 1980	POVLEVFM	1980 U. S. Census
Teen Pregnancies per 1,000 Females 1989	TEENPREG	VA Department of Health
Average % of Monthly Population Receiving AFDC FY 1990	ADFCRECP	VA Department of Social Services
Average Annual Unemployment Rate 1990	UNEMPLOY	*VA Employment Commission
% Female-Headed Family Households 1990	FEMHOUSE	*1990 U. S. Census
% Two-Parent Family Households 1990	TWOPARNT	*1990 U. S. Census
% Two-Parent Minority Family Households 1990	TWPARMHH	*1990 U. S. Census
% Minority Female-Headed Family Households 1990	FEMHMIHH	*1990 U. S. Census

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

5. Household Size/Value Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% Multifamily Housing Units 1990	MULTFMHU	*1990 U. S. Census
% Occupied Housing Units 1990	OCCPHOUS	*1990 U. S. Census
% Vacant Housing Units 1990	VACNTHOU	*1990 U. S. Census
% Owner-Occupied Housing Units 1990	OWNOCCHU	*1990 U. S. Census
% Minority Owner-Occupied Housing Units 1990	MINOOCHU	*1990 U. S. Census
% Renter-Occupied Housing Units 1990	RENTOCHU	*1990 U. S. Census
% Housing Units with 9 or more Rooms	HOUSUG9R	*1990 U. S. Census
% Housing Unit Rooms Occupied (owned or rented) 1990	HOUSUROC	*1990 U. S. Census
% Housing Unit Rooms Owner-Occupied 1990	HOUSUROO	*1990 U. S. Census
Persons per Occupied Housing Unit (owned or rented) 1990	PERPOCHU	*1990 U. S. Census
Persons per Owner-Occupied Housing Units 1990	PERPOOHU	*1990 U. S. Census
Persons per Renter-Occupied Housing Units 1990	PERPROHU	*1990 U. S. Census

***Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia**

5. Household Size/Value Variables (continued):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Average Population per Household 1990	POPPHOUS	*1990 U. S. Census
Persons per Family 1990	PERSPFAM	*1990 U. S. Census
% Occupied Housing Units with 1.01 or More Persons per Room 1990	OCHUG1PR	*1990 U. S. Census
% Owner-Occupied Housing Units Value Greater than $150,000 1990	OCHUG150	*1990 U. S. Census
Lower Quartile Value Owner-Occupied Housing Units 1990	OOCHULQV	*1990 U. S. Census
Median Value Owner-Occupied Housing Units 1990	OOCCHUMV	*1990 U. S. Census
Upper Quartile Owner-Occupied Housing Units 1990	OOCHUUQV	*1990 U. S. Census
Mean Minority Owner-Occupied Housing Unit Value	MMIOOHUV	*1990 U. S. Census
% Rental Housing Units with Monthly Rent of $500 or more 1990	RENTG500	*1990 U. S. Census
Lower Quartile Monthly Rent 1990	LQMORENT	*1990 U. S. Census
Median Monthly Rent 1990	MEDMRENT	*1990 U. S. Census
Upper Quartile Monthly Rent 1990	UPQMRENT	*1990 U. S. Census

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

II. Community Fiscal Resources Variables (by VA locality):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Median Adjusted Gross Income (Married Couple Returns) 1989	MDAGIMAR	*VA Department of Taxation
Median Adjusted Gross Income (All Returns) 1989	MDAGIALL	*VA Department of Taxation
Median Adjusted Gross Income (Individual Returns) 1989	MDAGIIND	*VA Department of Taxation
True Value Per Capita of Locally Taxed Property 1989	TVPCLTP	*VA Department of Taxation
Revenue Capacity Fiscal Stress Index 1988-89	FISXSTRS	*VA Commission on Local Government
Revenue Capacity Per Capita 1988-89	REVCAPPC	*VA Commission on Local Government
Revenue Effort 1988-89	REVEFF	*VA Commission on Local Government
Total Taxable Sales 1990	TAXSALES	*VA Department of Taxation
Locality % of Total State Taxable Sales 1990	PTAXSALE	*VA Department of Taxation
Per Capita Taxable Sales 1990	TAXSALPC	*VA Department of Taxation
Per Capita Taxable Sales Rank 1990	TAXRNKPC	*VA Department of Taxation
Taxable Sales Indices 1990 (1980 Index=100)	TAXSALIN	*VA Department of Taxation
1989-90 Composite Index	COMPIND	DOE IS

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

DIVISION FACTORS ANNOTATED DATA CATALOG

III. Student Characteristics Variables (by VA school division):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
March 31 Average Daily Membership (ADM) 1985	ADM85	DOE IS
March 31 ADM 1986	ADM86	DOE IS
March 31 ADM 1987	ADM87	DOE IS
March 31 ADM 1988	ADM88	DOE IS
March 31 ADM 1989	ADM89	DOE IS
March 31 ADM 1990	ADM90	DOE IS
% Change in March 31 ADM 1985-1990	CHNGADM	DOE IS
1989 School Census	SCLCEN89	DOE IS
1989 Adjusted School Census	ASCLCN89	DOE IS
% Public School Enrollment 1989-90	PPUBLIC	DOE IS
% Limited English Proficiency (LEP) or English as a Second Language (ESL) Students 1989-90	PLEPESL	Foreign Language Staff, DOE Student Services Divisions (LEP/ESL student counts); DOE IS (ADM)
% Gifted Students 1989-90	PGIFTED	Gifted Staff, DOE Student Services Divisions (gifted student counts); DOE IS (ADM)

III. Student Characteristics Variables (continued):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% Students Eligible for Chapter I Program 1989-90	PCHI	Chp. I Staff, DOE Program Support Div. (Chp. I student counts); DOE IS (ADM)
% Remedial Funded Students 1989-90	PREMED	Fiscal Analyst, DOE Policy & Planning Div.
% Students with Approved Applications for Free or Reduced Lunch 1989-90	PFREELUN	School Food Staff, DOE Administrative Support Division
% Special Education Students 1989-90	PSPED	DOE IS
% High School Enrollment (grades 8-12) 1989-90	PERHS	DOE IS
% of 1st Grade Test Takers Scoring in Lower Quartile on CogAT Verbal Section, Fall 1989	VLESSP	DOE Division of Assessment & Testing (A & T)
% of 1st Grade Test Takers Scoring in Lower Quartile on CogAT Non-Quantitative Section, Fall 1989	NLESSP	DOE A & T
% of 1st Grade Test Takers Scoring in Lower Quartile on CogAT Quantitative Section, Fall 1989	QLESSP	DOE A & T
% of 1st Grade Test Takers Scoring in Lower Quartile on one or more of 3 CogAT Sections, Fall 1989	ALESSP	DOE A & T

III. Student Characteristics Variables (continued):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Mean of %'s of 1st Grade Test Takers Scoring in Lower Quartile on 3 CogAT Sections, Fall 1989	MLESSP	DOE A & T
Mean Scaled Score on CogAT Verbal Section, Fall 1989	MUSSV	DOE A & T
Mean Scaled Score on CogAT Non-Quantitative Section, Fall 1989	MUSSN	DOE A & T
Mean Scaled Score on CogAT Quantitative Section, Fall 1989	MUSSQ	DOE A & T
Mean of Scaled Scores on 3 CogAT Sections, Fall 1989	VQNSS	DOE A & T

DIVISION FACTORS ANNOTATED DATA CATALOG

IV. School Division Fiscal Resources Variables:

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Per Pupil Expenditures (Regular Day) 1989-90	REGDAYPP	DOE Information Systems Division (IS)
Per Pupil Expenditures (Instruction) 1989-90	INSTRPP	DOE IS
Per Pupil Expenditures (Total Operations) 1989-90	OPERPP	DOE IS
Total Receipts and Balances 1989-90	RECPTPP	DOE IS
Per Pupil Disbursements 1989-90	DISBURPP	DOE IS
% Over Total Required Expenditures 1989-90	OVERTOT	DOE Administrative Support Division, Finance Office
% Over Total Required Expenditures at 90% 1989-90	OVETOT90	DOE Administrative Support Division, Finance Office
% Over Local Required Expenditures 1989-90	OVERLOC	DOE Administrative Support Division, Finance Office
% Over Local Required Expenditures at 90% 1989-90	OVELOC90	DOE Administrative Support Division, Finance Office

V. School Division Educational Resources Variables:

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
Average Elementary Teacher Salary 1989-90	ELTCHSAL	DOE IS
Average Secondary Teacher Salary 1989-90	SCTCHSAL	DOE IS
Average Teacher Salary K-12 1989-90	TCHSAL	DOE IS
Average Instructional Personnel Salary K-12 1989-90	INSTSAL	DOE IS
Average Elementary Instructional Personnel Salary 1989-90	ELINSSAL	DOE IS
Average Secondary Instructional Personnel Salary 1989-90	SCINSSAL	DOE IS
Pupil/Teacher Ratio K-12 1989-90	TCHRTK12	DOE IS
Pupil/Teacher Ratio K-7 1989-90	TCHRTK7	DOE IS
Pupil/Teacher Ratio 8-12 1989-90	TCHRT812	DOE IS
Pupil Instructor Ratio K-6 1989-90	INSRATK6	DOE IS
Average Class Size K-5 1989-90	CLSSIZK5	DOE IS
Instructional Personnel per 1,000 Students 1989-90	INST1000	DOE IS
Instructional Expenditures as a % of Operating Expenditures 1989-90	INSOPER	DOE IS

V. School Division Educational Resources Variables (continued):

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% Unendorsed Teachers 1989-90	TCHUNEND	DOE IS
Average Teacher Experience 1989-90	TCHEXPRC	DOE IS
% Teachers with Advanced Degree 1989-90	ADVDEG	DOE IS

VI. (E)lementary, (M)iddle, and (H)igh School Attainment Variables (1989-90 School Year; by VA school division)

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% of 4th grade students who were 11 or more years of age (i.e., overage for grade) (E)	P4GTR11	Annual School Report
% of students in grades K-5 who were absent 10 days or fewer (E)	PK5MISS	Supts. Memo 52 & Fall Membership Report
% of 8th grade students who were 15 or more years of age (i.e., overage for grade) (M)	P8GTR15	Annual School Report
% of students in grades 6-8 who were absent 10 days or fewer (M)	P68MISS	Supts. Memo 52 & Fall Membership Report
% of 8th grade students who took a foreign language (M)	P8FORGN	Supts. Memo 52 & Fall Membership Report
% of students in grades 9-12 who dropped out (H)	P912DP	Annual Dropout Report
% of students in grades 9-12 who were absent 10 days or fewer (H)	P912MIS	Supts. Memo 52
% of 11th & 12th grade students who took at least one Advanced Placement (AP) or college level course in grades 9-12 (H)	PCOLCRS	Supts. Memo 52 & Fall Membership Report

VII. (E)lementary, (M)iddle, and (H)igh School Achievement Variables (1989-90 School Year; by VA school division)

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% of 4th grade students who took the ITBS under standard conditions whose complete composite score are above the 25th percentile (E)	PBEL25	VSAP Data Tape
% of 4th grade students who took the ITBS under standard conditions whose complete composite scores are above the 50th percentile (E)	PABV50	VSAP Data Tape
% of 6th grade students passing all 3 Literacy Passport Tests in the current year and on the first attempt (E/M)	P6LITRT	Literacy Passport Test Data Tape
% of 8th grade students who took the ITBS under standard conditions whose complete composite scores are above the 25th percentile (M)	P8BW25	VSAP Data Tape
% of 8th grade students who took the ITBS under standard conditions whose complete composite scores are above the 50th percentile (M)	P8AB50	VSAP Data Tape
% of 8th grade students who took the ITBS under standard conditions whose complete composite scores are above the 75th percentile (M)	P8AB75	VSAP Data Tape
% of 11th grade students who took the TAP under standard conditions whose reading comprehension scores are above the 25th percentile (H)	PREAD	VSAP Data Tape

VII. (E)lementary, (M)iddle, and (H)igh School Achievement Variables (1989-90 School Year; by VA school division)

(continued)

VARIABLE DESCRIPTION	VARIABLE NAME	ORIGINAL SOURCE
% of 11th grade students who took the TAP under standard conditions whose mathematics scores are above the 25th percentile (H)	PMATH	VSAP Data Tape
% of 11th grade students who took the TAP under standard conditions whose complete composite scores are above the 50th percentile (H)	PNRM50	VSAP Data Tape
% of 11th grade students who took the TAP under standard conditions whose complete composite scores are above the 75th percentile (H)	PNRM75	VSAP Data Tape
% of 11th & 12th grade students who took the SAT (H)	PTKSAT	SAT Data Tape & Fall Membership Report
% of 11th & 12th grade SAT takers who scored at or above 1100 (H)	PA1100	SAT Data Tape
% of high school graduates receiving the Advanced Studies Diploma (H)	PHIADPL	Annual Report of Graduates

DIVISION FACTORS ANNOTATED DATA CATALOG

VIII. Miscellaneous Denominator Data (by VA locality)

VARIABLE DESCRIPTION	ORIGINAL SOURCE
Total Persons 1980	1980 U. S. Census
Total White Population 1990	*1990 U. S. Census
Total Black Population 1990	*1990 U. S. Census
Total Hispanic Origin Population 1990	*1990 U. S. Census
Total Other Races Population 1990	*1990 U. S. Census
Total Minorities 1990	*1990 U. S. Census
Total Housing Units 1990	*1990 U. S. Census
Total Households 1990	*1990 U. S. Census
Total Families 1990	*1990 U. S. Census
Total Family Households 1990	*1990 U. S. Census
Total Minority Family Households 1990	*1990 U. S. Census
Total Married Couple Family Households 1990	*1990 U. S. Census
Total Female-Headed Family Households 1990	*1990 U. S. Census

*Available via modem from the Electronic Bulletin Board, Center for Public Service, University of Virginia

APPENDIX D

OUTCOME ACCOUNTABILITY PROJECT (OAP)

INDICATOR DEFINITION LIST

OUTCOME ACCOUNTABILITY PROJECT
Indicator Definitions

Objective I: Preparing Students for College

Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1. Receiving the Advanced Studies Diploma	Advanced Diploma	Percent of high school graduates who received the Advanced Studies Diploma	Accountability	Annual Report of Graduates/Annual Report of Graduates
2. Minority Students Receiving the Advanced Studies Diploma	Minority Advanced Diploma	Percent of American Indian\Alaskan Native, Asian\Pacific Islander, Black, or Hispanic high school graduates who received the Advanced Studies Diploma	Information	Annual Report of Graduates/Annual Report of Graduates
3. Taking the SAT	Percent Taking SAT	Percent of 11th and 12th grade students who took the SAT	Accountability	SAT Data Tape/ Fall Membership Report
4. SAT scores	Percent with SAT Scores greater than 1100	Percent of 11th and 12th grade SAT takers who scored at or above 1100	Accountability	SAT Data Tape/ SAT Data Tape
5. Taking a Foreign Language (8th Graders)	Grade 8 Foreign Language	Percent of 8th grade students who took a foreign language	Information	Supts Memo 52/ Fall Membership Report
6. Taking Algebra I (8th Graders)	Grade 8 Algebra	Percent of 8th grade students who took Algebra I or Algebra I, Part I	Information	Supts Memo 52/ Fall Membership Report
7. Taking Advanced Placement/College Level Courses	Advanced Placement or College Courses	Percent of grade 11-12 students who took at least one Advanced Placement or College Level course in grades 9-12	Accountability	Supts Memo 52/ Fall Membership Report

Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
8. Advanced Placement Test Scores	Advanced Placement Test Scores	Percent of grade 11-12 students taking Advanced Placement courses who scored 3 or more on at least one Advanced Placement Test	Information	Supts Memo 52/ Supts Memo 52
9. Upper Quartile 11th Grade Test Scores	Grade 11 VSAP greater than 75%	Percent of 11th grade students who took the Virginia State Assessment Program Tests (TAP) under standard conditions whose complete composite scores are above the 75th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
10. Upper Quartile 8th Grade Test Scores	Grade 8 VSAP greater than 75%	Percent of 8th grade students who took the Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores are above the 75th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
11. Remedial Courses	College Freshmen not requiring Remedial Courses	Percent of the school division's first-time freshmen enrolled in a Virginia state supported community college or two- or four-year college or university part- or full-time in an academic, nonvocational major required to take one or more remedial courses or be in a remedial program	Accountability	SCHEV- not available 90-91
12. College GPA	College Freshmen GPA greater than 25	Percent of school division's first-time freshmen enrolled in a Virginia state-supported community college or two- or four-year college or university with a cumulative grade point average of 2.5 or greater	Accountability	SCHEV- not available 90-91

Objective II: Preparing Students for Work

Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1. Occupationally Prepared Graduates	Percent Graduates Occupationally Prepared	Vocational completers as a percentage of graduates with no continuing education plans	Accountability	Annual Report of Graduates/Annual Report of Graduates
2. Basic Reading Skills Acquisition	Percent of Basic Reading Skills Acquired	Percent of 11th grade students whose reading comprehension scores on the 11th grade Virginia State Assessment Program Tests (TAP) are above the 25th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
3. Basic Math Skills Acquisition	Basic Math Skills Acquired	Percent of 11th grade students whose mathematics scores on the 11th grade Virginia State Program Tests (TAP) are above the 25th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
4. Completed keyboarding or typing	Completed keyboard or typing	Percent of 12th grade students who completed a class that included keyboarding or typing	Accountability	Supts Memo 52/ Fall Membership Report

Objective III: Increasing the Graduation Rate

Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1. Literacy Passport First Time Pass Rate	Percent 1st time pass rate Literacy Passport	Percent of 6th grade students who passed all three Literacy Passport Tests on the first attempt	Accountability	Literacy Passport Data Tape/Literacy Passport Data Tape
2. Dropout Rate	Percent Dropouts Grade 7-12	Percent of grade 7-12 students who drop out	Accountability	Annual Report of Dropouts/Annual Report of Dropouts
3. Minority Dropout Rate	Percent Minority Dropouts Grade 7-12	Percent of grades 7-12 American Indian\Alaskan Native, Asian\Pacific Islander, Black, or Hispanic students who drop out	Information	Annual Report of Dropouts/Annual Report of Dropouts
4. Attendance	Attendance Rate	Percent of K-12 students absent 10 days or fewer	Accountability	Supts Memo 52/ Fall Membership Report
5. Above 25th Percentile 4th Grade Test Scores	Grade 4 VSAP Scores above 25%	Percent of all 4th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions whose composite scores are above the 25th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
6. Above 25th Percentile 8th Grade Test Scores	Grade 8 VSAP Scores above 25%	Percent of all 8th grade students who took Virginia State Assessment Program (ITBS) under standard conditions whose composite scores are above the 25th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
7. Over Age Students in the 4th Grade	Over age students Grade 4	Percent of 4th grade students 11 or more years of age	Accountability	Annual School Report/ Annual School Report
8. Over Age Students in the 8th Grade	Over age students Grade 8	Percent of 8th grade students 15 or more years of age	Accountability	Annual School Report/ Annual School Report

Objective IV: Increasing Special Education Students' Living Skills and Opportunities

	Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1.	Attendance	Sp. Ed. Attendance Rate	Percent of special education students who were absent 10 days or fewer	Accountability	Supts Memo 52/ Dec. 1 Child Count
2.	Dropout Rate	Sp. Ed. Percent Dropouts Grade 7-12	Percent of special education students in grade 7-12 plus ungraded special education students who drop out	Accountability	Annual Report of Dropouts/Annual Report of Dropouts
3.	Receiving Regular or Advance Studies Diploma	Sp. Ed. Regular/ Advance Diploma	Percent of hearing impaired, speech or language impaired, visually impaired, orthopedically impaired, specific learning disabilities, and/or seriously emotionally disturbed special education graduates/exiting students who received the Regular or Advanced Studies Diploma	Accountability	Annual Report of Graduates/Annual Report of Graduates
4.	Literacy Passport First Time Pass Rate	Sp. Ed. 1st time pass rate Literacy Passport	Percent of grade 6 special education students passing all three Literacy Passport Tests on the first attempt	Accountability	Literacy Passport Data Tape/Literacy Passport Data Tape
5.	Work Experience	Sp. Ed. Work Experience	Percent of special education students ages 15-21 who participated in paid or nonpaid work experience which includes formal training/supervision while on the job	Accountability	Supts Memo 52/ Supts Memo 52
6.	Co-Curricular Involvement	Grade 9-12 Sp. Ed. Co-curricular activity	Percent of grades 9-12 special education students who were involved in at least one school sponsored co-curricular activity with non-handicapped peers during the year	Information	Supts Memo 52/ Supts Memo 52

Objective V: Educating Elementary School Students

	Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1.	Above median 4th Grade Test Scores	Grade 4 VSAP above median	Percent of all 4th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions whose complete composite scores are above the 50th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
2.	Attendance	Grade K-5 Attendance Rate	Percent of K-5 students who were absent 10 days or fewer	Accountability	Supts Memo 52/ Fall Membership Report
3.	Literacy Passport First Time Pass Rate	Percent 1st time pass rate Literacy Passport	Percent of 6th grade students who passed all three Literacy Passport Tests in the current year on the first attempt	Accountability	Literacy Passport Data Tape/Literacy Passport Data Tape
4.	Over Age Students in 4th Grade	Over age students Grade 4	Percent of 4th grade students who are 11 or more years of age	Accountability	Annual School Report/ Fall Membership Report
5.	Over Age Minority Students in 4th Grade	Minority Over age students Grade 4	Percent of American Indian\Alaskan Native, Asian\Pacific Islander, Black, or Hispanic 4th grade students who are 11 or more years of age	Information	Annual School Report/ Fall Membership Report
6.	Physical Fitness Pass Rate	Physical Fitness pass rate Grade 4-5	Percent of students in grades 4-5 taking spring physical fitness tests who passed all four tests	Accountability	Annual Physical Fitness Report/Annual Physical Fitness Report

	Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1.	Attendance	Grade 6-8 Attendance Rate	Percent of students in grades 6-8 who were absent 10 days or fewer	Accountability	Supts Memo 52/ Fall Membership Report
2.	Taking Foreign Language	Grade 8 Foreign Language	Percent of students in grade 8 who took a foreign language	Information	Supts Memo 52/ Fall Membership Report
3.	Minority Students Taking Foreign Language	Minority Grade 8 Foreign Language	Percent of American Indian/Alaskan Native, Asian Pacific Islander, Black, and Hispanic students in grade 8 who took a foreign language	Information	Supts Memo 52/ Fall Membership Report
4.	Taking Algebra	Grade 8 Algebra	Percent of 8th grade students who took Algebra I or Algebra I Part I	Information	Supts Memo 52/ Fall Membership Report
5.	Minority Students Taking Algebra	Minority Grade 8 Algebra	Percent of American Indian/Alaskan Native, Asian Pacific Islander, Black, or Hispanic students in grade 8 who took Algebra I or Algebra I, Part I	Information	Supts Memo 52/ Fall Membership Report
6.	Upper Quartile 8th Grade Test Scores	Grade 8 VSAP greater than 75%	Percent of 8th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores were above the 75th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
7.	Above Median 8th Grade Test Scores	Grade 8 VSAP above median	Percent of 8th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores were above the 50th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
8.	Physical Fitness Pass Rate	Physical Fitness pass rate Grades 6, 7, 8,	Percent of students in grades 6, 7, and 8 taking spring physical fitness tests who passed all four tests	Accountability	Annual Physical Fitness Report/Annual Physical Fitness Report

	Indicator Name	Short Label on Report	Definition	Use	Source: Numerator/ Denominator
1.	Upper Quartile 11th Grade Test Scores	Grade 11 VSAP greater than 75%	Percent of 11th grade students who took Virginia State Assessment Program Tests (TAP) under standard conditions, whose composite scores are above the 75th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
2.	Above Median 11th Grade Test Scores	Grade 11 VSAP above median	Percent of 11th grade students who took Virginia State Assessment Program Tests (TAP) under standard conditions, whose complete composite scores are above the 50th percentile	Accountability	VSAP Data Tape/ VSAP Data Tape
3.	Attendance	Grade 9-12 Attendance Rate	Percent of students in grades 9-12 who were absent 10 days or fewer	Accountability	Supts Memo 52/ Supts Memo 52
4.	Dropout Rate	Percent Dropouts Grade 9-12	Percent of grade 9-12 students who drop out	Accountability	Annual Report of Dropouts/Annual Report of Dropouts
5.	Minority Dropout Rate	Percent Minority Dropouts Grade 9-12	Percent of grades 9-12 American Indian/Alaskan Native, Asian/Pacific Islander, Black, or Hispanic students who drop out	Information	Annual Report of Dropouts/Annual Report of Dropouts
6.	Physical Fitness Pass Rate	Physical Fitness pass rate Grade 9-10	Percent of students in grades 9-10 taking spring physical fitness test who passed all four tests	Accountability	Annual Physical Fitness Report/Annual Physical Fitness Report

APPENDIX E

OAP HIGH PRIORITY OUTCOMES SURVEY RESULTS

RFP #91-34 Factors Affecting School Division Performance

High Priority Outcome Indicator Survey

Assessment of Stakeholder Perceptions

Rationale

The project RFP and work plan required analysis of "high priority [OAP] outcomes." In addition, the project team needed some means of identifying a subset of indicators to statistically analyze since it was not feasible to analyze all Outcome Accountability Project (OAP) indicators within the time-lines of the project. There was team consensus that varying perceptions exist among educational stakeholders as to which OAP indicators are "high priority," and of the need to elicit such stakeholder input since they are primary users of indicator information. Results of this process served as a "barometer" of the degree of importance DOE and LEA stakeholders attach to various educational outcomes. In addition, the team viewed such data as multipurpose--applicable to the OAP project, the World Class Education (WCE) initiative, and technical assistance provided by student services staff and the regional representatives.

Methodology

There was team consensus that a low cost mechanism should be used to ascertain the perceptions of stakeholders regarding high priority outcomes. It was decided that convening a group of stakeholders for this purpose was too costly in terms of time and funding. Also, it was thought many interested educators would be unavailable during the research period (i.e., late July-early August 1991) due to vacations.

Taking such costs into account, the team decided to use a mail survey format to gather its data from stakeholders. The following five stakeholder groups were surveyed (the number of surveys mailed to each group is indicated in parenthesis):

- DOE division chiefs (10)
- officers of the Virginia Association of School Superintendents (10)
- officers of the Virginia Association of Elementary School Principals (7)
- officers and regional state directors of the Virginia Association of Secondary School Principals (14)
- a convenience sample of Virginia Education Association members (20)

Members of these groups were surveyed because they represented primary users of outcome indicator information, they were relatively familiar with OAP, and they were accessible through their organizations. 61 surveys were mailed to members of the above groups. It appears that several DOE division chiefs and division superintendents conferred with their staff members and collectively responded on one response form. 38 surveys were returned for an overall response rate of 62%.

Each respondent received a cover letter (Figure 1) or memo (Figure 2) which requested their assistance and provided a rationale for the survey and brief instructions on completing the response form, including suggested criteria for selecting high priority indicators. The selection criteria presented to the respondents were:

- Is the indicator useful for state and local policy development?
- Will the indicator have a positive impact on educational practice?
- Will the indicator promote increased student learning?
- Will the indicator encourage educators to raise their expectations for student performance?

The response form (Figure 3) was formatted around a list of the 50 OAP indicators collected during the 1989-90 school year. The indicators were listed under the seven OAP educational objectives. Respondents were asked to check the 10 indicators which best meet the above selection criteria and to return the form to the Division of Information Systems.

Results

The indicator responses were tabulated upon return of the response forms. The indicators that were checked most frequently by respondents as "high priority indicators" are shown on the next page (Figure 4) in descending order of frequency; indicators selected by 10 or more respondents are indicated. (The complete frequency counts by indicator are shown in Figure 3).

Figure 4

OAP Indicators Checked Most Frequently by Respondents as "High Priority Indicators"

(in descending order of frequency; indicators selected by 10 or more respondents included)

	Obj./Ind. Number	Indicator Name	Frequency Checked
1	III-2	Dropout Rate (grades 7-12)	21
2	II-1	Occupationally Prepared Graduates (i.e., vocational ed. completers)	20
3	II-2	Basic Reading Skills Acquisition	20
4	III-4	Attendance (K-12)	20
5	II-3	Basic Math Skills Acquisition	18
6	III-1	Literacy Passport First Time Pass Rate	17
7	VI-7	Above Median 8th Grade Test Scores	17
8	IV-3	Special Ed Students Receiving Regular or Advanced Studies Diploma	16
9	I-1	Receiving the Advanced Studies Diploma	13
10	I-7	Taking Advanced Placement/College Level Courses	11
11	V-1	Above Median 4th Grade Test Scores	11
12	VII-4	Dropout Rate (grades 9-12)	11
13	I-12	College GPA	10

Discussion

An immediate observation from the above data is that the six most frequently checked indicators seem to address basic skills acquisition, vocational education, and at-risk students. The remaining indicators, with the exception of dropout rate (grades 9-12), address college bound students and high academic achievement. This apparent dichotomy in how the respondents prioritized a limited number of educational outcomes may have implications for current Department initiatives such as the Common Core, increased technical assistance, etc., and perhaps should be further discussed and analyzed. Also, most of the above indicators address student

outcomes that have traditionally been the most widely reported (i.e., test scores, dropout rate, and attendance). It may be that the survey sample represented a "general population" of educators that tended to focus on indicators addressing the general school population.

However, the limitations of this data and of the simple methodology used in this exercise should be briefly noted:

- Only a small number of education stakeholders or users of outcome data were surveyed (although the groups participating represent direct-service educators who are close to educational outcomes). Caution should be used in generalizing the above results to other educators who were not surveyed.

- The respondents from each of the five groups may not be representative of the larger group membership in terms of their judgments and values regarding educational outcomes; that is, respondents such as group officers, a very small sample of VEA members, and high level DOE managers may prioritize outcomes differently than others in the groups they represent.

- The response form, brief and simple, was designed to encourage response and obtain quick feedback from respondents. It did not give them the opportunity to provide more extensive, open-ended comments regarding the judgments they made.

- The order of the indicators on the response form could have influenced the responses. Respondents may have tended to rate indicators higher simply because they appeared at the beginning of the form.

- The respondents only assessed educational outcomes measured by the current OAP indicators, a relatively small number of possible outcomes. Non-cognitive and post-secondary outcomes, for example, are not measured or measured only on a limited basis by the current OAP indicators.

- The respondents were asked to assess the indicators using the four criteria stated above. Being limited to these criteria may have affected the manner in which they assessed the indicators' importance versus using other criteria. The respondents also probably assessed the indicators using their own subjective criteria, in addition to the stated criteria.

Utilization

The project team considered these results in deciding on a

subset of indicators to statistically analyze in the input-output analysis component of the project. The indicators were analyzed independently and as combined composites or indices. Other criteria such as team members own perceptions of importance and quality of the indicator data (i.e., missing cases, skewness, etc.) also were considered in their use.

It is recommended that the results of this survey be disseminated to the OAP and Common Core project teams, the Student Services divisions, and the regional representatives.

FIGURE 1

July 17, 1991

NAME-
ADDRESS-

Dear MR-:

An important utilization of the outcome indicator data collected through the Outcome Accountability Project (OAP) is analyzing the effects of various factors on these indicators. As part of its new research focus, the Department of Education is studying this issue to provide information for state and local planning. The factors to be analyzed will include several categories of data related to characteristics of the community, its students, and the school division.

We need your assistance in helping us identify a limited number of high priority outcome indicators on which we will conduct further analysis. This screening process is needed since not all 50 indicators can be analyzed within the timeframe of this project. We value the perceptions of fellow educators and need your assistance in determining where to focus our research efforts.

Please review the enclosed listing of the 50 indicators used in the OAP. Using the criteria listed below, determine which 10 indicators best meet these criteria. Place a (✓) beside those 10 indicators.

- Is the indicator useful for state and local policy development?
- Will the indicator have a positive impact on educational practice?
- Will the indicator promote increased student learning?
- Will the indicator encourage educators to raise their expectations for student performance?

Return all completed forms to Ms. Cameron Harris, Chief, Information Systems, Department of Education, P.O. Box 6Q, Richmond, VA 23216-2060. If you have any questions, please contact Kent Dickey at (804) 371-8288 or Emmett Ridley at (804) 225-2687.

Your assistance in this process is greatly appreciated.

Sincerely,

Cameron Harris, Chief
Information Systems

CH/er/ead

Enclosure

FIGURE 2

July 16, 1991

MEMORANDUM

TO: Division Chiefs

FROM: Cameron Harris

SUBJECT: Outcome Accountability Project (OAP)

An important utilization of the outcome indicator data collected through the Outcome Accountability Project (OAP) is analyzing the effects of various factors on these indicators. As part of its new research focus, the Department of Education is studying this issue to provide information for state and local planning. The factors to be analyzed will include several categories of data related to characteristics of the community, its students, and the school division.

We need your assistance in helping us identify a limited number of high priority outcome indicators on which we will conduct further analysis. This screening process is needed since not all 50 indicators can be analyzed within the timeframe of this project. We value the perceptions of fellow educators and need your assistance in determining where to focus our research efforts.

Please review the attached listing of the 50 indicators used in the OAP or have a few members of your staff (approximately five people) review it. Using the criteria listed below, determine which 10 indicators best meet these criteria. Place a (✓) beside those 10 indicators.

- Is the indicator useful for state and local policy development?
- Will the indicator have a positive impact on educational practice?
- Will the indicator promote increased student learning?
- Will the indicator encourage educators to raise their expectations for student performance?

Return all completed forms to me. If you have any questions, please contact Kent Dickey at 1-8288 or Emmett Ridley at 5-2687.

Your assistance in this process is greatly appreciated.

CM/er/ead

Attachment

FIGURE 3
High Priority Outcome Indicator Response Form
(OAP)

As indicated in the cover letter, please mark the 10 indicators that best meet the criteria listed. Place a check mark beside your choice in the space provided.

Objective I: Preparing Students for College

	Indicator Name	Definition
13	1. Receiving the Advanced Studies Diploma	Percent of high school graduates who received the Advanced Studies Diploma
7	2. Minority Students Receiving the Advanced Studies Diploma	Percent of American Indian\Alaskan Native, Asian\Pacific Islander, Black, or Hispanic high school graduates who received the Advanced Studies Diploma
5	3. Taking the SAT	Percent of 11th and 12th grade students who took the SAT
6	4. SAT scores	Percent of 11th and 12th grade SAT takers who scored at or above 1100
8	5. Taking a Foreign Language (8th Graders)	Percent of 8th grade students who took a foreign language
9	6. Taking Algebra I (8th Graders)	Percent of 8th grade students who took Algebra I or Algebra I, Part I
11	7. Taking Advanced Placement\College Level Courses	Percent of grade 11-12 students who took at least one Advanced Placement or College Level course in grades 9-12
2	8. Advanced Placement Test Scores	Percent of grade 11-12 students taking Advanced Placement courses who scored 3 or more on at least one Advanced Placement Test
9	9. Upper Quartile 11th Grade Test Scores	Percent of 11th grade students who took the Virginia State Assessment Program Tests (TAP) under standard conditions whose complete composite scores are above the 75th percentile
5	10. Upper Quartile 8th Grade Test Scores	Percent of 8th grade students who took the Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores are above the 75th percentile
7	11. Remedial Courses	Percent of the school division's first-time freshmen enrolled in a Virginia state supported community college or two- or four-year college or university part- or full-time in an academic, nonvocational major required to take one or more remedial courses or be in a remedial program

10	12. College GPA	Percent of school division's first-time freshmen enrolled in a Virginia state-supported community college or two- or four-year college or university with a cumulative grade point average of 2.5 or greater

Objective II: Preparing Students for Work

Indicator Name		Definition
20	1. Occupationally Prepared Graduates	Vocational completers as a percentage of graduates with no continuing education plans
20	2. Basic Reading Skills Acquisition	Percent of 11th grade students whose reading comprehension scores on the 11th grade Virginia State Assessment Program Tests are above the 25th percentile
18	3. Basic Math Skills Acquisition	Percent of 11th grade students whose mathematics scores on the 11th grade Virginia State Program Tests are above the 25th percentile
5	4. Completed keyboarding or typing	Percent of 12th grade students who completed a class that included keyboarding or typing

Objective III: Increasing the Graduation Rate

Indicator Name		Definition
17	1. Literacy Passport First Time Pass Rate	Percent of 6th grade students who passed all three Literacy Passport Tests on the first attempt
21	2. Dropout Rate	Percent of grade 7-12 students who dropout
8	3. Minority Dropout Rate	Percent of grades 7-12 American Indian\Alaskan Native, Asian\Pacific Islander, Black, or Hispanic students who dropout
20	4. Attendance	Percent of K-12 students absent 10 days or fewer
2	5. Above 25th Percentile 4th Grade Test Scores	Percent of all 4th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions whose composite scores are above the 25th percentile
4	6. Above 25th Percentile 8th Grade Test Scores	Percent of all 8th grade students who took Virginia State Assessment Program (ITBS) under standard conditions whose composite scores are above the 25th percentile
7	7. Over Age Students in the 4th Grade	Percent of 4th grade students 11 or more years of age

8	8. Over Age Students in the 8th Grade	Percent of 8th grade students 15 or more years of age

Objective IV: Increasing Special Education Students' Living Skills and Opportunities

Indicator Name		Definition
3	1. Attendance	Percent of special education students who were absent 10 days or fewer
2	2. Dropout Rate	Percent of grade 7-12 plus ungraded special education students who were dropouts
16	3. Receiving Regular or Advance Studies Diploma	Percent of hearing impaired, speech or language impaired, visually impaired, orthopedically impaired, specific learning disabilities, and/or seriously emotionally disturbed special education graduates/exiting students who received the Regular or Advanced Studies Diploma
1	4. Literacy Passport First Time Pass Rate	Percent of grade 6 special education students passing all three Literacy Passport Tests on the first attempt
9	5. Work Experience	Percent of special education students ages 15-21 who participated in paid or nonpaid work experience training/supervision while on the job
6	6. Co-Curricular Involvement	Percent of grades 9-12 special education students who were involved in at least one school sponsored co-curricular activity with nonhandicapped peers during the year

Objective V: Educating Elementary School Students

Indicator Name		Definition
11	1. Above median 4th Grade Test Scores	Percent of all 4th grade students who took Virginia State Assessment Program Test (ITBS) under standard conditions whose complete composite scores are above the 50th percentile
7	2. Attendance	Percent of K-5 students who were absent 10 days or fewer
8	3. Literacy Passport First Pass Rate	Percent of 6th grade students who passed all three Literacy Passport Tests in the current year on the first attempt
9	4. Over Age Students in 4th Grade	Percent of 4th grade students who are 11 or more years of age
4	5. Over Age Minority Students in 4th Grade	Percent of American Indian\Alaskan native, Asian\Pacific Islander, Black, or Hispanic 4th grade students who are 11 or more years of age

2	6. Physical Fitness Pass Rate	Percent of students in grades 4-5 who passed all four spring physical fitness tests

Objective VI: Educating Middle School Students

	Indicator Name	Definition
7	1. Attendance	Percent of students in grades 6-8 who were absent 10 days or fewer
5	2. Taking Foreign Language	Percent of students in grade 8 who took foreign language
2	3. Minority Taking Foreign Language	Percent of American Indian/Alaskan native, Asian Pacific Islander, Black, and Hispanic students in grade 8 who took foreign language
5	4. Taking Algebra	Percent of 8th grade students who took Algebra I or Algebra I Part I
3	5. Minority Taking Algebra	Percent of American Indian/Alaskan native, Asian Pacific Islander, Black, or Hispanic students in grade 8 who took Algebra I or Algebra I, Part I
5	6. Upper Quartile 8th Grade Test Scores	Percent of 8th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores were above the 75th percentile
17	7. Above Median 8th Grade Test Scores	Percent of 8th grade students who took Virginia State Assessment Program Tests (ITBS) under standard conditions, whose complete composite scores were above the 50th percentile
4	8. Physical Fitness Pass Rate	Percent of students in grades 6, 7, and 8 who passed all four spring physical fitness tests

Objective VII: Educating Secondary School Students

	Indicator Name	Definition
5	1. Upper Quartile 11th Grade Test Scores	Percent of 11th grade students who took Virginia State Assessment Program Tests (TAP) under standard conditions, whose composite scores were above the 75th percentile
9	2. Above Median 11th Grade Test Scores	Percent of 11th grade students who took Virginia State Assessment Program Tests (TAP) under standard conditions, whose complete composite scores were above the 50th percentile
7	3. Attendance	Percent of students in grades 9-12 who were absent 10 days or fewer

11	4. Dropout Rate	Percent of grade 9-12 students who dropout
5	5. Minority Dropout Rate	Percent of grades 9-12 American Indian/Alaskan native, Asian/Pacific Islander, Black, or Hispanic students who dropout
4	6. Physical Fitness Pass Rate	Percent of students in grades 9-10 who passed all four spring physical fitness tests

Additional Request Form

If you would like additional copies of this report please send a check or money order written to the Virginia Department of Education for **$3.10** (includes postage). Sorry, we can not accept cash or purchase orders.

Unlimited, non-profit duplication is permitted. If a portion of the material is used, full credit must be given to the Virginia Department of Education.

Please fill out the form below and mail it to:

Virginia Department of Education
Office of Public Affairs — 25th floor
P.O. Box 2120
Richmond, Virginia 23216-2120

RFP # **91-34**

Title of report: **Factors Affecting School Division Performance**

Number of copies requested:_____ Amount enclosed:_____

Name:_____

Street Address (No P.O. Box Please):_____

City:_____ State:_____ Zip:_____

This form will serve as your mailing label, please make sure it is accurate.

This cover has been printed on 100% recycled paper.