R E P O R T R E S U M E S

ED 019 516 24 VT 005 598

AN ANALYSIS OF COST AND PERFORMANCE FACTORS IN THE OPERATION AND ADMINISTRATION OF VOCATIONAL PROGRAMS IN SECONDARY SCHOOLS. FINAL REPORT.

BY- DUEKER, RICHARD L. ALTMAN, JAMES W.
AMERICAN INST. FOR RESEARCH IN BEHAVIORAL SCIENCES

REPORT NUMBER AIR-F90-10/67-FR PUB DATE OCT 67
REPORT NUMBER BR-7-0957
CONTRACT OEC-1-7-070957-3522
EDRS PRICE MF-$0.25 HC-$2.04 49P.

DESCRIPTORS- *PROGRAM COSTS, *VOCATIONAL EDUCATION, *COST EFFECTIVENESS, *COMPREHENSIVE HIGH SCHOOLS, SCHOOL SURVEYS, *VOCATIONAL HIGH SCHOOLS, JOB PLACEMENT, UNEMPLOYMENT, COMPARATIVE ANALYSIS, QUESTIONNAIRES,

IN A STUDY TO IDENTIFY THE KINDS OF COST AND RELATED DATA THAT CAN BE OBTAINED TO AID PLANNING AND EVALUATING VOCATIONAL EDUCATION, THE ATTRITION OF THE SAMPLE OF 16 COMPREHENSIVE AND 16 VOCATIONAL SCHOOLS ASKED TO PARTICIPATE AND THE DATA COLLECTION PROBLEMS MADE THE AUTHORS SKEPTICAL OF ANY SUBSTANTIVE RESULTS. LIMITED DATA WERE COLLECTED FROM SCHOOLS BY MEANS OF QUESTIONNAIRES AND INTERVIEWS AND FROM EARLIER STUDIES. AN ORGANIZED BODY OF PERFORMANCE DATA WAS NOT AVAILABLE AT ANY OF THE SCHOOLS, AND AVAILABLE COST DATA DID NOT READILY LEND THEMSELVES TO MEANINGFUL ANALYSIS. FINDINGS, IF ACCEPTED AT FACE VALUE, SUGGESTED--(1) ACCORDING TO DATA REPORTED BY FIVE VOCATIONAL SCHOOLS AND FOUR COMPREHENSIVE SCHOOLS, THE GENERAL COST OF EDUCATION IN COMPREHENSIVE SCHOOLS WAS LOWER THAN IN VOCATIONAL SCHOOLS FOR 1961-62, BUT ROSE MUCH MORE RAPIDLY TO APPROXIMATE THE COST IN VOCATIONAL SCHOOLS BY 1965-66, AND (2) DATA FROM FOUR COMPREHENSIVE SCHOOLS SHOWED THAT THE COSTS OF ACADEMIC-GENERAL (NONVOCATIONAL) EDUCATION WERE HIGHER THAN FOR VOCATIONAL EDUCATION IN COMPREHENSIVE HIGH SCHOOLS FOR THE FISCAL YEARS, 1961-62, 1963-64, AND 1965-66. IT DID NOT APPEAR LIKELY THAT AVAILABLE COST OR PERFORMANCE DATA WOULD SERVE THE LONG-RANGE NEEDS OF EDUCATIONAL EVALUATION AND PLANNING. IT WAS RECOMMENDED THAT THE U.S. OFFICE OF EDUCATION UNDERTAKE A FEASIBILITY AND PRELIMINARY DESIGN STUDY FOR AN EVALUATION AND PLANNING INFORMATION SYSTEM WHICH WOULD ENCOMPASS ALL EDUCATION, NOT ONLY VOCATIONAL EDUCATION. (PS)

FINAL REPORT
Project No. 70957 .24
Contract No. OEC 1-7-070957-3522

AN ANALYSIS OF COST AND PERFORMANCE FACTORS IN THE OPERATION AND ADMINISTRATION OF VOCATIONAL PROGRAMS IN SECONDARY SCHOOLS

October 1967

U.S. DEPARTMENT OF HEALTH,
EDUCATION, AND WELFARE

Office of Education
Bureau of Research

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

AIR-F90-10/67-FR

Final Report

Project No. 70957
Contract No. OEC 1-7-070957-3522

An Analysis of Cost and Performance Factors in the Operation and Administration of Vocational Programs in Secondary Schools

Richard L. Dueker
James W. Altman

American Institutes for Research
Pittsburgh, Pennsylvania

October 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

ACKNOWLEDGMENTS

The American Institutes for Research (AIR) wishes to thank the following high school principals whose help, along with that of their respective staffs, in "digging out" and reporting the required information made this study possible. They are:

Mr. Edward Amejko
Oliver Wolcott Regional Vocational-Technical School

Mr. James W. Babb
Gaston College

Mr. Laurence H. Babin
Quincy Vocational-Technical School

Dr. Kenneth Bailey
Pacific High School

Mr. Ben M. Becker
Philip Schuyler Senior High School

Mr. Roger Berry
Central High School

Mr. David W. Berryman
Springfield Vocational-Technical Industrial School

Mr. C. B. Breithaupt
Capitol Hill High School

Mr. Joseph M. Brightbill
Central Dauphin High School

Mr. P. W. Chamness
Topeka Area Vocational-Technical School

Mr. V. U. Cortney
Las Vegas High School

Mr. Kenneth Cottom
Gerstmeyer Technical High School

Mr. David Dean
Bladensburg Senior High School

Mr. Lawrence C. Evangelista
Hazelton Senior High School

Mr. John W. Gorman
Tyrone Area Junior-Senior High School

Mr. Alvis N. Hanna
John Tyler High School

Mr. John P. Harrington
Diman Vocational High School

Mr. Randall Holladay
Duncan High School

Mr. Norman A. Jensen
Minneapolis Area Vocational-Technical School

Mr. Art H. Keller
Poplar Bluff Senior High School

Mr. John Kerpchar
J. M. Wright Regional Vocational-Technical School

Mr. David J. Korst
Macomber Vocational High School

Mr. Donald B. MacDonald
Haverhill Trade High School

Mr. W. Grady Mullins
Wyoming County Vocational-Technical School

Mr. O. Meredith Parry
William Penn Senior High School

Mr. Raymond E. Patton
El Paso Technical High School

Mr. Wallace Reid
McDuffie High School

Mr. H. W. Scheuerman
Lima Senior High School

Mr. F. W. Staley
Pontiac Central High School

Mr. Lewis J. Streeter
St. Johnsbury Trade School

Mr. Howard C. Warren
Owensboro Area Vocational-Technical School

Mr. N. T. Whiteman
Patterson Cooperative High School

Thanks also go to the many school district superintendents and business managers whose assistance at the district level so often proved invaluable in providing school data. Our gratitude is extended, in addition, to the various state directors of vocational education, many of whom personally endorsed the study to the participating schools in their states.

Finally, our thanks go to the school visitors, Alfred A. Junz, Wayne S. Ramp, Douglas Chapman, and Dale Kaiser of Southern Illinois University; Carlos Valone of the Eastern Regional Institute for Education; and Vivian Hudak and John Fetter of AIR for their important contributions to the data collection.

TABLE OF CONTENTS

List of Tables

SUMMARY

Sixteen comprehensive and 16 vocational schools were asked to participate in a study of the information available concerning the cost and performance characteristics of vocational education. It was found that an organized body of performance data does not exist. Available cost data do not readily lend themselves to coherent analysis. It seems likely that more intensive efforts to extract cost data at the local level than were possible in this study would yield somewhat more usable information. However, it does not appear likely that available cost or performance data will serve the long-range needs of educational evaluation and planning.

It is recommended that consideration be given to the design of an evaluation and planning information system. Such a system would have as its specific intent the recording and availability of cost and performance data needed as a basis for sound educational evaluation and planning.

INTRODUCTION

Few objective and systematic data exist concerning the pattern of cost allocation for vocational education. Even less data are available on relationships among cost, operational, situational, and performance factors. Lacking such elementary information, it is difficult to make decisions concerning the optimum allocation of future resources at any level or phase of the educational endeavor.

The purpose of the present study was to identify the kinds of cost and related data that can be obtained to aid planning and evaluation of vocational education. Additional objectives, contingent upon data availability, included:

1. The gathering and presentation of data concerning cost, operational, situational, and performance factors which would serve as first approximations to data based on large-scale samples.

2. The comparing of cost allocations between vocational and non-vocational programs for the comprehensive high schools in the sample.

3. The determination of relationships among the various kinds of available information.

The basic method of the study was to send a questionnaire to each of 32 schools, and to facilitate its completion through a later visit. Results of the study include an enumeration of problems involved in obtaining valid data. Since the problems were many and serious, the known limitations of resulting data were great. It was, however, possible to make a preliminary comparison of costs across fiscal years, curriculum types, and comprehensive versus vocational schools.

No body of organized data concerning performance was available at any of the schools. However, situational and performance data had previously been gathered for the same sample of schools under other studies conducted by AIR (1;2). Thus, a search was made for meaningful relationships between these situational performance data and the cost data obtained from the current study.

METHOD

The questionnaire used in this study was developed by the AIR staff in cooperation with Dr. Ernst W. Stromsdorfer of Pennsylvania State University. (Copies of the questionnaire and the instruction sheets are presented in Appendix A.) Characteristics of this questionnaire include the following:

1. Followed in format the accounting system described in the U.S. Office of Education's Handbook, Financial Accounting for Local and State School Systems, OE-22017, including the definitions of accounting categories.

2. Included all categories bearing on school individual expenses and excluded all others.

3. Provided breakdowns of course areas and specific trade and industry (T&I) course offerings.

4. Reflected best judgment of what information relevant to this study might be available.

Five parts were included in the questionnaire. Part A required financial information of the most general nature, with school totals being subdivided into monies spent in college preparatory, general, and vocational areas. Part B required the subdivision of additional accounts for a more detailed examination of expenditures; information for college preparatory, general, and vocational areas was again required with vocational subdivided into six areas, including T&I and technical. Part C subdivided T&I and technical into specific courses, and asked for specific expenditures in a few categories carried over from Part B. Part D was designed to supply information about enrollment, classroom area, types of classes, and average daily attendance, among other items. Parts A through D were to be completed by the school for each of three sample fiscal years, 1961-1962, 1963-1964, and 1965-1966. The remaining section, Part E, requested information on physical plant, use of the school, and gifts or grants awarded to the school. Part E was completed for sample year 1965-1966 only. Due to severe time pressure, this questionnaire was not pre-tested.

To secure cooperation in completing the questionnaire, letters were sent to appropriate state directors of vocational education, superintendents of schools, and school principals. (Copies of these letters are included in Appendix B.) The 32 schools asked to participate had already cooperated in two AIR studies (1;2). This sample included comprehensive and vocational schools with both high and low graduate job placement performance. Thirty-one of these schools initially agreed to participate.

These schools were then sent a complete set of questionnaires along with instructions and a return envelope. Approximately 10 days later, each school was telephoned and an inquiry was made concerning the state of completion of the questionnaire. Questions were answered and other help given as required. During the period May 22 to June 2, 1967, visits were made to most of the schools, either by AIR staff members or outside interviewers[1] familiar with the questionnaire and the objectives of the research. These representatives were instructed to review the questionnaires and obtain missing data, where possible, from school personnel. The questionnaires were then returned to AIR, where they were reviewed prior to data analysis. It is from this review, supplemented by the written reports of the interviewers, that the analysis of problems was obtained and the subsample selected for the examination of vocational costs.

The data analysis yielded costs per student for each of the 28 expenditure categories in Parts A and B of the questionnaire for each school in the sample. Data were too sparse from all of the other, more detailed parts of the questionnaire to permit meaningful analysis of costs.

Means and standard deviations of costs per student were calculated for the subsamples of schools defined by the following variables:

1. Type of school (comprehensive or vocational).

2. Type of curriculum (vocational or academic-general).

3. Graduate performance (high or low, as defined in Appendix C).

The cost data obtained in this study were also correlated with operational, situational, and performance data for the participating schools obtained under this study and earlier studies (1;2). Methods for defining all of the variables used are described in Appendix C.

---

[1] From Southern Illinois University, Carbondale, Illinois and Eastern Regional Institute for Education, Syracuse, New York.

RESULTS AND FINDINGS

Results are presented in this section, in order, from those most clearly displaying the inherent limitations of the study to those having the most potential substantive implications. Problems involved in obtaining data, their effects on attrition of the sample, and their consequent limitations on substantive findings of the study are presented first; costs as a function of time, type of school, and curriculum are then discussed. Finally, graduate performance, operational, and situational variables are examined in relation to cost.

Data Collection

The prime objective of this study was to examine the availability of data from which per pupil costs of vocational education could realistically be determined. It was recognized at the outset that there would be many difficulties. Even though only one of the 32 schools did not agree to participate when first contacted, several others declined to cooperate when they became aware of the amount of effort involved in providing the required data.

In addition, a relatively small part of the questionnaire had been completed by personnel in most schools prior to the project representative's visit. Therefore, the forms had to be completed using whatever sources were available. Usually the additional data were collected by seeking persons having access to these data and adjudicating the discrepancies among conflicting sources. In the one day available at each school, it was usually impossible for the project representative to complete the forms in full. Also, the necessity of gathering data largely precluded his intended role as critical reviewer and troubleshooter of special problems.

All of these problems were accentuated by a total data-gathering period of only a few weeks which, unfortunately, came close to the end of the school term. Even though all such problems could probably have been avoided or ameliorated by more time for gathering data and a larger effort by project representatives at the school, there was another set of data-collection problems to which there is no ready solution. These problems may be summarized as follows:

1. School cost data from past years were sometimes destroyed as a matter of policy and sometimes kept so casually as to be partially or totally lost.

2. Accounting categories or subject areas were combined in such a way that there was no recourse to basic data that would permit a finer-grained analysis.

3. Cost data for an entire school district were sometimes aggregated in such a way that it was impossible to determine the amount of money expended by a given school short of reference to individual invoices--which are typically not filed for easy analysis.

4. Records in some schools were kept by calendar year rather than by fiscal year.

5. The accounting system recommended by the U.S. Office of Education was followed by most, but not all, schools. Even schools nominally following USOE accounting methods frequently modified or deviated from these methods.

6. Schools providing only the vocational part of a total curriculum for a given student required dovetailing their cost records with those of schools providing the other curriculum offerings if meaningful results for comparison with other schools were to be obtained. Yet, integration of records across such interlocking schools was often difficult or impossible.

7. Budget projections were frequently made in great detail, but actual cost records were kept in much more gross fashion. (When detailed questions about past costs are raised, budget projections are often used on the assumption that actual costs should not differ greatly from forecast costs.)

8. There was a strong tendency to use number of pupils as the basis for required prorations even where other methods would have been more appropriate.[2]

Attrition

Having enumerated the problems encountered in the data collection, the actual attrition experiences in the sample will be discussed. There were four reasons for excluding cases, in addition to the non-return of questionnaires. They were:

---

[2]Methods recommended, but not always used, for this study followed Financial Accounting for Local and State School Systems, OE-22017, pp. 130-139.

1. The general use of figures which were prorations from school district totals.

2. The classification of a school as a "part-time vocational," i.e., providing only part of the student's total curriculum.

3. The lack of sufficient questionnaire information to allow the calculation of item costs per student hour.

4. The discovery that the school had changed in some important way from one sample year to the next.

This last factor should be given some amplification. In several cases, the school (as defined by the name of its physical plant, for example) had changed drastically in some important aspect over the sample years, so that the data for the separate years were not comparable. These changes included physical plant, type of student admitted, (e.g., from high school students to adults only), type of program (e.g., vocational to comprehensive school), and size (e.g., as the result of jointure). Where such changes occurred, the only recourse was to drop the school (all sample years) from the study.

Table I shows the sample attrition encountered in terms of the reasons for dropouts and the loss to each study condition (year, comprehensive or vocational school, high or low graduate placement performance) due to these reasons.

Impact of Data Collection and School Attrition Problems

The net impact of data collection and school attrition problems is such as to make the authors skeptical of any substantive results. Even though this project was viewed as a rough pilot study based on 32 schools, the attrition from that sample and the extent to which data had to be culled in order to circumvent known pitfalls lead most directly and obviously to the conclusion that data for realistic cost-effectiveness studies of vocational education are not easily obtained. In any event, data that were available have been pruned in order to eliminate the more obvious misleading elements and present a very conservative and gross summary suggesting something of the general substantive findings. This summary is presented in the following sections.

Table 1

Sample Attrition

		Sample Size	Number of Cases Lost Due to					Total Cases Analyzed
			No Questionnaire Returned	District Prorations	Part-Time Vocational Status	Lack of Information	Intra-Case Non-Comparability	
1961-1962* Comprehensive	High**	8	4	1	-	-	1	2
	Low***	8	3	1	-	2	-	2
Vocational	High	8	1	-	1	-	1	5
	Low	8	5	-	2	1	-	0
1963-1964 Comprehensive	High	8	4	1	-	-	1	2
	Low	8	3	1	-	2	-	2
Vocational	High	8	-	-	1	-	1	6
	Low	8	5	-	2	1	-	0
1965-1966 Comprehensive	High	8	2	3	-	-	1	2
	Low	8	2	1	-	2	-	3
Vocational	High	8	-	-	1	-	1	6
	Low	8	2	2	3	1	-	0

*The 1961-1962 sample year cases are included in the analysis of operational, situational, and performance variables versus costs.

**High performance schools are those having a relatively good composite record of placing graduates rapidly in related jobs, and to their expressed satisfaction.

***Low performance schools have a relatively poor composite record.

Costs over Time

Table II indicates the general cost of educating comprehensive and vocational pupils as derived from the sample for the three fiscal years examined. Costs are presented both on a per student hour basis and as cost per student per year by assuming the school year to equal 1,175 hours (a mean of the schools in the sample). The cost per year figures can then be compared with the current expenditure per pupil figures published by the U.S. Department of Health, Education, and Welfare, Office of Education.

Table II

Costs over Time

Year	Type of School						Current U.S. Per Pupil Cost**
	Comprehensive			Vocational			
	Cost*	S.D.	No. of Schools	Cost*	S.D.	No. of Schools	
1961-1962	.480 (564)	.108	4	.523 (615)	.193	5	(419)
1963-1964	.599 (704)	.109	4	.673 (791)	.090	5	(461)
1965-1966	.843 (991)	.362	4	.847 (995)	.179	5	(532)

*Per student hour (per student per year)--both in dollars.

**These costs are for average daily attendance in public elementary and secondary schools as indicated in the Digest of Educational Statistics, OE-10024-66, p. 57.

The results summarized in Table II, if accepted at face value, suggest the following:

1. Costs as estimated from this study are increasing, as are reference costs based on national figures.

2. Costs in the sample were higher throughout the period of the study than were costs nationally.

3. Costs for the sample were rising more rapidly than costs nationally.

4. Costs in comprehensive schools were lower than in vocational schools for 1961-1962, but rose much more rapidly in the interim to approximate costs in vocational schools by 1965-1966.

The regular rise of costs as reflected by our sample estimates is consistent with all of the external evidence. Thus, the view is supported that the residual data, after elimination of all that is highly suspect, may have some gross validity. However, the sizable difference between per pupil costs from national data and costs estimated from the sample in this study may lead one to question the validity of the results. Of course, with the very small residual sample of schools, the results can be expected to have a sizable component of random error. The consistency of differences, though, suggests the likelihood that costs for sample schools represent differences from the national reference figures likely to be reflected with larger samples. The following are suggested as sources of difference worth consideration:

1. The national figures represent an aggregate of primary and secondary schools, whereas the sample estimates are based only on secondary schools. It seems likely that educational costs for secondary students are higher than for elementary students.

2. The original sample of 32 schools was drawn from the population of public secondary schools offering five or more T&I courses. It is probable that schools able to offer such a variety of courses are more affluent on the average than schools making a more restricted offering.

3. Schools remaining in the sample were those tending to have more facile accounting systems. In general, it is expected that schools having the more generous budgets would have such systems.

Comprehensive Versus Vocational Schools

The comparative costs of educating vocational students in a comprehensive school as opposed to a vocational school are presented in Table III.

Table III

Comparative Costs of Vocational Education
in Comprehensive and Vocational Schools

Year	Type of School								
	Comprehensive (Low Performance)*			Comprehensive (High Performance)*			Vocational (High Performance)*		
	Cost**	S.D.	No. of Schools	Cost**	S.D.	No. of Schools	Cost**	S.D.	No. of Schools
1961-1962	.353	.141	2	.440	.118	2	.523	.193	5
1963-1964	.506	.020	2	.613	.139	2	.673	.090	5
1965-1966	.667	.111	2	.870	.384	2	.847	.179	5

*High performance schools are those having a relatively good composite record of placing graduates rapidly in related jobs, and to their expressed satisfaction. Low performance schools have a relatively poor composite record.

**Costs for vocational education only, per student hour, in dollars.

A comparison of high performance vocational schools with high performance comprehensive schools suggests that even though vocational education in comprehensive schools may have been less expensive some years ago, by 1965-1966, costs in the two comprehensive schools in the sample were only slightly higher than those in the five vocational schools. The low performance comprehensive schools, in contrast, started and remained low in costs, as compared to both high performance comprehensive and high performance vocational schools. The gap remained despite a virtual doubling of costs for low performance comprehensive schools over the period studied.

Usable data could not be obtained for any of the low performance vocational schools. Consequently, it is only possible to conjecture about costs for such schools. In any event, the small amount of data available from this study concerning the relative costs of vocational education in comprehensive versus vocational schools reveals no essential difference.

Vocational and Non-Vocational Education in Comprehensive Schools

Table IV gives comparative costs per student hour for vocational and academic-general curricula in comprehensive schools for the three sample years.

Table IV

Comparative Costs for Vocational and Non-Vocational Education in Comprehensive Schools

Year	Type of Course				No. of Schools
	Vocational		Academic-General		
	Cost	S.D.	Cost	S.D.	
1961-1962	.396	.137	.564	.100	4
1963-1964	.560	.113	.638	.111	4
1965-1966	.768	.301	.918	.434	4

In all cases, the academic-general costs were higher. This result is surprising in view of the tendency for respondents to prorate using number of pupils, a procedure which tends to make the figures equal. It is evident then, that careless use of proration did not result in a lack of difference. Also somewhat surprising is the direction of the trend. Although much has been said about the high cost of educating the vocational student, the present sample yields the opposite result.

Cost and School Performance[3]

Costs of vocational education in comprehensive schools are shown separately for high and low performance schools in Table V.

[3]High performance schools are those having a relatively good composite record of placing graduates rapidly in related jobs, and to their expressed satisfaction. Low performance schools have a relatively poor composite record.

Table V

Costs for High Versus Low Performance Schools

Year	Graduate Placement Performance									
	High					Low				
	Vocational		Academic-General		No. of Schools	Vocational		Academic-General		No. of Schools
	Cost	S.D.	Cost	S.D.		Cost	S.D.	Cost	S.D.	
1961-1962	.440	.118	.656	.038	2	.353	.141	.472	.040	2
1963-1964	.613	.139	.700	.122	2	.506	.020	.577	.046	2
1965-1966	.870	.384	1.155	.514	2	.666	.111	.680	.004	2

The lower costs of vocational education in low performance schools noted previously when comparing comprehensive and vocational schools are matched by similar cost differences for academic-general education. It should be noted that performance data were available only for 1961-1962. Thus, the differences in cost shown for subsequent years may or may not have their concomitant in performance.

Differences between high and low performance schools in terms of detailed cost categories were also studied. However, no consistent and meaningful pattern emerged across schools for any year, for either vocational or academic-general education.

Costs and Operational-Situational Factors

Costs in 31 categories for the year 1961-1962[4] were correlated with data relating to policies and practices, relations with the community, population of the area served by the school, industrialization, enrollment, age of the physical plant, and unemployment in the area surrounding the school. As would be expected from a large number of correlations, some did reach a statistical criterion of significance. However, it appears that the pattern for all variables except unemployment arose by chance. Results for unemployment are treated in more detail in the section which follows.

[4]The only year for which operational-situational data were available.

Costs and Unemployment Rate

Costs for schools located in areas with either high or low unemployment during 1961-1962 are shown in Table VI. Both comprehensive and vocational schools showed a relatively consistent tendency for costs to be higher in areas of high employment than in areas of low employment. Closer analysis disclosed that the bulk of the relationship was due to the effect of instructional costs, Items 8 through 22 on the questionnaire. Figures for the remaining subparts, ancillary services (Part A), maintenance of plant, and capital outlays showed no consistent trend.

It is impossible, of course, to determine the nature of causal relationships from the available data. However, the authors are inclined to doubt that there is a direct causal relationship in either direction. More likely, high employment and high educational costs are both resultant of a vigorous economic context.

Table VI

Costs and Unemployment Rate

Type of School	Unemployment Rate					
	High			Low		
	Cost*	S.D.	No. of Cases	Cost*	S.D.	No. of Cases
Comprehensive	.408	.086	2	.453	.105	2
Vocational	.441	.211	3	.522	.154	3
Both	.428	.173	5	.495	.141	5

*Per student per hour in dollars, vocational costs only.

CONCLUSIONS AND RECOMMENDATIONS

Available Cost Data

There are cost data available for individual schools which could not be obtained within the scope of the current study. To exploit such data fully would require a substantial investment of time and effort in most schools, even to cover a few years' data. An individual skilled in educational accounting methods would have to spend at least a few weeks at a given school, working closely with administrative and clerical staffs.

Even with an intensive effort at each school, we would not be optimistic about the scope and depth of the analysis that could be supported by the resulting data. Insofar as we have been able to determine from this study, cost data for vocational education are not routinely kept in a way that makes them accessible for rigorous analytic and evaluative purposes. In particular, breakdowns by course areas are almost entirely lacking. We would expect, therefore, that more intensive efforts to extract existing data would yield useful results, but that most analytic aspirations would be frustrated by inadequacies in the available data.

New Cost Data

The more promising approach to effective cost analysis seems to lie in the establishment of new procedures for the recording of cost data so that they would be readily available for assessment purposes. Such procedures could be compatible with existing U.S. Office of Education accounting guidelines, but would require specific attention to the needs of evaluation and planning for a facile data base.

Performance Data

An attempt was made to determine for each of the schools in this study whether an organized body of data existed concerning operating parameters and performance of its graduates. Insofar as we were able to determine, the only such organized information that was available had been generated under previous research studies conducted by AIR.

We would conclude, therefore, that a group interested in evaluation and planning on a continuing basis would do well to establish procedures which have as their specific purpose the generation of performance data. It is unlikely that these data will otherwise be available.

An Evaluation and Planning Information System

Our principal recommendation, then, is that the U.S. Office of Education undertake a feasibility and preliminary design study for an evaluation and planning information system. This effort should be fully cognizant of and compatible with educational assessment, educational statistics, and unified accounting programs. However, we can see no inevitable reason why the needs of a national educational evaluation and planning group will be fully served without design efforts directed to its specific purposes.

Such a design and, if deemed feasible, development effort needs to be broad in at least two respects. First, persons from a variety of disciplines can contribute to effective design. Local educators, business managers and accountants, educational administrators, policy boards, econometricians, behavioral scientists, and educational researchers come readily to mind as having worthwhile considerations to suggest. Second, consideration should be given to the design of a basic information system broadly enough conceived to encompass the purposes of the full gamut of education--not only vocational education.

APPENDIX A

Questionnaire and Instruction Sheets

AIR AMERICAN INSTITUTES FOR RESEARCH
135 NORTH BELLEFIELD AVENUE
PITTSBURGH, PENNSYLVANIA 15213

Institute for Performance Technology

GENERAL INFORMATION

Objective: Lack of appropriate cost data has attenuated the effectiveness of resource planning and allocation for education. The data you are asked to provide on the enclosed forms will assist the U. S. Office of Education in an important way toward the development of improved planning techniques.

Procedure: There are basically two types of materials to be used in this study: a set of financial sheets for each of three sample school years, and a book of definitions of the terminology used on these sheets. It is hoped that all information can be gathered by the end of the school day. As the actual time to be spent in the school is severely limited, it would be extremely helpful if you or your staff could do the following previous to our arrival:

1. Determine the location of records for the indicated study years and have these available for inspection.

2. Have copies made of the detailed school budgets where they are in a good format such as balance sheets, cash receipts and disbursements, cash accounts, general fund expenditures, etc.

3. Have available detailed financial information as broken by educational area and even by specific vocational course offering.

4. Complete as much of the requested information for the study years as possible. Where there are questions, have the data available and we will try to solve their entry.

5. Where items like food, transportation, textbooks, etc., are either cost shared by students or other sources, we will need to know the nature of such sharing.

Study Years: The study will be for the school years 1961-1962, 1963-1964, and 1965-1966. If your books and records are kept on a fiscal-year basis, the information should be readily transferable to the data forms. If your

TELEPHONE: (412) 683-7600 • CABLE: AIRESEARCH

records are kept on a calendar-year basis, it will be necessary to prorate expenditures from two-years' budgets into our form covering only the school year.

Forms: For each of the sample years, there are five forms used. The first three seek financial information in increasing detail.

PART A: Covers those items of expense most likely to be recorded for the whole school and not likely to be attributable to any specific course program.

PART B: Covers items which would be most meaningfully attributed to educational areas.

PART C: Requests additional detailed information on certain items of PART B with reference to specific course offerings.

PART D: Requests information related to enrollment, attendance, number of teachers, etc. These data will help the derivation of meaningful financial measures and ratios.

PART E: Refers to the physical plant, use of school premises, and gifts and other non-school systems.

THIS IS TO BE FILLED OUT ONLY ONCE FOR ALL THE STUDY YEARS

Prorating or Allocating Funds: A realistic picture of funds required in vocational programs can be obtained only if the allocations to these programs are undertaken on a sound basis. Where you have no records of such specific allocations, please attempt to make some allocation, whether by the number of pupils or by some other realistic method.

It would be helpful if an adding machine or calculator would be available for use during the day the staff member will be there. Also, the availability of photocopies of budgets and detailed budgets would be most helpful and reduce the amount of time required for transfer of data.

We look forward to working with you on this project.

DEFINITIONS OF ACCOUNTING CATEGORIES AND COST BREAKDOWN SUBDIVISIONS

The following definitions should be referred to when completing the cost of operations questionnaires. They are designed to coincide generally with those found in Financial Accounting for Local and State School Systems, OE-22017, U. S. Department of Health, Education, and Welfare, Office of Education. Should any questions arise, therefore, this source will probably provide the best answer. The Item number indicated below refers to the questionnaire, and the reference is to the appropriate page in the Financial Accounting Handbook.

Item 1. Attendance Services (Series 300, ref. p. 53)

Attendance services consist of those activities which have as their primary purpose the promotion and improvement of children's attendance at school. Included are salaries of attendance personnel and clerical staff, prorated if not full time (not including teachers of the home-bound or institutionalized); supplies including rented equipment used by these people in this capacity; and travel expenses (except maintenance of district-owned vehicles) required in this capacity.

Item 2. Health Services (Series 400, ref. p. 54)

Health services are activities in the field of physical and mental health (medical, dental, psychiatric, and nursing services), not direct instruction for all public school students and employed personnel. Examples include, but are not limited to in-school medical service, students pre-enrollment physical, or examinations prior to employment. Also include supplies (except such items as shoes, glasses, etc.), and travel expenses.

Item 3. Pupil Transportation Services (Series 500, ref. p. 57)

Pupil transportation services consist of those activities which have as their purpose the conveyance of pupils to and from school activities, either between home and school or on trips from curricular or co-curricular activities. Included are salaries for supervisors, drivers, mechanics, and clerks involved in this activity, prorated if not full time; contracted services (public carriers, parents carrying groups of children, etc.); replacement of vehicles (less trade-in) but not outlay for initial or additional vehicles; rental vehicles; insurance; expenditures in lieu of transportation (money spent on room and board for students, etc.); and maintenance supplies (gasoline, oil, parts, etc.).

Item 4. Operation of Plant (Series 600, ref. p. 62)

Operation of plant consists of the housekeeping activities (cleaning, heating, lighting, communications, handling furniture and stores, care of grounds, etc.) concerned with keeping the physical plant open and ready for use. Not included are expenses for repair and replacement of facilities and equipment. Include salaries of all personnel associated with operation (prorated if not full time), contracted services, heat and utilities, and supplies.

Item 5. Fixed Charges (Series 800, ref. p. 75)

Fixed charges are expenditures of a generally recurrent nature not readily allocable to other expenditure categories. Included are insurances and bonding (except transportation insurances), rental of land and buildings, interest on current loans (if paid back in same fiscal year of loan). Do not include school contributions to employee retirement or other fringe benefits. (See Item 11)

Item 6. Food Services (Series 900, ref. p. 80)

Food services are those activities which have as their purpose the preparation and serving of regular and incidental meals, lunches, or snacks in connection with school activities. Include only those expenses (prorated as required) for which no reimbursement (either through receipts from lunch sales or Federal or State Grants) is received. Include salaries of all personnel associated with food service (prorated if not full time), food, and supplies.

Item 7. Student Body Activities (Series 1000, ref. p. 81)

Student body activities are direct and personal services to public school pupils that are managed and operated by the student body under the direction of adults and are not part of the regular instructional program. Examples are athletics, entertainments, publications, clubs, etc. Include salaries of all personnel connected with all activities, prorated with regard to extent of participation and other relevant expenses such as supplies. Include as expenses only that portion of the costs which were/are not reimbursable (by fees, admission to activities, or other sources).

Items 8 through 17. Salaries for Instruction (Series 210, ref. p. 47)

Salaries for instruction are divided into categories as indicated below. Total gross figures should be included for all personnel within a category, prorated where full time is not expended within a single category. Note that the fringe benefit figures are to apply to teachers only. The categories are principal, assistant, or special principal

(any personnel performing the functions of a principal), consultants, and supervisors (e.g., supervisors of libraries and consultants for audio-visual education). Teachers (including teachers of the exceptional, homebound or institutionalized), fixed changes (fringe benefits, teachers only), other instructional personnel (librarians, audio-visual personnel, guidance and others), and secretarial and clerical help.

Item 18. Textbooks (Series 220, ref. p. 49)

Expenditures for textbooks furnished free to all public school pupils, binding and repairs, and freight and cartage charges. If texts are purchased then resold or rented, include here only the difference between the purchase price and the total money return.

Item 19. School Library (Series 230, ref. p. 50

Expenditures for regular or incidental purchases of books and periodicals available for general use by the pupils whether or not a library area proper exists. Do not include the capital outlay expended in stocking a new library.

Item 20. Audio-Visual Materials (Series 230, ref. p. 50)

Expenditures for regular or incidental purchases of audio-visual materials available for general use by the pupils whether or not a central audio-visual laboratory or storage facility exists. Do not include the capital outlay expended in stocking a new audio-visual facility.

Item 21. Teaching Supplies (Series 240, ref. p. 51)

Expenditures for all supplies which are actually or constructively consumed in the teaching-learning process, including their freight or cartage. Included are such things as tests, chalk, paints, brushes, shop supplies, oils, cleaners, work books, physical education supplies, printing of classroom materials, etc.

Item 22. Other Expenses for Instruction (Series 250, ref. p. 51)

Expenditures such as supplies (e.g., office supplies, professional books and subscriptions for the instructional staff, supplies for teachers on-the-job training, graduation expenses, etc.), travel expenses and miscellaneous.

Items 23 through 25. Maintenance of the Plant (Series 700, ref. p. 68)

Maintenance of the plant consists of those activities that are concerned with keeping the grounds, buildings, and equipment in their

original condition of completeness or efficiency, either through repairs or replacements of property (less than replacement of a whole building). Subdivisions of maintenance are replacement of instructional equipment (piece-for-piece replacement of not built-in items manufactured by others than school employees), repair of instructional equipment (prorated salaries of all personnel as associated with the repair of instructional equipment, and cost of parts), and a total of all remaining maintenance expenditures.

Items 26 through 28. Capital Outlay (Series 1200, ref. p. 88)

Capital outlay expenditures are those which result in the acquisition of fixed assets or additions to fixed assets. Examples are expenditures for land or existing buildings, improvements of grounds, construction of buildings, additions to buildings, remodeling, etc. Three subdivisions are included herein: Buildings (plans and fees toward acquisition and improvement of buildings and building sites, and actual expenditures for said acquisitions and improvement); instructional equipment (acquisition expenses for furniture and equipment for instruction, e.g., desks, bookcases, typewriters, major laboratory and shop equipment, etc.); and all other capital outlays.

PART A

SCHOOL:_____

SCHOOL CODE:_____

For Period:

From: _____, 196_

To: _____, 196_

106-1( ) Calender Year
2( ) Fiscal Year

INSTRUCTIONS: Indicate in the space to the left whether you are using a fiscal or a calendar year basis for your financial data. For each of the financial categories listed in the left column, enter the appropriate financial data for the whole school (Column A) for the year shown. Round each figure to the nearest thousand. The last three 0's are already entered for you. If any specific category or sub-category is not applicable to your school, indicate this by marking "NA" in the appropriate space.

For each financial category completed for the whole school, attempt to pro-rate or proportionately allocate this total figure among the three general types of educational program listed; e.g., College Preparatory Education, General Education, and All Vocational Education. If such an allocation of funds is possible, use the following code to indicate the method you used for this allocation. Definitions of these codes are provided below.

A. TIME
B. TIME-FLOOR AREA
C. AVERAGE DAILY ATTENDANCE (ADA) OR AVERAGE DAILY MEMBERSHIP (ADM)
D. HOUR-CONSUMPTION
E. NUMBER OF PUPILS
F. MILEAGE
G. QUANTITY CONSUMED

AMERICAN INSTITUTES FOR RESEARCH
135 North Bellefield Ave.
Pittsburgh, Pennsylvania
(412) 683-7600

ITEM # (See Notes)	FINANCIAL CATEGORY	CODE	TOTAL SCHOOL EXPENDITURE FOR THE YEAR (A)	BASIS FOR ALLOCATION OR PRO-RATING AMONG EDUCATIONAL AREAS (Use Above Code) (B)	PORTION ATTRIBUTABLE TO COLLEGE PREPARATORY EDUCATION (C)	PORTION ATTRIBUTABLE TO GENERAL EDUCATION (D)	PORTION ATTRIBUTABLE TO ALL VOCATIONAL EDUCATION (E)	COMMENTS
1	ATTENDANCE SERVICES	107	$, ,000		$, ,000	$, ,000	$, ,000	
2	HEALTH SERVICES	206	$, ,000		$, ,000	$, ,000	$, ,000	
3	TRANSPORTATION SERVICES	306	$, ,000		$, ,000	$, ,000	$, ,000	
4	OPERATION OF PLANT	406	$, ,000		$, ,000	$, ,000	$, ,000	
5	FIXED CHARGES (Other than employee benefits)	506	$, ,000		$, ,000	$, ,000	$, ,000	
6	FOOD SERVICES	606	$, ,000		$, ,000	$, ,000	$, ,000	
7	STUDENT BODY ACTIVITIES	706	$, ,000		$, ,000	$, ,000	$, ,000	

DEFINITION OF PRO-RATING METHODS

A. TIME. The time method consists of allocating a part of an expenditure to a given activity in proportion to the time spent in the activity.

B. TIME-FLOOR AREA. The time-floor area method consists of allocating a part of an expenditure to a given activity in proportion to the gross floor area used by the activity and the length of time the floor area is used.

C. AVERAGE DAILY MEMBERSHIP. The average daily membership method consists of allocating a part of an expenditure to a given activity in proportion to the average daily membership of the pupils engaged in that activity.

D. AVERAGE DAILY ATTENDANCE. The average daily attendance method consists of allocating a part of an expenditure to a given activity in proportion to the average daily attendance of the pupils engaged in that activity.

D. HOUR-CONSUMPTION. The hour-consumption method consists of allocating a part of an expenditure to a given activity in proportion to the length of time the activity uses facilities multiplied by the hourly rate of consumption of utilities by the facility.

E. NUMBER OF PUPILS. The number of pupils method consists of allocating a part of an expenditure to a given activity in proportion to the actual number (not an average like ADM) of pupils involved.

F. MILEAGE. The mileage method consists of allocating a part of an expenditure to a given activity in proportion to the mileage traveled for the activity.

G. QUANTITY CONSUMED. The quantity consumed method consists of allocating a part of an expenditure to a given activity in proportion to the actual consumption of supplies or other commodities.

PART B

INSTRUCTIONS: For each of the financial categories listed in the left column, enter the appropriate financial data for the whole school (Column A) for the same year as in Part A. Round each figure as indicated by the 0's. If any specific category or sub-category is not applicable to your school, indicate this by marking "NA" in the appropriate space.

For each financial category completed for the whole school, attempt to pro-rate or allocate this total figure among the educational programs offered, including the specific vocational offerings listed. If you cannot provide specific figures, give the total for all vocational programs (Column E). If such allocations are used, use the same code as you used on Part A to indicate the basis.

In some of the categories, we would appreciate additional detail with reference to specific courses. Where the phrase "See Part C" is found, space in Part C for additional specific course detail is provided.

ITEM (See Note)	FINANCIAL CATEGORY	CODE	TOTAL SCHOOL EXPENDITURE (A)	BASIS OF ALLOCATION (B)	ATTRIBUTABLE TO COLLEGE PREPARATORY (C)	ATTRIBUTABLE TO GENERAL EDUCATION (D)	ATTRIBUTABLE TO ALL VOCATIONAL (E)	VOCATIONAL AREA SUB-CATEGORIES					
								AGRICULTURE EDUCATION (F)	DISTRIBUTIVE EDUCATION (G)	HEALTH EDUCATION (H)	HOME ECONOMICS (I)	OFFICE EDUCATION (J)	T & I and TECHNICAL (K)
	INSTRUCTIONAL COSTS												
8	PRINCIPAL AND OTHER ADMINISTRATIVE	806	$, 00		$, 00	$, 00	$, 00	$, 00	$, 00	$, 00	$, 00	$, 00	$, 00
9	CONSULTANTS AND SUPERVISORS	906	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
10	TEACHERS	1006	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000 See Part C
11	FIXED CHARGES (Benefits)	1106	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
12	OTHER INSTRUCTIONAL STAFF (Total)	1206	,000		,000	,000	, 00	, 00	, 00	, 00	, 00	, 00	, 00
13	School Librarian(s)	1306	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
14	Audio-Visual Personnel	1406	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
15	Guidance and Placement	1506	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
16	Other Instructionsl Personnel	1606	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
17	SECRETARIAL AND CLERICAL AIDES	1706	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
18	TEXTBOOKS	1806	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
19	LIBRARY MATERIALS (books, etc.)	1906	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
20	AUDIO-VISUAL MATERIALS	2006	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
21	TEACHING SUPPLIES	2106	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
22	OTHER TEACHING EXPENSES (e.g. travel, supplies, etc.)	2206	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
	MAINTENANCE OF PLANT												
23	REPLACEMENT-INSTRUCTIONAL EQUIP.	2306	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
24	REPAIR OF INSTRUCTIONAL EQUIP.	2406	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
25	ALL OTHER MAINTENANCE	2506	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00
	CAPITAL OUTLAYS (This Year)												
26	BUILDINGS	2606	,000		,000	,000	,000	,000	,000	,000	,000	,000	,000
27	INSTRUCTIONAL EQUIPMENT	2706	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00 See Part C
28	ALL OTHER CAPITAL OUTLAYS	2806	, 00		, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00	, 00

PART C

INSTRUCTIONS: In certain categories of Column K of PART B, it was indicated that additional information would be desired on the allocation of costs by Trade and Industrial and/or Technical Course subjects taught in your school. If at all possible, we would like the total figures reported in Column K, PART B broken into the courses listed below. If your school does not teach a listed course, indicate this in Column A. If a course that is taught in your school is not listed, enter this in the "Other" space. First transfer the totals from Column K, PART B to the spaces indicated below and then try to allocate each total to the appropriate course listed in the left column. For Columns H & I below indicate the expected useful life of the equipment.

CODE	SUBJECT OR COURSE OFFERING IN STUDY YEAR	TOTAL $ NOT TAUGHT (A)	$ TEACHERS (B) #10	$ FIXED CHARGES (Benefits) (C) #11	$ OTHER INSTRUCTIONAL PERSONNEL (D) #12	$ TEXTBOOKS (E) #18	$ AUDIO-VISUAL EQUIPMENT (F) #20	$ TEACHING SUPPLIES (G) #21	$ REPLACEMENT OF INSTRUCTIONAL EQUIPMENT (H) #23	$ REPAIR OF INSTRUCTIONAL EQUIPMENT (I) #24	$ CAPITAL OUTLAY INSTRUCTIONAL EQUIPMENT (J) #27
01	AUTOMOTIVE MECHANICS										
02	AUTO BODY REPAIR										
03	AIRCRAFT MECHANICS										
04	AIR-CONDITIONING, HEATING										
05	CARPENTRY										
06	COMMERCIAL ART										
07	DATA PROCESSING										
08	DRAFTING										
09	ELECTRICAL TRADES										
10	ELECTRONICS										
11	FOOD TRADES										
12	FOUNDRY										
13	MACHINE TRADES										
14	MASONRY										
15	MILL AND CABINETRY										
16	METAL TRADES										
17	PAINTING & DECORATING										
18	PLUMBING										
19	PRINTING										
20	RADIO & TV REPAIR										
21	SHEET METAL FABRICATION										
22	SHOE REPAIR										
23	TAILORING-POWER SEWING										
24	UPHOLSTERY										
25	WELDING										
	OTHER										

PART D

INSTRUCTIONS: In the coulmn at the left are listed various educational programs which may be taught at your school, If an educational area is not taught, indicate this by marking an "X" in Column A. Under Trade and Industrial and Technical Courses list all the separate offerings by the school in the study year. For each educational area and course listed, complete the information requested in the column headings. Also complete the data requested at the bottom of the page.

EDUCATIONAL AREA OR COURSE	CODE	NOT TAUGHT	TOTAL NUMBER FULL-TIME EQUIVALENT TEACHERS	TOTAL DEGREES OR CERTIFICATES GRANTED STUDENTS	TOTAL SQUARE FEET ALLOCATED AREA OR COURSE	AVERAGE CLASS SIZE	TOTAL NUMBER OF STUDENTS ENROLLED	Average Hours per Student per Week				% AVERAGE DAILY ATTENDANCE
								ACADEMIC CLASSES AND LABS	VOCATIONAL CLASSES	VOCATIONAL LABS OR SHOPS	COOPERATIVE WORK-STUDY PROGRAMS	
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
COLLEGE PREPARATORY	5006											
GENERAL	5106											
ALL VOCATIONAL	5206											
AGRICULTURE	5306											
DISTRIBUTIVE	5406											
HEALTH	5506											
HOME ECONOMICS	5606											
OFFICE	5706											
T&I or TECHNICAL*	5806											
TOTAL FOR SCHOOL												

*List in the blanks the courses shown in Part "C" which are offered by your school and include any additional ones not shown there. Use separate sheets if required. Fill in items B through K for each.

A. How many weeks in the school year? _____ Weeks

B. Total number of class hours per week? _____ Hours

C. Total cost of operating the school for the study year. $_____

PART E

ADDITIONAL DATA ON PHYSICAL PLANT, SCHOOL USE AND GIFTS AND GRANTS
(Complete only for the last study year 1965-1966)

I. Life Cycle of Physical Plant

A. How many buildings comprise the physical plant of this school? _____Buildings

B. For each building of the school's physical plant which existed during the study year, please record the following:

	FIRST BUILDING	SECOND BUILDING	THIRD BUILDING
1. When was the structure built?	Year _____	Year _____	Year _____
2. What was the original cost of the building?	$_____	$_____	$_____
3. How long is the building expected to be in use based on the date of original construction?	_____ Year	_____ Year	_____ Year
4. Is (was) the building to be destroyed or sold by the school district when the school no longer needs it?	( )Destroyed ( )Sold ( )Other _____ (Explain)	( )Destroyed ( )Sold ( )Other _____ (Explain)	( )Destroyed ( )Sold ( )Other _____ (Explain)
5. If destroyed or sold, what was the cost of destruction or the value at the time of sale?	$_____	$_____	$_____
6. Has the building undergone a renovation designed to increase its useful life (e.g. a complete rewiring or replumbing, new roof)?	( )YES ( )NO What?_____ _____	( )YES ( )NO What?_____ _____	( )YES ( )NO What?_____ _____
FIRST RENOVATION			
(a) When was it done?	Year _____	Year _____	Year_____
(b) What was original cost?	$_____	$_____	$_____
(c) How many years is the renovation expected to be useful?	_____Years	_____Years	_____Years
SECOND RENOVATION			
(a) When was it done?	Year _____	Year _____	Year _____
(b) What was original cost?	$_____	$_____	$_____
(c) How many years is the renovation expected to be useful?	_____Years	_____Years	_____Years
7. Was this building originally designed as a vocational structure?	( )YES ( )NO	( )YES ( )NO	( )YES ( )NO

(Please fill out additional sheets for more than three buildings or more than two renovations per building.)

II. Use of School Premises

A. How many hours per day or week are the school premises available for use? _____Hours per day _____Hours per week

B. Are the school premises used for other than regular full-time day school instruction? ( )YES ( )NO

1. If "Yes" to Question B, please answer the following for each type of use other than community services:

	ADULT EDUCATION	SUMMER SCHOOL	MANPOWER DEVELOPMENT TRAINING	OTHER (Specify) _____
(a) Is this use during the regular school day, or at other times, such as night?	( ) School Day ( ) Other	( ) School Day ( ) Other	( ) School Day ( ) Other	( ) School Day ( ) Other
(b) Of the total hours available (per day or week) for school building use, how many are used for such activities?	Hour/day _____ Hour/week _____	Hour/day _____ Hour/week _____	Hour/day _____ Hour/week _____	Hour/day _____ Hour/week _____
(c) What are the total number of student hours involved per week?	_____	_____	_____	_____

	ADULT EDUCATION	SUMMER SCHOOL	MANPOWER DEVELOPMENT TRAINING	OTHER (Specify) _____
(d). Is there any charge or reimbursement for this use?	( ) YES ( ) NO	( ) YES ( ) NO	( ) YES ( ) NO	( ) YES ( ) NO
(1) If "Yes" to "d" above, what is the dollar amount?	$_____	$_____	$_____	$_____
(2) Does this cover the full cost of the program? e.g., all overhead, operating, and instructional costs.	( ) YES ( ) NO	( ) YES ( ) NO	( ) YES ( ) NO	( ) YES ( ) NO
(3) If "No" to "(2)" above, what is this designed to cover?				
(i) Instruction only	( )	( )	( )	( )
(ii) Operating costs only (utilities & incidental maintenance & janitorial)	( )	( )	( )	( )
(iii) Overhead costs (rent, interest on capital, administration, etc.)	( )	( )	( )	( )
(iv) (i) & (ii)	( )	( )	( )	( )
(v) (i) & (iii)	( )	( )	( )	( )
(vi) (ii) & (iii)	( )	( )	( )	( )

III. Gifts and Other Non-School System Support

A. Does your school regularly receive support in the form of goods and services from other local, state, or federal governments? Examples of this would be free electricity, water, sewage, or police services? ( ) YES ( ) NO

1. If "Yes" to Question "A" above, what is the type of support and annual value of this support?

   a. Type_____ Annual Value_____

   b. Type_____ Annual Value_____

   c. Type_____ Annual Value_____

   (Please record annual value consistent with either the fiscal year or calendar year method of accounting used by your school).

B. Has your school received at any time within the existence of the school the gift or grant of a building or other physical structure (other than shop equipment, etc.)? ( ) YES ( ) NO

1. If "Yes" to "B" above,

   a. When was the gift given?_____

   b. What was its monetary value at the time of the gift?_____

   c. What was the expected useful life at the time of the gift?_____

C. Is your school using any buildings or equipment on a loan basis, such as federal surplus machine tools, for which it is not making a reciprocal payment? ( ) YES ( ) NO

1. If the answer is "Yes" to "C" above, what is the current market value of such equipment?

   a. Exact amount _____

   b. Approximate amount (if an exact or audited amount is not available)_____

   c. Don't Know (check if a realistic estimate cannot be made)_____

APPENDIX B

Samples of Letters Sent to State Directors of Vocational Education, Superintendents of Schools, and School Principals

STATE DIRECTORS

AIR AMERICAN INSTITUTES FOR RESEARCH
135 NORTH BELLEFIELD AVENUE
PITTSBURGH, PENNSYLVANIA 15213

We are contacting you at this time to obtain your assistance with another research study. Your cooperation during the past few years with the studies, "The Process and Product of T&I High School Level Education in the United States" sponsored by the Ford Foundation, and the "School and Community Factors in Employment Success of T&I Graduates" sponsored by the Department of Labor is greatly appreciated.

This new study is being conducted for the U.S. Office of Education and is entitled "An Analysis of Cost and Performance Factors in the Operation and Administration of Vocational Programs in Secondary Schools." Where vocational and non-vocational programs are conducted within the same school, data for non-vocational programs will also be obtained.

We anticipate obtaining data from 32 schools across the country, including the attached list from your state.

A data form will be sent to each participating school and a personal visit will be made by a representative from AIR. It is our intention that the current study will provide information that will be helpful in the development of improved educational planning and resource allocation.

Any assistance you can offer will be greatly appreciated.

Sincerely,

James W. Altman
Project Director

JWA:jl

TELEPHONE: (412) 683-7600 • CABLE: AIRESEARCH

SUPERINTENDENTS

AIR AMERICAN INSTITUTES FOR RESEARCH
135 NORTH BELLEFIELD AVENUE
PITTSBURGH, PENNSYLVANIA 15213

Past cooperation in the studies "The Process and Product of T&I High School Level Education in the United States" and "School and Community Factors in the Employment Success of T&I Graduates" is greatly appreciated. The U.S. Office of Education is in urgent need of additional information concerning the availability of cost and performance information as it relates to vocational education. The American Institutes for Research is assisting the Office of Education in gathering information from 32 schools across the country, including (Name of School).

Data forms for the study are undergoing final preparation and will be sent for your information in the very near future. Our representative will phone the school to make arrangements for a one-day visit during the latter part of May. It is anticipated that he will be able to obtain the required information in that period of time. His efforts will be greatly facilitated, of course, if the school staff is able to review the types of information required ahead of time and ensure that the data are readily available.

Your past cooperation has been most beneficial to educational research and development, and we hope that we can obtain your additional cooperation in this endeavor. We will be pleased to offer each school a $200 honorarium as a token of appreciation. Data will not be associated with schools, districts, or states for either the U.S. Office of Education or in any general publications.

Sincerely,

James W. Altman
Project Director

JWA:jl

TELEPHONE: (412) 683-7600 • CABLE: AIRESEARCH

PRINCIPALS

AIR AMERICAN INSTITUTES FOR RESEARCH
135 NORTH BELLEFIELD AVENUE
PITTSBURGH, PENNSYLVANIA 15213

Past cooperation in the studies "The Process and Product of T&I High School Level Education in the United States" and "School and Community Factors in Employment Success of T&I Graduates" is greatly appreciated. The U.S. Office of Education is in urgent need of additional information concerning the availability of cost and performance information as it relates to vocational education. The American Institutes for Research is assisting the Office of Education in gathering information from 32 schools across the country, including (Name of School).

Data forms for the study are undergoing final preparation and will be sent to you in the near future so that you are able to review in advance the types of information required. Our representative will contact you to make the necessary arrangements for a one-day visit during the latter part of May.

Your past cooperation has been most beneficial to educational research and development and we hope that we can obtain your additional cooperation in this endeavor. We will be pleased to offer each school a $200 honorarium as a token of appreciation. Data will not be associated with schools, districts, or states for either the U.S. Office of Education or in any general publications.

Sincerely,

James W. Altman
Project Director

JWA:jl

TELEPHONE: (412) 683-7600 • CABLE: AIRESEARCH

APPENDIX C

Definition of Variables

Definition of Variables

Cost Per Student

The following formula was used to obtain cost per student hour:

$$\text{Cost/student hour} = \frac{C}{A \times N \times W \times H}$$

Where: C = school cost

A = average daily attendance

N = number of pupils enrolled

W = number of weeks in the school year

H = number of hours per school week

School Type

In general, schools offering a vocational curriculum can either be classed as vocational or comprehensive. Vocational schools offer no courses other than those specifically designed to teach one of a selection of trades, and in some cases related courses required by state law (English, history, a mathematics or science course, etc.) before a diploma can be awarded. Comprehensive schools offer college preparatory and general education as well as vocational courses.

Where a vocational school depended on "feeder schools" for providing its students with the related or required subjects, it was considered as a "part-time vocational" since such schools usually have only half-day sessions. Cost figures obtained from these schools do not represent the complete cost of educating the student and, therefore, cannot be meaningfully compared with those cost figures obtained from either the comprehensive or "full-time" vocational schools. Thus, the "part-time" vocational data were used only in the correlational analysis.

School type was the most important single variable under consideration in that this differentiation made it possible to examine the differences between academic-general and vocational costs and also, those between vocational curricula as taught in the comprehensive and vocational schools.

Curriculum Type

Of major concern in the present study was the effect of curriculum type on the cost of educating the student. Thus, the comprehensive schools in the sample were divided into vocational or academic-general

course areas so that any cost per pupil differential could be identified. The total cost of educating a pupil in the trade or "major" within the division was to be represented, including related costs.

Graduate Performance

The third major variable was job performance of vocational graduates from the participating schools. The Eninger study (2) derived many measures of graduate performance from which three were selected on the basis of their stability and reliability and combined into a single measure. The three selected were job security, job relatedness, and job satisfaction.

The job security measure describes what percentage of employable time in the two years following graduation was actually spent in gainful employment. The equation is:

$$JS = \frac{M}{T} \times 100$$

Where: M = total months employed in the two years following graduation (includes part-time jobs)

T = total months of employable time; i.e., months in the two years following graduation minus months spent in: (1) military service, (2) hospitals, (3) full-time education

Job relatedness describes the degree to which the graduate has been working in the trade for which he was trained. It is based upon his judgment of how each job he has held related to his high school training. The equation is:

$$JR = \frac{\sum_{i=1}^{N} R_i \cdot d_i}{4M} \times 100$$

Where: R_i = relatedness rating of job; i.e., "same" = 4; "highly related" = 3; "slightly related" = 2; "unrelated" = 1

d_i = duration of any given full-time job in months

M = total months employed full time in the two years following graduation

N = number of separate jobs held

Job satisfaction is based upon the graduate's rating of how satisfied he has been with jobs held since high school graduation. The equation is:

$$JS = \frac{\sum_{i=1}^{N} S_i \cdot d_i}{4M} \times 100$$

Where: S_i = satisfaction rating of job; i.e., "very satisfied" = 4; "satisfied" = 3; "dissatisfied" = 2; "very dissatisfied" = 1

d_i = duration of any given <u>full-time</u> job in months

M = total months employed full time in the two years following graduation

N = number of separate jobs held

For each of these measures, a school score was obtained by taking the mean of the individuals' scores on that measure.

After determining the best measures of employment performance, the eight high- and eight low-performing schools of each type, i.e., vocational and comprehensive schools, were identified using the following method:

1. The 100 schools in the original sample were separated into the 50 vocational and 50 comprehensive schools.

2. Each school's score for each criterion was converted to a standard score (z) to insure comparability of scores from one criterion to another.

3. The three z-scores were summed algebraically with regard for the sign in order to develop a combined score for each school.

4. The school scores (sums of the z-scores) were then rank ordered by sign. (The highest positive scoring school became the first school to be selected for the high performance group, the next highest scoring school became the second, etc. This procedure was repeated for the negative scoring schools for the low performance group.)

5. The 16 comprehensive and 16 vocational schools were selected by completing the process described in step 4.

Administration Policies and Practices

The Altman and Morrison study (1) produced several of the variables examined in the present research. The first of these was a quantification of the policies and practices of the school administration with regard to graduate placement. Five aspects of these policies and practices seemed particularly relevant and were, therefore, included in the present study. These aspects were:

1. The existence of a specific placement program.

2. The identification of a placement coordinator.

3. The assignment of defined responsibilities for the program.

4. A personal, direct approach to community representatives with regard to placement.

5. A flexible variety of approaches as opposed to a sizable, inflexible one.

In order to derive quantitative information on these aspects, the same basic data used by Altman and Morrison were reexamined. The questionnaires previously completed by administrators and teachers of the schools participating in the current study contained six items relating to policies and practices. These items and the procedures used to obtain item school scores were as follows:

Item: A check list of those staff members who have assigned responsibilities for T&I graduate placement. (Answered by the principal only.)

Scoring: The number of staff members checked.

Item: Is there one person who has direct responsibility for coordinating and/or controlling placement effort? (Answered by the principal only.)

Scoring: Scored together with the item above, a "yes" response incrementing the above score by one.

Item: Does the policy of your school require you to assist placement? If so, do you agree with the policy? Are policy activities assigned or left to the discretion of the staff member? Are reports required written, verbal, or none? Does the school allow time for placement activities? How much time? How many graduates have you placed? (Answered by all personnel but the principal.)

Scoring: A consensus that a policy existed was scored 2, ambivalence as to its existence was scored 1. Agreement with the policy was scored as the mean of the individual responses: strongly agree = 4; agree = 3; disagree = 2; strongly disagree = 1. The respondents' majority description of the policy was scored: specific = 1; left to the individual = 0. The respondents' majority description of the reporting policy was scored: written = 2; verbal = 1; none = 0. The respondents' majority view as to whether or not time was given for placement activities was scored: yes = 1; no = 0. Number of graduates placed was scored as the mean of the individual responses. These subpart scores were summed to obtain a school score for the total item.

Item: Principal methods used to contact employers: personal visit, telephone calls, letter contact, and other. (Answered by the T&I instructors only.)

Scoring: The subscore for each alternative was obtained by dividing the number of "yes" responses by the total number of respondents and multiplying the result by a factor that varies with the "personalness" of the alternative: personal call = 1.75; telephone call = 1.50; letter contact = 1.25; and other = 1.00. The total item score was the sum of the subscores.

Item: A list of 20 ways for school personnel to assist the placement of graduates. (Answered by all personnel.)

Scoring: Each subitem was scored as to the frequency with which this type of assistance was given: 0 times = 0; 1 to 12 times = 1; 13 to 24 times = 2; 25 to 48 times = 3; and more than 48 times = 4. The individual score was the sum of the subitem scores and the school score was the mean of the individual scores.

Item: List of those employers contacted by the respondent.

Scoring: The mean of the individual respondents' numbers of employers contacted.

Once school scores were established, they were ranked for each of the individual items and mean rank for each school obtained. These mean ranks are the policies and practices scores.

Relations with the Community

The school's relations with certain aspects of the community were also considered by Altman and Morrison as relating to the cost of vocational education. Specifically, the degree and type of contact with employers, unions, the Employment Security Office (ESO), and civic organizations (Chamber of Commerce, Elks, Kiwanis, etc.) were ascertained from questionnaire items completed by the school's instructional staff. Separate scores were calculated for relations with each of these groups and a composite score derived. A description of the items and the scoring is as follows:

Employers

Item: A list of reasons for contacting employers with the frequency of each type of contact to be indicated by the respondent.

Item: Respondent asked to list the name and address of the last four employers contacted for reasons other than placement.

Item: A list of the ways that schools use to promote school-employer relations with the frequency of each type to be indicated by the respondent.

Unions

Item: A list of reasons for contacting labor organizations and the frequency of each type of contact by the respondent.

Item: A list of the ways schools use to promote school-labor organization contacts and the frequency of each type by respondent.

ESO

Item: A list of reasons for contacting ESO's and the frequency of each type of contact by the respondent.

Item: A list of reasons for ESO's contacting the school and frequency of receipt of each type by the respondent.

Civic Organizations

Item: A list of civic organizations and frequency and extent of contact by the respondent with each.

Item: Respondent asked to list the names and addresses of the last four organizations contacted by the respondent in any capacity related to vocational education.

Item: A list of reasons for contacting civic organizations and the frequency of each type of contact by the respondent.

Scoring: Scores were assigned to ranges of frequencies, beginning with 0, for no interaction. The school's score for each item was the mean of the scores for that school's respondents. The individual item scores were ranked by schools and a mean rank for each school obtained. This mean rank became the community relations score for the school.

Population, Industrialization, and Unemployment

Three variables possibly relating to differences in costs in education as they relate to the community surrounding the schools were also examined. These variables were: population of the community, its degree of industrialization, and the unemployment rate therein.

The population figures were obtained for the general area served by each of the schools in the sample. Industrialization was defined as the percentage of the labor force engaged in durable and non-durable manufacturing. Unemployment rate was that pertaining to the area served by the school. All figures were compiled from 1960 U.S. Census information.

Vocational Enrollment and Age of the Physical Plant

Two variables were derived from information obtained in the present study. The first, vocational enrollment, was the number of students enrolled in agriculture, distributive health, home economics, office, and T&I education. The age of the physical plant, the second variable, was the mean of the ages of the various buildings comprising the school.

It was mentioned previously that three fiscal years, 1961-1962, 1963-1964, and 1965-1966 were sampled in the present study. This period was chosen so that it would overlap with the time periods examined by the Eninger and the Altman and Morrison studies. It should be remembered that most of the inter-study comparisons made were based on data collected on the 1961-1962 fiscal year, the only sample year common to all three studies. Type of school and curriculum-type comparisons, however, were made for all sample years, since these variables are relatively constant over time.

REFERENCES

1. Altman, J. W., & Morrison, E. J. School and community factors in employment success of trade and industry course graduates. Pittsburgh: American Institutes for Research, August 1966.

2. Eninger, M. U. The process and product of T&I high school level vocational education in the United States: The product. Pittsburgh: American Institutes for Research, September 1965.

OE 6000 (REV. 9-66)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION

ERIC REPORT RESUME

ERIC ACCESSION NO.	CLEARINGHOUSE ACCESSION NUMBER	RESUME DATE	P.A.	T.A.
		10-31-67		

IS DOCUMENT COPYRIGHTED? YES ☐ NO ☒

ERIC REPRODUCTION RELEASE? YES ☒ NO ☐

TITLE

An Analysis of Cost and Performance Factors in the Operation and Administration of Vocational Programs in Secondary Schools--Final Report

PERSONAL AUTHOR(S)

Dueker, Richard L. Altman, James W.

INSTITUTION (SOURCE) American Institutes for Research, Pittsburgh, Pa., Institute for Performance Technology — SOURCE CODE

REPORT/SERIES NO. AIR-F90-10/67-FR

OTHER SOURCE — SOURCE CODE

OTHER REPORT NO.

OTHER SOURCE — SOURCE CODE

OTHER REPORT NO.

PUB'L. DATE 31-Oct-67 | CONTRACT/GRANT NUMBER OEC-1-7-070957-3522

PAGINATION, ETC.

40 p.

RETRIEVAL TERMS

Cost of Vocational Education
School Survey
Cost Data Availability

IDENTIFIERS Comprehensive Schools, Office of Education, Vocational Schools, American Institutes for Research

ABSTRACT

Sixteen comprehensive and 16 vocational schools were asked to participate in a study of the information available concerning the cost and performance characteristics of vocational education. It was found that an organized body of performance data does not exist. Available cost data do not readily lend themselves to coherent analysis. It seems likely that more intensive efforts to extract cost data at the local level than were possible in this study would yield somewhat more usable information. However, it does not appear likely that available cost or performance data will serve the long-range needs of educational evaluation and planning.

It is recommended that consideration be given to the design of an evaluation and planning information system. Such a system would have as its specific intent the recording and availability of cost and performance data needed as a basis for sound educational evaluation and planning.