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PERMANENT ADDRESS:

10423 - 52 St
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A COST ANALYSIS OF SELECTED SCHOOLS IN AN URBAN SCHOOL SYSTEM

BY

© WILLIAM RICHARD DUKE

A THESIS

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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Cost Analysis of Selected Schools in an Urban School System" submitted by William Richard Duke in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Supervisor

External Examiner

Date: September 15, 1970

ABSTRACT

This study was part of a research project which had as its central purpose the cost analysis of an urban school system conducted in a programmatic format. Twenty-five schools comprised the selected sample in the project: twelve elementary schools, eight elementary and junior high schools, and five senior high schools. The main focus of this particular study was the senior high school level of the school system costed, but findings from the other studies are incorporated in the thesis.

The research design combined the conventional function-object approach to cost analysis with a programmatic approach, based primarily on curricular programs. This two-dimensional approach integrated function-object expenditures with curricular programs offered in the schools. Costs were reported in aggregated and unit form. They were categorized as direct costs, indirect, and implementary costs. A computer program was developed to provide all the direct instructional costs.

Two types of unit costs were determined. A "pupil-course" unit cost was calculated to provide a measure of operating expenditures directly associated with a subject, a curricular program, and clusters of programs. A "pupil-enrolled" cost also was determined. This unit cost was based on the enrolment in the high school rather than in a course of a particular curricular program.

A cost pattern for curricular programs was identified, based on the per pupil-course cost unit. Language arts, modern languages, mathematics, science, social sciences, and physical education constituted the lowest-cost programs; fine arts and business education made up the middle-cost group; and home economics, industrial arts, and technical education comprised the highest-cost group.

The average per pupil-enrolled total cost for each senior high school was: $1,120.16 in School A; $1,011.91 in School B; $840.80 in School C; $917.14 in School D; and $1,048.58 in School E. The average per pupil-enrolled total cost of the high school selected sample was $999.94. The corresponding figure for the selected project sample was $845.25.

The average per pupil-enrolled cost for resident non-curricular programs at the senior high school level was $27.17 for instructional media services; $28.99 for guidance, and $101.97 for general administration.

Varying curricular emphases, in terms of financial allocations, were noted by means of a two-dimensional program budget format based on actual non-equivalent unit expenditures. English language arts, mathematics, science, social sciences, business education, and technical education received the greatest emphasis. The modern languages and physical education received moderate emphasis, whereas the programs in fine arts, home economics, and industrial arts received the least financial emphasis.

The average percentage of total expenditures in the selected sample devoted to direct instruction was 43.01; to indirect instruction the average percent allocated was 14.83; and to implementary services an average of 42.16 percent.

The programmatic approach to cost analysis was found useful in providing a broader base of information for decision-making.

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STATEMENT OF THE PROBLEM AND ITS SIGNIFICANCE

This chapter is divided into five sections. The first section is a general introduction to the study with an indication of some of the background to it. The status of this study as part of a larger urban project is indicated. In addition, the relationship of the urban project to a province-wide project is briefly described. The second section includes a general statement of the problem and two general sub-problems. Eighteen specific sub-problems pertaining to this study are stated in the form of questions. In addition, there are seven specific sub-problems that pertain to the urban project as a whole.

Section three deals with the definition of selected terms arising mainly out of the statement of the general and specific problems. The fourth section outlines the importance of the problem. Topics relating to cost analysis, such as the role of cost analyses in the allocation of resources in education, are discussed and the potential significant contributions of the study are delineated. A chapter summary and overview of succeeding chapters comprises the fifth section.

I. INTRODUCTION

The allocation of scarce resources in an organization is an integral part of the decision-making process. Decision-makers require various kinds of information to sharpen their intuition and improve their judgment. Cost data are but one type of information required. Chamberlin (12:6) stresses the importance of the fiscal aspect of decision-making:

> Each decision tends to involve a budgetary provision. Each decision requisitions funds for salaries and for the purchase of material and services. Also, each decision requisitions the scarce resources on hand, such as space in buildings, inventories of supplies, equipment and employees' and pupils' time. Under the limits of scarcity, all desired decisions cannot be made, all valid and valuable objectives cannot be pursued.

Cost data become increasingly essential as the competition for resources increases. This study attempted to make more meaningful to decision-makers the kinds of information that can be gleaned from a cost analysis.

Background of the Study

This study was one of a group of cost studies that were conducted in Alberta. The studies were co-ordinated by Dr. P. J. Atherton of the Department of Educational Administration of the University of Alberta and partially funded by the Alberta Department of Education. The master plan called for representative school units including one large urban school system to be cost-analyzed. These

representative units were selected by total rankings based on the variables: (1) school population, (2) assessment per pupil, (3) supplementary requisition per pupil, (4) expenditure per pupil, (5) staff-student ratio, and (6) density of school population.

The urban school system cost study involved a team of four researchers, all graduate students at the University of Alberta. The degree of interdependence of the individual researchers varied, depending on their particular research assignment. This study, while primarily concerned with the senior high school level, integrated some aspects of all four studies.

A differentiating feature of the urban school system project from the provincial project was the emphasis placed on curricular and non-curricular programs. Costs displayed in this manner tend toward a program budget format, that is, a budget format that attempts to relate inputs with mission-oriented activities. Generally speaking, cost studies to date have not proceeded beyond a functional-object breakdown of unit costs. This study employed both the conventional function-object approach and the program approach.

II. THE PROBLEM

The problem was stated in the following general way: What were the operational costs in a selected number of schools in an urban school system for the school year 1969-

70, and how could these costs be reported in a more meaningful manner to decision makers?

Unit costs were computed on these bases, incorporating program-budgeting concepts: (1) subject, (2) grade, (3) grade division (senior high school), (4) six specific senior high school pupil-program routes, (5) eleven curricular programs, (6) four curriculum clusters, and (7) three non-curricular programs.

General Sub-Problems

The sub-problems were stated as follows:

(1) In what ways can a program budget format be integrated with a cost analysis methodology?

(2) In what ways can an electronic data processing system assist in the gathering, processing, and analyzing of cost data?

Specific Sub-Problems of the Project

The specific sub-problems were related to either this study or the total project.

Specific Sub-Problems Relating to this Study. The following eighteen sub-problems relating to this study concerned each of the five selected senior high schools for the school year 1969-70.

(1) What were the average qualifications, length of teaching experience, and salary of teachers?

(2) What were the average qualifications, length of

teaching experience, and salary of teachers in each curricular program?

(3) What were the average qualifications, length of teaching experience, and salary of teachers in each curriculum cluster?

(4) What were the direct instructional costs per pupil-course-equivalent?

(5) What were the direct instructional per pupil-course costs by curricular program?

(6) What were the direct instructional per pupil-course costs by curriculum cluster?

(7) What were the minimum and maximum direct instructional per pupil-course-equivalent costs for six pupil-program routes?

(8) What were the average, direct instructional per pupil costs by grade?

(9) What were the resident, indirect instructional per pupil-course and per pupil-enrolled costs by curricular program?

(10) What were the resident, indirect instructional per pupil-course and per pupil-enrolled costs by curriculum cluster?

(11) What were the resident per pupil-enrolled costs of three non-curricular programs, namely, instructional media, guidance, and general administration?

(12) What were the resident implementary per pupil-

enrolled costs?

(13) What were the resident, combined, indirect and implementary per pupil-enrolled costs by division and by grade?

(14) What were the total educational per pupil-course and per pupil-enrolled costs of curricular programs?

(15) What were the total educational per pupil-course and per pupil-enrolled costs of curriculum clusters?

(16) What were the total educational per pupil-enrolled costs by grade and grade division?

(17) What were the per pupil-enrolled educational costs by function-object expenditure classification?

(18) What were the aggregate and unit costs of eleven curricular programs utilizing a program-budget format?

Specific Sub-Problems Relating to the Project. These seven sub-problems related to the project for the school year 1969-70.

(1) What were the per pupil-enrolled educational costs by grade?

(2) What were the per pupil-enrolled educational costs by grade division?

(3) What were the per pupil-course educational costs by grade divisions in eleven curricular programs?

(4) What were the per pupil-course educational costs by grade division in four curriculum clusters?

(5) What were the resident per pupil-enrolled costs of instructional media, guidance, and general administration programs by grade division?

(6) What were the average per pupil-enrolled costs by aggregate expenditure categories?

(7) What were average teaching qualifications, experience, and salary of teachers?

III. DEFINITION OF TERMS

This section does not include all the terms that are defined in the study. A number of terms have been defined in the appropriate section throughout the study. However, the key working definitions pertinent to the stated problems and sub-problems appear in this section.

Project: refers to the four studies that constituted the cost analysis of selected schools.

This Study: refers to the particular study conducted by this investigator and reported in this thesis.

Cost: used synonymously with expenditure, refers to the sacrifice made in monetary terms.

Direct Cost: that portion of the teacher's salary that can be allocated to scheduled teaching with regular classes of pupils (cf. infra. 24-25).

Indirect Cost: those costs that can be assigned directly to a subject or curricular area, e.g., science equipment costs were assigned to the science program.

Implementary Costs: those costs that cannot be directly assigned to a subject or curricular program, e.g., plant operation costs cannot be directly assigned to a curriculum area without using a proration technique. A useful distinction between indirect costs and implementary costs is as follows: indirect costs are eliminated when a subject or curricular program is eliminated; implementary costs are not.

Resident and Non-Resident Cost: refers to the location where cost is incurred. A "resident" cost was one that could be assigned directly to a school, a "non-resident" cost was either regional or system-wide in nature.

Curricular Program: a group of related subjects, e.g., mathematics courses comprise the mathematics program. Eleven different curricular programs were specified (see Table XXVII in Appendix A).

Curriculum Cluster: a group of curricular program areas grouped by the school system along functional lines. The curriculum clusters defined in Figure 3, page 57, were taken from the organizational chart of the school system.

Educational Cost: used in this study to mean all

the operational costs that were examined within the limits of the study.

Instructional Cost: limited in use to curricular activities, i.e., direct and indirect instructional costs.

Grade Division: refers to the twelve grades divided into four equal sections, e.g., Division Four comprises the senior high school grades, namely, grades ten, eleven, and twelve, which are referred to in this study simply as "senior high school".

General Administration: includes all resident implementary costs except those for guidance, plant operation, plant maintenance and food services. For example, school stenographers assigned to the principal's office were classified as "general administration".

Instructional Media: refers to all operational costs such as salaries, equipment and supplies associated with libraries, audio-visual services and educational television at the school level.

Pupil: a person enrolled or registered in a course or in a school in the period in which the count was taken (see Tables XXVIII and XXIX, Appendix B).

School Year: the period from September 1, 1969 to August 31, 1970.

Program Budget Format: a budget format that attempts to display expenditures by programs, e.g., curricular programs, rather than by function and object only.

Program Accounting: a type of accounting that organizes inputs into activities which may be referred to as "programs".

Pupil-Course: a pupil taking a course or subject in a curricular program or curriculum cluster. For example, every pupil in English 10 constituted a pupil-course unit.

Pupil-Course-Equivalent: a pupil taking a course or subject which has been standardized on a time basis, i.e., a pupil taking 200 minutes of instruction in a course per week.

Pupil-Enrolled: used interchangeably with "enrolled pupil" and "senior high school enrolment". This unit refers to the conventional per pupil unit based on an average daily membership or an alternative count of pupil membership such as enrolment at a specific date.

Unit Cost: relates to the type of cost being derived, e.g., a unit cost may refer to a pupil-course cost, a pupil-course-equivalent-cost, or a pupil-enrolled cost depending on the point under investigation.

Function-Object-Classification: refers to the posting

of expenditures by grouping the items of expenditure (objects) associated with a type of activity (function) that has a broad common purpose, e.g., administration.

Average: used synonymously with "mean" in this study.

IV. IMPORTANCE OF THE PROBLEM

The allocation of resources to education continues to be a pervasive problem. Burkhead (9:84), stated in 1965 that resources for public education were in a more critical state than ever, while at the same time there was mounting pressure for adding programs and expanding existing programs.

The pressure for expansion can be attributed to the fusion of a number of elements. Brandwood (6:4), suggested in 1969 that a growing recognition of the important contribution of education to economic and social development is foremost. Further, there is the realization that the rapid expansion of education and increased educational costs necessitate taking all reasonable steps to ensure efficient utilization of resources. He adds (6:7):

> At a time when the public's aspirations and expectations of local schools appear to exceed willingness and capacity to provide sufficient resources, a demand has grown for planning and budgetary reforms which will result in a greater emphasis upon displaying the programmatic, end objectives of our schools.

Cited by Brandwood (6:7), Bundy's statement based on his study of the New York Public Schools is relevant:

> Budget formulation now is incremental, fragmented and unprogrammatic .... Thus, there exists now a system with little accountability to the public ... in the way it allocates resources to meet education needs of the city.

According to Hill and Mattox (32:5), the public in general requires some assurance that funds for education are spent responsibly. In addition, legislators are pressing to know what the returns are for the ever-increasing expenditures.

Cost analyses have a significant role in the problem of resource allocation. In 1959, Kershaw and McKean, two economic analysts cited by Chamberlin (12:23), investigated the possibilities of using analytical tools to cut unproductive expenses or to increase productivity in education. They note that their analytical tools were rendered nearly useless by the lack of cost data. Hill and Mattox (32:506) opine that:

> School district officials need information about the relationships between costs and achievements. Only with such information may objectives be pursued more effectively and efficiently. The allocation of scarce resources may be decided in terms of the expected benefits; the effectiveness of the decision may be assessed in terms of its results. Among alternative objectives, the more prized objectives should be sought .... Today, school district officials do not have enough information to make and check the effectiveness and efficiency of their plans.

The same authors (32:248) caution educators:

> A genuine possibility exists that the work being done by experts in accounting, data processing and systems analysis may lead to the development of a program budgeting system

> for public education, including educational program structure and measurements of program effectiveness, without the leadership and active participation of outstanding leaders in the educational profession.

This study attempted to make a significant contribution in a number of ways:

(1) by applying a programmatic design to cost analysis through the specification of curricular and non-curricular programs;

(2) by providing baseline cost data to decision-makers of the school system analyzed, using a conventional format based on functional categories and a programmatic format based on curricular programs;

(3) by developing general computerized programs which embrace the programmatic concept for analyzing and displaying cost data;

(4) by increasing the analytic capability associated with the conduct of cost analyses in attempting to organize inputs in a manner that facilitates the recognition and analysis of outputs in a school system.

V. SUMMARY OF CHAPTER I

School boards and the public at large have become increasingly concerned about the allocation of scarce resources. As the demands for resources in education increase a corresponding counter-demand has developed for accountability in terms of what has been accomplished.

Cost analyses are primarily input oriented, but inputs can be programmatically displayed in order to provide more meaningful information to decision makers and to the public. A programmatic format would also facilitate further analyses of the cost-utility and cost-effectiveness type, in addition to providing descriptive data relative to the current situation. Cost analyses are an integral part of a program budget.

Succeeding Chapters

Chapter II contains a review of the related literature with special emphasis on cost analysis and program accounting. Chapter III deals with the research design of this study. The research procedures employed in the study are covered in Chapter IV, including such aspects as instrumentation, data sources, and data collection. Chapter V covers the analytical aspect of the study involving the descriptive treatment of the data. Chapter VI includes the summary of findings, the conclusions and the implications of the study. The appendices include much of the primary data as well as the auxiliary data, such as enrolments, used in the analyses.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The review of the pertinent literature follows the framework for this study. The focus is on cost analyses in relation to a program budget format. Consequently, this chapter reviews some specific aspects of cost analysis, and relates cost analysis to program accounting and budgeting, and to Planning-Programming-Budgeting Systems (PPBS). The related literature on cost analysis was organized in such a way as to provide a particular perspective, which may be characterized by the underlying assumption that a cost analysis provides decision-makers with data that can improve the quality of their decisions.

More specifically, this chapter begins by defining cost analysis and outlining some of its purposes. The next section deals with the conventional and program types of accounting systems. Reviewed next are the two major factors in cost analysis, namely, input units and output units. In the next section, the place of cost analysis in the design of a program budget format is examined. Both concepts are then related to the larger context of the resource-allocation-decision system referred to as "PPBS". The final section, preceding the summary, samples the literature on PPBS itself.

I. COST ANALYSIS

Fowlkes and Hansen (21:471) define cost analysis in this way:

> Cost Analysis is the process of studying the total cost of public education for a given community, state, or area for a given year; trends in total school costs; the costs of specific services, e.g., transportation or English; the cost of education by grades or levels, e.g., elementary school costs, secondary school costs; costs of nonattendance; costs and tax paying ability; cost and size of school; reasons for increased costs; reasons for decreased costs; need for increased costs and need for decrease in costs.

Dei Rossi (15:99) offers a broader concept of cost analysis in this statement:

> Cost analysis can be thought of as encompassing those activities by which cost and program data are compiled, analyzed, and used to estimate and project future cost.

This definition is useful in that it provides a wider perspective for costs analysis, i.e., a predictive dimension is included.

Unit cost analysis, for the purpose of the urban project, refers to the detailed determination of designated educational expenditures for specific functions, activities, curricular and non-curricular programs, the conversion of these expenditures into unit costs on a per pupil basis, and the examination and analysis of the resultant unit costs.

Cost analysis, attempting to define more than overall system costs per pupil are relatively recent in Canadian education (Canada). The

difficulty in defining an educational "product" has been suggested as the reason for this lag (Glaze, 23:128). One of the first significant educational cost analyses was conducted by the National Committee on Standard Reports for Institutions of Higher Education in 1935 (Linn, 42: 177-270). This committee published a series of analytical procedures to be followed in American colleges and universities.

The major purposes of cost studies are listed by Hull (35:372): (1) to measure instructional costs by all meaningful divisions of level, function, type of unit, curriculum, and class organization; (2) to understand what components comprise costs and how changes in these components affect cost levels; and (3) to predict future costs when changes in cost components are introduced (for example, changes in enrolment, faculty salaries, or workloads). Basic to these purposes is the existence of an adequate accounting system.

This study concentrated on the first purpose listed by Hull, namely, to measure educational costs by a number of meaningful divisions. However, some attention was devoted to the effect of certain factors on cost levels, e.g., teacher qualifications and experience.

II. ACCOUNTING SYSTEMS

Any attempt to study costs in education must

eventually look to the system of accounting for the raw data. Knezevich (39:153) states that, "It would be extremely difficult, if not impossible, to have meaningful unit cost analysis without designing an accounting system to satisfy such purposes."

The literature on accounting systems defines two broad categories, identified as conventional accounting systems and as program accounting systems. A conventional accounting system is characterized by the function-object approach currently in use, whereas a program accounting system involves a program-oriented expenditure classification of a curricular and/or non-curricular type.

Conventional Accounting Systems

Rosentengel and Eastmond (50:198) list four functions of accounting in a school system. These are to:

(1) help develop the educational program,

(2) meet legal requirements,

(3) provide data for cost studies,

(4) furnish the necessary information for budget building and reporting.

In order to fulfill the various functions required, various types of account records are needed; namely, (1) a financial plan integrated with the educational plan, (2) control account, (3) receipt account, (4) expenditure account, (5) subsidy account, (6) original documents, and (7) financial reports (Johns and Morphet, 37:453-454).

Linn (42:200-201) reports six ways of classifying expenditures. These are by (1) fund, (2) function, (3) character, (4) activity, (5) object, and (6) school (class or other educational unit). Generally speaking, most accounting systems use a combination of these classifications. One of the most common combinations is the functional-character-object classification or more simply, a function-object classification system. The Federal Government of Canada (26:30) recommends the following classifications of expenditures:

> (1) by purpose, i.e., activity or activities in which the responsible unit is engaged;
>
> (2) by source, i.e., the organizational unit responsible for initiating the expenditure or providing the service from which revenues are obtained, such as responsibility centers [schools];
>
> (3) by object of expenditure, i.e., salaries, travel, material, etc.

A typical minimum function-object classification system, in use in Alberta in 1970, (24:4-5), includes the following major categories: (1) Administration, (2) Instruction, (3) Instructional Aids, (4) Tuition Agreements, (5) Auxiliary Services, (6) Cafeteria, (7) Plant Operation and Maintenance, (8) Debt Charges, (9) Contributions to Capital and Loan Fund, (10) Conveyance and Maintenance of Pupils, and (11) Other Operational Expenditures.

For the most part, coding systems now in use in

North America generally stop at the function-object level, but some school systems, including the one under study, employ a location code as well.

Lindman (41:66), a strong critic of the conventional accounting system states:

> The system [accounting] was established when public schools offered for all students a single program with few, if any, auxiliary services. Since then, school programs have become complex and varied; and the single-dimension accounting system, even with its amendments and additions, is hopelessly inadequate.

Program Accounting Systems

A program accounting system to a large extent subsumes the conventional-type accounting system with some modifications. In program accounting, the function-object classification is re-ordered to provide a program format. There are a number of ways in which this re-ordering can take place depending on the orientation given to the term "program". Lipot (43:87) describes four possibilities for the orientation given to educational programs and activities.

> Programs can be: (a) mission-oriented, (b) product-oriented, (c) process-oriented, or (d) service-oriented. The basic orientation chosen will affect the selection of programs within the overall concept of education.

For purposes of illustration, mission orientation is generally associated with long-range planning; product orientation with private industry; process orientation with

"industries" where inputs are not constant and where the output may lack uniformity thereby emphasizing the treatment aspect; and service orientation with a supporting activity concept.

Much research surrounds the developments taking place in program accounting (C.S.E.I.P., 11; M.S.E.I.P., 45). On the basis of various schemes put forward, Lipot (43: 90-93) summarizes the major dimensions or classification codes most often suggested with respect to revenue and expenditure accounts: (1) Fund, e.g., building fund, (2) Type of account, e.g., assets, (3) Object, (4) Location, (5) Type of School or Client, (6) Income Source, e.g., local taxes, (8) Curricular, (9) Time, e.g., day classes.

To further the comparison with a conventional accounting system, the function category is broken down by Lipot (43:91) into the following major subheadings:

(a) Direct Teaching Service (containing all direct teaching functions)

(b) Instructional Support (containing all support for instruction, including principals' salaries, instructional materials, and supplies)

(c) Student Services (containing all non-instructional services directly for students)

(d) Plant Maintenance and Operation

(e) General Control (containing district administration and planning)

Lindman (41:69-73) advocates a three-dimensional system to replace the present one-dimensional accounting

system. His three dimensions include: (1) the Type-of-School Dimension; (2) the Function-object Dimension; and (3) the Scope-of-Service Dimension. The type-of-school dimension includes the categories: (a) Pre-kindergarten, (b) Elementary schools, (c) Junior high schools, (d) Senior high schools, (e) Adult or evening schools, (f) Summer schools, (g) Special schools, and (h) Community services.

The function-object dimension has two major categories. These are (a) Instruction and (b) Support services. The "Instruction" category includes such object entries as principals' and supervisors' salaries, classroom teachers' salaries, books, instructional supplies, etc. The "Support Services" category contains such items as administration, plant operation, plant maintenance, pupil transportation, other support services, and fixed charges.

The scope-of-service dimension includes such major categories as: (a) The Basic program, (b) Vocational education, (c) Special education, (d) Compensatory education, (e) Health services, (f) Pupil transportation, (g) Lunch program, and (h) Other supplementary programs.

Barro (2:30) recommended a three-way classification of school programs, that is, by subjects, types of students, and grade levels. He explains his categories in this way:

> ... Each set of categories may be the most important in connection with particular educational issues or situations. For example, if a current issue facing the district has to do with educational provisions for special groups such as disadvantages, retarded, or

> gifted students, it would be important to have information on resources and expenditures for these groups. Then a categorization by student type would be important. If, however, the problem were to decide on plans for constructing new school buildings, classification by level would be important because different buildings are required, say, for primary, middle, and high schools. Or, if the issue at hand had to do with the adequacy of instruction in reading or some other subject, or if it involved a question of balance between vocational and college preparatory program, categorization by subject would be most informative.

Barro (2:43) further states that:

> An advantage of a multidimensional classification scheme is that it provides the flexibility needed to display information in formats appropriate to different situations. The three-way classification of program activities and their resource requirements makes it possible to construct a number of different program budget formats [six possibilities] to suit each audience and issue.

Several school districts in the United States, e.g., Los Angeles City Schools and St. Louis Public Schools (Lindman, 41:53, 48), use a subject approach, with the Los Angeles system adding a grade-level dimension.

This multidimensional approach has been criticized by some writers rather harshly. Furno (22:142) states:

> The literature abounds with proposals -- many of them by college professors -- advocating that school systems seek the ideal PPBS structure to allocate costs by subject matter and by grade level for each school. But there is no one best structure for program costs. Numerous structures have been suggested. They may be developed on the basis of (1) grade level, (2) subject matter, (3) organizational categories, (4) services provided, and (5) project-oriented categories. Before any administrator attempts to take his school system down the primrose path of programming costs by subject matter, by grade level and by school, he should look at other alternatives

and seriously weigh the benefits to be derived against the agony and costs involved.

III. MAJOR ELEMENTS IN A COST STUDY

Two major factors must be isolated in a cost study. They are: (1) the cost of educational services and (2) the product or number of teaching units produced for the costs involved (Williams, 54:28).

Educational Costs

Williams (54:28) lists four primary factors or bases of educational cost: (1) professional staff salaries, annuities and pensions; (2) the number of hours a week taught by teachers; (3) the number of students enrolled in the classes taught by staff members; and (4) costs of maintaining the plant and supporting services.

Direct instructional costs are determined primarily by a staff workload survey. Stecklein (52:6) suggests that measures of workload can be determined by course inventories or staff member reports, the latter method being superior. A combination of these methods was used in this project.

Tyndall and Barnes (53:116) recommend that staff workload be computed on a percentage basis, i.e., (1) to specify some arbitrary but acceptable official work week, (2) to assign costs by taking the teaching time as a fraction of the work week, and (3) to apply that fraction to the hourly salary rate. Instead of an hourly rate, a

yearly salary rate can be used.

Indirect costs of instruction generally refer to those costs not directly related to instruction. That is, Hartley (31:164) categorizes all educational expenditures as either direct or indirect, but in this project it was found helpful not to do so because of the analytic procedures used.

The implementary costs of instruction include general implementary expense and physical plant implementary expense. General implementary expenses are those associated with central office, staff welfare and services, library and general instructional services. Physical plant implementary expenses include all budgeted subdivisions of the physical plant division (Evans, 18:42).

There are a number of techniques for allocating implementary expenditures to instruction. Perhaps the best known are: (1) the straight line method; (2) the primary use plan; and (3) the progressive primary use plan (Workman, 55:20-24). Of these three techniques, the straight-line method is the most commonly used; however, the straight-line method and the primary use plan can be used together (Atherton, 1:12).

A major problem in assigning costs to a program or any other unit is that of prorating direct, indirect and implementary costs. Reason and White (49:162-166) enumerate the most common methods (sometimes referred to as standards

or bases) for prorating expenditures. These are: (1) time, (2) time-ADM (average daily membership) or time-ADA (average daily attendance), (3) time-floor area, (4) hour-consumption, (5) number of pupils, (6) mileage and/or (7) quantity consumed. According to the United States Office of Education (48:248) there are three main problems associated with prorations.

(1) Prorating between functional classifications such as prorating the salary of a person who performs custodial and maintenance work between operation of plant and maintenance of plant accounts.

(2) Prorating between program area or organization units such as prorating the salary of a teacher who serves both an elementary and secondary school.

(3) Prorating expenditures to community services accounts such as prorating expenditures for heat, light, and supplies between community activities, rental of facilities.

The literature is not firm on the question of prorating implementary costs, particularly writers favoring program accounting. Dei Rossi (15:49) reports that:

> ... the allocation of support costs, such as Administration, should be made to other programs only if it is actually possible to relate the activities or purchases giving rise to these programs directly. No attempt should be made to allocate or prorate general support costs to other programs on the basis of arbitrary although logical rules.

Bethke (5:20), commenting on program accounting systems, took an in-between stand on the question of prorating implementary costs:

> The basic aim of the system [program accounting] is to charge only direct expenses [and indirect] to the various cost centers. If any proration of costs, such as heat, light, etc., to specific programs is to be considered, such proration will be handled through separate cost analysis reports.

Product or Number of Teaching Units Produced (Outputs)

The second major factor in a cost analysis is the isolation of outputs. Hartley (30:13) holds that the major advantage of program budgeting over conventional approaches is the greater amount of attention devoted to outputs, or programmatic outcomes of a school as compared to inputs (objects purchased) necessary to support these programs. Hill and Mattox (32:106) report this comment made by a respondent in their study:

> ... In order to accomplish these ends [to make rational, informed decisions about unit costs and program quality], carefully constructed work units must be defined for each program area and valid work unit reporting systems must be devised and implemented; all of which must be integrated into a consistent accounting whole.

Hartley (30:22) suggests that there are at least three basic approaches to devising a program structure that will provide certain outputs:

> (1) Organizational or grade level categories. Programs might include: (a) early childhood, (b) primary grades, (c) intermediate grades, (d) technical high school, (e) comprehensive high school, etc.
>
> (2) Organization on curricular or subject matter. Direct and indirect costs are apportioned to subject area such as: (a) language arts, (b) science, (c) mathematics, (d) social science, creative arts, etc.

(3) Organization on a hybrid format. Combining grade level organization at the elementary level with subject matter at the secondary level.

Within any of these program structures, or a combination of them, the number of pupils enrolled can be considered as an output (Atherton, 1:9). A ratio of the instructional costs and the output (number of pupils enrolled) provides a unit-cost figure. The future utility of cost analyses in general is contingent upon the identification and quantification of other educational outputs. For instance, demonstrated relationships between cost and quality of education are needed.

Most of the large-scale cost analyses* conducted have been at the post secondary level; however, a number of recent studies have examined the public school system. Cage (10) completed a cost analysis of selected programs in the state of Iowa in 1968. In Alberta, Myroon (46) completed a unit cost analysis of a county school system in 1969. Whereas these studies were cost analysis studies per se, the trend of cost studies appears headed toward a broader context, namely, a program budgeting approach, i.e., a programmatic format for displaying costs. Cost analysis is integral to any form of program budgeting which becomes

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*See Hubbard (34), Tyndall and Barnes (53), Brammer (4) and Elmore (17) in the Bibliography. In Alberta, Atherton (1), and Workman (55) have cost accounted the Junior Colleges.

a part of the Planning-Programming-Budgeting System concept.

IV. A PROGRAM BUDGET FORMAT

A program budget format is an integral part of a program budgeting system which Benton and Tenzer (3:30) define as follows:

> A Program Budgeting System is a framework within which agency-wide Systems Analysis is performed, wherein the Program Budget performs the vital functions of forcing the organization to clearly define its objectives and the costs of obtaining those objectives; integrates the results of Systems Analysis (results which are expressed as programs) to the conventional budgets of the organization; and serves as a means of communicating, to individuals in and out of the organization, its formal objectives and supporting activities.

Systems analysis, in this context, refers to a systematic approach to helping a decision-maker choose a course of action by investigating the full problem analytically in an appropriate framework to bring judgment and intuition to bear on the problem (Benton and Tenzer, 3:30).

Fisher (20:7) summarizes the primary considerations involved in a program budgeting system under three main headings: (A) Structure or format, (B) Analytical process, and (C) Data or information systems. These headings serve to accentuate the essential components of PPBS.

A. Structure or Format of a Program Budget

A program budget format has three identifying

characteristics (Benton and Tenzer, 3:20-26): (1) the program structure, (2) the cost structure, and (3) the time dimension. According to Benton and Tenzer (3:22), program structure is a link between the organizational goals and the traditional processes of financial control. Major programs should represent organizational output in such a way as to portray organizational goals. Major programs are made up of program elements which are described in functional terms utilized in conventional budgets. Program elements are limited to resource inputs such as personnel, equipment, supplies, etc.

The cost structure displays resource utilization by program category. For example, a general curricular program area such as "science" can be linked to direct costs (teacher salaries), indirect costs (science equipment and supplies), and implementary costs (maintenance).

The time dimension should normally extend from three to five years to facilitate planning. Figure 1, an adaptation from Benton and Tenzer (3:21), displays the three identifying characteristics of a program budget format, namely; program structure, cost structure and a time dimension.

Similar to the relationship between program accounting and conventional accounting systems, is the relationship between a program budget format and conventional budget format, the latter being defined as the budget format used in

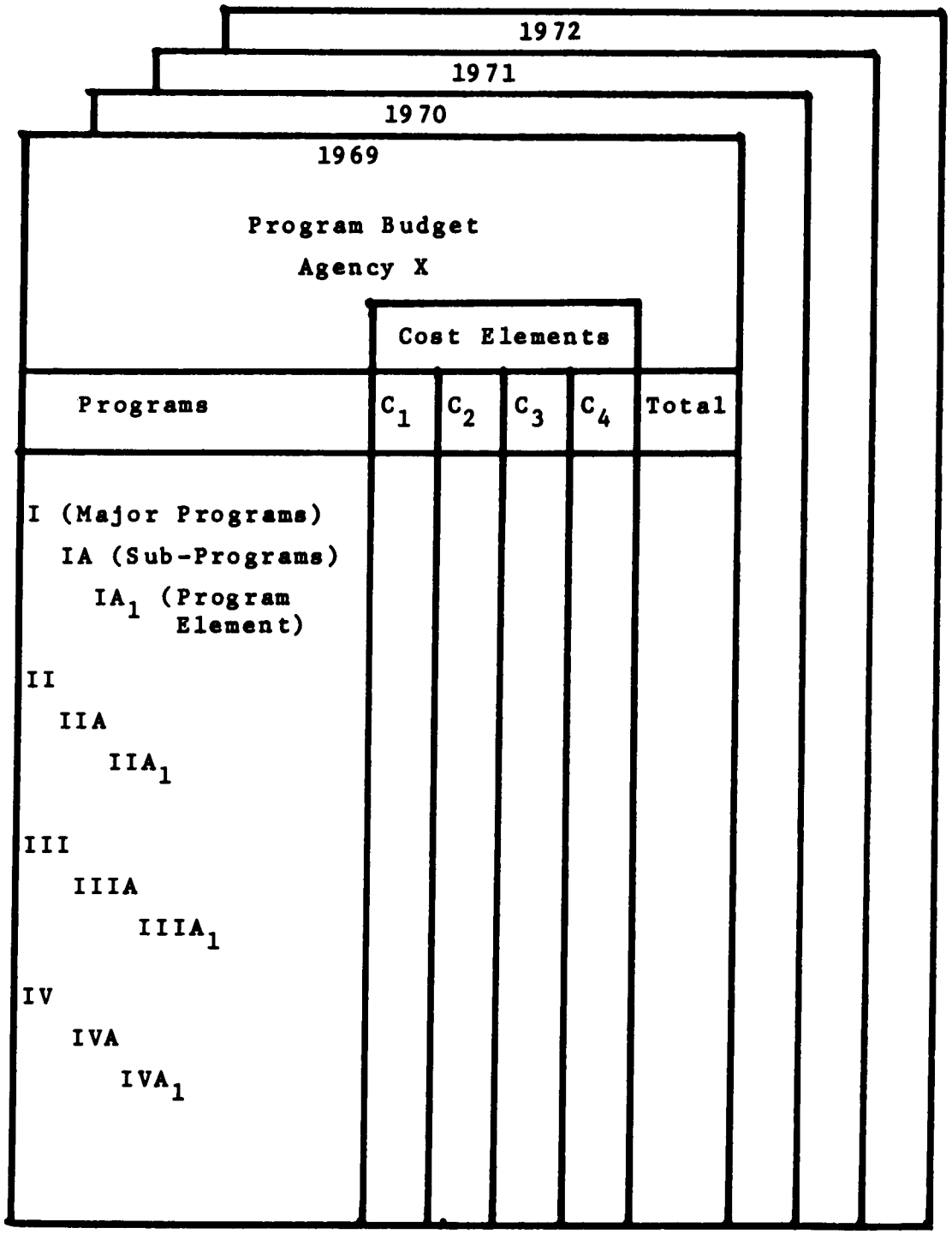

FIGURE 1

A PROGRAM BUDGET FORMAT

Alberta in 1970. The expression describing the relationship between the program budget and the conventional budget is generally referred to as a "crosswalk". Dei Rossi (15: 47) described a crosswalk as a tabular array, with columns showing the conventional budget cost categories and the rows showing the program budget cost categories as in Figure 1. Put another way, the function-object format of a conventional budget format remains as a dimension in the program budget format.

The program structure. Hartley (31:160-166) describes five kinds of program structures which include (1) grade-level organization, (2) middle school and junior college organization, (3) curricular and subject-matter organization, (4) grade-level and subject-matter organization, (4) grade-level and subject-matter organization, and (5) services performed. Hartley reported that an ideal curricular-based program structure would display curricular programs on one dimension, for instance, mathematics, and function-object costs, e.g., teacher salaries, along another dimension extending over a number of years. This type of program structure has a curriculum or department bias which may inhibit creative planners. Knezevich (38:5) cautions against the danger of perpetuating the current curricular programs as the only "program" in the program budgeting concept. Knezevich (38:7) felt that the term "program", by definition a group of activities related to an objective,

could not be applied to a curricular program because the latter is not a performance-based objective.

Barro (2:40) reports that a complete program structure requires three modes of classification, namely, subject area, type of student, and level of education. More specifically, the subject area category would include the curriculum areas in addition to the direct and auxiliary support programs such as instructional media and transportation services. The type-of-student category includes such headings as "Regular Program" and "Programs Differentiated by Environmental or Cultural backgrounds of Students," whereas the level-of-education category refers to the typical grade-division breakdown, e.g., elementary education, in addition to specific grade levels.

The cost structure. A second identifying characteristic of a program budget format is the cost structure. Benton and Tenzer (3:25) state that:

> The purpose of the cost structure is to display resource utilization by program category, to highlight the cost implications of resource substitutions, and to illuminate the impact on costs of changes in resource usage associated with changes in programs.

A cost structure involves elements that were classified into two categories by the Midwestern States Educational Information Project (45:19-37). These are: (1) Accounting for Expenditures, and (2) Accounting for Revenues. In accounting for expenditures an eighteen-digit

code was recommended to identify all possible expenditures. Briefly, the expenditure code sections included eight entries, namely: (1) Fund, (2) Type of Account, (3) Organizational Unit, (4) Area of Responsibility, (5) Subject Area, (6) Course, (7) Activity, and (8) Object.

The revenue side required six code sections. These were: (1) Fund, (2) Type of Account, (3) Organizational Unit, (4) Source and Type of Revenue, (5) Subject Area, and (6) Course. Chambers (13:37), commenting on this program-oriented accounting system, concludes that in addition to a number of advantages there were two major weaknesses:

> (a) the excessive number of digits necessary to record financial transactions, especially expenditures, and (b) the difficulties of implementing the system in districts utilizing manual accounting techniques.

The time dimension. A conventional budget shows the financial impact for a single year: a program budget extends over several years, thus involving long-range planning. Dei Rossi (15:57) differentiates between the educational plan and the funding statement in this way:

> A longer planning time horizon does not require formal commitment to the plan for longer periods of time. Single-year funding and authorization are in no way incompatible with long-range planning.

B. Analytical Process

A second identifying characteristic of a program budgeting system is the analytical aspect. McCullough

(44:41-42) describes six key features of a complete analysis:

(1) Emphasis is placed on incremental costs. Total program cost analysis requires a framework that provides for incremental costing.

(2) Emphasis is placed on total program costs. Unit costs have limitations insofar as providing a meaningful picture of resource allocations.

(3) Emphasis is placed on annual costs over a long time-period. The time horizon may extend up to fifteen years but more typically from three to five years.

(4) Emphasis is placed on a base case for purposes of measuring the incremental costs of alternatives. An analysis that leads to examining alternative programs must start with descriptive data comprising a base case for further comparison.

(5) Presentation of resources and costs by program and program element. This involves at least a two-dimensional approach to exhibiting the pertinent information.

(6) Utilization of a computer model is essential for rapid, consistent costings. A school system must possess, or have access to, computer facilities if it is to conduct analyses in an on-going fashion.

Developing a cost model. Computer models will have an increasingly significant role in cost analyses and related research in the years ahead. Dei Rossi (16:100) states that

there are two major considerations in the development of a cost model, namely, the structuring of the cost data and the development of estimating relationships. This study was limited to structuring the cost data and the analysis of it. With the development of computer programs to facilitate the analysis, future cost analyses should address themselves to the predictive aspects suggested by Dei Rossi.

C. Data or Information Systems

Fisher (20:8) outlines two major functions of the information system in connection with PPBS:

> (1) progress reporting and control, to give an indication how well (or poorly) major programs decisions are being carried out in the process of implementation; and (2) providing data and information to serve as a basis for the analytical process.

This study was concerned with the second point only, namely, the provision of data from the information system and the processing of it. The following writings indicate some of the considerations involved in the conduct of the study.

Data processing is a series of planned actions and operations upon information to achieve a desired result (I.B.M., 36:6). Regardless of the information to be processed or the equipment used, all data processing involves at least three basic considerations:

(1) The source data or input entering the system,

(2) The orderly, planned processing within the system,

(3) The end result or output from the system.

The project was sufficiently large that automatic data processing (ADP) or electronic data processing (EDP) had to be utilized. Hill and Mattox (32:106) stated that in an organization of any size, data processing requires computer support.

Tyndall and Barnes (53:117) reported that it may be possible to eliminate manual processing of data entirely. They refer to such a study conducted at the University of California. Hubbard (34:109), reporting on a cost analysis at Wayne State, attributes the success of the project to availability of computer facilities.

Program budgeting necessitated effective management accounting systems and information systems to measure performance and to provide inputs to the planning system. Damp (14:52) writes:

> ... Information systems for school boards' business administration require the processing of personnel, supplies, facilities and equipment, and financial data .... The challenge to school boards in the introduction of programme budgeting will be the development of near total information systems to fully correlate input and output data.

There is some research that indicates that the lack of EDP equipment was the greatest single conversion problem in connection with adopting a PPB system (Hill and Mattox, 32:97).

Goodlad et al., in Exton (19:44), state that the most sophisticated types of equipment and processes are employed by the Chicago public schools. Chicago uses its EDP center for six functions: budget and finance, personnel and payroll, materials, student accounting and scheduling, computer education, and research. Goodlad goes on to point out two major drawbacks which impeded EDP progress: (1) the wide variation in record-keeping among public school districts, and (2) semantic and communication difficulties arising between technologist and educators in defining what types of information are needed most.

Referring to budget making, James and Cronin, cited in Chamberlin (12:9) lament that, "That striking and repetitive factor in this drama is the paucity of relevant information." James, in Hill and Mattox (32:52), points out that there is insufficient information available at the policy-making level to provide a rational basis for allocating the resources of a school district. However, according to Schick (51:257), "the case for PPBS rests on the assumption that the form in which information is classified and used governs the actions of budget makers, and conversely, that alterations in form will produce desired changes in behavior." If this assumption does not hold, PPBS is reduced to a trivial manipulation of techniques. Yarmolinsky (56:31) posits that the electronic revolution offers the creative planner and strategist

greater scope as it makes available more data, assembled more rapidly, from a wider geographic range of sources, but the interpretation of these data is still up to the human mind.

V. PURPOSES, REQUIREMENTS AND APPLICATIONS OF PPBS

The role of PPBS in this study was limited to providing a conceptual framework. The purpose of this section was to provide a brief overview of the literature in this field.

In a survey of the literature Hill and Mattox (32: 76) identified six major purposes of program budgeting: (1) evaluation of present programs, (2) evaluation of program proposals in terms of objectives, (3) allocation of financial resources in terms of total needs of priorities, (4) assistance in cost control and analysis, (5) appraisal of program performance, and (6) to make the budget more understandable.

The Rand Corporation, reported by Hill and Mattox (32:51-52), isolated seven requirements of a PPB system applied to education: (1) clear definition of educational objectives, (2) definition of budget categories in terms of programs that pursue these objectives, (3) identification of program costs, (4) measurement of the effectiveness of the programs in terms of progress toward stated objectives,

(5) determination of the most economical means to achieve these objectives, (6) regular review and revision of objectives, programs and budgets in the light of experience and of changing conditions, and (7) long-range planning and cost projections.

An example of a specific application of PPBS to education at the local school district level is provided by Burkhead in Hill and Mattox (32:61-62). He categorized various programs on the basis of application of performance data. The four categories are:

(1) Programs supported by detailed performance data. This category includes food services, attendance services, business office activities (accounting and purchasing) and library services.

(2) Programs supported by some performance data. These include guidance, counselling, testing, psychological services, maintenance, and some remedial and special education programs.

(3) Programs supported by performance data in a broad educational sense. Instruction is in this category, subdivided by subject matter and grade level.

(4) Programs not supported by performance data, e.g., administration.

Advantages and Disadvantages of PPBS

A Planning-Programming-Budgeting System has certain inadequacies as well as particular advantages. Grieder (28:8) enumerated several reasons for the inadequacy of program budgeting, namely, (1) making decisions which are primarily value-based, (2) over-emphasizing the economic

decision-making model, (3) the difficulty in measuring educational inputs and outputs, and (4) neglect of the expressive (individual) dimensions of the individual in favor of the instrumental (societal) ones such as manpower needs. Kammerer, cited in Hill and Mattox (32:45-46), added several others: (1) only the larger organizations may be able to justify its cost, (2) comparability of unit costs is usually invalid because of intervening variables, (3) unit cost factors tell nothing of qualitative levels of service, and (4) not all activities lend themselves to comparison on the basis of work units or unit costs, e.g., public health services.

In a recent critique of program budgeting, Holland (33:69) writes:

> Already many educators and administrators are sick of the term Programme Budgeting. Eventually the cult of Programme Budgeting will fall into disrepute as have other much ballyhooed movements to make education efficient. The fact remains, however, that the term also refers to a set of concepts and a body of literature that offers an approach to a rather complete integration of educational administration, politics, research and planning.

Greenhouse (27:27) took a similar view when he said

> ... PPBS is not surprisingly like many conceptual "innovations" .... That many discoveries consist in rearranging and regrouping ideas which are individually already known does not diminish the usefulness of the results.

Several recent studies involving PPBS in education have particular relevance to this project. Chamberlin (12) examined program budgeting using a decision-making

model. Hill and Mattox (32) conducted a comprehensive survey of program budgeting practices examining such aspects as purposes, criteria for design, advantages, shortcomings, and conversion problems. Koening (40) described a cost analysis done in a systems framework in the Palo Alto Unified School District. Burkhead (8) elaborated on input-output studies conducted in the urban school systems of Chicago and Atlanta. Three other extensive projects were in operation in Dade County (Florida), New York City and Sacramento (Brandwood, 6:19).

On the Canadian scene, Brandwood (6:49) recently completed a thesis entitled "A Programme Budget Model for Selected School Programmes in the Province of Ontario". He recommends that ten or twelve programs would be adequate for purposes of budgeting in most school systems.

This study examined eleven high school curricular and three non-curricular programs in addition to the typical function-object unit costs associated with cost analysis.

VI. SUMMARY OF CHAPTER II

Meaningful cost analyses are dependent on the accounting system used. A program accounting system is superior to a function-object type of system in that the relationship between financial inputs and educational outputs is facilitated. The simplest form of relationship derived in a cost analysis relates educational cost to an

output unit such as the number of teaching units produced.

A program budget format has three characteristics, namely, a program structure, a cost structure, and a time factor. The program structure links organizational goals with activities whereas the cost structure displays resource utilization by program category. The long-range integration of these components leads to a resource-allocation-decision system known as PPBS. Vital to the implementation of this rationally-based decision system is the existence of a supporting information system.

CHAPTER III

DESIGN OF THE STUDY

The first section of this chapter provides a general outline of the project indicating the general areas of responsibilities of the four researchers involved. The second section, comprising the bulk of the chapter, develops the methodological framework used in the study. This framework was conceptualized in terms of three dimensions: (1) the cost structure, (2) the program structure, and (3) the analysis aspect. The third section contains the delineation of the study.

I. GENERAL OUTLINE OF THE PROJECT

The general tasks of the four project researchers were as follows:

Researcher 1: To establish the framework for the total project and to relate it specifically to program accounting and more broadly to PPBS concepts; to organize the conduct of the project and secure the related auxiliary data; to cost analyze the resident operational expenditures of a selected sample of senior high schools by subject, grade, selected curricular and non-curricular program, and school; and to integrate the aggregated cost findings of each researcher from the total selected sample of schools.

Researcher 2: To cost analyze the resident operational expenditures of a selected sample of junior high schools by subject, grade, curricular and non-curricular program, and school.

Researcher 3: To cost analyze the resident operational expenditures of a selected sample of elementary schools by subject, grade, curricular and non-curricular program, and school.

Researcher 4: To determine through cost analysis procedures the system-level (non-resident) indirect and implementary operational costs.

The separate studies that resulted were parallel and integrative in nature, for example, the methodology employed for each grade division was very similar, but independent, whereas the determination of system-level indirect and implementary costs, although independently researched, was integral to the other three studies.

II. THE METHODOLOGICAL FRAMEWORK

In general terms, this study integrated a unit-cost methodology with a program concept of school activities. The methodological framework consisted of two major components (cf. supra:32-34):

(1) The cost structure,

(2) The program structure.

Benton and Tenzer (3:15) felt that these components were an essential part of the program budget format.[1] The "programs" referred to involved eleven curricular areas (see Table XXVII, Appendix A) and three non-curricular areas (see page 62).

A "crosswalk" approach (cf. supra:32) was utilized in moving from a function-object classification system to a program-accounting system. The overall design can be conceptually divided into three phases:

(1) The conventional function-object classification phase,

(2) The program-oriented classification phase,

(3) The integrated cost-analysis phase.

Cost-Structure: Classification by Function-Object

This study employed an adapted version of a function-object classification system of expenditures developed by Reason and White (49:27-35) who refer to their system as a "functional-character-object" classification system. The term "functional" refers to the kind of educational activity involved; "character" refers to the nature of the payment as a fiscal transaction and "object" refers to the specific item purchased. In this study the term "function-object"

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[1]There was also a time factor, that is, a program budget extends over a period of more than one year. This factor cannot be applied in this instance, but would be added if an actual program budget was put into operation.

was used to encompass the same ideas.

Figure 2 summarizes the function-object classification system of expenditures used in this study. However, no expenditures were found in several of the classifications.

100 Administration. Reason and White (49:37) assign to this category all those activities which have as their purpose the general regulation, direction, and control of the affairs of the school district that are system-wide and not confined to one school, subject, or narrow phase of school activity. The data for this series were provided by Researcher 4.

200 Instruction. This series includes those activities dealing directly with the teaching of students or improving the quality of teaching. The salaries, or prorated portions thereof, of classroom teachers, resident administrators, department heads and other resident staff delineated below are included.

"Other Instructional Staff" includes all other certified teachers who perform duties during the teaching day that do not involve teaching subjects to pupils. Separate sub-categories include salaries of teacher-certificated library, audio-visual, television and guidance personnel resident in the schools.

"Special Supervision" refers to that portion of teacher salaries going toward activities other than teaching,

Expenditure Accounts		
Series	100	ADMINISTRATION
		110 Salaries
		(a) Academic
		(b) Support
		120 Expenses
	200	INSTRUCTION
		210 Salaries
		211 Teachers
		212 Administrators
		213 Department Heads
		214 Other Instructional Staff
		(a) Library
		(b) Audio-visual and Television
		(c) Guidance
		(d) Other
		(1) Substitute Teachers
		(2) General Supervision
		(3) Special Supervision
		215 Clerical and Business Support Staff
		230 Library Equipment and Supplies
		235 Audio-visual Equipment and Supplies
		240 Instructional Equipment and Supplies (Curriculum)
		242 General Classroom Equipment, Supplies and Textbooks
		250 Other
	300	ATTENDANCE SERVICES
		310 Salaries
		320 Expenses
	400	HEALTH SERVICES
		410 Salaries
		420 Expenses
	500	PUPIL TRANSPORTATION
		510 Salaries
		520 Other

FIGURE 2

FUNCTION-OBJECT CLASSIFICATION OF EXPENDITURES

Expenditure Accounts		
Series	600	PLANT OPERATION
		610 Salaries
		640 Utilities
		(a) Fuel
		(b) Light and Power
		(c) Telephones
		(d) Water
		650 Supplies
		(a) Custodial
		660 Other Expenses
	700	PLANT MAINTENANCE
		710 Salaries
		720 Repair and Replacement of General Equipment and Furniture
		740 Other
	800	FIXED CHARGES
	900	FOOD SERVICES
		910 Salaries
		920 Other
	1000	STUDENT BODY ACTIVITIES
	1100	COMMUNITY SERVICES
	1300	DEBT SERVICE FROM CURRENT FUNDS
	1400	OUTGOING TRANSFER ACCOUNTS

FIGURE 2 (concluded)

substitute duty, and general pupil supervision. Activities included in this category are: language laboratory supervision, administrative supervision, house-league supervision and science laboratory supervision. In none of these activities was there a direct count of students. In some cases students were not directly involved at all. In any case, released time was provided for these teachers.

The salaries of resident secretaries, clerical assistants, and business personnel are aggregated under "Clerical and Business Support Staff".

"Library Equipment and Supplies" includes expenditures such as bookbinding costs, library books, instructional materials center supplies, equipment, maps, and globes. As a general guideline, any materials or equipment that are handled through the school library are placed in this category.

"Audio-visual Equipment and Supplies" includes such items as projector bulbs, transparencies, overhead projectors, and film strip projectors, as well as repairs to audio-visual equipment.

For the purposes of this study, the category "Instructional Equipment and Supplies" is an aggregation of those costs pertaining to instructional equipment and supplies that could be assigned to one of the eleven curricular programs used in the study. "General Classroom Equipment, Supplies and Textbooks" includes the remainder

of the instructional equipment and supplies that are not assigned to a specific curricular program. The remaining "Other" category includes such items as data processing costs, guidance materials, and the cost of materials used in curriculum development activities in general.

300 Attendance Services, 400 Health Services and 500 Pupil Transportation. The data for these three series were provided by Researcher 4. These were treated as non-resident costs in the project.

600 Plant Operation. Reason and White (49:62) state that this classification "consists of the housekeeping activities concerned with keeping the physical plant open and ready for use." Cleaning, disinfecting, heating, lighting, communications, power, moving furniture, handling stores, and caring for grounds are activities generally included in this category. In this study, "salaries" related to plant operation were aggregated directly by school. Similarly, data were available for each of the "utilities" for each school. The category "Supplies" includes items provided for the caretakers either by direct purpose or supplies from warehouse inventory.

700 Plant Maintenance. This classification consists of those activities connected with keeping the grounds, buildings, and equipment at a new-condition level either through repairs or through replacement. The "Salaries"

pertaining to the Plant Maintenance classification were treated as non-resident costs in this study and were provided by Researcher 4. The category "Repair and Replacement of General Equipment and Furnishings" includes such expenditure items as repairs to furniture and equipment, purchase and maintenance of caretaking equipment, and caretakers' tools.

800 Fixed Charges. The elements of this classification were defined by Researcher 4, and the appropriate data for the study were provided by him.

900 Food Services. This category includes full-time and prorated portions of salaries of persons engaged in the preparation and serving of regular and incidental meals, lunches, or snacks in connection with school activities. In this study, there were no expenses indicated in the data used, and therefore, it was assumed that the expenses incurred were balanced by revenues from the sale of lunches.

1000 Student Body Activities, 1100 Community Services, 1300 Debt Service from Current Funds, and 1400 Outgoing Transfer Accounts. These expenditure accounts were treated as non-resident and were, therefore, examined and reported by Researcher 4.

The entire expenditure series comprises the function-object classifications used for the cost structure component

in this study. The second component developed was the program structure.

Program Structure: Classification of Programs

The term "program" in this study is used in the noun form rather than the verb form. Knezevich (38:5) held that "programming in the verb sense implies translating time phased plans into action by relating resources to stated objectives." Used in a noun sense, a program is solely a group of inputs enabling the provision of curricular or non-curricular activities which may or may not be related to stated objectives (Knezevich, 38:7). This study did not explore the goals and objectives of the school system involved: it, therefore, was limited to costing related groups of inputs which were called "programs".

Barro's (2:30-43) three-dimensional classification (cf. supra:33) of school programs was utilized in this study. He divides programs on the basis of:

(1) Subject,

(2) Grade,

(3) Type of student.

In this study, the individual subject was the fundamental unit selected for costing purposes. These were then aggregated into curricular areas.

The single grade dimension was used in most of the analysis but in some instances a grade range was found more suitable, e.g., allocating indirect costs to curricular

areas that were not distinguishable by grade because high school students move across grade lines.

The type-of-student dimension was operationalized, at least in part, by the designation of six program routes which were assumed to represent a type of student requiring this differentiation. The particulars are given and amplified below.

The two broad categories of curricular and non-curricular programs were used in this study. Curricular programs involved direct instruction, e.g., science programs, whereas, the non-curricular programs dealt with supporting activities such as administration. A curriculum cluster is a group of related curricular programs. In this study, the groupings were determined by the functional categorization of these programs in the organizational structure of the school system, that is, groups of programs were clustered together in four separate functional categories to identify the areas of supervisory responsibilities of system-level curriculum staff.

Curricular Programs

Curricular programs were sub-classified on a three-dimensional basis, namely, by subject, grade-level, and type of pupil.

The subject dimension. After a preliminary listing of all the subjects was made, eleven curricular programs

were defined. The guidelines used were an adaptation of Hartley's (31:164-66) classifications. The eleven categories selected were applied to the Department of Education (Alberta) (25:20-22) listing of high school courses and found to be satisfactory. The eleven curricular programs identified were:

(1) English Language Arts,

(2) Modern Languages,

(3) Mathematics,

(4) Science,

(5) Social Sciences,

(6) Physical Education,

(7) Fine Arts,

7.1 Music

7.2 Drama

7.3 Art

(8) Home Economics,

(9) Industrial Arts,

(10) Business Education,

(11) Technical Education.

Table XXVII, Appendix A, provides a complete breakdown of all the courses included in these eleven categories. For classification purposes, all combined courses, e.g., Music 21/31, were considered as single courses at the highest grade level indicated. The fine arts program was subdivided into the subprograms, namely, music, drama and

art. This subdivision was necessary in order to accommodate the aggregation involved at the curriculum cluster level. The school system organizational chart placed the fine arts courses in two separate curriculum clusters, and, therefore, required that these subjects be kept separate to enable aggregation at the curriculum cluster level. The curriculum clusters used were:

(1) Communications,

(2) Environmental Studies,

(3) Humanities,

(4) General Vocational Education.

Figure 3 illustrates the component programs in each curriculum cluster. The English language arts program, the modern languages program and the music and drama portion of the fine arts program, make up the communications cluster. The environmental studies cluster is comprised of the mathematics, science and physical education programs. The social sciences and art (taken from the fine arts program) make up the humanities cluster, whereas the general vocational education cluster consists of the home economics, industrial arts, business education and technical education programs.

The grade dimension. The overall project was designed to provide cost data for all grades, on an individual grade basis and on a grade-range basis. The grade divisions were defined as follows:

Curriculum Cluster	Curricular Areas[a]
Communications	English Language Arts Modern Languages Music Drama
Environmental Studies	Mathematics Science Physical Education
Humanities	Social Sciences Arts
General Vocational Education	Home Economics Industrial Arts Business Education Technical Education

[a]For further breakdown see Table XXXVII

FIGURE 3

CURRICULUM CLUSTERS BY CURRICULAR AREAS AS DEPICTED IN ORGANIZATIONAL CHART

Division 1: Grades 1 to 3 inclusive,

Division 2: Grades 4 to 6 inclusive,

Division 3: Grades 7 to 9 inclusive,

Division 4: Grades 10 to 12 inclusive.

This study was concerned primarily with Division 4 which is commonly referred to as "senior high school" in Alberta.

The type-of-pupil dimension. A study of the typical subject patterns offered in the five high schools in the sample suggested at least six different student-program routes. These were:

(1) Academic: No restrictions (complete freedom of choice by student),

(2) Academic: English-Social Studies Restriction,

(3) Academic: Mathematics-Science Restriction,

(4) General Diploma,

(5) Technical Education,

(6) Business Education.

The courses contained in these six student-program routes are defined in Figure 4. All program routes were equivalent in terms of instructional time, that is, full-time instruction (forty credits in Alberta) was the base used. The costing of these program routes involved the determination of the minimum and maximum cost of each route. In this way, the range of costs associated with a student-program route were shown.

	Program-Route One. Academic: No Restrictions
Grade Ten:	Includes English 10, Social Studies 10, Physical Education 10, Mathematics 10, five credits of science - matriculation courses, a modern language course, and two five-credit equivalent options.
Grade Eleven:	Social Studies 20, ten additional credits of language arts, a matriculation mathematics course, a science course, a modern language course, plus two options at the Grade Eleven level.
Grade Twelve:	English 30 and Social Studies 30, a matriculation mathematics course, a science course, a modern language course, plus three options at the Grade Twelve level.
	Program-Route Two. Academic: English-Social Studies Restriction
Grade Ten:	English 13, Social Studies 13, Physical Education 10, Mathematics 10 or equivalent, another language arts course, a five-credit equivalent matriculation science course and ten credits of options.
Grade Eleven:	English 23, a social science course, a matriculation mathematics course, a matriculation science course, and twenty credits of Grade Eleven options.
Grade Twelve:	English 33, a matriculation mathematics course, two science courses, and a social science course, plus three options, all at the Grade Twelve level.
	Program-Route Three. Academic: Mathematics-Science Restriction
Grade Ten:	English 10, Social Studies 10, Physical Education 10, a general mathematics course, a general science course (Science 11), a modern language course, and ten credits of options.

FIGURE 4

COURSE SPECIFICATION OF STUDENT-PROGRAM ROUTES

Grade Eleven:	Social Studies 20, two language arts courses, a modern language course and twenty credits of options at the Grade Eleven level.
Grade Twelve:	English 30, a social science course, a modern language course, and twenty-five credits of Grade Twelve options.
	Program-Route Four. General Diploma
Grade Ten:	Physical Education 10, a language arts course, a social science course, a mathematics course, a science course, and fifteen credits of options.
Grade Eleven:	A language arts course, a social science course, and thirty credits of Grade Eleven options.
Grade Twelve:	A language arts course and two other Grade Twelve level course in addition to twenty-five credits of options at any grade level.
	Program-Route Five. Technical Education
Grade Ten:	Physical Education 10, a language arts course, a social science course, a mathematics course, a science course and fifteen credits of technical-type courses.
Grade Eleven:	A language arts course, a social science course, a mathematics course, a science course, and twenty credits of options including at least fifteen credits of technical education.
Grade Twelve:	A language arts course, a mathematics course, a science course, a social science course, and a twenty-credit equivalent technical education course, all at the Grade Twelve level.

FIGURE 4 (continued)

Program-Route Six. Business Education	
Grade Ten:	Physical Education 10, a language arts course, a social science course, a mathematics course, a science course, and three Grade Ten business education options.
Grade Eleven:	Bookkeeping 20, Typing 20, a language arts course, a social science course, a mathematics course, and fifteen credits of Grade Eleven level business education courses.
Grade Twelve:	A language arts course, a mathematics course, a science course, a social science course, and twenty credits of Grade Twelve level business education courses.

FIGURE 4 (concluded)

Non-Curricular Programs

Non-curricular programs were defined as a group of related activities which do not involve formal instruction. The non-curricular programs costed at each school were:

(1) Instructional Media,

(2) Guidance (Counselling),

(3) General Administration.

"Instructional Media" included library, audio-visual, and television expenditures; "Guidance" included expenditures associated with pupil counselling functions; and "General Administration" dealt with all resident supporting activities with the exception of those involving the physical plant and food services.

In an attempt to keep each researcher as independent as possible, the non-curricular programs selected were confined to resident programs within each school. Non-curricular programs are for the most part centrally directed and, therefore, did not lend themselves to analysis by Researchers 1, 2, and 3. Consequently, Researcher 4 (involved with system-level costs) directed his attention to non-curricular programs.

The program classification phase was followed by cost-analysis which combined the function-object and program classification phases.

Cost Analysis

The cost-analysis phase involved three general sets

of data. They were:

(1) direct and indirect expenditure data,

(2) implementary expenditure data,

(3) auxiliary data.

In a simplified form, the following formula represents the type of computations involved:

$$\text{Unit Cost} = \frac{\text{Direct and Indirect Expenditures} + \text{Implementary Expenditures}}{\text{Appropriate Unit of Auxiliary Data}}$$

The major components of a cost analysis study are provided in Figure 5. A brief description of these components follows.

Numerator of the ratio. The numerator of the ratio includes the sum of the direct, indirect and implementary costs, or some combination of them, depending on the output unit sought. Direct costs were derived from the staff workload survey as were some of the indirect costs such as science laboratory supervision by a teacher. Other indirect costs involved equipment and supplies directly allocable to curricular programs, e.g., physical education equipment and supplies, and curriculum-oriented support staff, e.g., a science laboratory assistant. The implementary costs were subdivided into general implementary costs which were the general instructional services such as school-office secretaries and physical plant implementary costs, e.g., plant operation. These implementary costs were

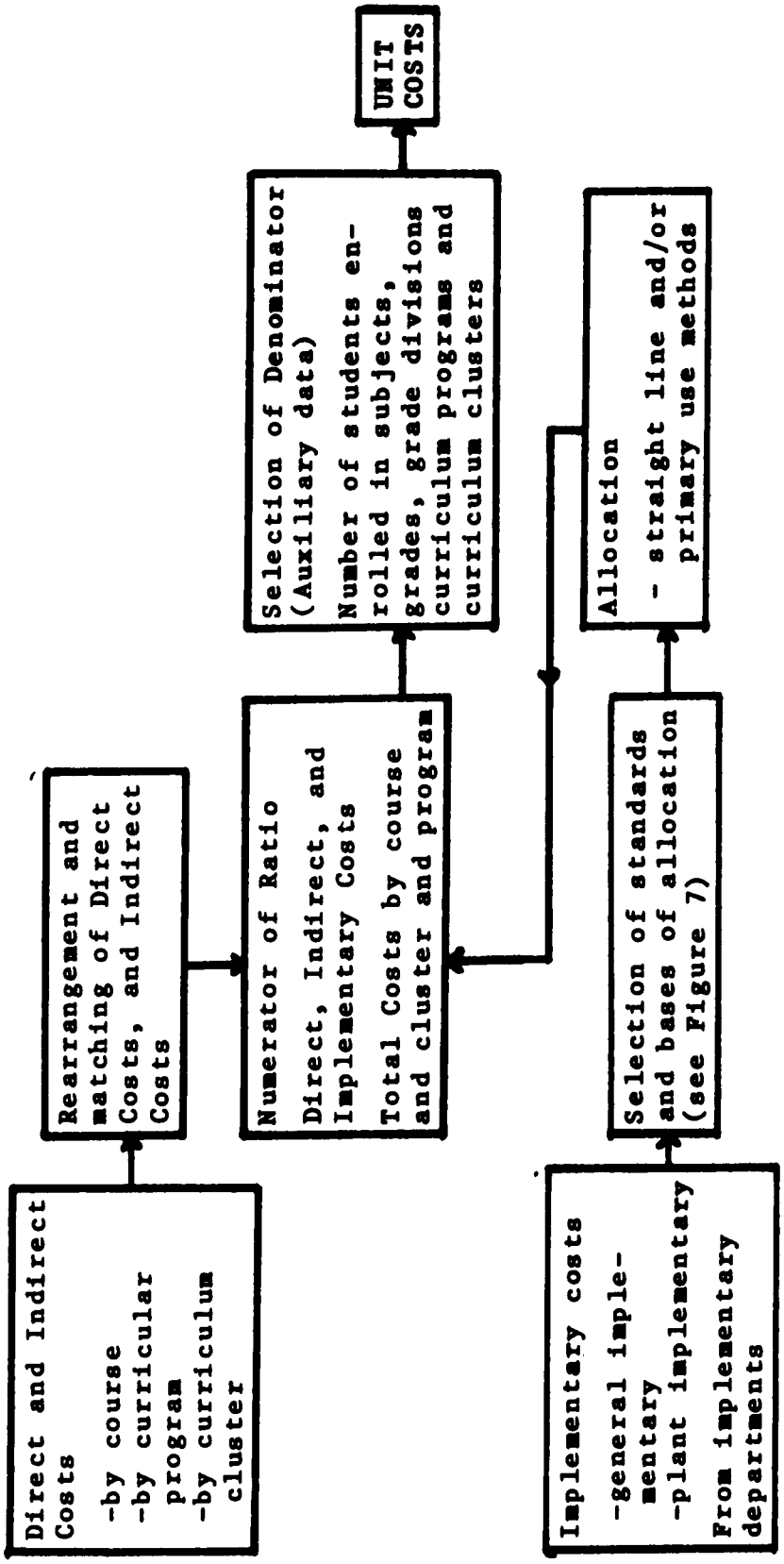

FIGURE 5

A SCHEMA OF A UNIT-COST ANALYSIS METHODOLOGY

then prorated on a selected basis (cf. infra: 92-93) and allocated accordingly.

Selection of the denominator. The denominator of the ratio is comprised of the auxiliary data related to the output unit required. The major auxiliary unit was the pupil. Two types of "per pupil" units were used in this study: "per pupil-enrolled" referred to aggregated grade enrolment, whereas "per pupil-course" referred to the total of all the pupils enrolled in the program or cluster. For example, there were 2,464 pupils enrolled in School A, 3,087 pupils enrolled in the courses making up the language arts program, and 4,550 pupils enrolled in the courses comprising the communications cluster. When courses are clustered, the resultant number of pupils represents duplication of some or many individual pupils.

Other significant auxiliary data used in the study pertained to the teaching staff. For instance, the teaching qualifications and experience of teachers were secured and analyzed in relation to schools and curricular programs.

On a global basis, Figure 5 illustrates the general computational aspects involved in a unit-cost analysis. For instance, the matched direct and indirect costs are added to the prorated implementary costs providing a total cost figure as the dividend. The divisor, comprised of a selected auxiliary unit such as pupils enrolled, enables the computation of the quotient as a per-unit cost.

Depending on the selection of the components of the dividend and the divisor, different types of unit costs can be determined. The following unit costs pertaining to high schools were reported in this study:

(1) Direct Instructional Costs
   - per pupil-course-equivalent
   - per pupil-course by curricular program
   - per pupil by grade

(2) Resident Indirect Instructional Costs
   - per pupil-enrolled by program
   - per pupil-course by program
   - per pupil-enrolled by curriculum cluster
   - per pupil-course by curriculum cluster

(3) Resident Implementary Costs
   - per pupil-enrolled of instructional media, guidance, and administration

(4) Combined Resident Indirect and Implementary Costs
   - per pupil-enrolled by grade and school

(5) Total Resident Educational Costs
   - per pupil-enrolled by program
   - per pupil-course by program
   - per pupil-enrolled by curriculum cluster
   - per pupil-course by curriculum cluster
   - per pupil-enrolled by grade and school

Once the basic data have been collected, the range

of analysis is limited only by the purpose of the study and the level of analytic capability available to the researcher. In this study, the problem of having basic cost data readily available on a continuing basis was investigated, but an exhaustive inquiry in that area was not pursued.

III. DELINEATION OF THE STUDY

This section delineates the study under four separate headings. These topics deal with the selection of the sample, assumptions, delimitations, and limitations of the study.

Selection of the Sample

The twenty-five schools in the project, including the five high schools in this study, were selected by the research director of the school system. Factors such as size of school, age, type, location and program organization (variable scheduling, semestering) were considered, but were not applied in a statistical sense. Tables XXVIII to XXXI, Appendix B provide a description of the selected schools in this study with respect to pupil enrolments and numbers of teachers respectively. Since the schools were arbitrarily selected, no attempt was made to generalize the findings to the entire system.

Assumptions

Several general assumptions were made in the conduct of this study. These were that:

(1) Differences in unit-costs reflected differences in cost rather than differences in quality.

(2) Projecting actual expenditures made over a period of less than a year to cover a full year yielded estimated expenditures that were close to actual expenditures.

(3) Records from which the necessary costs data were extracted were complete and accurate.

(4) Bases and standards selected for proration of implementary costs were reasonably accurate.

Delimitations

The study was delimited to:

(1) Expenditures made by an urban school system in the school year 1969-70.

(2) The analysis of total operational expenditures in a selected sample of schools.

(3) Operating expenditures, including debt service, but excluding depreciation and capital outlay, except where these items came out of current revenue.

(4) Regular day students.

(5) Cost figures, not cost-utility, cost effectiveness, or cost benefit analysis.

(6) The reporting of descriptive data, indicating differences.

Limitations

The limitations of cost studies have been elaborated upon by several writers. Hull (35:372-75) enumerated six limitations and undesirable features.

(1) All cost-study data are quantitative and not qualitative in nature.

(2) The quantitative measures of performance currently utilized are not accurate, e.g., time spent on an activity.

(3) The use of cost studies may imply that cost is the most important aspect of the educational climate.

(4) By charging all expenditures back to instruction, real costs may be obscured, and real instructional costs may be distorted.

(5) The nature of cost-study data may lead to faulty interpretation, misuses, and the establishment of improper relationships.

(6) The availability of cost-study data may lead to abuses resulting from excessive zeal to reduce costs.

Of the above-mentioned points, only the first two are direct limitations on the methodology of cost studies; the remaining four points emphasize the improper use of cost-study data. Two additional limitations had particular relevance to this study:

(1) The problem of interpreting individual school timetables in a uniform manner, e.g., accurate designation

of learning activities as subjects.

(2) The problem of uniform interpretation of expenditure data by members of the research team making individual applications, e.g., classification of accounts.

Referring to limitations generally, Burke (7:120) stated that most of the unit-cost theory as applied to educational costs is not valid. He suggested three other factors which contribute to the limitations of unit-cost studies. They are:

(1) The lack of a unit of measure which is unchanging, e.g., a weighted pupil.

(2) Lack of uniform cost-accounting system.

(3) Lack of uniform standards or specifications for describing the good or service whose cost is to be compared.

Burke (7:121) concluded that, "The only defensible use of per pupil expenditure comparisons is to offer a challenge for explaining differences or lack of differences."

In this study, the emphasis was on description, i.e., various unit costs at different levels of aggregation. Differences that emerged were not investigated; they may serve as the basis for advancing new hypotheses. The idiosyncratic nature of this study militates against the generalization of the findings to the entire system.

IV. SUMMARY OF CHAPTER III

Three phases comprise the conceptual design of this study. First, the conventional function-object classification phase is an adaptation of an expenditure classification system developed by Reason and White (49: 27). Second, the program-oriented classification phase includes the identification of programs by subject, grade and type-of-pupil dimensions. Third, the integrated cost analysis phase focussed on the synthesis of direct and indirect expenditure data, implementary expenditure data, and auxiliary data resulting in various unit costs. These unit costs offer a challenge to decision makers for explaining differences or lack of differences.

CHAPTER IV

RESEARCH PROCEDURES

Events that transpired prior to the data-gathering stage are reported in the first section of this chapter. The various sources of data are enumerated and described in the second section. The third section provides a resume of the three methods utilized to collect data, namely: (1) search of the information system, (2) structured interview, and (3) consultation. The fourth section is a description of the analytical processes, including an outline of the role of the computer in the study, and providing a chart of the proration methods utilized.

I. FORMULATION OF THE STUDY

This study was initiated informally through discussions between the faculty advisor and the school superintendent of the urban system involved. This led to a series of three formal meetings attended by school system officials, the advisor and the investigator. One of these meetings also involved three officials of the Department of Education. These meetings served three purposes:

(1) the presentation and discussion of the research proposal as to the value of the project,

(2) the degree of participation of the school

system,

(3) the establishment of a school system liaison committee to offer guidance in the conduct of the project.

The liaison committee consisted of two appointed officials and a third person who volunteered his assistance. The two appointed officials represented the "academic" and "business" sides of the organization. One formal meeting of the liaison committee and this investigator was held at which time the overall plan for securing data was formulated. A memorandum (Appendix C) supporting the investigator's letter of intent served to legitimate the study to those officials contacted in connection with the project.

The liaison committee suggested that complete anonymity was preferred in view of possible controversy surrounding the interpretation of differential costs. This recommendation was followed in the reporting of the project. Another guiding principle was the minimization of resident school personnel involvement. This principle necessitated a thorough search of the information system to insure that only those data that were not already available in central office were gathered at the school level.

Following the transmission of the memorandum to schools tentatively selected for participation in the project, each of the resident principals was contacted by

this investigator with the view to arranging an exploratory meeting between the principal, this investigator, and the researcher involved. At these introductory meetings, the nature of the project was explained, as were the implications of participation. All twenty-five principals agreed to participate in the project.

A copy of the interview schedule used (Appendix D) was left with each principal for familiarization purposes. Included was a sample time log to be used by those wishing to do so. Subsequent meetings with the principal and members of his staff involved were arranged by the individual researcher concerned or this investigator.

Similarly, introductory meetings were arranged with the central office officials involved. Generally speaking, the procedure used involved an initial meeting with the unit head or line officer. Subsequent consultations were primarily with the staff members most closely connected with the expenditure under study. To further facilitate matters, a temporary office for the project team was arranged by the liaison committee.

II. DATA SOURCES

Two general kinds of data, cost data and auxiliary data were collected from eight types of sources:

(1) the staff workload survey,

(2) the direct purchases by schools computer run,

(3) the inventory charges to schools computer run,

(4) the instructional staff payroll computer run,

(5) the resident support staff payroll computer run,

(6) the general ledger,

(7) regularly compiled school system data,

(8) interviews and consultations with appropriate instructional and support personnel.

Staff Workload Survey

Appendix E contains a sample of the type of form used in this study. There were five kinds of data connected with this form: (1) teacher qualifications and experience for salary purposes, (2) basic and total salary, (3) courses taught and other activities, (4) time allotted to each course or activity per week or timetable cycle, and (5) the number of students enrolled, where applicable.

Semestering practices in some high schools necessitated the integration of two sets of timetables.

Direct Purchases Computer Run

This computer run included all the direct purchases made by each school on an accumulating basis. These expenditure accounts were monthly summaries of a "bundle listing" which, in effect, was the first tally of all the item expenditures leading to the categorization by account code. The direct purchases run was coded by location and by account code. The monthly accumulated totals ran for the

calendar year, i.e., January 1 to December 31, rather than the school year, September 1 to next August 31.

Inventory Charges Computer Run

The inventory charges run functioned in the same manner as the direct charges run. It included items supplied to each school from inventory. Accumulated cost totals for each account code were identified with a school by a location code.

Instructional Staff Payroll Computer Run

This system-wide alphabetized computer run contained the names, salaries, and other particulars of the instructional staff who were covered by the collective working agreement with the Alberta Teachers' Association. In addition to salary particulars (basic and other salary), the qualifications and teaching experience for salary purposes were extracted from this monthly source.

Resident Support Staff Payroll Run

All support staff assigned to a particular school were listed by title on this bi-weekly run. School support staff fell into three categories of employees: (1) full-year employees, (2) ten-month employees, and (3) part-time employees paid on an hourly basis.

General Ledger

The general ledger served as a checking document.

Coding errors, or unusual entries in the direct changes or inventory runs necessitated reference to the general ledger for explanatory purposes. The accounting base was an accrual entry system.

Regularly Compiled School System Data

Some of the auxiliary data such as enrolments by school were made available by the appropriate official. For example, the "Superintendent's Report on Enrolment" provided enrolment data, in addition to the number of teachers employed in each school which served as a check on other data. Staff lists, indicating administrative designations, e.g., principal, first assistant principal, second assistant principal, and timetables were obtained from the appropriate staffing officer.

Interviews and Consultations

Forty-three structured interviews were conducted with resident administrators, librarians, and heads of guidance departments (see Appendix D). Unstructured interviews were held with the system supervisors of library and audio-visual services in addition to the directors of counselling and administrative staffing. One or more consultations took place with fifteen officials, most notably, the supervisors of general information systems, personnel, payroll and other business personnel, the directors of academic and support personnel, and curriculum

personnel. In addition, there were eight consultations with Department of Education supervisors and inspectors in connection with the suitability of various proration techniques.

Cost Data

Three types of cost data were sought in this study, namely, direct costs, resident indirect costs, and resident implementary costs. The following comments relate the type of cost with the type of data source.

Direct costs. The direct costs were obtained from the results of the staff workload survey. A typical staff workload survey directly involves the participation of teachers. This study, by design, did not involve direct interviews with classroom teachers. The information relative to teacher workload was procured from high school timetables submitted to central office, school principals' "peg-boards", and consultations with school-level administrators. Teacher salaries and particulars in connection with staff changes were obtained from the system academic payroll records and consultations with appropriate officials.

Resident indirect costs. Those costs, other than salary costs of formally-scheduled teaching classes, that could be assigned to a subject area directly were defined as indirect costs. These data came from the staff workload survey, the direct purchases and inventory charges computer

runs, and the instructional and support staff computer runs.

Resident implementary costs. All cost sources contained implementary costs to some degree. For example, released teacher time for cafeteria supervision is an implementary cost that appeared on the staff workload survey. The direct charges and inventory computer runs contained many implementary costs such as utilities and caretaking supplies respectively. The support staff payroll run was primarily implementary in nature, e.g., custodians and secretaries. Non-resident implementary costs were obtained by Researcher 4.

Auxiliary Data

The auxiliary data came from four main sources: (1) subject enrolments came from the staff workload survey, (2) teaching qualifications and experience were extracted from the instructional staff payroll computer run, (3) school and grade enrolments, timetables, and staff lists were obtained from the central office records, and (4) information pertinent to the distribution of special service time, e.g., library services, was obtained by interview of the appropriate official. Although most of the auxiliary data were available somewhere in the information system, many consultations were required to determine their availability, form and location.

Two types of enrolments used in the study were grade enrolments and subject enrolments. The grade enrolments used (see Table XXVIII, Appendix B) were an average of the December 31, 1969, and February 28, 1970 figures. Since registrations tend to be somewhat inflated at the beginning of a school year or semester, it appeared more realistic to average a low figure (December 31 enrolment) with a high figure (February 28 enrolment). A relationship existed between the degree of semestering and the amount of difference in these enrolments. Changes tended to be insignificant in the least-semestered high school and very significant (over 200 pupils) in one of the highly semestered schools.

Subject enrolments were taken at approximately the same time (Table XXIX, Appendix B). For example, the subject enrolments for the first semester were taken during the month of January, but before the semester break which came near the end of January. The second semester class enrolments were taken near the end of the month of February. This approach tended to inflate the enrolments of the highly semestered schools because second semester enrolments were taken early in the semester. A preferable practice would have been to take subject enrolments at the beginning of each semester and allow for inflated figures. However, reliable data were not available for the early part of the fall semester. That is, the subject enrolments for all

schools were not available as of a specified date, e.g., October 1. For this reason, the alternative described was adopted.

III. DATA COLLECTION

In gathering the data, an effort was made to (a) use the information already available, and (b) reduce the imposition on teacher and school-administration time to a minimum. This approach meant a great deal of extra work on the part of the researchers, particularly in the case of the staff workload survey. With some exceptions, the data required were not in a directly usable form. For instance, where high school course designations were not clear on the high school timetable, they were checked against "Form A" cards submitted to the central office, and discrepancies that still existed were then pursued directly with the high school principal or one of his assistants. These check-points served to make the data more accurate than dependence on a single source, namely, a teacher-completed form.

Methods of Collection

The typical cost-analysis instrumentation techniques were minimally employed in this study. Forms and questionnaires were used for guideline purposes by the researchers, but virtually all the data collected involved direct interviews or consultations, or an examination of primary source data. In some instances, e.g., staff workload survey, all

three sources were involved.

Searching the information system. One of the major functions of the liaison committee was to direct this investigator to individuals in the organization who could assist in the collection of the required data. The cost data required for the staff workload survey were transferred from the instructional staff payroll computer run to the "Staff Workload Survey Worksheet" (Appendix E) by each researcher. Similarly, the auxiliary data needed were collected by examining school timetables, teacher timetables and reported enrolment figures.

The direct purchases and inventory supplied-to-schools data were extracted from the appropriate runs and categorized according to the design of the study. For example, expenditures were first classified as indirect or implementary. If indirect, the account was further categorized according to curricular area. Both indirect and implementary expenditures were also classified according to the function-object classification used (see Figure 2, pp. 48-49).

Data from the support staff computer runs were categorized as either indirect or implementary expenditures and were further classified by function-object and by curricular area where appropriate.

Some of the auxiliary data, such as timetables, school enrolments, and teacher lists, were obtained from the

appropriate officer in the form available and then were restructured according to need.

Structured interview. The forty-three structured interviews included five principals, nine first-assistant principals, fifteen second-assistant principals, nine teacher-librarians, and five counselling department heads. The nature of the data sought are illustrated in the interview schedule (Appendix D). Copies of the schedule were left at each school on the introductory visit to allow those involved to familiarize themselves with the content of the subsequent interview. The "returns" in this connection were 100 per cent.

Consultations. This investigator spent approximately two months in the school system. Throughout the exploratory and data collection phases of the study, this investigator was resident in the central office quarters provided by the school system. This approach facilitated a large number of consultations with those persons most closely associated with the search at hand. This continuous exposure in the system fostered a high acceptance of the researchers by the members of the organization. After the initial period, many consultations could be made by telephone without first "legitimating" the purpose of the call. This procedure minimized personal interpretations of unclear data. Officials contacted for information were most cooperative.

IV. TREATMENT OF THE DATA

Four kinds of outputs were required, namely: (1) direct instructional costs, (2) resident indirect instructional costs, (3) resident implementary educational costs, and (4) non-resident indirect and implementary costs.

Direct Instructional Costs

It was originally intended that the computational treatment of all data was to be computerized. However, because of the lead time necessary for computer-program development, and the time constraint imposed by a team project in a graduate-school setting, a significant portion of the computations involved in this study was done manually. On the other hand, the largest single aspect in the study, namely, the calculation of direct costs, was computerized.

Figure 6 is illustrative of the computer function in the project. The input data consisted of the staff work-load data plus the specification of curricular program and curriculum clusters. In summary, the computer input data consisted of the teacher time study, payroll data, pupil enrolments, and a specification of curricular programs and clusters.

The resulting computer output consisted of all the direct instructional costs by subject, by curricular program, and by curriculum cluster. These unit costs were

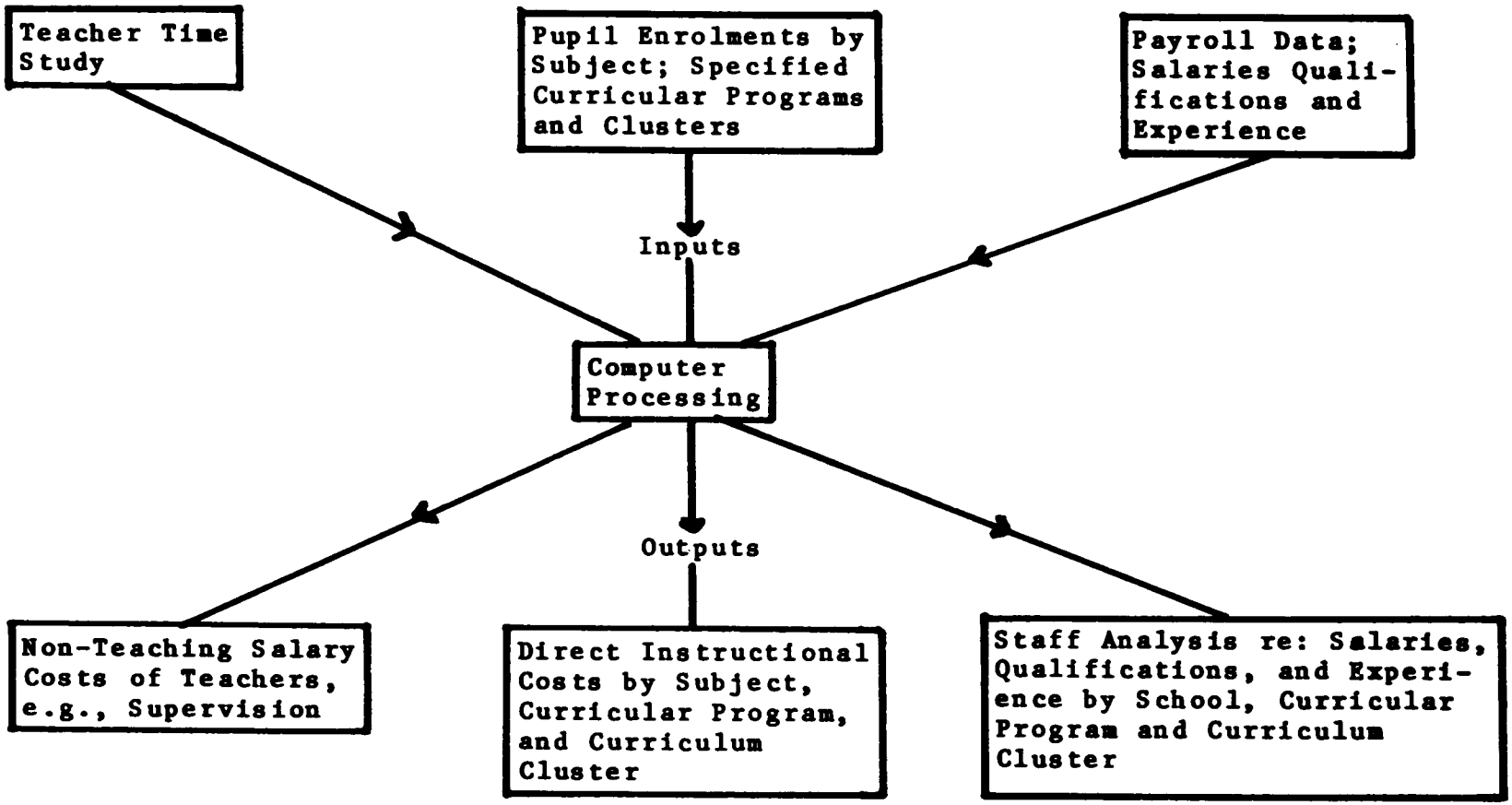

FIGURE 6

AN ILLUSTRATION OF COMPUTER INPUTS AND OUTPUTS FOR THE DIRECT INSTRUCTION COMPONENT OF A COST ANALYSIS

available by grade and by grade division. In addition, the staff analysis (see Figure 6) by school and curricular program was done by computer. The "Non-Teaching Salary Costs" refers to those activities conducted by the instructional staff during school hours which did not involve subject classes. To this extent, some resident indirect and implementary costs were computer outputs. Tables I, II, III, XXX, XXXII, XXXIII, XXXVII, and XXXVIII were direct computer outputs.

The classification of the direct, resident indirect and implementary instructional salary expenditures into function-object type expenditures was done manually. With reference to Figure 2, on pages 48-49, Series 210, 211, 212, 213, and 214 were extracted from the computer run. The proration statistic involved in allocating instructional salary costs of function or activity was time spent in that activity as a fraction of a work week.

Resident Indirect Instructional Costs

These costs were computed manually after extracting the large portion of them from the school system's direct charges and inventory computer runs. Resident indirect costs were also obtained from the staff workload survey and the school system's support staff computer run. The direct charges and inventory runs provided the indirect equipment and supplies expenditure connected with Series 230, 235, and 240 of the function-object classification system used.

Series 240, "Instructional Equipment and Supplies (Curriculum)", was a special adaptation to facilitate the aggregation of curriculum-oriented expenditures or indirect costs.

In the computation of curricular program and curriculum cluster unit costs, instructional media (library, audio-visual, and educational television expenses) were included. Table XXXIV (Appendix F) gives the prorations used to allocate instructional media costs to curricular programs. However, it should be noted that "Instructional Media" was also costed as a separate program and treated as a general implementary program for illustrative purposes. The actual cost of an instructional media program was considered a useful output of the study. Similarly, on the basis of related literature and consultations with the supervisory personnel in the school system, it was decided to treat instructional media both as an indirect cost for curricular program purposes and separately as a general implementary program. In the computations of total educational costs per pupil this situation was accounted for.

The account codes used by the school system were more extensive than was required for the study. For example, expenses for home economics had eight different account codes. The procedure followed in obtaining resident indirect costs was as follows: all relevant costs were extracted from the various computer runs and placed in one of eighteen

categories. The eighteen categories included thirteen curricular areas (fine arts was subdivided into music, drama and art), library, audio-visual, guidance, general implementary, and plant implementary categories. The last three categories, namely, guidance,[1] general implementary, and plant implementary are not in the indirect expenditure classification. The codes used by the system were more than sufficiently descriptive to allow this type of categorization. When there was any doubt in this respect, appropriate consultations were made.

One of the problems in the study was connected with the proration of the indirect expenditures in these accounts to cover the school year before it had expired. To wait for actual expenditures involved a delay of approximately four months, therefore a proration technique was employed.

An examination of the expenditure pattern relative to school equipment and supplies revealed a non-linear relationship over the school year. Hence, prorating the expenditures by account for the remaining portion of the year would prove to be inaccurate. Instead, the adjusted actual expenditures for a full twelve-month period were used. Actual expenditures for the calendar year 1969 were upwardly adjusted by ten percent. The adjustment percentage was arrived at through consultations with the three officials

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[1]Guidance personnel interviewed agreed that guidance services should be treated as an implementary cost.

deemed to be most closely connected with these expenditure classifications. It was assumed that the ten per cent figure accounted for enrolment increase, inflation, developmental factors, and the overlapping calendar and school years.

Resident indirect expenditures did not require proration to curricular programs in that total costs were allocated. However, some of these costs were already prorated by time, e.g., indirect costs from the staff work-load survey. Conversely, in the calculation of per pupil costs by grade, resident indirect costs were treated as implementary costs and prorated accordingly. The proration statistic used was the number of pupils.

Resident Implementary Educational Costs

The implementary costs in this study were subdivided into general implementary and plant implementary categories. The resident, general implementary expenses included administrative salaries of instructional personnel (Series 212), clerical and business support staff (Series 215), some general and special supervision costs (Series 215), some general and special supervision costs (Series 214 (d) (2) and 214 (d) (3)), general classroom equipment supplies and texts (Series 242), and "Other" educational expenses (Series 250) such as data processing. Food services (Series 910) was also included in the resident, general implementary expenditure category.

The plant implementary expenditure included the 600 Series and the 700 Series. The 600 Series (Plant Operation) was comprised of custodial salaries, utilities, and custodial supplies. The salaries of custodians were extracted from the support staff payroll computer run, whereas the remaining expenditures in the 700 Series came from the direct purchase and inventory runs. Utilities and custodial supplies were subject to the same upward adjustment required for indirect costs (cf. supra: 88-89).

School support staff salaries (both general and plant implementary), in addition to several indirect salary expenditures, e.g., science laboratory assistants, were of three kinds. There were full-year employees, ten-month employees, and part-time employees paid by the hour. Since the support staff computer run did not provide yearly salaries, the bi-weekly and hourly rates were converted to yearly rates. Where the conversion chart provided did not apply, semi-monthly rates were multiplied by the factor 26.1 for full-year employees, and an additional factor of five-sixths was applied for ten-month employees. Hourly rates were multiplied by the factor 2,008 which was suggested by the officials involved as an average figure reflecting the total hours spent by hourly-paid employees in one year.

Other methods of determining the support staff salaries allocatable to the school year were considered, but the approach described above was selected because it was

reasonably accurate and relatively simple to apply. The fact that most anniversary dates for pay increases occurred September 1st was a significant determinant.

The 700 Series (Plant Maintenance) was a relatively small expenditure item on a resident basis. This expenditure was extracted from the direct purchases and inventory runs, and included items primarily related to the repair and replacement of general equipment and furnishings (Series 720). The proration of resident implementary costs to the various instructional components is described in the following section.

Non-Resident Indirect and Implementary Costs

These expenditures were provided by Researcher 4 and included: (1) 100 Administration series, (2) 500 Pupil Transportation series, (3) most of the 700 Plant Maintenance series, (4) 800 Fixed Charges series, (5) 1000 Student Body Activities series, and (6) 1300 Debt Service from Current Funds.

In prorating the resident and non-resident implementary costs to curricular programs, curriculum clusters, school, and grade level, several proration methods, or combinations of them were used. Figure 7 summarizes the various proration methods used by function-category. For example, the salaries of resident administrators (Series 212) were prorated to curricular programs and curriculum clusters by dollar volume and time; to the school by time; and to grade level by the number of pupils.

Expenditure Series	Proration Method			
	Curricular Program	Curricular Cluster	School	Grade
100 ADMINISTRATION				
110 Salaries	DV	DV	NP	NP
120 Expenses	DV	DV	NP	NP
200 INSTRUCTION				
210 Salaries	AE	AE	AE	AE
211 Teachers	AE	AE	AE	AE
212 Administrators	DV & T	DV & T	AE	NP & T
213 Dept. Heads	DV & T	DV & T	AE	NP
214 Other Instr. St.				
a. Library	DV & T	DV & T	AE & T	NP
b. AV & TV	DV & T	DV & T	AE & T	NP
c. Guidance	DV & NP	DV & T	AE & T	NP
d. Other				
1. Sub. Teacher	DV	DV	AE	NP
2. Gen. Super.	DV	DV	AE	NP
3. Spec. Super.	DV	DV	AE	NP
215 Clerical & Bus. Support Staff	AE & DV	AE & DV	AE	NP
230 Library Equip. & Supplies	AE & QC	AE & QC	AE	NP
235 AV Equip. & Supplies	AE & QC	AE & QC	AE	NP
240 Instr. Equip. & Supp. (Curric.)	AE	AE	AE	NP
242 General CR Equip. Supp. & Texts.	AE & DV	AE & DV	AE	NP
250 Other Non-Res. Instr. Expenses	DV	DV	NP	NP
300 ATTENDANCE SERV.				
500 PUPIL TRANS.				
510 Salaries & Other	DV	DV	NP	NP

FIGURE 7

PRORATION METHODS USED TO ALLOCATE EXPENDITURE TO CURRICULAR PROGRAMS, CURRICULUM CLUSTERS, SCHOOLS, AND GRADES

Expenditure Series	Proration Method			
	Curricular Program	Curricular Cluster	School	Grade
600 PLANT OPERATION				
610 Salaries	DV	DV	AE	NP
610 Utilities				
a. Fuel	DV	DV	AE	NP
b. Light & Power	DV	DV	AE	NP
c. Telephones	DV	DV	AE	NP
d. Water	DV	DV	AE	NP
650 Supplies				
a. Custodial	DV	DV	AE	NP
Non-Resident Expenses	DV	DV	NP	NP
700 PLANT MAINTENANCE				
710 Non-Resident Salary & Expenses	DV	DV	NP	NP
720 Repair & Replace of Gen. Equip. & Furniture	AE & DV	AE & DV	AE	NP
800 FIXED CHARGES	DV	DV	NP	NP
900 FOOD SERVICES				
910 Salaries	DV	DV	AE	NP
1000 STUDENT BODY ACT.	DV	DV	NP	NP
1300 DEBT SERVICE FROM CURRENT FUNDS	DV	DV	NP	NP

LEGEND:

T: Time
NP: Number of pupils
AE: Actual expenditures
DV: Dollar volume
QC: Quantity consumed

NOTE: Teachers' salaries were prorated to subjects by time.

FIGURE 7

(concluded)

Three tables in the Appendix provide the actual proration statistics used in allocating implementary costs. Table XXXV (Appendix F) contains the prorating statistics used to allocate resident and non-resident implementary costs to curricular programs and curriculum clusters. These statistics are proportions based on dollar volume resulting from combining direct and indirect instructional costs. For example, 12.32 per cent of the total direct and indirect instructional costs were in the English language arts program in High School A. The same rationale was used to prorate implementary costs to curricular clusters. For example, 19.18 per cent of the direct and indirect expenditures in School A were in the communications cluster.

The dollar volume proration method was selected after considering other methods for allocating implementary costs to curricular programs. "Number of pupils in a program" was the first method tried, but found to be unsatisfactory. This method did not adequately account for "low-density" subjects like those in technical education, industrial arts, and home economics. These subjects are characterized by low enrolments and larger than normal floor areas with a higher demand on utility services. Conversely, the number of pupils in a program tended to inflate "high-density" courses, such as three-credit academic courses, e.g., science. In other words, a program that had many registrants, but had fewer teaching periods, was allocated

a disproportionately large share of the costs.

A second proration method tried was a combination of floor space and pupil-course enrolment. This procedure tended to account reasonably well for technical education and industrial arts courses, but not for home economics, science, and to a lesser degree the social sciences.

The method finally selected, "dollar volume", removed the obvious inequities which still remained. Consultations were held with subject area supervisors who felt that the "dollar volume" method on an individual school basis provided the most equitable allocation of implementary costs to curricular programs.

Table XXXVI (Appendix F) provides a breakdown of the resident administrative component that pertains to school principals and their assistants. For example, Administrator 2 in School A spends 90 per cent of his time in General Administration and 10 per cent of his time supervising Technical Education. This table also provides grade level prorations where a school differentiated its administrative time in this fashion.

Although there is some doubt as to the value of prorating implementary costs to instructional activities (cf. supra: 26), this procedure was followed in this project in keeping with conventional practice in cost analysis.

V. SUMMARY OF CHAPTER IV

The research procedures employed in this study were divided into four stages. The first stage involved the formulation of the study in terms of the guidelines to be followed. The second stage included the identification of the data sources which totalled eight in number. Next, the methods used for collecting data comprised the third stage in the research procedures. These were: (1) search of the information system, (2) structured interview, and (3) consultation. The fourth and final stage involved the treatment of the data. Four different kinds of outputs were analyzed together with the computer function and prorations involved: (1) direct instructional costs, (2) resident indirect instructional costs, (3) resident implementary educational costs, and (4) non-resident indirect and implementary costs.

CHAPTER V

ANALYSIS AND FINDINGS

This chapter contains seven sections pertaining to the analysis and tabulation of the data of this study and the urban project. The material is ordered in the same sequence as the sub-problems in Chapter I.

The first section deals with an analysis of the qualifications, experience, and salary levels of the teaching staffs of the high schools in the selected sample. The staff analysis is followed by a description of pertinent characteristics of each high school. The next section contains an analysis of the direct instruction costs by subject, curricular program, curriculum cluster, student-program route, and by grade level.

The third section deals with the resident indirect instructional costs by curricular program and by curriculum cluster, in addition to the resident per pupil-enrolled costs of instructional media, guidance, and general administration services. This leads to the fourth section which dwells on the resident implementary per pupil-enrolled costs. Included are the combined resident, indirect and implementary per pupil-enrolled costs by grade.

The fifth section of this chapter contains the total per pupil educational costs. These are tabulated by curricular program, curriculum cluster, and grade level.

Also included is a complete breakdown of per pupil-enrolled costs by a modified conventional function-object expenditure classification system, followed by a two-dimensional program-budget format.

The findings relative to the total project are reported in section six. Unit costs are given by grade, by grade division, by pupil-course in each curricular program and curriculum cluster, and by aggregated function-object expenditure categories. Included also is a summary of costs pertaining to instructional media, guidance, and general administration services as well as a general analysis of the teaching staff in the project sample.

I. STAFF ANALYSIS AND AUXILIARY DATA PERTAINING TO SELECTED HIGH SCHOOLS

This section has two parts. The first is an analysis of the teaching staffs of the five high schools on the basis of average teaching qualifications, teaching experience (for salary purposes), and salary. This analysis was done by school, by sample, by curricular program in each school, and by curriculum cluster in each school, that is, sub-problems 1, 2, and 3 of Chapter I. The second part is a description of some of the pertinent characteristics of each high school in the sample. This information precedes the cost data to provide some contextual background, and is not directly related to the sub-problems appearing in Chapter I.

Average Teaching Qualifications, Experience and Salary of Teachers

Tables XXIX and XXX (Appendix B) provide aggregated data in connection with the average teaching qualifications, experience and salary of teachers by school and by high school sample. The average salary for all five schools was $10,017.22, ranging from an average of $9,554.80 in School C to $10,514.70 in School B. The average length of teaching experience for salary purposes was 6.05 years (the maximum experience counted for salary purposes is eleven years), ranging from an average of 5.12 years in School C to 6.71 years in School A. The average years of teacher training in the sample of 515 teachers was 4.6 years, ranging from an average of 5.4 years in School E to 4.9 years in School B.

Table XXXII (Appendix B) gives the average teaching qualifications, experience, and salary of teachers by curricular program in each high school.

School B had four curricular programs taught by teachers who averaged 5.0 years of training. No other school reached this level in any program area. Generally speaking, the qualifications of teachers in the academic programs such as English language arts, modern languages, etc., tended to be higher than those of teachers in the general vocational cluster. Both schools offering technical education (Schools A and E) were staffed with teachers with qualifications below four years. The business education program in School E was the only other program where the

average training of teachers was under four years.

There was no general pattern evident with respect to the average years of experience for salary purposes. The range in School A was from 3.88 years in modern languages to 7.63 years in technical education. School B ranged from 4.40 years to 10.40 years in social sciences and business education respectively. High School C, with the least-experienced staff, ranged from 2.63 years in physical education to 8.00 years in modern languages. The range in School D was from 3.90 years to 8.18 years in English language arts and business education respectively. Lastly, the range of teaching experience for salary purposes in School E was from 2.63 years in fine arts to 7.70 years in technical education. The relatively high average years of experience for technical education teachers results from the common practice of recognizing work experience for salary purposes. Since the teacher's salary is a function of his training and experience, the average salary of the teachers in each program reflected these two factors. School B tended to have the highest average salaries, whereas School C tended to have the lowest.

Table XXXIII (Appendix B) is an analysis of average qualifications, experience and salary of teachers by curriculum cluster. School D had the highest average salary in environmental studies and in general vocational education. School B had the highest average salary in the communications

cluster, and School A was highest in the humanities. Conversely, School D was lowest in the communications cluster, and School C had the lowest average salaries in the environmental studies, the humanities, and general vocational education. Generally speaking, the general vocational education cluster was characterized by low average training and somewhat higher years of experience, except in the case of School D where the average training was 4.8 years. No other general pattern was evident.

Other Pertinent Data

The five senior high schools in the selected sample were coded simply as A, B, C, D, and E. Each high school had several characteristics which added meaning to the analysis of the cost data. A number of general characteristics were identified as follows (see also Tables XXVII to XXXI in Appendix B).

School A. This was the largest school with 2,464 pupils and 148 teachers. Generally speaking, all subjects were semestered with the exception of the technical education subjects. The school operated on an eight-period schedule. Administratively, this school differed from the others in that it was organized along curriculum lines, that is, each administrator took some curriculum responsibility as opposed to the grade-level responsibility approach. School A offered the greatest number of credits (1,059) and

a total of 139 courses. This school had a wide vocational education offering in terms of courses available. The average teaching salary in this school was the second highest in the sample.

School B. This was the smallest high school with 68 teachers and 1,205 students. An eight-block timetable on a four-day cycle was used, resulting in six teaching periods per day.

None of the courses offered was semestered. There were 81 courses offered with a total of 392 credits. No technical education courses were offered. The administration in this school was organized along grade-level lines, and was involved in the counselling function.

The teaching staff in this school had the highest average training, the most years of experience (for salary purposes), and the highest average salary.

School C. This high school was the second smallest of the group with 75 teachers and 1,581 pupils. School C offered semestered and non-semestered courses in many subjects. Consequently, this school was representative of two kinds of program organization. A seven-block timetable constituted the schedule offerings. Ten of the eleven curricular programs were offered: there was no technical education program.

The teaching staff in this school had the second

lowest average training, the least years of experience, and the lowest average salary.

School D. This high school was the largest of the non-technical high schools. It had a teaching staff of 90 and a pupil enrolment of 2,022. The number of courses offered was 78, and the number of credits was 353. Both totals were the lowest in the sample. There were no home economics or technical education courses offered. This school was partially semestered, primarily in the area of physical education. There were a considerable number of "half-courses" offered, that is, three-credit courses which operated on a semester basis.

The administration was organized along grade-lines for co-ordinating purposes. The teaching staff in this school had the second highest average training, the second lowest years of experience, and third highest average salary.

School E. This high school was the second largest school in the sample with a teaching staff of 134 and an enrolment of 2,224 pupils. School E was fully semestered with essentially a four-block daily timetable. Ten of the eleven curricular programs defined were offered: there were no industrial arts courses. School E offered the greatest number of courses (162), and its total credit offering was 1,009, second only to School A.

The administration in this school was geared to grade-level coordination as a way of allocating supervisory duties. The teachers in this school had the lowest average training, the third highest average years of experience, and the second lowest average salary.

The difference in average teacher salaries in the five high schools had a direct bearing on the derived unit costs. For example, the difference between Schools B and C was 9.1 per cent, that is, direct instructional costs in School B were 9.1 per cent higher than School C on this factor alone.

II. DIRECT INSTRUCTIONAL COSTS

Five analyses pertaining to direct instructional costs disclosed the findings relative to the specific sub-problems numbered 4 to 8 on page 5 of this study. While all five sub-problems dealt with direct instructional costs, the first three were subject-oriented, the fourth was grade-level oriented, and the fifth was pupil-oriented (cf. supra: 54).

Direct Instructional Costs per Pupil-Course-Equivalent: Grade Ten

Table I gives the grade ten direct instructional costs per pupil-course-equivalent in each of the five high schools. A pupil-course-equivalent is one form of standard unit. The unit costs in this table are comparable to the

TABLE I

GRADE TEN DIRECT INSTRUCTIONAL COSTS PER PUPIL-COURSE-EQUIVALENT IN FIVE HIGH SCHOOLS

COURSES	A		B		C		D		E	
	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs
Language Arts:										
English 10	496	$ 45.48	401	$ 48.95	505	$ 45.99	551	$ 56.45	684	$ 44.51
English 13	306	43.71	56	103.17	118	50.65	82	76.71	125	70.08
English 19	-	-	-	-	-	-	-	-	14	145.84
Lit. 11-- Occup.10	6	291.10	-	-	-	-	-	-	-	-
Lit. 11	-	-	-	-	14	112.64	90	47.74	-	-
Reading 10	-	-	21	105.13	157	77.66	87	52.00	104	63.84
Reading 19	-	-	-	-	-	-	-	-	-	-
Totals	808	$ 380.29	478	$ 257.25	794	$ 286.94	810	$ 232.90	959	$ 324.27
Modern Languages:										
French 10	261	$ 46.42	217	$ 57.63	231	$ 68.82	281	$ 52.61	316	$ 48.51
French 11	42	63.05	131	61.85	62	71.22	214	68.62	68	69.85
German 10	71	49.73	-	-	61	63.11	29	44.08	103	68.04
Latin 10	-	-	-	-	-	-	-	-	-	-
Ukrainian 10	88	35.26	-	-	-	-	-	-	-	-
Totals	462	$ 194.46	348	$ 119.48	354	$ 203.15	524	$ 165.31	487	$ 186.40

TABLE I (cont'd)

COURSES	A		B		C		D		E	
	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs
Mathematics:										
Math 10	478	$ 51.94	370	$ 45.93	451	$ 48.50	536	$ 61.40	662	$ 39.97
Math 10X	63	63.67	-	-	-	-	-	-	-	-
Math 10 (new)	-	-	25	41.18	-	-	-	-	-	-
Math 11	-	-	111	56.16	-	-	93	62.60	178	50.89
Math 12	-	-	-	-	-	-	-	-	82	64.22
Math 14	211	49.64	-	-	-	-	-	-	155	45.80
Math 15	323	63.55	-	-	253	53.45	66	38.85	23	92.38
Math 19	-	-	-	-	-	-	-	-	-	-
Totals	1075	$ 228.80	506	$ 143.27	704	$ 101.95	695	$ 162.85	1100	$ 293.26
Science:										
Biology 10	544	$ 42.86	361	$ 35.90	307	$ 54.68	605	$ 48.00	190	$ 54.54
Chemistry 10	586	51.22	397	62.38	477	44.00	525	50.14	413	56.12
Chemistry 10X	-	-	-	-	-	-	27	98.52	-	-
Chem./Biol.10	-	-	-	-	-	-	-	-	169	48.29
Chem./Phys.10	-	-	-	-	-	-	-	-	43	89.56
Physics 10	284	47.46	140	81.26	162	42.40	325	62.26	-	-
Phys./Biol.10	-	-	-	-	-	-	-	-	46	73.89
Science 11	349	42.32	131	68.98	200	51.55	128	65.37	295	54.59
Science 15	-	-	-	-	-	-	-	-	18	118.04
Science 19	-	-	-	-	-	-	-	-	14	112.64
Totals	1763	$ 183.86	1029	$ 248.52	1146	$ 192.63	1610	$ 324.29	1188	$ 607.67

TABLE I (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Social Sciences:										
Soc. St. 10	593	$ 53.78	459	$ 46.42	429	$ 53.31	578	$ 48.89	605	$ 44.21
Soc. St. 13	257	47.49	-	-	157	49.61	58	44.21	210	59.69
Soc. St. 19	-	-	-	-	-	-	-	-	22	92.81
Totals	850	$ 101.27	459	$ 46.42	586	$ 102.92	636	$ 93.10	837	$ 196.71
Physical Education:										
Phys. Ed. 10	762	$ 39.13	441	$ 46.99	652	$ 47.89	686	$ 45.83	891	$ 52.24
Totals	762	$ 39.13	441	$ 46.99	652	$ 47.89	686	$ 45.83	891	$ 52.24
Fine Arts:										
Art 10	-	-	118	$ 70.54	132	$ 54.77	119	$ 40.58	170	$ 58.50
Arts & Cr.10	191	$ 76.49	-	-	-	-	-	-	-	-
Drama 10	170	61.76	62	68.69	54	73.19	171	53.32	61	60.60
Drama 11	42	52.25	-	-	-	-	-	-	-	-
Music 10	4	128.69	-	-	-	-	-	-	-	-
Music 11/13	-	-	-	-	-	-	-	-	11	144.12
Music 11	43	48.05	14	126.66	18	92.68	46	108.92	-	-
Music 14	-	-	-	-	-	-	-	-	74	67.57
Music 15	-	-	-	-	-	-	-	-	51	67.91
Totals	450	$ 357.73	194	$ 265.89	204	$ 220.64	236	$ 202.82	367	$ 398.70

TABLE I (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Home Economics:										
Child Care & Home Nurs. 10	34	$ 82.00	-	-	-	-	-	-	-	-
Fab. & Dress10	122	61.71	89	$ 68.99	51	$ 97.55	-	-	90	$ 92.09
Fds. & Nut.10	127	64.77	94	82.85	-	-	-	-	73	104.69
Home Ec. 10	-	-	-	-	-	-	-	-		
Home Ec.Cr.10	32	69.02	-	-	-	-	-	-	28	129.33
Totals	315	$ 277.50	183	$ 151.84	51	$ 97.55	-	-	191	$ 326.11
Industrial Arts:										
Drafting 10	59	$ 87.39	-	-	99	$ 57.27	90	$ 52.78	-	-
Elec. 10	-	-	58	$ 98.14	-	-	-	-	-	-
I.A.Gen. 10	38	57.75	-	-	-	-	-	-	-	-
I.A.Electron.10	57	81.66	-	-	-	-	-	-	-	-
I.A.Graph.Com. 10	37	59.31	84	80.75	-	-	-	-	-	-
I.A.Mat. 10	-	-	85	64.68	-	-	-	-	-	-
I.A.Pow.M.10	68	71.00	93	76.39	-	-	-	-	-	-
Wood 10	79	96.13	-	-	-	-	-	-	-	-
Totals	338	$ 453.24	320	$ 319.96	99	$ 57.27	90	$ 52.78	-	-

TABLE I (cont'd)

COURSES	A Course Enrolment	A Per Pupil Course-Eq. Costs	B Course Enrolment	B Per Pupil Course-Eq. Costs	C Course Enrolment	C Per Pupil Course-Eq. Costs	D Course Enrolment	D Per Pupil Course-Eq. Costs	E Course Enrolment	E Per Pupil Course-Eq. Costs
Business Education:										
Bookkpg. 10	145	$ 68.51	70	$ 69.40	103	$ 60.19	44	$ 100.66	185	$ 47.34
Bus. Fund. 10	28	59.59	16	109.16	-	-	128	60.18	65	56.62
Occup. 10	-	-	-	-	74	38.58	-	-	-	-
Record Kpg. 10	12	112.42	-	-	75	50.46	60	42.60	-	-
Shorthand 10	70	49.83	39	86.41	55	66.60	35	110.03	116	35.52
Typing 10	379	38.16	365	56.58	375	49.54	340	56.46	517	39.27
Totals	634	$ 328.51	490	$ 321.55	682	$ 265.37	607	$ 369.93	883	$ 168.75
Technical:										
Automo. 12	-	-	-	-	-	-	-	-	119	$ 104.94
Automo. 19	-	-	-	-	-	-	-	-	16	103.23
Beau. Cul. 12	-	-	-	-	-	-	-	-	61	133.13
Bldg. Const.12	-	-	-	-	-	-	-	-	35	182.24
Bldg. Const.19	-	-	-	-	-	-	-	-	22	201.31
Com. Art 12	-	-	-	-	-	-	-	-	35	68.98
Drafting 12	-	-	-	-	-	-	-	-	67	90.81
Elec. 12	-	-	-	-	-	-	-	-	14	90.98
Elec. 19	-	-	-	-	-	-	-	-	5	254.74
Food Prep. 12	-	-	-	-	-	-	-	-	27	135.65
Food Prep. 19	-	-	-	-	-	-	-	-	4	303.99
Gen. Tech. 15/16	171	$ 79.98	-	-	-	-	-	-	-	-
Gra. Arts 12	-	-	-	-	-	-	-	-	50	133.38

TABLE I (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Technical (cont'd)										
Voc. Exp. 15/16	75	$ 129.43	-	-	-	-	-	-	-	-
Mach. Shop 12	-	-	-	-	-	-	-	-	22	$ 114.28
Welding 12	-	-	-	-	-	-	-	-	102	98.61
Welding 19	-	-	-	-	-	-	-	-	13	117.69
Sheet Mtl.12/19	-	-	-	-	-	-	-	-	18	109.05
Electron. 12	-	-	-	-	-	-	-	-	52	73.47
Pipe Trds. 12	-	-	-	-	-	-	-	-	11	178.48
Totals	246	$ 209.41	-	-	-	-	-	-	673	$2494.93

extent that each represents five credits of instructional time or 200 minutes per week. Since the vast majority of courses are, in fact, five-credit courses, the unit cost in these instances is also the "real" cost or the actual cost derived from the staff workload survey. However, variable credit weightings for the same designated course from school to school and within the same school accentuated the need for a standard time unit throughout. Actual credit weights were not displayed because of the space factor. In choosing between enrolment figures and credit weights, it was felt that the enrolment figure would be more significant to a decision-maker. Furthermore, actual credit weightings of high school courses are readily accessible elsewhere to the decision-maker, if needed. The actual cost, then, becomes a factor of the equivalent cost.

The courses in Table I were grouped by curricular program to indicate the breadth of offerings in each school. The range of standard unit costs and the sample average cost in each of the eleven curricular programs were as follows:

	Range	Average[1]
(1) Language Arts:	$43.71 - 291.10	$ 50.71
(2) Modern Languages:	35.26 - 71.22	57.01
(3) Mathematics:	38.85 - 63.67	51.86
(4) Science:	35.90 - 118.04	52.24

[1]This is an arithmetic average of the unit costs for each school.

	Range	Average
(5) Social Sciences:	$44.21 - 92.81	$ 49.94
(6) Physical Education:	39.13 - 52.24	47.94
(7) Fine Arts:	40.58 - 144.12	63.67
(8) Home Economics:	61.71 - 129.33	80.01
(9) Industrial Arts:	52.78 - 98.14	73.88
(10) Business Education:	35.52 - 112.42	48.74
(11) Technical Education:	68.98 - 303.99	117.25

Direct instructional costs were most affected by two factors: (1) teacher's salary, and (2) course enrolment. Inordinately high unit costs were invariably the result of the combination of highly qualified and experienced teachers, and low course enrolment. Consequently, courses which had lower than average enrolments, e.g., fine arts, home economics, industrial arts, and technical education, generally had higher unit costs. High-demand courses, e.g., science, consistently showed higher enrolments per teacher, and hence lower costs.

Other factors that affected direct instructional costs included the amount of preparation time provided for teachers and the type of scheduling used. Since preparation time was prorated back to the workload of the teacher, more preparation time granted to a teacher meant higher instructional costs in those courses taught by that teacher. Similarly, unit costs tended to be higher in a school that used a seven-period day, e.g., School D, compared with one utilizing an eight-period day, e.g., School A. By way of illustration, a teacher who teaches one five-credit course in a seven-period day has one-seventh of his salary prorated

to that course, whereas the same situation in an eight-period day involves a proration figure of one-eighth.

At the grade ten level, there appeared to be three categories of direct instructional unit costs. A low-cost category included the courses of the language arts, mathematics, science, social sciences, physical education, and business education programs. The standardized unit costs for these courses clustered about fifty dollars per pupil-course-equivalent. A second category, or middle-range cost courses, included those of the modern languages and fine arts programs. The mean costs in these programs was approximately sixty dollars per pupil-course-equivalent. The third category, the highest-cost courses, included those of the home economics, industrial arts, and technical education programs. These programs were considerably more costly than the lowest-cost group on the basis of direct instructional costs only. The highest-cost group averaged around ninety dollars, but a greater range was evident.

The range of unit costs varied considerably from school to school with the possible exception of the home economics program. The per pupil-course-equivalent costs in this program were consistently high.

Direct Instructional Costs: Grade Eleven

Grade eleven direct instructional costs are given in Table II. The same per pupil unit, namely, the pupil-course-equivalent was used. Since these costs are a direct function

TABLE II

GRADE ELEVEN DIRECT INSTRUCTIONAL COSTS PER PUPIL-COURSE-EQUIVALENT

IN FIVE HIGH SCHOOLS

Courses	A		B		C		D		E	
	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs
Language Arts:										
English 20	449	$ 48.22	294	$ 63.07	302	$ 45.29	660	$ 55.62	447	$ 56.11
English 23	447	45.14	43	63.50	121	59.08	105	78.80	188	57.78
English 29	-	-	-	-	-	-	-	-	17	120.11
Language 20	-	-	-	-	-	-	-	-	-	-
Language 21	59	39.37	66	92.13	71	42.32	77	115.72	123	57.57
Language 22	297	50.83	157	62.71	193	46.49	432	55.35	387	54.24
Literature 20	-	-	23	95.99	-	-	-	-	-	-
Literature 21	87	49.72	115	74.85	73	47.36	176	60.34	98	67.86
Reading 10/20	-	-	-	-	-	-	-	-	7	291.69
Totals	1339	$ 233.28	698	$ 452.25	770	$ 240.53	1450	$ 365.83	1267	$ 705.36
Modern Languages:										
French 20	208	$ 52.96	170	$ 77.02	165	$ 44.98	325	$ 62.68	164	$ 59.32
French 21	95	75.67	68	51.30	-	-	127	56.54	53	56.86
German 20	50	47.02	-	-	30	73.59	-	-	59	64.43
Latin 20	-	-	-	-	14	145.84	-	-	-	-
Ukrainian 20	49	42.17	-	-	-	-	-	-	-	-
Totals	342	$ 217.82	238	$ 128.32	209	$ 264.41	452	$ 119.22	276	$ 180.61

TABLE II (cont'd)

Courses	A Course Enrolment	A Per Pupil Course-Eq. Costs	B Course Enrolment	B Per Pupil Course-Eq. Costs	C Course Enrolment	C Per Pupil Course-Eq. Costs	D Course Enrolment	D Per Pupil Course-Eq. Costs	E Course Enrolment	E Per Pupil Course-Eq. Costs
Mathematics:										
Math 20	502	$ 45.80	307	$ 56.81	318	$ 47.60	638	$ 62.75	521	$ 36.67
Math 21	55	63.74	67	74.91	115	54.22	70	95.00	72	43.87
Math 22	92	48.85	-	-	-	-	-	-	84	61.15
Math 25	30	98.93	-	-	-	-	-	-	13	92.58
Math 29	-	-	-	-	-	-	-	-	17	124.99
Totals	679	$ 257.32	374	$ 131.72	433	$ 101.82	708	$ 157.75	707	$ 359.26
Sciences:										
Biology 20	394	$ 50.28	254	$ 50.04	219	$ 60.86	528	$ 53.34	54	$ 52.88
Biology 10/20	-	-	-	-	-	-	-	-	169	79.22
Chemistry 10/20	-	-	-	-	-	-	-	-	28	45.65
Chemistry 20	409	59.76	300	53.50	280	63.54	579	58.52	328	58.02
Chemistry 20X	-	-	-	-	25	88.32	34	78.24	-	-
Chem./Biol. 20	-	-	-	-	-	-	-	-	119	53.36
Chem./Phys. 20	-	-	-	-	-	-	-	-	74	49.97
Physics 20	263	50.78	128	54.38	160	89.78	431	32.58	-	-
Physics 20X	-	-	-	-	-	-	50	45.50	-	-
Physics 10/20	-	-	-	-	-	-	-	-	155	52.57
Totals	1066	$ 160.82	682	$ 157.92	684	$ 302.50	1622	$ 268.18	927	$ 391.67

TABLE II (cont'd)

Courses	A Course Enrolment	A Per Pupil Course-Eq. Costs	B Course Enrolment	B Per Pupil Course-Eq. Costs	C Course Enrolment	C Per Pupil Course-Eq. Costs	D Course Enrolment	D Per Pupil Course-Eq. Costs	E Course Enrolment	E Per Pupil Course-Eq. Costs
Soc. St. 20	538	$ 50.58	329	$ 48.87	287	$ 46.39	717	$ 49.57	507	$ 46.24
Soc. St. 23	-	-	-	-	-	-	87	49.71	82	125.01
Soc. St. 29	69	32.57	-	-	91	41.40	-	-	14	145.84
Geography 20	11	171.08	-	-	61	55.65	101	49.26	13	163.77
Psychology 20	268	38.08	169	55.30	178	34.80	461	45.16	167	38.54
Sociology 20	262	51.25	58	72.53	173	43.67	349	48.30	168	74.00
Totals	1148	$ 343.56	556	$ 176.70	790	$ 221.91	1715	$ 242.00	951	$ 593.40
Physical Education:										
Phys. Ed. 20	142	$ 51.37	172	$ 60.56	90	$ 46.15	177	$ 50.53	97	$ 75.39
Totals	142	$ 51.37	172	$ 60.56	90	$ 46.15	177	$ 50.53	97	$ 75.39
Fine Arts:										
Art 20/21	-	-	-	-	-	-	-	-	88	$ 62.81
Arts 21	13	$ 103.77	-	-	-	-	-	-	-	-
Art 20	76	57.85	35	70.44	67	64.04	32	75.45	-	-
Arts & Cr. 20	-	-	39	86.78	-	-	-	-	-	-
Drama 20	82	52.86	9	78.49	45	70.30	18	83.92	35	68.98
Music 21	-	-	-	-	-	-	29	86.39	-	-
Music 25	-	-	-	-	-	-	-	-	55	60.55
Totals	171	$ 214.48	83	$ 235.71	112	$ 134.34	69	$ 245.76	148	$ 192.24

TABLE II (cont'd)

COURSES	A Course Enrolment	A Per Pupil Course-Eq. Costs	B Course Enrolment	B Per Pupil Course-Eq. Costs	C Course Enrolment	C Per Pupil Course-Eq. Costs	D Course Enrolment	D Per Pupil Course-Eq. Costs	E Course Enrolment	E Per Pupil Course-Eq. Costs
Home Economics:										
Cloth. Sel. 20	-	-	-	-	-	-	-	-	16	$ 132.80
Fab. & Dr. 20	48	$ 114.13	-	-	20	$ 165.67	-	-	27	212.82
Fds. & Nu. 20	43	134.37	84	$ 89.82	-	-	-	-	30	106.00
Hms. & H.F. 20	31	127.64	35	70.03	-	-	-	-	21	172.45
Totals	122	$ 376.14	119	$ 159.85	20	$ 165.67	-	-	94	$ 624.07
Industrial Arts:										
Drafting 20	18	$ 97.03	-	-	39	$ 81.54	-	-	-	-
I.A. Elec. 20	10	119.28	-	-	-	-	-	-	-	-
I.A. Elecy. 21	-	-	28	$ 135.38	-	-	-	-	-	-
I.A.Gra.Com.20	11	99.40	19	71.00	-	-	-	-	-	-
I.A. Mat. 20	-	-	36	60.96	-	-	-	-	-	-
I.A. Pwr.Mech. 20	8	154.87	26	109.07	-	-	-	-	-	-
Totals	47	$ 470.58	109	$ 376.41	39	$ 81.54	-	-	-	-
Business Education:										
Law 20	110	$ 56.18	47	$ 80.65	142	$ 47.93	226	$ 32.49	76	$ 32.57
Bookkpg. 20	50	67.69	26	61.99	32	51.88	35	99.36	63	74.19
Cler. Prtc. 20	61	44.39	22	85.85	65	37.14	61	86.99	99	49.59
Data Proc. 20	-	-	-	-	-	-	-	-	-	-
Data Proc. 22	72	53.80	-	-	-	-	108	64.13	92	67.10

TABLE II (cont'd)

COURSES	A Course Enrol-ment	A Per Pupil Course-Eq. Costs	B Course Enrol-ment	B Per Pupil Course-Eq. Costs	C Course Enrol-ment	C Per Pupil Course-Eq. Costs	D Course Enrol-ment	D Per Pupil Course-Eq. Costs	E Course Enrol-ment	E Per Pupil Course-Eq. Costs
Business Education (cont'd):										
Dist. Ed. 20	-	-	-	-	42	$ 69.18	-	-	-	-
Merch. 20	44	$ 65.37	-	-	14	118.57	47	$ 70.85	52	$ 62.41
Shorthand 20	28	82.96	10	$83.96	48	39.58	35	110.03	34	59.01
Typing 20	259	46.92	103	73.73	175	59.82	223	60.17	186	59.79
Totals	621	$ 417.31	208	$ 386.18	518	$ 424.10	735	$ 524.02	602	$ 404.66
Technical:										
Auto. 22 TT	-	-	-	-	-	-	-	-	12	$ 184.72
Auto. 22	-	-	-	-	-	-	-	-	38	140.57
Auto. 12/22	55	$ 59.34	-	-	-	-	-	-	-	-
Beau. Cul. 22	-	-	-	-	-	-	-	-	37	68.85
Beau. Cul. 12/22	38	78.98	-	-	-	-	-	-	-	-
Bldg. Cons. 22	-	-	-	-	-	-	-	-	14	150.30
Bldg. Cons. 12/22	12	90.89	-	-	-	-	-	-	-	-
Com. Art 12/22	42	66.36	-	-	-	-	-	-	45	56.61
Drafting 22	-	-	-	-	-	-	-	-	12	139.80
Drafting 12/22	16	94.72	-	-	-	-	-	-	-	-
Electricity 22	-	-	-	-	-	-	-	-	47	59.91
Elec. 12/22	20	81.19	-	-	-	-	-	-	-	-
Electron. 22	-	-	-	-	-	-	-	-	17	153.17
Electron. 12/22	27	109.44	-	-	-	-	-	-	-	-
Com. Foods 12/22	11	123.29	-	-	-	-	-	-	-	-

TABLE II (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Technical (cont'd):										
Food Prep. 22	-	-	-	-	-	-	-	-	5	$ 335.01
Graph. Arts 22	-	-	-	-	-	-	-	-	20	66.63
Gr. Arts 12/22	36	$ 70.98	-	-	-	-	-	-	-	-
Mach.Sh. 12/22	17	72.43	-	-	-	-	-	-	-	-
Perform. Arts 12/22	39	68.03	-	-	-	-	-	-	-	-
Pipe Trades 22	-	-	-	-	-	-	-	-	5	265.57
Pipe Tds. 12/22	30	97.55	-	-	-	-	-	-	17	77.87
Sheet Mtl. 22	-	-	-	-	-	-	-	-	4	221.31
Sht. Mtl. 12/22	7	170.44	-	-	-	-	-	-	9	147.09
Welding 12/22	19	92.41	-	-	-	-	-	-	-	-
Com. Art 22	-	-	-	-	-	-	-	-	16	181.96
Totals	369	$1276.02	-	-	-	-	-	-	298	$2289.37

of the salaries of teachers and class enrolments, the cost trend was very similar to that in grade ten. Unit costs tended to be higher in fine arts, home economics, industrial arts and technical education than in the other grade eleven curricular programs. Generally speaking, there was a trend to higher unit costs in grade eleven compared to grade ten.

The range and average of the standard unit costs in each of the eleven curricular programs were as follows:

	Range	Average
(1) Language Arts:	$39.37 - 115.72	$ 56.41
(2) Modern Languages:	42.17 - 145.84	60.70
(3) Mathematics:	36.67 - 124.99	53.50
(4) Sciences:	32.58 - 89.78	54.40
(5) Social Sciences:	32.57 - 171.08	50.37
(6) Physical Education:	50.53 - 75.39	55.29
(7) Fine Arts:	52.86 - 103.77	67.08
(8) Home Economics:	70.03 - 212.82	121.67
(9) Industrial Arts:	60.96 - 154.87	89.81
(10) Business Education:	32.49 - 118.57	58.87
(11) Technical Education:	56.61 - 335.01	101.07

The cost pattern established in grade ten, although still evident in grade eleven, experienced some modification. The per pupil-course-equivalent cost of direct instruction in the modern languages was still higher than the low-cost group, but the difference was reduced. The fine arts courses maintained a similar differential to that in grade ten. The greatest changes occurred in home economics, industrial arts and technical education. The unit costs in industrial arts increased by 21.6 per cent whereas the increase in home economics was 52.1 per cent. Conversely, the decrease in grade eleven unit cost in technical education

compared to grade ten was 13.8 per cent. Unit costs in industrial arts and home economics tended to be uniformly high, particularly in home economics. However, the unit costs in technical education varied a great deal as indicated by the cost range of $56.61 in Commercial Art to $335.01 in Food Preparation 22. High-demand courses tended to have lower unit costs. Although unit costs were generally higher in technical education courses, the great variation in costs suggests that the same cost factors do not apply in all the courses offered.

As was the case in grade ten, the low-cost courses in any program tended to be courses high in demand, e.g., Mathematics 20, whereas courses in limited demand tended to cluster in the high end of the cost range, e.g., Mathematics 29.

Direct Instructional Costs: Grade Twelve

Table III gives the direct instructional costs per pupil-course-equivalent in grade twelve. The range and average of the standard unit costs for each curricular program were as follows:

	Range	Average
(1) Language Arts:	$46.26 - 91.03	$ 57.99
(2) Modern Languages:	43.39 - 240.89	74.95
(3) Mathematics:	47.27 - 79.01	59.63
(4) Sciences:	44.20 - 91.48	59.48
(5) Social Sciences:	32.70 - 106.56	51.40
(6) Physical Education:	54.26 - 121.18	69.22
(7) Fine Arts:	31.03 - 191.82	68.97
(8) Home Economics:	112.76 - 177.07	132.31
(9) Industrial Arts:	99.08 - 526.44	263.45
(10) Business Education:	32.56 - 273.06	76.58
(11) Technical Education:	71.59 - 350.55	148.42

TABLE III

GRADE TWELVE DIRECT INSTRUCTIONAL COSTS PER PUPIL-COURSE-EQUIVALENT IN FIVE HIGH SCHOOLS

COURSES	A		B		C		D		E	
	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs
Language Arts:										
English 30	486	$ 57.95	335	$ 62.85	302	$ 46.26	462	$ 69.59	426	$ 54.45
English 33	454	48.86	45	91.03	150	56.44	87	60.34	124	68.75
Totals	940	$ 106.81	380	$ 153.88	452	$ 102.70	549	$ 129.93	550	$ 123.20
Modern Languages:										
French 30	149	$ 79.94	112	$ 68.27	89	$ 72.70	209	$ 88.11	173	$ 57.46
French 31	12	97.03	67	59.84	-	-	104	73.80	-	-
German 30	27	43.39	-	-	25	88.31	-	-	28	78.85
Latin 30	-	-	7	240.89	18	113.43	-	-	-	-
Ukrainian 30	15	68.63	-	-	-	-	-	-	-	-
Totals	203	$ 288.99	186	$ 369.00	132	$ 274.44	313	$ 161.91	201	$ 136.31
Mathematics:										
Math 30	361	$ 54.08	243	$ 65.80	215	$ 48.55	363	$ 63.70	382	$ 52.41
Math 31(old)	63	47.27	48	76.00	36	59.02	84	79.01	99	58.29
Math 31 (new)	23	48.02	25	75.54	-	-	-	-	-	-
Math 32	54	55.15	-	-	-	-	-	-	22	61.50
Totals	501	$ 204.52	316	$ 217.34	251	$ 107.57	720	$ 142.71	503	$ 172.20

TABLE III (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Sciences:										
Biology 30	279	$ 45.48	212	$ 55.90	119	$ 67.58	377	$ 65.42	254	$ 45.82
Chemistry 30	188	52.68	259	58.25	155	68.25	312	90.19	322	52.37
Chemistry 30X	155	44.20	-	-	77	57.52	-	-	-	-
Physics 30	222	61.68	121	60.09	-	-	167	83.35	201	51.63
Physics 30X	22	85.85	-	-	153	33.30	27	91.48	29	59.53
Totals	866	$ 289.89	592	$ 174.24	504	$ 226.65	883	$ 330.44	806	$ 209.35
Social Sciences:										
Soc. Sts. 30	401	$ 53.86	315	$ 50.30	242	$ 50.62	428	$ 57.65	199	$ 40.67
Soc. Sts. 33	-	-	-	-	78	61.82	-	-	-	-
Soc. Sts. 36	63	79.55	-	-	-	-	40	106.56	63	62.45
Soc. Sts.30/36	-	-	-	-	-	-	-	-	133	48.69
Economics 30	61	32.70	37	83.96	69	37.16	56	73.07	26	52.03
Totals	525	$ 166.11	352	$ 134.26	389	$ 149.60	524	$ 237.28	421	$ 203.84
Physical Education:										
Phys. Ed. 30	115	$ 58.38	70	$ 54.26	52	$ 91.48	15	$ 121.18	71	$ 75.34
Phys. Ed.20/30	-	-	-	-	-	-	-	-	25	66.07
Totals	115	$ 58.38	70	$ 54.26	52	$ 91.48	15	$ 121.18	96	$ 141.41

TABLE III (cont'd)

COURSES	A		B		C		D		E	
	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs	Course Enrolment	Per Pupil Course-Eq. Costs
Fine Arts:										
Art 30	-	-	15	$ 81.89	12	$ 112.74	-	-	-	-
Art 30/31	-	-	-	-	-	-	-	-	57	$ 103.99
Arts & Cr.30	16	$ 84.31	51	66.36	10	157.70	-	-	-	-
Drama 30	20	74.19	8	88.31	22	71.68	-	-	9	142.45
Music 11/31	-	-	-	-	-	-	-	-	46	71.99
Tut. Music	100	31.03	-	-	-	-	-	-	-	-
Music 10/30	-	-	-	-	-	-	-	-	9	191.82
Music 35	-	-	-	-	-	-	-	-	38	83.69
Music 11/21/31	-	-	58	61.15	9	185.37	-	-	-	-
Music 21/31	37	27.82	-	-	54	30.89	-	-	20	83.00
Totals	173	$ 217.35	132	$ 297.71	107	$ 558.38	-	-	119	$ 572.95
Home Economics:										
Fab. & Dress 30	27	$ 135.11	-	-	13	$ 127.05	-	-	16	$ 132.80
Fab. & Dr.20/30	17	112.76	39	$ 119.94	-	-	-	-	10	158.53
Fds. & Nut. 30	-	-	-	-	-	-	-	-	12	177.07
Totals	44	$ 247.87	39	$ 119.94	13	$ 127.05	-	-	38	$ 468.40
Industrial Arts:										
I.A.Elec. 30	10	$ 526.44	-	-	-	-	-	-	-	-
I.A.Gr.Com.30	-	-	-	-	16	$ 99.08	-	-	-	-
Totals	10	$ 526.44	-	-	16	$ 99.08	-	-	-	-

TABLE III (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Business Education:										
Accounting 30	17	$ 99.19	-	-	25	$ 66.40	-	-	26	$ 116.55
Bus. Mach. 30	131	66.49	48	$ 73.03	71	73.57	45	$ 98.42	87	61.49
Bus. Org. & Mgmt. 30	-	-	-	-	72	46.25	35	121.78	16	108.42
Data Pro. 32 CLU	-	-	-	-	-	-	-	-	22	56.97
Data Pro. 32	45	57.32	-	-	-	-	18	95.91	-	-
Data Pro. 32K	-	-	-	-	-	-	-	-	8	156.66
Dist. Ed. 30	-	-	-	-	26	111.75	-	-	-	-
Merch. 30	24	41.42	-	-	-	-	-	-	-	-
Off. Prac. 30	89	63.96	25	75.54	-	-	62	90.13	86	32.56
Off. Prac. 32	-	-	-	-	-	-	-	-	10	120.35
Secy. Prac. 35	-	-	-	-	-	-	-	-	30	273.06
Shorthand 30	-	-	7	119.94	-	-	19	111.83	49	49.10
Shorthand 31	44	86.15	-	-	10	135.29	-	-	-	-
STOP 31	-	-	-	-	37	104.31	-	-	-	-
Typing 30	81	33.55	42	86.55	52	55.07	44	146.76	145	45.10
Totals	431	$ 448.08	122	$ 355.06	293	$ 592.64	223	$ 664.83	479	$1020.26
Technical:										
Auto. 32	27	$ 192.21	-	-	-	-	-	-	15	$ 134.44
Auto. 22/32	-	-	-	-	-	-	-	-	10	201.67
Beau. Cul. 32	17	80.60	-	-	-	-	-	-	9	165.58

TABLE III (cont'd)

COURSES	A		B		C		D		E	
	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs	Course Enrol-ment	Per Pupil Course-Eq. Costs
Technical (cont'd)										
Bldg. Cons. 32	12	$ 90.89	-	-	-	-	-	-	4	$ 266.12
Bldg. Cons. 22/32	-	-	-	-	-	-	-	-	5	101.67
Comm. Art 32	16	168.76	-	-	-	-	-	-	-	-
Comm. Fds. 32	10	135.61	-	-	-	-	-	-	-	-
Drafting 32	24	71.50	-	-	-	-	-	-	8	246.19
Elecs. 32	-	-	-	-	-	-	-	-	5	350.55
Fd. Prep. 32	-	-	-	-	-	-	-	-	10	121.60
Fd. Prep. 29/32	-	-	-	-	-	-	-	-	10	185.83
Gra. Arts 32	10	120.00	-	-	-	-	-	-	8	222.25
Per. Arts 32	19	161.05	-	-	-	-	-	-	-	-
Pipe Trds. 32	7	250.69	-	-	-	-	-	-	7	189.88
Sht. Mtl. 32	8	198.61	-	-	-	-	-	-	7	189.88
Welding 32	14	125.34	-	-	-	-	-	-	-	-
Electricity 32	19	97.61	-	-	-	-	-	-	-	-
Mach. Shop 32	22	135.64	-	-	-	-	-	-	-	-
Elecs. 22/32	-	-	-	-	-	-	-	-	5	101.67
Totals	205	$1728.51	-	-	-	-	-	-	103	$2477.33

The cost pattern established in grades ten and eleven continued in grade twelve with two modifications. Course costs in physical education and business education increased significantly placing them in the middle-range group with modern languages and fine arts. The four curricular programs with the largest number of pupils involved had the lowest per pupil-course-equivalent costs. These were the language arts, mathematics, science, and social sciences programs.

The high-cost group continued to include home economics, industrial arts and technical education. Only two industrial arts courses were offered at the grade twelve level with a total enrolment of twenty-six pupils. Home economics was the next lowest with 134 pupils, followed by technical education with 300 pupils.

The overall direct instructional per pupil-course-equivalent costs showed an increase at the grade twelve level somewhat similar to the increase evident from grade ten to grade eleven. In addition to the previously-mentioned factors of teacher's salary, class enrolment, and type of scheduling, a fourth factor, that of additional released teaching time, was noted. Since released teaching time was prorated back to subjects taught, additional released time increased direct instructional unit costs. It appeared that senior teachers tended to have less teaching time than the general average.

Direct Instructional per Pupil-Course Costs by Curricular Program

Table XXXVII, in Appendix G, gives a breakdown of the average costs per pupil-course in each curricular program by grade and school and an average cost per pupil-enrolled by grade, that is, the direct instructional cost per curricular program divided by the number of pupils in the grade. It should be noted that these are not "equivalent" costs. In addition, the number of courses in each curricular program is indicated, as is the number of credits offered by grade and school. The actual courses are listed in Tables I, II, and III. In determining the credit values offered, all courses were counted and variable credit weightings of the same course were counted separately and then added. The number of pupils registered in the different courses comprising a curricular program is shown, as is the total direct instruction cost by grade and school in each curricular program.

Table IV is a summary of Table XXXVI in Appendix G with two additions. In Table IV, the average cost per pupil-course-equivalent is given for each school in addition to the average figure for the selected sample. The average direct instructional cost per pupil-course-equivalent is also provided by grade, school and selected sample. The unit costs derived in this table differ somewhat from Table XXXVII in Appendix G in that they are equivalent costs, with adjustments made where required. Also the variations in

TABLE IV

SUMMARY OF DIRECT INSTRUCTIONAL PER PUPIL-COURSE COSTS
BY CURRICULAR PROGRAM

Program Area Grade Ten	School A	School B	School C	School D	School E	Sample Average
English Language Arts	$ 46.63	$ 57.77	$ 45.45	$ 51.61	$ 54.20	$ 50.71
Modern Languages	46.32	59.22	68.26	58.68	55.62	57.01
Mathematics	55.66	49.47	50.28	59.42	45.46	51.86
Science	27.33	32.64	28.48	29.50	43.76	52.24a
Social Sciences	51.88	46.42	52.31	48.47	49.37	49.94
Physical Education	39.13	46.99	56.56	45.83	52.24	47.94
Fine Arts	67.87	74.00	62.99	47.12	64.55	63.67
Home Economics	65.88	76.11	97.55	-	102.37	80.01
Industrial Arts	78.76	78.37	61.90	52.78	-	73.88
Business Education	47.68	62.50	45.40	53.72	41.01	48.74
Technical Education	209.03	-	-	-	127.44	117.25a
Average Grade Ten Cost	51.92	52.35	47.38	46.16	56.77	51.30
Program Area Grade Eleven						
English Language Arts	47.48	68.79	47.85	60.98	59.00	56.41
Modern Languages	52.87	69.67	63.73	60.95	59.94	60.70
Mathematics	50.02	60.05	49.36	65.94	43.46	53.50
Science	27.02	26.20	30.47	30.01	47.26	54.40a
Social Sciences	48.13	53.29	43.32	35.68	59.66	50.37a
Physical Education	51.37	60.56	46.15	50.53	75.39	55.29
Fine Arts	58.95	78.99	66.56	81.39	63.33	67.08
Home Economics	124.70	84.00	165.67	-	156.09	121.67
Industrial Arts	112.16	78.76	81.54	-	-	89.81
Business Education	53.62	75.60	59.30	59.39	57.48	58.87
Technical Education	324.20	-	-	-	272.16	101.07a
Average Grade Eleven Cost	64.38	57.19	47.83	47.79	67.63	57.21

TABLE IV (cont'd)

Program Area Grade Twelve	School A	School B	School C	School D	School E	Sample Average
English Language Arts	$ 53.56	$ 66.19	$ 49.64	$ 68.12	$ 56.90	$ 57.99
Modern Languages	75.26	71.73	81.21	83.35	60.44	74.95
Mathematics	54.93	68.12	50.05	66.14	53.96	59.63
Science	51.99	57.79	55.84	78.36	50.38	59.48
Social Sciences	54.48	53.84	50.48	63.03	47.16	51.40
Physical Education	58.38	54.26	91.48	121.18	72.93	69.22
Fine Arts	40.26	67.16	73.30	-	95.46	68.97
Home Economics	126.48	119.94	127.05	-	153.55	132.31
Industrial Arts	526.44	-	99.08	-	-	263.45
Business Education	60.72	80.89	108.60	110.26	70.48	76.58a
Technical Education	409.96	-	-	-	591.30	148.42a
Average Grade Twelve Cost	75.83	64.13	63.90	75.04	72.04	71.29
Program Area Grades Ten, Eleven and Twelve Combined						
English Language Arts	49.11	64.77	47.30	59.68	56.93	55.02
Modern Languages	54.38	65.46	69.36	65.47	57.86	62.12
Mathematics	54.37	57.71	49.95	63.54	46.70	54.05
Science	33.02	37.20	34.97	40.18	46.70	52.87a
Social Sciences	50.71	51.12	47.89	43.59	53.38	48.92
Physical Education	43.01	51.15	56.77	48.06	56.14	50.86
Fine Arts	59.49	72.80	66.54	55.71	71.89	60.05
Home Economics	86.34	83.87	118.33	-	124.02	97.75
Industrial Arts	94.07	78.45	70.74	52.78	-	81.02
Business Education	53.29	68.56	62.63	64.44	53.25	59.09
Techical Education	312.51	-	-	-	207.31	126.40a
Average per Pupil Cost	61.73	56.55	50.82	52.28	63.58	57.64

a - Standardized pupil-course-equivalent unit.

credit weightings (time allotted) are indicated in Table XXXVII in Appendix G.

The overall cost pattern is reflected in the increasing average unit grade costs. In all schools, the average pupil-course grade costs increased from grades ten to twelve.

The final portion of Table IV gives the direct per pupil-course-equivalent costs by high school program. A unit cost for the sample is also provided.

Direct Instructional per Pupil-Course Costs by Curriculum Cluster

Table XXXVIII, in Appendix G, provides a detailed breakdown of the direct instructional per pupil-course costs, by curriculum cluster, by grade, and by school. The number of courses and credits offered in each cluster is indicated. In addition, the total number of pupils registered in all the courses of each cluster is given, as is the total direct expenditure for each cluster by grade and school.

Table V, page 132, summarizes Table XXXVIII (Appendix G) by extracting the pupil-course costs by grade and school. An average direct instructional per pupil-course cost and an average grade cost for the selected high schools have been added to this summary table. These are all actual costs rather than "equivalent" unit costs.

The level of aggregation involved in deriving unit

TABLE V

SUMMARY OF DIRECT INSTRUCTIONAL PER PUPIL-COURSE COSTS BY CURRICULUM CLUSTER

Curriculum Cluster	School A	School B	School C	School D	School E
Grade Ten:					
Communications	$48.53	$60.15	$53.99	$54.34	$56.49
Environmental Studies	38.37	40.15	41.32	40.20	46.73
Humanities	56.39	51.35	52.76	47.22	50.91
General Voc. Ed.	84.16	70.12	50.56	53.60	79.42
Average Gr. Ten Cost	$51.92	$52.35	$47.38	$46.16	$56.77
Grade Eleven:					
Communications	$48.78	$69.11	$52.08	$61.57	$59.42
Environmental Studies	37.46	41.32	38.83	41.60	47.28
Humanities	49.31	56.32	44.94	36.41	59.93
General Voc. Ed.	149.62	78.68	64.49	59.39	126.48
Average Gr. Eleven Cost	$64.38	$57.19	$47.83	$47.79	$67.63
Grade Twelve:					
Communications	$54.80	$67.64	$56.90	$73.65	$61.87
Environmental Studies	53.48	60.87	56.34	74.78	53.20
Humanities	55.36	56.38	54.91	63.03	53.94
General Voc. Ed.	179.43	90.35	108.87	110.26	147.79
Average Gr. Twelve Cost	$75.83	$64.13	$63.90	$75.04	$72.04
High School Totals:					
Communications	$50.42	$65.47	$53.99	$61.55	$58.86
Environmental Studies	41.34	45.34	43.31	47.51	48.32
Humanities	53.09	54.57	49.83	43.72	55.20
General Voc. Ed.	126.22	74.44	66.05	63.80	105.96
Average High School Pupil Cost	$61.73	$56.55	$50.82	$52.28	$63.58

costs at a curriculum cluster level provided an indication of curricular emphasis in a particular school. For instance, School D spent as much per pupil-course in communications as it did in general vocational education, that is, $61.55 as compared with $63.80 (see column five of Table V). Conversely, School A spent more than twice as much per unit on general vocational education, with figures of $50.42 and $126.22 in communications and vocational education respectively.

Minimum and Maximum per Pupil-Course-Equivalent Program-Route Costs for Six Program Routes

Table XXXIX (Appendix H) lists all the courses and their respective unit costs in each of the six defined program routes (cf. supra: 59-61). These minimum and maximum program-route costs were based on a standard unit of forty instructional credits per grade. Consequently, the number of courses in a program route may differ but the total number of credits was held constant.

Table XXXIX (Appendix H) was summarized and reported in Table VI, with one addition. The totals for three years of each program route were added, thereby providing a minimum and maximum program-route cost for a three-year high school program in the school year 1969-70.

An analysis of this table revealed that the range of minimum program-route costs is from $1,031.51 to $1,621.74. The lower figure represents the minimum

TABLE VI

SUMMARY OF SIX MINIMUM-MAXIMUM PER PUPIL-COURSE-EQUIVALENT PROGRAM-ROUTE DIRECT INSTRUCTIONAL COSTS

PROGRAM ROUTE	GRADE	SCHOOL A		SCHOOL B		SCHOOL C		SCHOOL D		SCHOOL E	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Academic: No Restriction	10	$356.96	$560.58	$407.80	$557.78	$390.12	$526.44	$388.90	$570.53	$352.52	$899.07
	11	356.06	653.82	480.81	669.21	355.03	692.71	429.22	663.53	378.77	765.74
	12	340.74	1123.08	476.46	818.32	365.73	815.94	565.59	775.56	412.77	915.50
Totals		$1053.76	$2337.48	$1365.07	$2045.31	$1110.88	$2035.09	$1383.71	$2009.62	$1144.06	$2580.31
Academic: Eng.-Soc.Rest.	10	$591.95	$781.08	$551.05	$704.13	$445.23	$573.44	$412.40	$579.49	$408.90	$1107.15
	11	338.05	829.58	457.03	679.35	358.44	736.15	446.08	695.99	365.71	1064.50
	12	316.75	1090.87	536.71	697.52	365.18	791.74	589.22	817.30	415.69	928.91
Totals		$1246.75	$2701.53	$1544.79	$2081.00	$1168.85	$2101.33	$1447.70	$2092.78	$1190.30	$3100.56
Academic: Math-Sci.Rest.	10	$351.82	$566.17	$446.79	$565.27	$403.42	$533.60	$382.65	$566.71	$364.65	$974.56
	11	351.81	806.40	447.76	735.06	334.16	734.75	405.49	715.54	378.02	970.40
	12	345.60	1162.94	463.36	844.74	388.00	816.29	833.60	579.78	370.41	1008.00
Totals		$1049.23	$2535.51	$1357.91	$2145.07	$1125.58	$2084.64	$1621.74	$1862.03	$1113.08	$2952.96

TABLE VI (cont'd)

PROGRAM ROUTE	GRADE	SCHOOL A		SCHOOL B		SCHOOL C		SCHOOL D		SCHOOL E	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
General Diploma	10	$354.92	$801.36	$411.87	$711.79	$373.77	$559.72	$361.67	$634.03	$350.63	$1255.95
	11	334.45	947.73	451.03	767.55	329.17	689.16	400.51	734.20	351.69	1218.62
	12	342.14	1223.24	513.15	745.33	355.94	732.38	434.99	700.86	415.86	1265.10
Totals		$1031.51	$2972.33	$1376.05	$2224.67	$1058.88	$1981.26	$1197.17	$2069.09	$1118.18	$3739.67
Technical Education	10	$420.41	$606.39	-	-	-	-	-	-	$462.48	$1255.95
	11	405.61	1057.85	-	-	-	-	-	-	392.03	1716.28
	12	496.18	1030.56	-	-	-	-	-	-	424.14	1888.83
Totals		$1322.20	$2694.80	-	-	-	-	-	-	$1278.65	$4861.06
Business Education	10	$349.87	$491.92	$446.83	$635.81	$373.74	$419.57	$400.32	$561.54	$350.63	$629.14
	11	386.72	639.96	561.00	629.61	367.67	558.49	490.26	687.83	404.46	612.76
	12	372.56	604.80	585.01	665.68	406.56	670.20	643.40	822.92	390.79	903.40
Totals		$1109.15	$1736.68	$1592.84	$1931.10	$1147.97	$1648.26	$1533.98	$2072.29	$1145.88	$2145.30

program-route cost of a "standardized" general diploma student in School A. The higher figure represents the minimum program-route cost of a student in an academic program with a mathematics-science restriction in School D. The percentage increase was 57.2. Generally speaking, however, a wide variation in minimum program-route costs did not exist. For instance, the typically high-cost technical education area was in the middle of this range.

A wide variation among the program-routes existed at the maximum end. The maximum range limits were $1,648.26 and $4,861.06, a difference amounting to 194.9 per cent. The figure of $1,648.26 represented the maximum cost of a business education program in School C, whereas the figure $4,861.06 constituted the maximum program-route cost in technical education in School E. For a single program-route the greatest range was found to exist in the technical education program of School E. The minimum and maximum program-route costs were $1,278.65 and $4,861.06 respectively, an upward change of 280.2 per cent. The least variation existed in the academic, mathematics-science restriction program-route in School D. The difference of $240.29 amounted to a 76.5 per cent change.

The cost trend with respect to the range of minimum and maximum costs of program-routes appeared to be more closely associated with the differentiation of courses in the program than any other factor. Put another way, the

greater the number of courses available in a program route, the greater the range in costs. School E, for instance, offered the greatest number of courses and had the greatest range of costs. Conversely, School D offered the fewest number of courses and had the smallest cost range. Thus, in the schools under study, the cost-range of the program routes tended to be a function of the number of courses offered rather than the number of students enrolled in the school.

Average Direct Instructional per Pupil-Enrolled Costs by Grade and School

Table VII gives the direct instructional per pupil-enrolled costs by the grade dimension in addition to the direct instructional cost per high school pupil. These derived costs are directly related to sub-problem 8 on page 5. Unit costs are provided for each school and for the selected sample.

This table demonstrates the unreliability of grade level costs in the absence of standard units, in this case, a standard or equivalent pupil. On contrast to the subject costs (Tables I, II, and III) and the curricular program and curricular-cluster costs, the per pupil-enrolled costs by grade level decreased significantly from grade ten to grade twelve. For instance, in School A there was a drop of 17.9 per cent from grade ten to eleven, and a further drop of 32.7 per cent from grade eleven to twelve, with an

TABLE VII

AVERAGE DIRECT INSTRUCTIONAL PER PUPIL-ENROLLED COSTS

BY GRADE AND BY HIGH SCHOOL

	HIGH SCHOOL										
	A		B		C		D		E		
	Grade Enrolment	Per Pupil Cost	Grade Enrolment	Per Pupil Cost	Grade Enrolment	Per Pupil Cost	Grade Enrolment	Per Pupil Cost	Grade Enrolment	Per Pupil Cost	Selected Sample Averages
Grade 10	675	$589.21	446	$522.10	579	$423.26	613	$443.85	786	$542.96	$508.06
Grade 11	824	473.85	365	503.09	492	363.03	817	405.82	716	506.73	450.54
Grade 12	965	318.85	394	356.32	510	276.78	592	374.45	722	348.33	333.00
Total Enrolments	2,464		1,205		1,581		2,022		2,224		
Direct Instructional Cost Per High School Pupil		$444.75		$462.14		$357.26		$408.17		$468.11	$430.07

overall drop of 45.89 per cent from grade ten to twelve.

Two major factors contributed to this inconsistency in cost patterns. The first factor was the lack of a standard unit for a grade-enrolled pupil. The resulting unit costs in this table have been computed on the assumption that all enrolled pupils were equivalent in terms of direct instructional time provided. This assumption, commonly held in public school cost analyses, is untenable at the high school level, particularly in large, differentiated, high schools. To illustrate, in the school system under study most grade ten students were required to register in a full-time program. Generally speaking, the same practice prevailed in grade eleven. However, grade twelve students were seldom registered in a full-time program. A considerable number of part-time students appeared as full-time equivalents in the school enrolment figures. In sum, the pupil-enrolled unit does not reflect unit costs as accurately as does the pupil-course unit (used in Table I).

A second factor contributing to this apparent anomaly is the common practice of high school students taking subjects at grade levels other than their own, e.g., a grade twelve student taking a grade ten course. This practice tends to inflate the grade costs at the lower levels because of the more common practice of senior students taking junior courses than the reverse.

On the basis of these two factors, the validity of grade costs in this study is in question. Standardized grade-level enrolments would need to be used and the wider choice range of students accounted for. In this study, both of these factors had the effect of reducing unit costs at the upper grade levels and inflating them at the lower ones. Again, subject or curricular program costs are a more accurate indication of actual expenditures unless standardized enrolment figures are used when computing pupil-enrolled costs.

Also suspect is the total direct instructional cost per high school pupil reported in Table VII because, although it accounted for student movement in the grades, it did not differentiate between full-time and part-time students. However, the average unit figure reported does provide some useful information. For instance, in School A, the average per pupil-enrolled cost for direct instruction was $444.75. This figure, respresenting the average cost per pupil-enrolled, serves as a useful starting point for further analysis.

III. RESIDENT INDIRECT INSTRUCTIONAL COSTS

Resident indirect instructional costs were calculated for two purposes. First, resident indirect instructional costs were needed for the determination of curricular program costs. Second, indirect costs were necessary for the computation of curriculum cluster costs. Both of these

costs were determined on a grade-division basis, that is, a high school basis.

Two unit costs were also computed in each case. The cost per pupil-enrolled in the school, and the cost per pupil-course in either the curricular program or curricular cluster were calculated. This procedure served to identify cost differences on the basis of the number of students actually participating in a program area and the general total enrolment in the school.

Resident indirect costs resulted from prorated and full-time salaries of persons not engaged in direct instruction, e.g., a science laboratory assistant or the prorated portion of the released teaching time of a department head in addition to his supervisory stipend, and from costs of equipment and supplies that were directly assigned to a curricular area, e.g., science supplies.

This section focuses on questions 9, 10, and 11 of the specific sub-problems on page 5 of this study.

Resident Indirect Instructional per Pupil-Enrolled Costs by High School Curricular Program

Table VIII provides a breakdown of the resident indirect costs by curricular program area. Indirect costs varied considerably over the eleven curricular areas. Mathematics was consistently around $3.00 per pupil-course, whereas technical education required $110.76 (School E in one instance, and $153.28 (School A) per pupil-course in the

TABLE VIII

RESIDENT INDIRECT INSTRUCTIONAL PER PUPIL-COURSE AND PUPIL-ENROLLED COSTS BY HIGH SCHOOL CURRICULAR PROGRAM

CURRICULAR PROGRAM		HIGH SCHOOL A Costs	B Costs	C Costs	D Costs	E Costs	Total Selected Sample
English Language Arts							
	Salaries	$ 16,633.22	$ 8,575.14	$ 15,100.82	$ 11,495.00	$ 20,997.59	$ 72,801.77
	Other[a]	3,959.11	4,010.22	4,268.30	4,895.42	5,650.85	22,783.90
	Total	$ 20,592.33	$ 12,585.36	$ 19,369.12	$ 16,390.42	$ 26,648.44	$ 95,585.67
Cost Per Pupil Enrolled in School[b]		$ 8.36	$ 10.44	$ 12.25	$ 8.11	$ 11.98	$ 10.07
Cost Per Pupil-Course in Program[c]		$ 6.67	$ 8.09	$ 9.61	$ 5.83	$ 9.15	$ 7.72
Modern Languages	Salaries	$ 8,442.50	$ 3,453.01	$ 4,026.48	$ 4,767.50	$ 5,428.90	$ 26,118.39
	Other	1,468.73	1,915.45	1,124.46	2,342.05	864.38	7,715.07
	Total	$ 9,911.23	$ 5,368.46	$ 5,150.94	$ 7,109.55	$ 6,293.28	$ 33,833.46
Cost Per Pupil Enrolled in School		$ 4.02	$ 4.46	$ 3.26	$ 3.52	$ 2.83	$ 3.56
Cost Per Pupil-Course in Program		$ 9.84	$ 6.95	$ 7.41	$ 5.52	$ 6.53	$ 7.16
Mathematics							
	Salaries	$ 6,198.00	$ 3,200.54	$ 3,860.48	$ 4,173.80	$ 5,894.37	$ 23,327.19
	Other	-	286.44	355.69	851.38	470.90	1,964.41
	Total	$ 6,198.00	$ 3,486.98	$ 4,216.17	$ 5,025.18	$ 6,365.27	$ 25,291.60
Cost Per Pupil Enrolled in School		$ 2.52	$ 2.89	$ 2.67	$ 2.49	$ 2.86	$ 2.66
Cost Per Pupil-Course in Program		$ 2.75	$ 2.92	$ 3.04	$ 2.72	$ 2.76	$ 2.81

TABLE VIII (cont'd)

CURRICULAR PROGRAM		HIGH SCHOOL A Costs	B Costs	C Costs	D Costs	E Costs	Total Selected Sample
Science							
	Salaries	$ 13,276.95	$ 6,160.58	$ 8,293.06	$ 10,581.80	$ 12,585.88	$ 50,898.27
	Other	17,156.53	5,134.60	11,110.47	13,424.99	10,438.27	57,264.86
	Total	$ 30,433.48	$ 11,295.18	$ 19,403.53	$ 24,006.79	$ 23,024.15	$108,163.13
Cost Per Pupil Enrolled in School		$ 12.35	$ 9.37	$ 12.27	$ 11.87	$ 10.35	$ 11.39
Cost Per Pupil-Course in Program		$ 8.24	$ 4.90	$ 8.28	$ 5.83	$ 7.88	$ 7.03
Social Sciences							
	Salaries	$ 13,686.45	$ 7,422.03	$ 20,021.30	$ 9,084.30	$ 16,677.44	$ 66,891.52
	Other	5,773.70	3,437.33	6,402.46	5,214.68	8,005.37	28,833.54
	Total	$ 19,460.15	$ 10,859.36	$ 26,423.76	$ 14,298.98	$ 24,682.81	$ 95,725.06
Cost Per Pupil Enrolled in School		$ 7.90	$ 9.01	$ 16.71	$ 7.07	$ 11.10	$ 10.08
Cost Per Pupil-Course in Program		$ 7.71	$ 7.94	$ 14.97	$ 4.97	$ 11.17	$ 8.91
Physical Education							
	Salaries	$ 8,412.38	$ 6,289.71	$ 2,651.20	$ 4,125.20	$ 10,168.19	$ 31,646.68
	Other	18,286.07	4,617.65	762.21	2,795.10	2,260.34	28,721.37
	Total	$ 26,698.45	$ 10,907.36	$ 3,413.41	$ 6,920.30	$ 12,428.53	$ 60,368.05
Cost Per Pupil Enrolled in School		$ 10.84	$ 9.05	$ 2.16	$ 3.42	$ 5.59	$ 6.36
Cost Per Pupil-Course in Program		$ 26.20	$ 15.97	$ 4.47	$ 7.88	$ 6.89	$ 13.64

TABLE VIII (cont'd)

CURRICULAR PROGRAM		HIGH SCHOOL A Costs	B Costs	C Costs	D Costs	E Costs	Total Selected Sample
Fine Arts	Salaries	$ 5,750.10	$ 1,937.64	$ 1,052.22	$ 4,105.50	$ 6,094.12	$ 18,939.58
	Other	4,606.12	4,016.92	2,923.04	5,998.52	3,847.57	21,392.17
	Total	$ 10,356.22	$ 5,954.56	$ 3,975.26	$ 10,104.02	$ 9,941.69	$ 40,331.75
Cost Per Pupil Enrolled in School		$ 4.20	$ 4.94	$ 2.51	$ 5.00	$ 4.47	$ 4.25
Cost Per Pupil-Course in Program		$ 13.77	$ 14.56	$ 9.40	$ 32.08	$ 13.73	$ 15.38
Home Economics	Salaries	$ 3,872.88	$ 215.29	$ 524.52	$ 395.00	$ 5,868.72	$ 10,876.41
	Other	1,561.03	1,614.27	397.07	355.45	910.49	4,838.81
	Total	$ 5,433.91	$ 1,829.56	$ 921.59	$ 750.45	$ 6,779.21	$ 15,714.72
Cost Per Pupil Enrolled in School		$ 2.21	$ 1.52	$ .58	$ .37	$ 3.05	$ 1.65
Cost Per Pupil-Course in Program		$ 11.30	$ 5.37	$ 10.97	$ -	$ 20.99	$ 12.79
Industrial Arts	Salaries	$ 3,801.88	$ 3,103.89	$ 524.52	$ 395.00	-	$ 7,825.29
	Other	15,907.60	9,551.15	1,122.14	1,536.26	-	28,117.15
	Total	$ 19,709.48	$ 12,655.04	$ 1,646.66	$ 1,931.26	-	$ 35,942.44
Cost Per Pupil Enrolled in School		$ 8.00	$ 10.50	$ 1.04	$ .96	-	$ 3.79
Cost Per Pupil-Course in Program		$ 49.90	$ 31.56	$ 10.69	$ 21.46	-	$ 34.56

TABLE VIII (cont'd)

CURRICULAR PROGRAM		HIGH SCHOOL A Costs	B Costs	C Costs	D Costs	E Costs	Total Selected Sample
Business Education	Salaries	$ 6,588.38	$ 3,103.89	$ 7,596.32	$ 8,004.60	$ 9,881.77	$ 35,174.96
	Other	18,504,75	9,257.65	25,119.95	28,670.76	12,547.83	94,100.94
	Total	$ 25,093.13	$ 12,361.54	$ 32,716.27	$ 36,675.36	$ 22,429.60	$129,275.90
Cost Per Pupil Enrolled in School		$ 10.18	$ 10.26	$ 20.69	$ 18.14	$ 10.09	$ 13.61
Cost Per Pupil-Course in Program		$ 14.88	$ 15.08	$ 21.91	$ 23.44	$ 11.42	$ 17.17
Technical Education	Salaries	$ 24,382.51	-	-	-	$ 10,664.62	$ 35,047.13
	Other	$103,143.60	-	-	-	95,553.64	198,697.24
	Total	$127,526.11	-	-	-	$106,218.26	$233,744.37
Cost Per Pupil Enrolled in School		$ 51.76	-	-	-	$ 47.76	$ 24.62[d]
Cost Per Pupil-Course in Program		$ 153.28	-	-	-	$ 110.76	$ 130.51
Total Salaries		$111,045.25	$ 43,461.72	$ 63,650.92	$ 57,127.70	$104,261.60	$379,547.19
Total Other		190,367.24	43,841.68	53,585.79	66,084.61	140,549.64	494,428.96
Grand Total		$301,412.49	$ 87,303.40	$117,236.71	$123,212.31	$244,811.24	$873.976.15
Cost Per Pupil Enrolled in School		$ 122.33	$ 72.45	$ 74.15	$ 60.94	$ 110.08	$ 92.04
Cost Per Pupil-Course in Program		$ 17.00	$ 8.87	$ 10.55	$ 7.81	$ 14.96	$ 12.34

[a]Other includes direct and inventory charges to curricular area in a specific school in addition to

TABLE VIII (cont'd)

prorated library and audio-visual supplies and equipment.

[b]Refers to high school enrolment.

[c]Includes all the pupils in every course of a particular curricular program.

[d]This average figure includes all the pupils in the selected sample, not just those in the schools where technical education programs are offered. The average cost in $49.86 per enrolled pupil if only the schools offering technical education are considered.

other. To further the comparison, both unit costs in mathematics in all schools were very close, indicating that the school enrolment and the number of students in the mathematics were of similar magnitude. Conversely, in technical education, there was a noteworthy difference in this respect. The number of students in the program was approximately one-third to one-half of the school enrolment figure.

The indirect costs in the English language arts and social sciences programs were primarily instructional media costs, prorated in accordance with Table XXXIV (Appendix F). There were no account codes bearing directly on these programs.

Indirect expenditures in science were relatively uniform and perhaps lower than anticipated. The lower per pupil-course costs reflected the large number of students taking science courses. In contrast to science, physical education and fine arts had a pupil-course unit cost markedly different from the pupil-enrolled unit figure, particularly in the fine arts program. The greatest divergence in the two unit costs calculated was in the home economics and industrial arts areas. The per pupil-course indirect cost in industrial arts varied from $10.69 to $49.90, whereas the pupil-course indirect costs in home economics varied from $5.37 to $20.99. The respective ranges based on high school enrolment figures were $0.96 to

$10.50 in industrial arts and $0.37 to $3.05 in home economics. The proportion of total enrolment in these programs was comparatively small. By contrast, the expenditure pattern in business education was quite consistent.

The final portion of Table VIII gives aggregate unit costs on a school enrolment and pupil-course basis. The range for resident indirect costs on a pupil-enrolled basis was $60.94 (School D to $122.33 School A). The average comparable unit cost for the sample was $92.04. The range of costs on a per pupil-course basis was $7.81 (School D) to $17.00 (School A) with a sample average of $12.34.

Although there was a wide variation in the magnitude of resident indirect costs, the individual effect on some programs, e.g., technical education, industrial arts, and home economics, and the total effect on all programs, amounted to a noteworthy portion of the total educational cost.

Resident Indirect Instructional per Pupil-Course and Pupil-Enrolled Costs by Curriculum Cluster

Table IX is basically an aggregation of Table VIII, that is, the resident indirect costs of eleven curricular programs were consolidated and assigned to four curriculum clusters. A higher level of aggregation reduced the range of unit costs in each cluster. For example, the range of

TABLE IX

RESIDENT INDIRECT INSTRUCTIONAL PER PUPIL-COURSE AND PUPIL-ENROLLED COSTS BY CURRICULUM CLUSTER

CURRICULUM CLUSTERS		HIGH SCHOOLS A Costs	B Costs	C Costs	D Costs	E Costs	SAMPLE TOTALS
COMMUNICATIONS	Salaries	$ 34,509.96	$ 15,403.57	$ 20,429.87	$ 36,565.81	$ 5,795.12	$112,704.33
	Other[a]	8,498.59	7,913.01	4,922.77	10,670.75	7,849.06	39,854.18
	Total	$ 43,008.55	$ 23,316.58	$ 25,352.64	$ 47,236.56	$ 13,644.18	$152,558.51
Cost Per Pupil Enrolled in School		$ 17.45	$ 19.35	$ 16.03	$ 23.36	$ 6.13	$ 16.07
Cost Per Pupil-Course in Cluster		$ 9.45	$ 9.41	$ 8.70	$ 11.08	$ 3.18	$ 8.25
ENVIRONMENTAL STUDIES	Salaries	$ 34,759.41	$ 16,102.43	$ 18,076.34	$ 25,806.61	$ 21,286.44	$116,031.23
	Other	35,442.60	10,038.69	12,228.37	21,245.27	13,169.51	92,124.44
	Total	$ 70,202.01	$ 26,141.12	$ 30,304.71	$ 47,051.88	$ 34,455.95	$208,155.67
Cost Per Pupil Enrolled in School		$ 28.49	$ 21.69	$ 19.17	$ 23.27	$ 15.49	$ 21.92
Cost Per Pupil-Course in Cluster		$ 10.07	$ 6.25	$ 6.76	$ 6.88	$ 5.46	$ 7.23
HUMANITIES	Salaries	$ 23,295.44	$ 9,822.85	$ 25,130.34	$ 13,714.12	$ 19,338.93	$ 91,301.68
	Other	7,309.07	5,466.91	7,636.56	6,420.80	10,519.11	37,352.45
	Total	$ 30,604.51	$ 15,289.76	$ 32,766.90	$ 20,134.92	$ 29,858.04	$128,654.13
Cost Per Pupil Enrolled in School		$ 12.42	$ 12.69	$ 20.73	$ 9.96	$ 13.43	$ 13.55
Cost Per Pupil-Course in Cluster		$ 10.86	$ 9.54	$ 16.50	$ 6.65	$ 11.83	$ 10.74

TABLE IX (cont'd)

CURRICULUM CLUSTERS		HIGH SCHOOLS A Costs	B Costs	C Costs	D Costs	E Costs	SAMPLE TOTALS
GENERAL VOCATIONAL EDUCATION							
	Salaries	$ 41,836.00	$ 6,649.18	$ 6,742.38	$ 9,335.14	$ 32,822.61	$ 99,385.31
	Other	139,116.98	20,423.07	26,639.16	30,562.47	109,011.96	325,753.64
	Total	$180,952.98	$ 27,072.25	$ 35,381.54	$ 39,897.61	$141,834.57	$425,138.95
Cost Per Pupil Enrolled in School		$ 73.44	$ 22.47	$ 22.38	$ 19.73	$ 63.77	$ 44.77
Cost Per Pupil-Course in Cluster		$ 53.32	$ 17.33	$ 20.78	$ 24.11	$ 43.70	$ 36.60

[a]These came from the inventory and direct charge runs.

unit costs in the communications cluster was $6.13 to $23.36 on a pupil-enrolled basis and $4.18 to $11.08 on a pupil-course basis. The respective sample averages were $16.07 and $8.25. With the exception of School E, and to a lesser extent, School D, the other schools were close to the average unit costs for the sample.

The range of resident indirect unit costs was narrowest in the environmental studies cluster. The pupil-enrolled unit cost range was from $15.49 in School E to $28.49 in School A. The average for the sample was $21.92. The per pupil-course cost range was from $5.46 in School E to $10.07 in School A with a sample average of $7.23. Only Schools A and E differed markedly from the average, School A was higher; and School E lower.

The resident indirect unit costs in the humanities cluster did not vary markedly with the exception of School C. Per pupil-enrolled and per pupil-course costs of $20.73 and $16.50 were considerably higher than the corresponding average unit costs of $13.35 and $10.74. An aggressive library program in School C was a contributing factor.

The general vocational education cluster can be divided into two groups; those schools with technical education (Schools A and E) and the remainder. Resident indirect unit costs in the schools without technical education were relatively consistent ranging from $19.73 in School D to $22.47 in School B on a pupil-enrolled basis.

Similarly, the range for these schools was $17.33 in School B to $24.11 in School D on a per pupil-course basis. In contrast, the same categories were higher in Schools A and E. The comparable unit cost, on a pupil-enrolled basis, was $73.44 for School A and $63.77 for School E. The respective per pupil-course costs were $53.32 in School A and $43.70 in School E.

Generally speaking, a cost pattern for resident indirect costs was evident at the curriculum-cluster level of aggregation. The schools offering technical education deviated markedly from the group in the general vocational education cluster, but all others, with minor exceptions, varied only slightly.

Resident per Pupil-Enrolled Costs of Instructional Media, Guidance and General Administration (Non-Curricular Programs)

Table X summarizes the costs associated with three resident non-curricular programs, namely, instructional media, guidance, and general administration. Instructional media included library, audio-visual and television support services. The instructional media program was further sub-divided into library and audio-visual services. The resident guidance program consisted primarily of the salaries of counselling personnel, and the general administration program included the non-curricular portion of the salaries of principals, clerical and business support staff, teachers involved in general supervision, e.g., cafeteria,

TABLE X

RESIDENT PER PUPIL-ENROLLED COSTS OF INSTRUCTIONAL MEDIA, GUIDANCE AND GENERAL ADMINISTRATION SERVICES

		Library	Instructional Media A.V.	Total	Guidance (Counselling)	General Administration[a]
High School A	Salaries	$29,085.00	$15,001.16	$44,086.16	$79,199.75	$334,264.67
	Other	13,837.68	2,658.60	16,496.28	367.38	9,079.43
	Total	42,922.68	17,659.76	60,582.44	79,567.13	343,344.10
Cost per pupil		$ 17.42	$ 7.17	$ 24.59	$ 32.29	$ 139.30
High School B	Salaries	18,030.10	1,821.15	19,851.25	46,366.25	112,604.53
	Other	9,841.01	1,616.77	11,457.78	74.78	5,561.79
	Total	27,871.11	3,437.92	31,309.03	46,441.03	118,166.32
Cost per pupil		$ 23.12	$ 2.85	$ 25.98	$ 38.54	$ 98.06
High School C	Salaries	29,514.43	2,041.80	31,556.23	30,500.00	118,286.31
	Other	10,949.98	3,277.70	14,227.68	22.82	6,482.27
	Total	40,464.41	5,319.50	45,783.91	30,522.82	124,768.58
Cost per pupil		$ 25.59	$ 3.36	$ 28.96	$ 19.31	$ 78.92
High School D	Salaries	31,811.00	3,150.00	34,961.00	46,836.34	160,515.95
	Other	19,888.51	1,395.91	21,284.42	260.64	11,801.78
	Total	51,699.51	4,545.91	56,245.42	47,096.98	172,317.73
Cost per pupil		$ 25.57	$ 2.25	$ 27.82	$ 23.29	$ 85.22
High School E	Salaries	21,050.00	24,200.00	45,250.00	71,644.20	196,493.83
	Other	17,157.96	1,678.20	18,836.16	30.41	13,329.21
	Total	38,207.96	25,878.20	64,086.16	71,674.61	209,823.04
Cost per pupil		$ 17.18	$ 11.64	$ 28.82	$ 32.22	$ 94.34
Totals		$201,165.67	$56,841.29	$258,006.96	$275,302.57	$906,319.77
Average Cost per pupil		21.18	5.99	27.17	28.99	101.97

[a]Includes all resident expenditures not charged to curricular programs with the exception of guidance, plant operation, plant maintenance, and food services.

teachers allotted released teaching time for substitute duties, and the costs of general classroom equipment and supplies not allocable to any specific curriculum area. "General Administration" included the following series of accounts from Figure 2, pages 48-49: Series 212 (adjusted for curricular activities), 214(d)(1), 214(d)(2), 215, 242, and 250 (see Table XVII, pp. 178-180).

The resident per pupil-enrolled costs of instructional media were consistent in the five schools. The range of expenditures was from $24.59 in School A to $28.96 in School C. The average per pupil-enrolled expenditures in the five schools was $27.17. The non-resident per pupil-enrolled costs for instructional media, as provided by Researcher 4, were $4.32 for library and $2.40 for audio-visual services totalling $6.73. The combined resident and non-resident per pupil-enrolled costs for instructional media of the high schools in the sample was $33.90.

The unit costs in the guidance program covered a wider range. School C had the lowest cost at $19.31, whereas School B was the highest at $38.54. The average per pupil-enrolled resident expenditure for guidance was $28.99. A factor which partially accounted for the higher unit cost in School B was the assignment of some counselling functions to administrators. In every instance, the unit cost was almost entirely made up of expenditures on salaries.

The non-resident per pupil-enrolled costs of the

guidance program, determined by Researcher 4, came to $11.67. The average total per pupil-enrolled cost of the guidance program in the selected high schools was $40.66.

The resident per pupil-enrolled costs of general administration ranged from $78.92 in School C to $139.30 in School A. The average unit cost was $101.97. The major contributing factor to the comparative high unit cost in School A was the substitute teacher expenditure which amounted to $52.00 per pupil-enrolled (see Table XVII, pp.178-180). Conversely, School E had no expenditure in this area; that is, when the regular teacher was absent the class was cancelled. The per pupil-enrolled costs of general supervision in the five schools ranged from $4.60 in School C to $17.34 in School E, whereas the range for clerical and business support staff was from $15.14 in School C to $32.94 in School A. The unit costs associated with school administrators' salaries were uniform from school to school, but a marked difference was evident with respect to clerical and business support staff.

IV. RESIDENT IMPLEMENTARY PER PUPIL COSTS

This section deals with questions 12 and 13 of the specific sub-problems on page 5. Resident implementary per pupil-enrolled costs are illustrated in Table XI. The total implementary costs were further subdivided into plant implementary and general implementary. Plant implementary

TABLE XI

RESIDENT IMPLEMENTARY PER PUPIL-ENROLLED COSTS BY SCHOOL

	Implementary Cost per Pupil-Enrolled		
	General Implementary	Plant Implementary	Total Implementary
School A	$ 184.67	$ 95.27	$ 279.94
School B	134.84	69.28	204.12
School C	94.50	41.66	136.16
School D	117.93	56.89	174.82
School E	133.62	63.58	197.20
Sample Average	137.16	67.45	204.61

costs included the plant maintenance and plant operation expenditures whereas the general implementary included all other expenditures that could not be charged to curricular programs.

The resident implementary per pupil-enrolled expenditures ranged from $136.16 in School C to $279.94 in School A. The average for the five schools was $204.61. The unit costs of plant operation and maintenance followed the same expenditure pattern, with School C having the lowest figure at $41.66 and School A the highest with $95.27. The average unit cost for the plant implementary category was $67.45.

Two adjustments were made in the resident expenditures on utilities. The utilities accounts (Series 640) of School A and School B were reduced by $9,291.71 and

$11,423.16 respectively, because of refunds resulting from joint usage with a municipal department. Since no other adjustments were made for after-hours usage, the per pupil-enrolled costs in schools in which extensive evening community programs were held were inflated, e.g., School A. The relative effect of this factor was not determined. It was also assumed that the general implementary costs charged to each school were entirely allocable to the day program.

Combined Resident, Indirect and Implementary Expenditures

Table XII contains the resident indirect and implementary expenditures of each school in an undifferentiated manner. The aggregates were subdivided into two categories, namely, salaries and expenses, and unit costs were calculated for each. The per pupil-enrolled costs were combined to provide single unit costs for combined resident, indirect and implementary expenditures.

The consistency in the pattern of costs in all the schools was exemplified by the same magnitudinal order of costs in each category from school to school. That is, School A tended to be the highest in all categories, School E the next, followed by Schools B, D, and C respectively. However, it is to be expected that when aggregate costs are used, the larger schools will have larger expenditures in general. The actual range of unit costs involved an increase of 91.1 per cent between School A ($402.27) and

TABLE XII

COMBINED RESIDENT, INDIRECT AND IMPLEMENTARY EXPENDITURES BY FUNCTIONAL CATEGORY

	High School					
	A	B	C	D	E	Aggregate
SALARIES:						
Principals	$ 113,805.50	$ 48,395.26	$ 57,565.66	$ 80,840.00	$ 94,740.00	$ 395,346.42
Dept. Heads	42,831.38	16,769.90	24,168.75	22,117.70	53,955.01	159,842.74
Support Staff[a]	252,012.54	78,854.62	65,559.75	133,396.00	175,539.69	705,362.60
General Supervision by Academic Staff	32,502.53	13,488.09	7,266.50	2,821.25	38,571.14	94,649.51
Substitute Teachers	128,119.60	25,445.56	29,622.90	37,832.70	-	221,020.76
Guidance (Counsel.)	79,199.75	46,836.34	30,500.00	46,836.34	71,644.20	275,016.63
Library	29,085.00	18,030.10	29,514.43	31,811.00	24,200.00	132,640.53
A.V. & T.V.	15,001.60	1,821.15	2,041.80	3,150.00	9,778.81	31,793.36
Other Inst. Staff	9,907.00	2,840.25	1,967.10	1,660.00	8,144.89	24,519.24
Total	702,464.90	252,481.27	248,206.89	360,464.99	476,573.74	2,040,191.79
Cost per Pupil	285.09	209.53	156.99	178.27	214.28	214.84
EXPENSES:						
Instructional[b]	199,446.60	49,402.35	60,066.64	77,884.26	153,494.88	540,294.73
Non-Instructional[c]	89,279.66	31,385.54	24,237.49	38,368.37	53,311.73	236,582.79
Total	288,726.26	80,787.89	84,304.13	116,252.63	206,806.61	776,877.52
Cost per Pupil	117.18	67.04	53.32	57.49	92.99	81.81
Grand Total	$991,191.16	$333,269.16	$332,511.02	$476,716.62	$683,380.35	$2,817,069.31
Cost per Pupil	402.27	276.57	210.31	235.76	307.28	296.65

[a] Includes clerical and business support staff, plant operation salaries and food service salaries.

[b] Includes expenditure series 230, 235, 240, 242, and 250 from Table XXXI.

[c] Includes expenditure series 640, 650, and 720 from Table XXXI.

TABLE XII

COMBINED RESIDENT, INDIRECT AND IMPLEMENTARY EXPENDITURES BY FUNCTIONAL CATEGORY

	High School					
	A	B	C	D	E	Aggregate
SALARIES:						
Principals	$ 113,805.50	$ 48,395.26	$ 57,565.66	$ 80,840.00	$ 94,740.00	$ 395,346.42
Dept. Heads	42,831.38	16,769.90	24,168.75	22,117.70	53,955.01	159,842.74
Support Staff[a]	252,012.54	78,854.62	65,559.75	133,396.00	175,539.69	705,362.60
General Supervision by Academic Staff	32,502.53	13,488.09	7,266.50	2,821.25	38,571.14	94,649.51
Substitute Teachers	128,119.60	25,445.56	29,622.90	37,832.70	-	221,020.76
Guidance (Counsel.)	79,199.75	46,836.34	30,500.00	46,836.34	71,644.20	275,016.63
Library	29,085.00	18,030.10	29,514.43	31,811.00	24,200.00	132,640.53
A.V. & T.V.	15,001.60	1,821.15	2,041.80	3,150.00	9,778.81	31,793.36
Other Inst. Staff	9,907.00	2,840.25	1,967.10	1,660.00	8,144.89	24,519.24
Total	702,464.90	252,481.27	248,206.89	360,464.99	476,573.74	2,040,191.79
Cost per Pupil	285.09	209.53	156.99	178.27	214.28	214.84
EXPENSES:						
Instructional[b]	199,446.60	49,402.35	60,066.64	77,884.26	153,494.88	540,294.73
Non-Instructional[c]	89,279.66	31,385.54	24,237.49	38,368.37	53,311.73	236,582.79
Total	288,726.26	80,787.89	84,304.13	116,252.63	206,806.61	776,877.52
Cost per Pupil	117.18	67.04	53.32	57.49	92.99	81.81
Grand Total	$991,191.16	$333,269.16	$332,511.02	$476,716.62	$683,380.35	$2,817,069.31
Cost per Pupil	402.27	276.57	210.31	235.76	307.28	296.65

[a] Includes clerical and business support staff, plant operation salaries and food service salaries.

[b] Includes expenditure series 230, 235, 240, 242, and 250 from Table XXXI.

[c] Includes expenditure series 640, 650, and 720 from Table XXXI.

School C ($210.31). The average per pupil-enrolled cost for combined resident, indirect and implementary expenditures was $296.65. This figure was comprised of a unit cost of $214.84 for salaries and $81.81 for expenses.

The factor which contributed most to the relatively high unit cost in School A was the expenditure on "built-in" substitutes. This factor alone constituted a per pupil-enrolled cost of $52.00. In addition, relatively higher costs in the areas of support staff, instructional equipment and supplies, and plant operation and maintenance were contributing factors. Conversely, most of the cost factors in School C, with the notable exception of instructional media costs, tended to be relatively lower in magnitude.

Table XIII which is derived from Table XII, provides a breakdown of combined resident, indirect and implementary per pupil-enrolled costs by grade, adjusted in accordance with Table XXXVI (Appendix F) which takes into the account the differentiated duties of school administrators. There were no grade differences in School A because the administration was differentiated along curriculum lines rather than grade levels. The resulting indirect costs were prorated equally over all the grades.

Adjusting the administrative costs (principals and assistant principals) on a grade basis did not create any major differences in unit costs, nor was there a directional expenditure pattern in evidence.

TABLE XIII

ADJUSTED* COMBINED RESIDENT, INDIRECT AND IMPLEMENTARY PER PUPIL-ENROLLED COSTS BY GRADE

	HIGH SCHOOL				
	A Per Pupil Cost	B Per Pupil Cost	C Per Pupil Cost	D Per Pupil Cost	E Per Pupil Cost
GRADE 10:					
Salaries	$ 285.09	$ 203.79	$ 154.99	$ 179.09	$ 217.88
Other	117.18	67.04	53.32	57.49	92.99
Total	$ 402.27	$ 270.83	$ 208.31	$ 236.58	$ 310.87
GRADE 11:					
Salaries	$ 285.09	$ 215.89	$ 156.68	$ 174.15	$ 212.02
Other	117.18	67.04	53.32	57.49	92.99
Total	$ 402.27	$ 282.93	$ 210.00	$ 231.64	$ 305.01
GRADE 12:					
Salaries	$ 285.09	$ 210.14	$ 159.57	$ 179.72	$ 212.63
Other	117.18	67.04	53.32	57.49	92.99
Total	$ 402.27	$ 277.18	$ 212.89	$ 237.21	$ 305.62
Overall Averages:					
By School	$ 402.27	$ 276.57	$ 210.31	$ 235.76	$ 307.28
By Sample	296.65	296.65	296.65	296.65	296.65

*School Administration Cost adjusted by grade in accordance with Table XXXVI.

V. TOTAL EDUCATIONAL PER PUPIL COSTS

This section contains the portion of the analyses that was concerned with the total educational per pupil costs for the selected high schools. Included also are the non-resident indirect and implementary costs provided by Researcher 4. Questions 14, 15, 16, 17, and 18 of the specific sub-problems on page 6 were analyzed. The derived costs are given by: (1) curricular program, (2) curriculum cluster, (3) grade and school, (4) function-object categories, and (5) curricular-based program-budget format.

Per Pupil Costs by Curricular Programs

Table XIV gives two unit costs, that is, pupil-course and pupil-enrolled, for each curricular program by school. These unit costs included all resident and non-resident charges, i.e., direct, indirect and implementary. Since the non-resident, indirect per pupil-enrolled costs averaged only $8.88, they were aggregated with the non-resident implementary expenditures and prorated to programs by dollar volume.

The first type of unit cost displayed is the "per pupil-course in program" cost. This unit cost is based on the total enrolment of the students in all the courses of a particular curricular program. The unit costs derived are actual costs per pupil-course in that equivalent time units were not used. Therefore, for any kind of comparison, the

TABLE XIV

ESTIMATED TOTAL COSTS OF CURRICULAR PROGRAMS BY PUPIL-COURSE AND BY HIGH SCHOOL ENROLMENT

	HIGH SCHOOL									
	A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil
LANGUAGE ARTS:										
Direct Costs	$49.11	$61.53	$64.77	$83.64	$47.30	$60.32	$59.68	$82.19	$56.93	$74.51
Resident Indirect Costs	6.67	8.36	8.09	10.44	9.61	12.25	5.83	8.11	9.15	11.98
Resident Implementary Costs	27.53	34.49	27.83	35.93	17.96	22.90	24.41	33.92	22.54	29.50
Non-resident Indirect and Implementary Costs	26.87	33.66	37.23	48.08	36.03	45.94	38.15	53.00	31.22	40.87
Total Cost Per Pupil	$110.18	$138.04	$137.92	$178.09	$110.90	$141.41	$128.07	$177.22	$119.84	$156.86
MODERN LANGUAGES:										
Direct Costs	$ 54.38	$ 22.22	$ 65.46	$ 41.93	$ 69.36	$ 30.49	$ 65.47	$ 41.74	$ 57.86	$ 25.08
Resident Indirect Costs	9.84	4.02	6.95	4.46	7.41	3.26	5.52	3.52	6.53	2.83
Resident Implementary Costs	31.17	12.96	27.66	17.72	24.22	10.65	26.46	16.87	21.97	9.52
Non-resident Indirect and Implementary Costs	30.95	12.65	37.01	23.71	48.60	21.36	41.35	26.36	30.44	13.19
Total Cost Per Pupil	$126.34	$ 51.85	$137.08	$ 87.82	$149.59	$ 65.76	$138.80	$ 88.49	$116.80	$ 50.62

TABLE XIV (cont'd)

	HIGH SCHOOL A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil
MATHEMATICS:										
Direct Costs	$ 54.37	$ 49.75	$ 57.71	$ 57.28	$ 49.95	$ 43.85	$ 63.54	$ 58.13	$ 46.70	$ 48.51
Resident Indirect Costs	2.75	2.52	2.92	2.89	3.04	2.67	2.72	2.49	2.76	2.86
Resident Implementary Costs	28.20	25.81	23.16	22.98	16.72	14.68	24.69	22.59	16.86	17.51
Non-resident Indirect and Implementary Costs	27.52	25.19	30.99	30.76	33.54	29.45	38.58	35.30	23.36	24.26
Total Cost Per Pupil	$112.84	$103.27	$114.78	$113.91	$103.25	$ 90.65	$129.53	$118.51	$ 89.68	$ 93.14
SCIENCE:										
Direct Costs	$ 33.02	$ 49.51	$ 37.20	$ 71.09	$ 34.97	$ 51.63	$ 40.18	$ 81.78	$ 46.70	$ 61.33
Resident Indirect Costs	8.24	12.35	4.90	9.37	8.28	12.27	5.83	11.87	7.88	10.35
Resident Implementary Costs	20.34	30.54	16.07	30.72	14.66	20.17	17.15	34.89	18.62	24.45
Non-resident Indirect and Implementary Costs	19.87	29.80	21.51	41.11	27.41	40.46	26.79	54.53	25.79	33.87
Total Cost Per Pupil	$ 81.47	$122.20	$ 79.68	$152.29	$ 85.32	$124.53	$ 89.95	$183.07	$ 98.99	$130.00

TABLE XIV (cont'd)

	HIGH SCHOOL A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil
SOCIAL SCIENCES:										
Direct Costs	$ 50.71	$ 58.66	$ 51.12	$ 71.15	$ 47.89	$ 61.21	$ 43.59	$ 71.94	$ 53.38	$ 53.02
Resident Indirect Costs	7.71	7.90	7.94	9.01	14.97	16.71	4.97	7.07	11.17	11.10
Resident Implementary Costs	28.84	29.53	22.55	25.58	19.84	22.15	18.06	25.68	22.02	21.87
Non-resident Indirect and Implementary Costs	28.15	28.82	30.17	34.23	39.81	44.45	28.22	40.13	30.50	30.30
Total Cost Per Pupil	$115.41	$124.91	$111.78	$139.97	$122.54	$144.52	$ 94.84	$144.82	$117.07	$116.29
PHYSICAL EDUCATION:										
Direct Costs	$ 43.01	$ 17.79	$ 51.15	$ 28.99	$ 56.77	$ 27.40	$ 48.06	$ 20.87	$ 56.14	$ 27.36
Resident Indirect Costs	26.20	10.84	15.97	9.05	4.47	2.16	7.88	3.42	6.89	5.59
Resident Implementary Costs	34.18	14.14	25.64	14.53	19.33	9.33	20.85	9.06	23.06	11.24
Non-resident Indirect and Implementary Costs	33.36	10.76	34.32	15.16	38.78	13.87	32.59	7.98	31.95	13.17
Total Cost Per Pupil	$136.75	$ 53.53	$127.08	$ 67.73	$119.35	$ 52.76	$109.38	$ 41.33	$118.04	$ 57.36

TABLE XIV (cont'd)

	HIGH SCHOOL									
	A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil
FINE ARTS:										
Direct Costs	$ 59.49	$ 18.16	$ 72.80	$ 24.71	$ 66.54	$ 17.80	$ 55.71	$ 8.68	$ 71.89	$ 23.85
Resident Indirect Costs	13.77	4.20	14.56	4.94	9.40	2.51	32.08	5.00	13.73	4.47
Resident Implementary Costs	36.13	11.03	33.38	11.33	23.97	6.41	32.77	5.10	29.20	9.51
Non-resident Indirect and Implementary Costs	35.27	10.76	44.66	15.16	48.09	13.87	51.20	7.98	40.45	13.17
Total Cost Per Pupil	$144.66	$ 44.15	$165.40	$ 56.14	$148.00	$ 40.59	$171.76	$ 26.76	$155.27	$ 51.00
HOME ECONOMICS:										
Direct Costs	$ 86.34	$ 16.85	$ 83.87	$ 23.74	$118.33	$ 6.29	-	-	$124.02	$ 18.01
Resident Indirect Costs	11.30	2.21	11.30	2.21	5.37	1.52	-	-		0.37
Resident Implementary Costs	40.18	9.41	34.05	9.63	40.75	2.16	-	-	49.42	7.18
Non-resident Indirect and Implementary Costs	47.02	9.18	45.56	12.89	81.75	4.34	-	-	68.47	9.94
Total Cost Per Pupil	$184.84	$ 37.65	$174.78	$ 48.47	$246.20	$ 14.31	-	-	$241.91	$ 35.50

TABLE XIV (cont'd)

	HIGH SCHOOL									
	A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil Course in Program	Per High School Pupil
INDUSTRIAL ARTS:										
Direct Costs	$ 94.07	$ 15.08	$ 78.45	$ 26.11	$ 70.74	$ 6.89	$ 52.78	$ 2.35	-	-
Resident Indirect Costs	49.90	8.00	31.56	10.50	10.69	1.04	21.46	0.96	-	-
Resident Implementary Costs	70.90	11.37	41.96	13.96	25.72	2.51	27.49	1.22	-	-
Non-resident Indirect and Implementary Costs	69.19	11.09	56.15	18.69	51.60	5.03	42.96	1.91	-	-
Total Cost Per Pupil	$284.06	$ 45.54	$208.12	$ 69.26	$158.75	$ 15.47	$144.69	$ 6.44	-	-
BUSINESS EDUCATION:										
Direct Costs	$ 53.20	$ 36.40	$ 68.56	$ 46.66	$ 62.63	$ 59.17	$ 64.44	$ 49.87	$ 53.25	$ 47.02
Resident Indirect Costs	14.88	10.18	15.08	10.26	21.91	20.69	23.44	18.14	11.42	10.09
Resident Implementary Costs	33.63	23.01	31.95	21.74	26.67	25.19	32.75	25.35	22.06	19.48
Non-resident Indirect and Implementary Costs	32.82	22.46	42.75	29.09	53.52	50.54	51.18	39.61	30.58	26.99
Total Cost Per Pupil	$134.53	$ 92.05	$158.34	$107.75	$164.73	$155.59	$107.37	$132.97	$117.31	$103.58

TABLE XIV (cont'd)

	HIGH SCHOOL									
	A		B		C		D		E	
	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil	Per Pupil-Course in Program	Per High School Pupil
TECHNICAL EDUCATION:										
Direct Costs	$312.51	$105.52	-	-	-	-	-	-	$207.31	$ 89.19
Resident Indirect Costs	153.28	51.76	-	-	-	-	-	-	110.76	47.76
Resident Implementary Costs	229.98	77.06	-	-	-	-	-	-	108.28	46.93
Non-resident Indirect and Implementary Costs	224.43	75.78	-	-	-	-	-	-	150.00	65.02
Total Cost Per Pupil	$920.20	$310.12	-	-	-	-	-	-	$576.35	$248.90

different credit weightings of courses must be taken into account. For instance, to compare modern language unit costs with technical education, one must bear in mind the credit factor which is in a one-to-three ratio approximately. That is, all modern language courses have a five-credit weighting, whereas the technical education courses range from five to twenty-five credits, averaging slightly under fifteen credits per course.

The per pupil-course unit cost ranges and arithmetic averages were as follows for the selected sample:

	Range	Average[1]
English Language Arts	$110.18 - 137.92	$121.38
Modern Languages	116.80 - 149.59	133.72
Mathematics	89.68 - 129.53	110.02
Science	79.68 - 98.99	87.08
Social Sciences	94.98 - 122.54	112.33
Physical Education	108.38 - 136.75	122.12
Fine Arts	144.66 - 171.76	157.02
Home Economics	174.78 - 241.91	211.93
Industrial Arts	144.69 - 284.06	198.91
Business Education	107.37 - 164.73	170.57
Technical Education	576.35 - 920.20	748.28

The cost pattern evidenced did not deviate substantially from that observed in the direct instructional costs. Three cost groups were identified. Language arts, mathematics, science, social sciences, and physical education constituted the lowest-cost group; modern languages, fine arts, and business education were categorized as middle-cost programs; and home economics, industrial arts and

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[1]This is an arithmetic average of the unit costs for each school.

technical education, made up the highest-cost group.

On an individual school basis, no distinct cost pattern was identified that differed markedly from the general cost pattern. The relatively wide range in per pupil-course costs was the result of a number of factors. Teacher salaries, class enrolments and resident and non-resident implementary costs were the major factors. Indirect costs were exceptionally high in only two programs, namely, industrial arts and technical education. Generally speaking, schools offering a wide range of courses exhibited a wider range of unit costs.

The second type of unit cost displayed in Table XIV is the "per high school pupil" or the "per pupil-enrolled" cost by curricular program. This unit cost indicated the relative emphasis given to a curricular program, i.e., a high unit cost indicated a large expenditure in a particular area in relation to others in the school. The range and average of unit costs based on total high school enrolment were as follows:

	Range	Average
English Language Arts	$138.04 - 178.09	$ 158.33
Modern Languages	50.62 - 88.49	68.91
Mathematics	90.65 - 118.51	103.89
Science	122.20 - 183.07	142.42
Social Sciences	116.29 - 144.82	134.10
Physical Education	41.33 - 67.73	54.54
Fine Arts	26.76 - 56.14	43.73
Home Economics	14.31 - 48.47	27.19
Industrial Arts	6.44 - 69.26	34.18
Business Education	92.05 - 155.59	118.39
Technical Education	248.90 - 310.12	279.51

On the basis of high school enrolment the usual cost trend was reversed. Generally speaking, the programs with low enrolments produced low per pupil-enrolled costs with the exception of technical education which remained as the highest unit-cost figure. The lowest-cost group on this basis included home economics, industrial arts, fine arts and physical education. The highest-cost group contained technical education, language arts, science, mathematics, social sciences, and business education. The modern language program was in between these two groups.

With the possible exception of technical education, this table reveals a general pattern of expenditures. There is a relatively high expenditure on the language arts, modern languages, science, mathematics, social science, and business education programs respectively, and a relatively low emphasis on programs in home economics, fine arts, physical education, and industrial arts. Technical education program costs were still high on the pupil-enrolled basis but were markedly lower than on a pupil-course basis, suggesting a low-emphasis trend.

Per Pupil Costs by Curriculum Cluster

Table XV is in effect an aggregation of Table XIV. The two types of unit costs displayed in Table XIV are also given in Table XV. The higher level of aggregation narrowed the unit-cost range in the three curriculum clusters of comparable subject differentiation, namely, communications,

TABLE XV

ESTIMATED TOTAL PER PUPIL COSTS OF CURRICULUM CLUSTERS BY PUPIL-COURSE AND BY HIGH SCHOOL ENROLMENT

	HIGH SCHOOL									
	A		B		C		D		E	
	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil
COMMUNICATIONS:										
Direct Costs	$ 50.42	$ 93.10	$ 65.47	$134.69	$ 53.99	$ 99.47	$ 61.55	$129.74	$ 58.86	$113.37
Resident Indirect Costs	9.45	17.45	9.41	19.35	8.70	16.03	11.08	23.36	3.18	6.13
Resident Implementary Costs	29.08	53.69	28.39	58.40	19.60	36.11	26.21	55.24	21.60	41.61
Non-resident Indirect and Implementary Costs	28.37	52.40	27.99	78.16	39.32	72.45	40.96	86.33	29.92	57.64
Total Cost Per Pupil	$117.32	$216.64	$141.26	$290.60	$121.61	$224.06	$139.80	$294.67	$113.56	$218.75
ENVIRONMENTAL SCIENCES:										
Direct Costs	$ 41.34	$116.92	$ 45.34	$157.36	$ 43.31	$122.87	$ 47.51	$160.78	$ 48.32	$137.20
Resident Indirect Costs	10.07	28.49	6.25	21.69	6.76	19.17	6.88	23.27	5.46	15.49
Resident Implementary Costs	24.97	70.63	19.56	67.89	15.65	44.40	19.62	66.41	18.73	53.18
Non-resident Indirect and Implementary Costs	24.37	68.92	26.18	90.86	31.40	89.09	30.67	103.78	25.95	73.68
Total Cost Per Pupil	$100.75	$284.96	$ 97.33	$337.80	$ 97.12	$275.53	$104.68	$354.24	$ 98.46	$279.55

TABLE XV (cont'd)

	HIGH SCHOOL									
	A		B		C		D		E	
	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil	Cost Per Pupil-Course Enrolled in Cluster Courses	Cost Per High School Pupil
HUMANITIES:										
Direct Costs	$ 53.09	$ 60.74	$ 54.57	$ 73.59	$ 49.83	$ 62.60	$ 43.72	$ 65.42	$ 55.20	$ 62.64
Resident Indirect Costs	10.86	12.42	9.54	12.69	16.50	20.73	6.65	9.96	11.83	13.43
Resident Implementary Costs	31.05	35.52	24.26	32.72	20.74	26.05	18.18	27.20	23.34	26.48
Non-resident Indirect and Implementary Costs	30.30	34.67	32.47	43.79	41.60	52.26	28.40	42.51	32.33	36.69
Total Cost Per Pupil	$125.30	$143.35	$120.84	$162.79	$128.67	$161.64	$ 96.95	$145.09	$122.70	$139.24
GENERAL VOCATIONAL EDUCATION:										
Direct Costs	$126.22	$173.86	$ 74.44	$ 96.50	$ 66.05	$ 72.32	$ 63.80	$ 52.22	$105.96	$154.22
Resident Indirect Costs	53.32	73.44	17.33	22.47	20.78	22.38	24.11	19.73	43.70	63.77
Resident Implementary Costs	87.08	120.09	34.80	45.11	27.04	29.60	31.72	25.96	51.94	75.92
Non-resident Indirect and Implementary Costs	85.08	117.20	46.58	60.37	54.24	59.39	49.56	40.57	71.95	105.18
Total Cost Per Pupil	$321.70	$484.59	$173.15	$224.45	$168.11	$183.69	$169.19	$138.48	$273.55	$399.09

environmental studies, and the humanities. The general vocational education cluster differed widely from school to school. The range and average of the per pupil-course costs in each cluster were as follows:

	Range	Average[1]
Communications	$113.56 - 144.26	$126.63
Environmental Studies	97.12 - 104.68	99.67
Humanities	96.95 - 128.67	119.89
General Vocational Education	168.11 - 321.70	221.12

The environmental studies curriculum cluster had the lowest per pupil-course cost and the narrowest range of unit costs over the five schools. The humanities cluster was next, followed by communications. The greatest range appeared in the general vocational education cluster as did the highest per pupil-course cost.

The relative effects of several cost factors are illustrated in Table XV. For instance, direct instructional costs and indirect costs were generally stabilized except in the general vocational education cluster. Resident implementary costs tended to be highest in School A and lowest in School C. The non-resident costs were initially prorated by total sample enrolment, and, therefore, showed no marked differences.

The range and average of the enrolled-pupil costs in each curriculum cluster were as follows:

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[1]This is an arithmetic average of the unit costs for each school.

	Range	Average
Communications	$216.64 - 294.67	$248.94
Environmental Studies	275.53 - 354.24	306.42
Humanities	139.24 - 162.79	150.42
General Vocational Education	138.48 - 484.59	286.06

These figures also depict the relative financial emphasis that each cluster received in the selected sample. For example, the humanities received less than half the unit expenditure accorded environmental studies in terms of resources allocated. General vocational education courses received the second largest unit allocation followed by the courses comprising the communications cluster.

On an individual school basis, this relative emphasis varied to the largest extent in the general vocational education cluster. For example, School D allocated $138.48 per pupil-enrolled to general vocational education, whereas, in School A, the unit-cost figure per enrolled pupil was $484.59. Conversely, School D showed higher unit allocations in the other three clusters.

The two-dimensional approach utilized in Table XV to display unit costs enabled the examination of actual per pupil-course costs, by curriculum cluster, in relation to the emphasis given each cluster on the basis of total enrolment. This approach provided a broader perspective for studying resource allocations, that is, the pupil-course unit gives an actual cost per pupil in a program, whereas the pupil-enrolled unit gives a proportion of the total cost based on total enrolment.

Per Pupil Educational Costs by Grade

Table XVI gives a breakdown of per pupil-enrolled educational costs by grade and school. This unit is made up of a direct instructional cost, an aggregated resident indirect and implementary cost, and an aggregated non-resident indirect and implementary cost.

As previously noted (cf. supra:139), the decreasing grade costs in advancing from grades ten to twelve respectively was the result of two main factors: (1) lack of a standard unit denoting pupil equivalence, and (2) no provision for the downward mobility of grade eleven and twelve students. Consequently, the unit costs by grade provided in Table XV are of little value except in demonstrating the cost distortions which such an approach produces. However, the aggregated per pupil-enrolled cost presented in this table has some value. The aggregated unit cost by school takes into account the grade mobility of high school students, and gives an average cost per enrolled, non-standardized pupil. It has meaning to the extent that the high school pupils involved take the same amount of instructional time.

School A had the highest unit educational cost at $1,120.21 per pupil-enrolled. School C had the lowest unit cost at $840.76. The second highest aggregated unit cost was $1,048.58 in School E, whereas the corresponding costs in School B and School D were $1,011.90 and $917.12

TABLE XVI

ESTIMATED TOTAL PER PUPIL-ENROLLED EDUCATIONAL COSTS BY GRADE AND SCHOOL

		HIGH SCHOOL				
		A	B	C	D	E
GRADE 10:	Direct Costs	$ 589.21	$ 522.10	$ 423.26	$ 443.85	$ 542.96
	Aggregated Indirect and Implementary Costs					
	Resident	402.27	270.83	208.31	236.58	310.87
	Non-resident	273.19	273.19	273.19	273.19	273.19
	Cost Per Pupil	$1,264.67	$ 1,066.12	$ 904.76	$ 953.62	$ 1,127.02
GRADE 11:	Direct Costs	$ 473.85	$ 503.09	$ 363.03	$ 405.82	$ 506.73
	Aggregated Indirect and Implementary Costs					
	Resident	402.27	282.93	210.00	231.64	305.01
	Non-resident	273.19	273.19	273.19	273.19	273.19
	Cost Per Pupil	$1,149.31	$ 1,059.21	$ 846.22	$ 910.65	$ 1,084.93
GRADE 12:	Direct Costs	$ 318.85	$ 356.32	$ 276.78	$ 374.45	$ 348.33
	Aggregated Indirect and Implementary Costs					
	Resident	402.27	277.18	212.89	237.21	305.62
	Non-resident	273.19	273.19	273.19	273.19	273.19
	Cost Per Pupil	$ 994.31	$ 906.69	$ 762.86	$ 884.85	$ 927.14
Aggregated Per Pupil Cost (Division 4)		$1,120.21	$ 1,011.90	$ 840.76	$ 917.12	$ 1,048.58

respectively. The effect of the resident indirect and implementary costs on total educational per pupil-enrolled costs was made apparent in this table. School A had the largest combined resident, indirect and implementary unit cost, whereas School C had the lowest. In every instance the combined resident and non-resident indirect and implementary unit costs were greater than the direct instructional costs.

Total Estimated per Pupil-Enrolled Costs by a Modified Function-Object Expenditure Classification

Table XVII was derived from the aggregated cost figures given in Table XL (Appendix I). Table XVII converts the expenditure figures in Table XL to unit costs, and indicates what percentage each category is of the grand total unit costs for each school. Those expenditure series in Figure 2, pp. 48-49, that had no cost entries were omitted in this table, e.g., 300 Attendance Services.

Non-resident administration costs were determined by Researcher 4 to be $33.59 per pupil-enrolled. This category accounted for a range of from 3.00 to 4.00 percent of the total unit cost per school, the average being 3.36 percent.

"Instructional" costs amounted to a sample average of $691.53 per pupil-enrolled, constituting a portion of total expenditure of 69.15 percent. However, the average percentage of total expenditure that was devoted to direct

TABLE XVII

AVERAGE ESTIMATED PER PUPIL-ENROLLED COSTS IN EACH OF THE FIVE HIGH SCHOOLS BY A MODIFIED FUNCTION-OBJECT EXPENDITURE CLASSIFICATION

	A		B		C		D		E		Sample	
Expenditure Series	Cost per Pupil-Enrol.	Per-cent	Cost per Pupil-Enrol.	Per-cent	Cost per Pupil-Enrol.	Per-cent	Cost per Pupil-Enrol.	Per-cent	Cost per Pupil-Enrol.	Per-cent	Cost per Pupil-Enrol.	Per-cent
100 ADMINISTRATION												
Total Expend.	$33.59	3.00	$33.59	3.32	$33.49	4.00	$33.59	3.66	$33.59	3.20	$33.59	3.36
200 INSTRUCTION												
210 Salaries												
211 Teachers[a]	444.75	39.70	462.14	45.67	357.26	42.49	408.16	44.50	468.11	44.64	430.07	43.04
212 Administr.	46.19	4.12	40.16	3.97	36.41	4.33	39.98	4.36	42.60	4.06	41.63	4.17
213 Dept. Hds.	17.36	1.55	13.91	1.37	15.30	1.82	10.94	1.19	24.26	2.31	16.83	1.68
214 Other Inst.												
a. Library	11.80	1.05	14.96	1.48	18.68	2.22	15.73	1.72	10.88	1.04	13.97	1.40
b. AV & TV	6.09	0.54	1.51	0.15	1.29	0.15	1.56	0.17	4.40	0.42	3.35	0.34
c. Guidance	32.14	2.87	38.87	3.84	19.20	2.29	23.16	2.53	32.21	3.07	28.96	2.91
d. Other												
1. Sub. Teach.	52.00	4.64	21.12	2.09	18.74	2.23	18.71	2.04	-	-	23.28	2.33
2. Gen. Super.	13.19	1.18	11.19	1.11	4.60	0.55	1.40	0.15	17.34	1.65	9.97	1.00
3. Spec. Sup.[b]	4.02	0.36	2.36	0.23	1.24	0.15	0.82	0.09	3.66	0.35	2.58	0.26
215 Cler. & Bus. Supp. Staff	32.89	2.94	20.98	2.07	15.14	1.80	19.30	2.10	28.41	2.71	24.49	2.45
230 Library Equip. & Supp.	5.62	0.52	8.17	0.81	6.93	0.82	9.84	1.07	7.71	0.74	7.55	0.76
235 AV Equip. & Supplies	1.08	0.10	1.34	0.13	2.07	0.25	0.69	0.08	0.76	0.07	1.12	0.11

TABLE XVII (cont'd)

Expenditure Series	A Cost Per Pupil-Enrol.	A Per cent	B Cost Per Pupil-Enrol.	B Per cent	C Cost Per Pupil-Enrol.	C Per cent	D Cost Per Pupil-Enrol.	D Per cent	E Cost Per Pupil-Enrol.	E Per cent	SAMPLE Cost Per Pupil-Enrol.	SAMPLE Per cent
240 Instr. Equip. & Supplies (Curric)	$70.56	6.30	$26.87	2.66	$24.89	2.96	$22.16	2.42	$54.55	5.20	$43.36	4.26
242 General CR Equip. Supplies & Texts	3.12	0.28	4.23	0.42	3.79	0.45	5.53	0.60	4.66	0.44	4.20	0.42
250 Other Non-Resident Instr. Costs	0.57	0.05	0.38	0.04	0.31	0.04	0.31	0.03	1.54	0.15	0.67	0.07
	39.50	3.53	39.50	3.90	39.50	4.70	39.50	4.31	39.50	3.77	39.50	3.95
Totals	$780.90	69.73	$707.69	69.94	$565.44	67.25	$617.79	67.36	$740.59	70.62	$691.53	69.15
500 PUPIL TRANS. High School	$ 37.86	3.38	$ 37.86	3.74	$ 37.86	4.50	$ 37.86	4.13	$ 37.86	3.61	$ 37.86	3.79
600 PLANT OPERATION												
610 Salaries	59.04	5.27	43.24	4.27	26.33	3.13	37.92	4.13	39.61	3.78	42.54	4.26
640 Utilities[c]												
a. Fuel	9.19	0.82	6.28	0.62	4.43	0.53	5.27	0.57	6.46	0.62	6.55	0.66
b. Light & Pwr.	17.11	1.53	10.75	1.06	7.05	0.84	9.08	0.99	12.28	1.17	11.79	1.18
c. Telephones	3.17	0.28	1.62	0.16	1.24	0.15	1.17	0.13	2.69	0.26	2.11	0.21
d. Water	3.09	0.28	3.92	0.39	0.83	0.10	1.09	0.12	0.92	0.09	1.89	0.19
650 Supplies												
a. Custodial	3.22	0.29	2.79	0.28	1.44	0.17	1.80	0.20	1.39	0.13	2.14	0.21
Non-Resident Expend.	12.25	1.09	12.25	1.21	12.25	1.46	12.25	1.34	12.25	1.17	12.25	1.23
Totals	$107.07	9.56	$ 80.85	7.99	$ 53.57	6.38	$ 68.58	7.48	$ 75.60	7.22	$ 79.27	7.94

TABLE XVII (cont'd)

Expenditure Series	A Cost Per Pupil-Enrol.	A Per cent	B Cost Per Pupil-Enrol.	B Per cent	C Cost Per Pupil-Enrol.	C Per cent	D Cost Per Pupil-Enrol.	D Per cent	E Cost Per Pupil-Enrol.	E Per cent	SAMPLE Cost Per Pupil-Enrol.	SAMPLE Per cent
700 PLANT MAINTENANCE												
Non-Resident Expend.	$25.74	2.30	$25.74	2.54	$25.74	3.06	$25.74	2.81	$25.74	2.45	$25.74	2.58
720 Repair & Replacement of Gen. Equip. & Furn. (Resident)	0.45	0.04	0.69	0.07	0.34	0.04	0.56	0.06	0.23	0.02	0.44	0.04
Totals	$26.19	2.34	$26.43	2.61	$26.08	3.10	$26.30	2.87	$25.97	2.47	$26.18	2.62
800 FIXED CHARGES	$17.64	1.57	$17.64	1.74	$17.64	2.10	$17.64	1.92	$17.64	1.68	$17.64	1.77
900 FOOD SERVICES												
910 Salaries	10.29	0.92	1.23	0.12	-	-	8.76	0.96	10.91	1.04	7.25	0.73
1000 STUDENT BODY ACT.	0.88	0.08	0.88	0.09	0.88	0.10	0.88	0.10	0.88	0.09	0.88	0.09
1300 DEBT SERVICE & CAPITAL FROM CURRENT FUNDS	105.74	9.44	105.74	10.45	105.74	12.58	105.74	11.53	105.74	10.08	105.74	10.58
Totals	$1120.16		$1011.91		$ 840.80		$ 917.14		$1048.58		$ 999.94	

[a]Net basic salaries, e.g., gross academic salaries less Series 212, 213, 214 (a), (b), (c), (d) 1 and 2 (direct instructional costs).

[b]Indirect costs of teacher supervision.

[c]To be reduced by $9291.71 in School A and by $11,423.16 in School B.

instructional salaries only was 43.04 percent. The percentage range for the sample was 39.70 in School A to 45.67 in School B. The average per pupil-enrolled cost of direct instructional salaries was $430.07, with a range of from $357.26 in School C to $468.11 in School D.

Salaries of resident administrators were quite consistent, with an average of $41.63 per pupil-enrolled and a proportion of total expenditure of 4.17 percent. Department head prorated salary costs made up 1.68 percent of the total expenditure with a per pupil-enrolled cost range of $10.94 in School D to $24.26 in School E.

In the "Other Instructional Staff" category, resident library services consumed an average of 2.16 percent of the total expenditure, and guidance services required an average of just under three percent. Audio-visual salaries and expenses averaged 0.45 percent.

The cost of general supervision in the schools came to an average of 1.00 percent of total expenditure whereas the cost of special supervision, or indirect costs of teacher supervision, averaged 0.26 percent. The cost of a "built-in" substitute teacher policy varied from a low of $18.71 in School D to a high of $52.00 per pupil-enrolled in School A. School E did not have a "built-in" substitute teacher scheme. The latter figure constituted 4.64 percent of the expenditures for School A, compared with a sample average of 2.33 percent. The average per

average per pupil-enrolled costs were $53.57 and $107.07 respectively.

The average per pupil-enrolled cost of "Plant Maintenance" was $26.18. There was very little variation from school to school, and the 2.62 average percentage figure reflected all of the schools.

"Fixed Charges" amounted to $17.64 per pupil and an average percentage figure of 1.77. "Food Services" and "Student Body Activities" accounted for a total of 0.82 percent of the total expenditure with per pupil-enrolled costs averaging $7.25 and $0.88 respectively.

The last category, "Debt Service and Capital from Current Funds," averaged $105.74 per pupil-enrolled. This amount ranged from 9.44 percent in School A to 12.58 percent in School C, for an overall average of 10.58 percent of total expenditure.

Total Costs in a Program Structure

Table XVIII displays the eleven curricular program costs by functional category in a program budget format based on curricular organization. The row totals give an estimated total cost for eleven curricular programs and guidance.[1] The column totals provide the total expenditure by functional category.

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[1]The guidance program was included as a non-curricular program in Table XVIII for the purpose of illustration.

TABLE XVIII

A PROGRAM COST STRUCTURE

	Direct Expend.	Indirect Expend.	Implementary Expenditures						
	Teachers' Salaries	Support Serv. Supplies, Equipment	General Implement.	Plant Operation	Plant Mainten.	Trans-portation	Fixed Charges	Debt Serv. & Capital out of Current Rev.	Totals 1969-70
English Language Arts	$681,090.62	$119,625.17	$238,522.40	$122,087.27	$40,325.09	$58,317.00	$27,162.34	$162,863.07	$1,449.992.96
Modern Languages	293,658.70	44,385.94	103,702.80	53,591.95	17,701.27	25,599.07	11,923.29	71,491.07	623,054.09
Mathematics	486,372.72	41,016.58	156,024.82	79,861.04	26,377.88	38,146.94	17,767.72	106,533.74	952,101.44
Science	591,038.33	129,846.11	215,140.73	110,119.41	36,372.14	52,600.35	24,499.69	146,898.07	1,306,514.83
Social Sciences	525,310.07	115,021.87	191,464.96	98,001.01	32,369.46	46,811.80	21,803.55	130,732.26	1,161,514.98
Physical Education	225,136.12	69,230.95	87,938.59	45,011.22	14,867.08	21,500.35	10,014.23	60,044.46	533,743.00
Fine Arts	172,258.73	46,838.13	64,556.93	33,043.35	10,914.13	15,783.70	7,351.58	44,079.46	394,826.01
Home Economics	120,129.90	19,686.72	39,410.61	20,172.25	6,662.84	9,635.61	4,487.98	26,909.56	247,095.47
Industrial Arts	84,257.92	39,939.26	39,557.66	20,247.52	6,687.70	9,671.56	4,504.73	27,009.97	231,866.32
Business Education	444,841.32	147,579.71	181,612.31	92,957.94	30,703.75	44,402.89	20,681.56	124,004.87	1,086,784.35
Technical Education	459,861.57	249,024.72	151,613.19	77,602.95	25,632.04	37,068.33	17,265.33	103,521.47	1,121,589.60
Guidance		386,091.45							386,091.45
Totals	4,083,956.00	1,408,276.61	1,470,545.00	752,695.91	248,613.38	359,537.60	167,462.00	1,004,088.00	9,495,174.50

The column "Teachers' Salaries" included only that portion of the salary of a teacher that went toward direct teaching duties in curriculum areas. The remaining portion of the salary of a teacher who performed other functions appears in the "Indirect" column, and under "General Implementary" in the "Implementary Expenditure" column.

The "Indirect Expenditures" included all those costs defined in this manner (cf. supra: 25) plus the prorated portion of non-resident indirect costs provided by Researcher 4.

The "Implementary Expenditure" section contains seven categories which were taken directly from the functional categories in Table XL in Appendix I, with the exception of "General Implementary" which contains all the administrative costs not allocated elsewhere. For instance, costs from the classification table of pp. 178-180, such as resident and system costs of administration in the 100 Administration Series, the 200 Instruction Series, the 900 Food Services Series, and the 1000 Student Body Activities Series, were combined under this heading.

Table XIX was derived directly from Table XVIII, page 184. In Table XIX the aggregate cost by category was converted to a per pupil-enrolled cost and percentage of the total cost. For example, the average per pupil-enrolled cost of language arts in the sample was $152.70 which amounted to 15.27 percent of the total educational

TABLE XIX

ESTIMATED PER PUPIL-ENROLLED COSTS IN A PROGRAM COST STRUCTURE

	Direct Expend. Teachers' Salaries		Indirect Exp. Support Services		Implementary Expenditures													
			Supp.	Equip.	General Implement.		Plant Operation		Plant Maintenance		Transport.		Fixed Charges		Debt Serv.& Cap. out of Current Rev.		Totals 1969-70	
	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent	Per Pupil	Per cent
English Language Arts	$71.72	7.17%	$12.60	1.26%	$25.12	2.51%	$12.86	1.29%	$ 4.25	0.42%	$ 6.14	0.62%	$ 2.86	0.28%	$17.15	1.72%	$152.70	15.27%
Modern Languages	30.92	3.09	4.67	0.46	11.02	1.10	5.64	0.56	1.86	0.19	2.70	0.27	1.26	0.12	7.53	0.75	65.61	6.56
Mathematics	51.22	5.12	4.32	0.43	16.43	1.64	8.41	0.84	2.78	0.28	4.02	0.40	1.87	0.19	11.22	1.10	100.26	10.03
Science	62.24	6.23	13.67	1.37	22.66	2.27	11.60	1.16	3.83	0.38	5.54	0.55	2.58	0.26	15.47	1.55	137.59	13.76
Social Sciences	55.32	5.53	12.11	1.21	20.16	2.02	10.32	1.03	3.41	0.34	4.93	0.49	2.30	0.23	13.77	1.38	122.32	12.23
Physical Education	23.71	2.37	7.29	0.73	9.26	0.93	4.74	0.47	1.57	0.16	2.26	0.23	1.05	0.10	6.33	0.63	56.21	5.62
Fine Arts	18.14	1.82	4.94	0.49	6.80	0.68	3.48	0.35	1.15	0.12	1.66	0.17	0.78	0.08	4.64	0.46	41.58	4.16
Home Economics	12.65	1.27	2.08	0.21	4.15	0.41	2.12	0.21	0.70	0.07	1.01	0.10	0.47	0.05	2.83	0.29	26.01	2.60
Industrial Arts	8.87	0.88	4.20	0.42	4.17	0.42	2.13	0.21	0.70	0.07	1.02	0.10	0.47	0.05	2.84	0.29	24.42	2.44
Business Education	46.85	4.69	15.54	1.56	19.12	1.91	9.79	0.98	3.23	0.32	4.68	0.47	2.18	0.22	13.06	1.31	114.44	11.45
Technical Education	48.43	4.84	26.22	2.62	15.97	1.60	8.17	0.82	2.70	0.27	3.90	0.39	1.82	0.18	10.90	1.09	118.11	11.81
Guidance			40.66	4.07													40.66	4.07
Totals	$430.07	43.01	$148.30	14.83	$154.86	15.49	$79.26	7.93	$26.18	2.62	$37.86	3.79	$17.64	1.76	$105.74	10.57	$999.91	100.00

expenditure. Similarly, the average per pupil-enrolled cost of the technical education program was $118.11 or 11.81 percent of the total expenditure. Of the eleven curricular programs costed, the highest allocation went to the English language arts, previously noted, and the lowest to industrial arts. The per pupil-enrolled allocation to industrial arts averaged $24.24 or 2.44 percent of the total expenditure.

Table XIX also discloses the relative emphasis given to each curriculum program in terms of fiscal allocation. The English language arts, mathematics, sciences, social sciences, business education, and technical education received a strong emphasis. Modern languages and physical education were moderately emphasized, whereas the fine arts, home economics and industrial arts received the least emphasis. The guidance program which encompassed the pupil personnel services at the school and system level averaged $40.66 for pupil, or 4.07 percent of the total expenditure. By way of comparison, this figure is similar to the unit allocation for the fine arts program ($41.58) and greater than the corresponding unit expenditures for home economics ($26.01) and industrial arts ($24.42).

Table XIX also provides a breakdown of expenditures by function. The percentage of total expenditures devoted to direct instruction averaged $43.01. Indirect expenditures accounted for an average of 14.83 percent and the

remaining 42.16 percent average was attributable to implementary costs. The latter comprised the following averages: 15.49 percent for general implementary; 7.93 percent for plant operation; 2.62 percent for plant maintenance; 3.79 percent for transportation; 1.76 percent for fixed charges; and 10.58 percent for debt service and capital out of current revenue.

A major feature of a curricular program structure is the identification of financial inputs with curricular programs. Tables XVIII and XIX exemplify the "crosswalk" described by Dei Rossi (cf. supra: 32) which serves as a transitional stage between a conventional budget format and a program-budget format. This two-dimensional approach to budget reporting provides more meaningful information with respect to the allocation of resources than a single-dimension function-object approach. A function-object based conventional budget format does not differentiate among the various curricular purposes for which funds are allocated.

VI. PROJECT SAMPLE PER PUPIL COSTS

The findings provided by Researchers 2 and 3 were combined with the findings of this study in this section. The analysis conducted follows the order of the seven sub-problems stated in Chapter I related to the urban project.

Estimated per Pupil-Enrolled Costs by Grade of All the Schools in the Project Sample

The estimated average per pupil-enrolled costs by grade are given in Table XX. Data provided by Researchers 2 and 3 were combined where an overlap in grades existed, namely, grades one to six inclusive. The unit costs for grades seven to nine inclusive were provided by Researcher 2. The unit costs for the high school grades, namely, grades ten to twelve inclusive, were taken from this study.

The highest per pupil-enrolled costs in the elementary grades, that is, grades one to six inclusive, appeared in grade six. The average unit cost for that grade was $708.48. The next highest per pupil-enrolled cost was in grade one with a figure of $697.22. Grade two was next with a unit cost of $679.02 followed by grade four with $660.35. The two lowest per pupil-enrolled costs in the elementary grades were in grade three with a unit cost of $651.92 and in grade five with $635.65.

At the junior high school level (division three), the highest average per pupil-enrolled cost was in grade nine at $821.98. The next highest unit cost was $797.01 at the grade seven level, followed by a per pupil-enrolled cost of $782.98 in grade eight.

At the high school level, the highest average per pupil-enrolled costs were found at the grade ten level ($1,127.02) and the lowest at the grade twelve level ($927.14). This anomaly was discussed earlier in this chapter.

TABLE XX

ESTIMATED PER PUPIL-ENROLLED COSTS BY GRADE OF ALL THE SCHOOLS IN THE PROJECT SAMPLE

	Number of Pupils Enrolled	Estimated Cost per Pupil-Enrolled
Grade One	1,185	$ 697.22
Two	1,194	679.02
Three	1,136	651.92
Four	1,089	660.35
Five	1,118	635.65
Six	1,086	708.48
Seven	1,214	797.01
Eight	1,073	782.98
Nine	1,055	821.98
Ten	3,099	1,127.02
Eleven	3,214	1,084.93
Twelve	3,183	927.14

Estimated per Pupil-Enrolled Costs by Grade Division in the Project Sample

Table XXI gives the total number of pupils enrolled in each grade division in the project sample, and the average estimated per pupil-enrolled cost. The overlapping data provided by Researchers 2 and 3 were combined in grades one to six inclusive.

The estimated average per pupil-enrolled cost for a division one pupil in the project sample was $676.39. This average unit cost was slightly higher than the figure of $667.84 in division two. The average per pupil-enrolled

TABLE XXI

ESTIMATED PER PUPIL-ENROLLED COSTS BY GRADE DIVISION IN THE PROJECT SAMPLE

	Number of Pupils Enrolled	Estimated Cost per Pupil-Enrolled
Division One Grades One to Three Incl.	3,515	$ 676.39
Division Two Grades Four to Six Incl.	3,293	667.84
Division Three Grades Seven to Nine Incl.	3,342	800.39
Division Four Grades Ten to Twelve Incl.	9,496	999.91
Urban Selected Sample	19,646	845.25

cost in division three was $800.39, and in division four it was $999.91.

It is noteworthy that the average per pupil-enrolled cost was highest in division four and lowest in division two. The average per pupil-enrolled cost for the project sample was $845.25.

Estimated per Pupil-Course Costs in Curricular Programs by Grade Division in the Project Sample

Table XXII gives the per pupil-course costs in curricular programs by grade division, and the average of these grade-division unit costs.

TABLE XXII

ESTIMATED PER PUPIL-COURSE COSTS IN CURRICULAR PROGRAMS
BY GRADE DIVISION

Curricular Programs	Cost per Pupil-Course in Program[a]				Average Costs Gr. 1-12 Incl.
	Division One	Division Two	Division Three	Division Four	
Language Arts	$ 64.15	$ 57.24	$ 107.89	$ 121.38[b]	$ 87.67
Modern Languages	140.92[c]	48.25	60.61	133.72	95.88
Mathematics	96.74	114.77	93.68	110.02	103.80
Science	34.76	47.78	85.23	87.08	63.71
Social Sciences	57.12	75.29	56.05	112.33	75.20
Physical Education	31.49	37.20	42.46	122.12	58.32
Fine Arts	34.13	40.19	61.85	157.02	73.30
Home Economics	-	-	117.58	211.93	164.76
Industrial Arts	-	-	124.76	198.91	161.84
Business Education	-	-	45.29	170.57	107.93
Technical Education	-	-	-	748.28	748.28

[a]Includes all the pupils registered in every course in the program area.

[b]This figure is an arithmetic average of the unit costs for each school.

[c]Only a small number of pupils were involved here.

The average per pupil-course cost by program over the four grade divisions combined was highest in technical education with a unit cost of $748.28. The lowest average per pupil-course cost was $58.32 in the physical education program. These figures are not directly comparable in that technical education courses have a higher credit rating than other courses. That is, credit equivalence would first have to be established among all the curricular programs before comparisons can be made. The per pupil-course costs displayed in this table are, therefore, actual rather than equivalent unit costs.

An examination of this table reveals several noteworthy cost trends. The mathematics program was the highest per pupil-course cost area at the elementary level with unit costs of $96.74 and $114.77 in divisions one and two respectively. Language arts, home economics, and industrial arts programs comprised the highest-cost group at the junior high level (division three), with unit costs of $107.89, $117.58, and $124.76 respectively, whereas industrial arts, home economics and technical education constituted the corresponding group at the high school level. The per pupil-course costs in the industrial arts, home economics, and technical education curriculum clusters were $151.84, $164.76, and $748.28 respectively.

Actual per pupil-course costs were lowest in the physical education, fine arts, and science programs at the

elementary level. The per pupil-course costs by curricular program in divisions one and two were $31.49 and $37.20 for physical education; $34.13 and $40.19 for fine arts; and $34.76 and $47.78 for science. At the junior high school level, physical education ($42.46) and business education ($45.29) comprised the lowest program cost group, whereas science ($87.08), mathematics ($110.02), and social sciences ($112.33) were the lowest per pupil-course cost programs at the high school level.

Estimated per Pupil-Course Costs in Curriculum Clusters by Grade Divisions in the Project Sample

The average per pupil-course costs in curriculum cluster by grade divisions are given in Table XXIII.

The curriculum clusters with the highest average per pupil-course costs were: environmental sciences in division one with a unit cost of $63.99; humanities in division two with a unit cost of $73.67; and general vocational education in divisions three and four with unit costs of $99.76 and $221.12 respectively. The corresponding lowest average per pupil-course costs by curriculum cluster were: humanities in division one and communications in division two, with unit costs of $55.73 and $52.46 respectively; humanities in division three with a unit cost of $56.05; and environmental sciences in division four at an average cost of $99.67 per pupil-course.

Over the total grade span of the urban sample, the

TABLE XXIII

ESTIMATED PER PUPIL-COURSE COSTS IN CURRICULUM CLUSTERS
BY GRADE DIVISIONS

	Cost per Pupil-Course in Clusters[a]				
Curriculum Clusters	Division One	Division Two	Division Three	Division Four	Average Costs Gr. 1-12 Incl.
Communications	$ 56.65[b]	$ 52.46	$ 84.86	$ 126.63[c]	$ 80.15
Environmental Sciences	63.99	68.53	74.00	99.67	76.55
Humanities	55.73	73.67	56.05	119.89	76.34
General Voc. Ed.	-	-	99.76	221.12	160.44

[a] Includes all the pupils registered in courses which make up the cluster.

[b] Art was included in the communications cluster.

[c] This figure is an arithmetic average of the unit costs for each school.

highest average per pupil-course cost was in the general vocational education cluster with a unit cost of $160.44. The corresponding lowest-cost figure was in the humanities curriculum cluster where the unit cost was $76.34, followed by the environmental sciences and communications with an average per pupil-course cost of $76.55 and $80.15 respectively.

The average per pupil-course expenditure in the general vocational education curriculum cluster was approximately double the corresponding unit cost in the three remaining curriculum clusters.

Resident per Pupil Costs of Instructional Media, Guidance, and General Administration in the Project Sample

The resident pupil-enrolled costs of instructional media, guidance, and general administration for the project sample are given in Table XXIV. Unit costs reported by Researchers 2 and 3 were averaged wherever there was an overlap in grade divisions.

The average resident cost of instructional media was $13.09 in grade divisions one and two respectively; $19.91 in division three, and $27.17 in division four. The arithmetic average of these unit costs was $18.57.

The resident per pupil-enrolled cost for guidance services was negligible in the elementary schools (divisions one and two) and, therefore, not reported. The average unit cost in division three (junior high school) was $13.88, and

TABLE XXIV

ESTIMATED RESIDENT PER PUPIL-ENROLLED COSTS OF INSTRUCTIONAL MEDIA, GUIDANCE, AND GENERAL ADMINISTRATION SERVICES IN THE PROJECT SAMPLE

	Cost Per Pupil				
	Div. One	Div. Two	Div. Three	Div. Four	Average[a]
Instructional Media	$13.09	$13.09	$19.91	$27.17	$ 18.57
Guidance	-	-	13.88	28.91	10.72
General Administration[b]	38.95	43.49	27.64	101.92	53.00
Totals	52.04	56.58	61.43	158.08	

[a] This is an arithmetic average of the unit cost in each division, ie., it is not weighted.

[b] Includes all resident expenditures not charged to curricular programs with the exception of guidance, plant operation, plant maintenance, and food services.

NOTE: The non-resident per enrolled-pupil costs of instructional media and guidance were determined by Researcher 4 to be $6.73 and $11.67 respectively.

at the senior high school level (division four) it was $28.99. The average unit cost for all four divisions was $10.72.

The cost of general administration did not follow the expected linear increase from division one to division four. The division three average unit cost of general administration was the lowest at $27.64 per pupil. The

per enrolled-pupil cost of resident general administration for the remaining divisions one, two, and four were $38.95, $43.49, and $101.92 respectively.

The cost pattern of the expenditures in these three non-curricular programs reveals a general increase in unit costs from the lower to higher grade divisions, with the exception noted. The unit costs at the high school level were markedly higher.

Average per Pupil Costs by Aggregated, Functional Categories in the Project Sample

Table XXV gives the average costs per enrolled pupil for each functional category. These unit costs were based on the total project sample. In addition, the proportion of the total funds allocated to each category was calculated.

Non-resident administration (100 Series) showed an estimated per pupil cost of $33.62. Instruction (200 Series), required the largest unit expenditure, namely, $556.97 per pupil, which accounted for approximately two-thirds of the total expenditure.

A unit cost of $20.54 was attributable to pupil transportation (500 Series), whereas the corresponding figure for plant operation (600 Series) was $70.54. Plant maintenance (700 Series) came to $26.16 per pupil, and fixed charges (800 Series) were $17.64 per pupil. Food services (900 Series) and student body activities (1000 Series) amounted to $3.50 and $0.57 per pupil respectively. Debt

TABLE XXV

AVERAGE PER PUPIL-ENROLLED COSTS IN THE PROJECT SAMPLE BY AGGREGATED FUNCTION-OBJECT EXPENDITURE CATEGORIES

Expenditure Series	Estimated Total Expenditures	Percentage of Expenditures	Estimated Costs per Pupil
100 Administration	$ 660,893.54	3.98%	$33.62
200 Instruction	11,144,447.03	67.07	566.97
500 Pupil Transport.	403,725.08	2.43	20.54
600 Plant Operation	1,386,470.69	8.35	70.54
700 Plant Maintenance	514,238.07	3.10	26.16
800 Fixed Charges	346,670.49	2.09	17.64
900 Food Services	68,813.00	0.41	3.50
1000 Student Body Act.	11,242.81	0.07	0.57
1200 Debt Service and Capital from Current Funds	2,077,742.72	12.51	105.71
Totals	$16,614,243.43	100.01%	$845.25[a]

[a] This is an average per pupil cost for the project sample. Since the high school sample used was proportionately larger than the other two, this unit cost would tend to be higher than a weighted system average.

service and capital from current funds (1200 Series) averaged $105.71 per pupil, constituting the second largest per pupil expenditure.

On a proportion of total expenditure basis, instruction, debt service and non-operating capital, and plant operation were highest with percentages of 67.07, 12.51, and 8.35 respectively.

The unweighted average per pupil-enrolled cost for the project sample was $845.25.

Average Teaching Qualifications, Experience, and Salary of Teachers in the Project Sample

Table XXVI provides the total number of teachers in the selected schools of the urban project, and the average of the teaching qualifications, experience, and salary of teachers in the three selected samples, namely, elementary, elementary-junior high, and senior high schools. In effect, an arithmetic average of averages was determined.

The average training of the three groups of teachers for salary purposes was 3.64 years, and the average number of years of experience for salary purposes was 5.77 years.

The average salary of the three groups of teachers in the project was $9.088.47.

TABLE XXVI

AVERAGE TEACHING QUALIFICATIONS, EXPERIENCE, AND SALARY OF TEACHERS IN THE PROJECT SAMPLE

Total Number of Teachers	970
Average Training (for salary purposes)	3.64
Average Experience (for salary purposes)	5.77
Average Salary	$9,088.47

VII. SUMMARY OF CHAPTER V

Per pupil-course and pupil-enrolled costs were reported by subject, curricular program, and curriculum cluster. A cost pattern based on the per pupil-course unit showed that language arts, modern languages, mathematics, science, social sciences, and physical education constituted the lowest-cost programs; fine arts and business education made up the middle-cost group; and home economics, industrial arts, and technical education comprised the highest-cost group.

On the per pupil-enrolled basis, the total cost for each senior high school was: $1,120.16 in School A; $1,011.91 in School B; $840.80 in School C; $917.14 in School D; and $1,048.58 in School E. The average for the five senior high schools was $999.94, and the corresponding figure for the project sample was $845.25.

English language arts, mathematics, science, social

sciences, business education, and technical education received the greatest financial emphasis. The modern languages and physical education received moderate emphasis, whereas the programs in fine arts, home economics, and industrial arts received the least financial emphasis.

The non-curricular programs at the school level were found to have per pupil-enrolled average costs of $27.17 for instructional media services, $28.99 for guidance, and $101.97 for general administration.

The average percentage of total expenditures in the senior high school selected sample devoted to direct instruction was 43.01. The corresponding percentages for indirect instruction and implementary services were 14.83 and 42.16 respectively.

CHAPTER VI

FINDINGS, CONCLUSIONS, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

This chapter contains four sections. The first section is basically a summary of the findings in Chapter V. The findings summarized pertain to the major problem, two general problems, and seven sub-problems associated with the total urban project, as well as eighteen sub-problems relating specifically to this study.

The second section deals with the conclusions and implications that emerged from this study in particular and the project in general. In addition, several questions dealing with cost differences identified in the school system under study are raised.

Some suggestions for research are offered in the third section.

I. SUMMARY OF THE STUDY

This section follows the sequence of problems which were stated in Chapter I.

Following the general statement of the major problem of this project in question form, there were two general sub-problems which pertained to the total project, but were most closely related to this study. Eighteen sub-problems, also stated as questions, were related

specifically to this study. Another seven specific sub-problems pertained to the total project.

The Problem

A general statement of the problem was as follows: What are the operational costs in a selected number of schools in an urban school system, and how can these costs be reported in a more meaningful manner to decision-makers? Unit costs were computed by (1) subject, (2) grade, (3) grade division (high school), (4) six specific pupil-program routes (high school), (5) eleven curricular programs, (6) four curriculum clusters, and (7) three non-curricular programs.

The general problem, which applied to all the studies in the project, was operationalized into two general sub-problems and eighteen specific sub-problems.

General Sub-Problems

The first general sub-problem was: In what ways can a program budget format be integrated with a cost analysis methodology?

A program budget format was identified as having three distinct dimensions (cf. supra: 30). These were: (1) the cost structure, (2) the program structure, and (3) the time element. The cost structure utilized in this study was the conventional function-object expenditure classification system used in Alberta and elsewhere.

Generally speaking, cost analyses of public school systems have been limited to an analysis of unit costs by function-object categories.

This study incorporated another dimension, namely, the program structure. The program structure utilized was primarily curricular in nature. In all, eleven curricular programs, four curriculum clusters, six pupil-program routes, and three non-curricular programs were costed.

Programs were further identified as having three dimensions (cf. supra: 54), namely, (1) the subject or curricular dimension, (2) the grade dimension, and (3) the type-of-pupil dimension. The curricular dimension received the most emphasis in this study. The pupil dimension was accommodated by costing six different, high-school, pupil-program routes, on the assumption that these program routes served the needs of different types of students.

The sequence of the analysis, in effect, outlined the progression from a unit-cost analysis based on individual subjects to a program-budget format which integrated the function-object cost structure with a programmatic structure. In other words, a "crosswalk" (cf. supra: 32) or tabular array was developed, with columns showing the conventional budget cost categories and the rows showing the program budget categories.

The unit costs derived proceeded from resident direct subject costs to resident indirect subject or

curricular costs, and to non-resident implementary unit costs. Included also were the unit costs for three non-curricular programs, namely, instructional media, guidance, and general administration services.

General sub-problem 2. In what ways can an electronic data processing system assist in the gathering, processing, and analyzing of cost data?

This problem was approached on two fronts: (1) the school system electronic data processing system, and (2) computer facilities available at the University of Alberta. Maximum use was made of the school system's electronic data processing system as a data source. A substantial portion of the data was obtained from four different computer runs, namely, the direct purchases run, the inventory charges run, the instructional staff payroll run, and the support staff payroll run. The school system electronic data processing system was not involved in the processing or analysis of the data used.

The computer facilities at the University of Alberta played a significant role in the processing and analysis of the direct instructional cost data and the staff analysis. Computer programs were developed that produced the following outputs: (1) non-teaching salary cost of teachers, (2) direct instructional costs by subject, curricular program, and curriculum cluster, and (3) analysis of salary levels, qualifications and experience of teachers by school,

curricular program, and curriculum cluster (see Figure 6, page 85). All other unit costs were computed manually. Much greater use could have been made of computer programs had a research design been available very early in the study. However, because of the unavailability of a suitable design, it was necessary to develop one locally. As a result, there was insufficient time to simultaneously develop the computer programs and still meet the study completion date that was set. However, subsequent studies, following a similar design, will be able to concentrate on the analytical aspect, and thereby take full advantage of computer capability now available.

Specific Sub-Problems Relating to this Study

There were eighteen sub-problems associated with this study. Each of the sub-problems involved analytical and computational aspects. The findings appropriate to each are summarized directly following the re-statement of the sub-problem.

Sub-problem 1. What were the average qualifications, length of teaching experience, and salary of teachers?

There was a difference amounting to 9.1 percent between the average salaries in the schools representing the lower and high limits respectively. That is, School B, with an average salary of $10,514.70 per teacher was 9.1 percent higher than School C where the average salary of teachers

was $9,554.80. The average salaries of teachers in Schools A, D, and E were $10,114.07, $10,068.13 and $9,834.39, respectively.

The average salary of teachers in the selected high school sample was $10,017.22. The average years of training and years of experience were 4.60 years and 6.05 years respectively.

Sub-problem 2. What were the average qualifications, length of teaching experience, and salary of teachers in each curricular program?

The qualifications of teachers in the academic programs such as English language arts and modern languages tended to be higher than the qualifications of teachers in the general vocation group, e.g., technical education. The teachers in the technical education program were the least qualified, by formal training standards, of any curricular group.

There were no general patterns evident with respect to the average years of experience by curricular program. However, technical education teachers had the highest average number of years of experience for salary purposes. This finding was attributable to the general practice of recognizing a portion of the field experience of technical education teachers for salary purposes.

Sub-problem 3. What were the average qualifications,

length of teaching experience, and salary of teachers in each curriculum cluster?

There was no general pattern with respect to the average qualifications, length of teaching experience, and salary of teachers in the four curriculum clusters. However, with the exception of School D, the average salary in the general vocational education cluster tended to be lower than the other three clusters.

In the remaining three clusters, School D had the highest average salaries in the environmental studies and general vocational education clusters, and was lowest in the communications cluster. School B had the highest average salary in the communications cluster, and School A was the highest in the humanities. School C had the lowest average salaries in three of the clusters, namely, environmental studies, humanities and general vocational education.

Sub-problem 4. What were the direct instructional costs per pupil-course-equivalent?

Direct instructional per pupil-course-equivalent costs were determined for each subject in each high school. A standard unit, the pupil-course-equivalent, was used to facilitate identifying differences on an equal time base, i.e., 200 minutes of instruction per week.

Direct instructional costs were most affected by two factors: (1) teacher's salary, and (2) course enrolment. Unusually high unit costs generally resulted from a

combination of a high teacher's salary and low pupil enrolment. Two other cost factors were noted. The type of scheduling used in the school affected direct instructional costs, as did the amount of preparation time allotted to teachers. In each case, the teaching load of the teacher was involved, i.e., the greater the teaching load, the lower the unit costs.

Three cost patterns on the basis of pupil-course-equivalents, were identified at the high school level. The lowest-cost courses included those comprising the language arts, mathematics, science, social sciences, and physical education programs. The middle-cost category included courses in modern languages, fine arts, and business education. The third group, or highest-cost courses, were in the home economics, industrial arts, and technical education areas.

Individual course costs tended to increase from grades ten to twelve. "High-demand" courses tended to be lower in cost, whereas "low-demand" or special courses tended to be more costly.

Sub-problem 5. What were the direct instructional per pupil-course costs by curricular program?

Pupil-course costs by curricular program were not based on a standard instructional time unit, and consequently, the range of unit costs was wider than the unit costs for course-equivalents. However, to facilitate gross comparisons,

a sample average per pupil-course-equivalent cost by curricular program was determined.

The cost pattern identified for curricular programs was essentially that described for the individual subjects in sub-problem 4. That is, individual subject costs were aggregated to curricular programs and then averaged. Sample average per pupil-course-equivalent costs ranged from $48.92 in the social science program to $126.40 in the technical education area, whereas average per pupil-course costs for the selected sample were $57.64. As with the pupil-course-equivalent costs, the lowest-cost programs included English language arts, mathematics, science, social sciences, and physical education. The highest-cost programs were industrial arts, home economics, and technical education. In the middle-cost group, closer to the lowest-cost group than the highest-cost group, were the modern languages, fine arts, and business education programs respectively.

Generally speaking, the average per pupil-course cost in a curricular program varied directly with the number of courses offered in the program: the greater the number of courses per program, the greater the average unit cost per program.

Sub-problem 6. What were the direct instructional per pupil-course costs by curriculum cluster?

The per pupil-course costs by curriculum cluster

resulted from an aggregation of various curriculum programs. The unit costs calculated provided an indication of the relative financial emphasis given to each curriculum cluster by each school. For example, School D spent as much per unit in communications courses as it did in general vocational education, that is, $61.55 as compared with $63.80 respectively. Conversely, in School A, more than twice as much per unit was spent on general vocational education courses than on courses in communications, indicating a much broader offering in vocational education courses.

The general cost pattern established in the analysis of curricular programs was maintained in the curriculum clusters.

Sub-problem 7. What were the minimum and maximum direct instructional per pupil-course-equivalent costs for pupil-program routes?

Minimum and maximum unit costs were computed for the following program routes: (1) Academic: no restriction, (2) Academic: English-Social Studies restriction, (3) Academic: Mathematics-Science restriction, (4) General Diploma, (5) Technical Education, and (6) Business Education. Minimum and maximum unit program-route costs were calculated by grade and by three-year or high-school program. These were determined by summing the pupil-course-equivalent costs comprising a program-route.

The sample range of minimum unit program-route costs was from $1,031.51 to $1,621.74 for a three-grade span. This amounted to a difference of 57.2 percent. A far greater variation was found to exist in the maximum costs. The range limits for maximum costs were $1,648.26 and $4,861.06 respectively, an increase of 194.9 percent. On an individual school basis, the greatest single program-route cost range was in the technical education program-route in School E. The respective minimum and maximum unit costs were $1,278.65 and $4,861.06 for a three-grade span. The percentage increase was 280.2 percent.

The unit costs in pupil-program routes appeared to be a function of the number of courses available in a program-route rather than the number of pupils enrolled in the school.

Sub-problem 8. What were the average direct instructional per pupil costs by grade?

Direct instructional per pupil costs were computed by grade and by school, in addition to the corresponding averages for the selected sample. These unit grade costs were found to be unreliable for two reasons: (1) a standardized enrolled pupil was not used, and (2) the wider choice range of grade eleven and grade twelve students was not accounted for. Consequently, the grade costs decreased rather than increased from grades ten to twelve. The direct unit costs by grade were contrary to the cost trend found in

grade subjects and grade curricular programs.

The average per pupil-enrolled direct instructional costs by grade were: $508.06 in grade ten, $450.54 in grade eleven, and $333.00 in grade twelve. The average direct instructional per pupil-enrolled cost for the selected sample was $430.07. This figure was considered to be useful only in that it demonstrated the cost distortion which occurs when unit expenditure is based on a non-standardized enrolled pupil. This unit cost can be particularly misleading if directly compared with other unit costs, such as elementary per pupil costs, where the latter are all full-time students.

Sub-problem 9. What were the resident indirect instructional per pupil-course and per pupil-enrolled costs by curricular program?

Resident indirect instructional per pupil costs were reported in two ways. One unit cost was based on the number of pupils enrolled in the school (conventional procedures), and the other unit cost was based on the number of pupils enrolled in the courses of a particular curricular program. This two-dimensional approach helped to give a perspective to indirect unit costs; for instance, a curricular program, e.g., home economics, had high indirect per pupil-course costs, but low per high-school enrolment unit costs since only a small proportion of the student body enrolled in home economics.

Resident indirect costs on a pupil-course basis were highest in technical education and industrial arts. The sample average per pupil-course cost in technical education was $130.51 and the corresponding figure in industrial arts was $34.56 per pupil-course. The lowest per pupil-course indirect cost was in the mathematics program where the unit cost was $2.81. The average per pupil-course cost for the selected sample was $12.34.

When the total indirect expenditures for the various curricular programs were costed out over the entire high school population, the lowest per pupil-enrolled indirect cost was in the home economics program where the unit cost was $1.65, reflecting the small proportion of students taking home economics courses. The total per pupil-enrolled indirect costs of all the programs in the selected sample was $92.04.

The resident indirect per pupil costs tended to be consistent from school to school. However, there was a wide range in the indirect costs from program to program. On an overall basis, the indirect costs comprised a considerable portion of the total educational costs.

Sub-problem 10. What were the resident indirect instructional per pupil-course and per pupil-enrolled costs by curriculum cluster?

Resident indirect instructional cost by curriculum cluster were aggregated from the corresponding curricular

program costs. Unit costs were reported by pupil-enrolled and by pupil-course.

The range of per pupil-enrolled, indirect costs by curriculum cluster on a sample basis averaged from $13.55 in the humanities to $44.77 in general vocational education. The corresponding range on a per pupil-course basis was from $7.23 in the environmental studies to $36.69 in general vocational education. Again, the high cost of technical education was the major factor in placing general vocational education indirect cost highest on both units.

A cost pattern was evident for resident indirect costs. The schools with a technical education program differed markedly from the group average in the general vocational education cluster. The indirect unit costs were generally consistent in the communications, environmental studies, and humanities curriculum clusters.

Sub-problem 11. What were the resident per pupil-enrolled costs of three non-curricular programs, namely, instructional media, guidance, and general administration?

The average resident per enrolled-pupil cost for the instructional media program was $27.17. This amount was comprised of a unit expenditure of $21.88 for library services and $5.99 for audio-visual services. The unit costs for instructional media were consistent throughout the sample schools.

The average guidance program unit cost was $28.99.

There was a considerable range in costs by school. School C had a per pupil-enrolled cost of $19.31 for guidance services, whereas the corresponding unit cost for School B was nearly double that, at $38.54.

The third non-curricular program, general administration, varied considerably also in unit costs from school to school. The per pupil-enrolled cost for general administration in School C was $78.92, the lowest unit cost of the group. Conversely, School A had a corresponding unit cost of $139.30, the sample high. The average unit cost of general administration was $101.97. The general administration program included the resident expenditures not charged to curricular programs with the exception of guidance, plant operation, plant maintenance, and food services.

Sub-problem 12. What were the resident implementary per pupil-enrolled costs?

The average total resident implementary cost per enrolled pupil was $204.61. School A had the highest unit cost at $279.94, and School C was lowest with a per pupil cost of $136.16. In descending order between these extremes, were School B ($204.12), School E ($197.20), and School D ($174.82).

Resident implementary costs were subdivided into general implementary and plant implementary categories. The magnitudes of these unit costs remained in the same

order as the total resident implementary costs. The average unit cost for the plant implementary category was $67.45 per pupil-enrolled, and for the general implementary category, $137.16.

Resident implementary costs constituted a noteworthy portion of the total educational cost.

Sub-problem 13. What were the combined resident, indirect and implementary per pupil-enrolled costs by grade division and by grade?

Aggregated resident, indirect and implementary costs were determined by function-object categories, and unit costs were then derived for each school by grade. There was only one change in the pattern of costs established in the resident implementary costs (Table XI, page 156). School E and School B reversed their relative positions, that is, School E now had the second highest per unit expenditure ($307.28) and School B had the third highest ($276.57). The other schools maintained their relative positions, namely, School A had the highest combined resident, indirect and implementary unit cost at $402.27, and School C had the lowest with a unit cost of $210.31. School D had the second lowest unit cost with a figure of $235.76. The corresponding average unit cost for the sample was $296.65.

Combined resident, indirect and implementary per pupil costs varied only slightly by grade within each school when adjustments were made to accommodate different administrative

supervisory practices.

Sub-problem 14. What were the total educational per pupil-course and per pupil-enrolled costs of curricular programs?

The total educational unit costs by curricular program were an aggregation of direct, resident indirect and implementary, and non-resident indirect and implementary unit costs. The cost pattern identified on a pupil-course basis was similar to that found in the area of direct instructional costs. That is, language arts, modern languages, mathematics, science, social sciences, and physical education constituted the lowest-cost programs, and home economics, industrial arts, and technical education, made up the highest-cost group. The fine arts and business education programs formed a middle-cost group.

The cost pattern in each school did not vary markedly from the cost pattern of the sample. Indirect costs were unusually high in two programs only, namely, industrial arts and technical education.

The cost pattern based on high school enrolment (pupil-enrolled unit) was generally reversed relative to the pupil-course unit, with the exception of the technical education program. The cost in this program was the highest in both pupil-course and pupil-enrolled units, indicating an exceptionally high-cost area. On the basis of high school enrolment (pupil-enrolled), the lowest-cost program group

included home economics, industrial arts, fine arts, and physical education. The highest-cost program group contained technical education, language arts, science, mathematics, social sciences and business education. The pupil-enrolled cost of the modern languages program fell in between these two groups.

In terms of allocated resources, a relatively high emphasis was accorded curricular programs in language arts, science, mathematics, social sciences, and business education. A relatively low financial emphasis was given to programs in home economics, fine arts, physical education, and industrial arts. Technical education, although high in unit costs, reflected a low-emphasis profile.

Sub-problem 15. What were the total educational per pupil-course and per pupil-enrolled costs of curriculum clusters?

On the basis of the per pupil-course unit, the average cost was highest in the general vocational education cluster, and lowest in the environmental studies curriculum cluster. The communications and humanities clusters had similar unit costs. The range of these average per pupil-course costs was $99.89 to $221.12.

On a high school enrolment (pupil-enrolled) basis, the environmental studies cluster had the highest unit cost, whereas the lowest unit cost was in the humanities, reflecting a larger enrolment in the environmental studies cluster.

The communications cluster was next to the lowest, followed by general vocational education. The range of average per pupil-enrolled costs was from $150.42 in the humanities cluster to $306.42 in the environmental studies.

The environmental studies cluster received the most emphasis in terms of financial resources, that is, the greatest number of dollars were spent there. On this basis, the humanities cluster received approximately half the financial emphasis accorded the other curriculum clusters.

Sub-problem 16. What were the total educational per pupil-enrolled costs by grade and grade division?

As in sub-problem 8, the derived total per pupil costs by grade were of little value because of the failure to account for two factors: (1) standard pupils on an instructional time basis, and (2) wider choice range of courses for senior students. These two factors resulted in decreasing unit costs from grade ten to twelve, rather than the opposite trend which was established in the analyses pertaining to instructional costs.

The grade-division unit cost, that is, the per high school pupil-enrolled costs, ranged from a low of $840.76 in School C to a high of $1,120.21 in School A. The average per high school pupil cost in School E was $1,048.58; School B had a unit cost of $1,011.90; followed by School D with a unit cost of $917.12. These unit costs were an aggregation of all the unit costs derived in the project.

Sub-problem 17. What were the per pupil-enrolled educational costs by function-object expenditure classification?

Per pupil-enrolled costs were determined for each high school, in addition to a corresponding average cost for the selected sample. There was a noteworthy variation in the magnitude of resident unit costs by function-object. Generally speaking, the unit costs determined by function-object classification maintained the same relative profile as did the total educational per pupil costs. That is, School A tended to have the highest unit costs in most categories, whereas School C generally had the lowest unit cost. The major exception to this pattern, namely, direct instruction costs of teachers, was noted on page 112.

The average per pupil-enrolled cost of the 100 Administration series (from Figure 2, pages 48-49) which included all non-resident administration costs, was $33.59, provided by Researcher 4. The unit costs in the 200 Instruction series totalled $691.53, with direct instructional costs accounting for $430.07. The individual school unit costs for direct instruction ranged from $357.26 in School C to $468.11 in School E.

The 500 Pupil Transportation series provided by Researcher 4, came to $37.86 per pupil-enrolled. This was a non-resident cost averaged for the entire system and, therefore, was the same per pupil-enrolled for each school.

The 600 Plant Operation series involved resident and non-resident unit costs which averaged in total to $79.27 per high school pupil. The individual school range was from $53.57 in School C to $107.07 in School A.

The 700 Plant Maintenance series was primarily non-resident in research design used, and therefore, unit costs were very similar for all the schools. The sample average in this series was $26.18 per pupil.

The remaining expenditures were primarily non-resident (with the exception of the 900 Food Services series which averaged $7.25 per pupil), and were provided by Researcher 4. The 800 Fixed Charges series came to $17.64 per pupil, and 1000 Student Body Activities series had an average unit cost of $0.88. A relatively large proportion of expenditures was allocated to the 1300 Debt Service and Capital from Current Funds series. The per pupil-enrolled cost in this category was $105.74 on a school system basis.

The average total educational unit cost for the selected high school sample was $999.94, based on high school enrolment.

Sub-problem 18. What were the aggregate and unit costs of eleven curricular programs utilizing a program-budget format?

A two-dimensional approach was used to report function-object expenditures by curricular programs. Of the curricular programs, the highest total allocation went

to the English language arts program (15.27 percent of total expenditures) and the lowest allocation went to industrial arts (2.44 percent). These percentages reflect a proportion of the total educational expenditure rather than a pupil-course unit cost.

Six of the eleven curricular programs received the greatest emphasis, in terms of the proportion of the total educational funds allocated to them. These were: English language arts, mathematics, sciences, social sciences, business education, and technical education. The modern languages and physical education received moderate financial emphasis as curricular programs, whereas the programs in fine arts, home economics, and industrial arts received the least financial emphasis. The actual breakdown of the unit costs by curricular program was as follows:

	Per Pupil Cost	Percentage of Total Expenditure
English language arts	$ 152.70	15.27
Modern languages	65.61	6.56
Mathematics	100.26	10.03
Science	137.59	13.76
Social Sciences	122.32	12.23
Physical Education	56.21	5.62
Fine Arts	41.58	4.16
Home Economics	26.01	2.60
Industrial Arts	24.42	2.44
Business Education	114.44	11.45
Technical Education	118.11	11.81

The percentage of total expenditures devoted to direct instruction was 43.01; to indirect instruction the percent allocated was 14.83; and the percentage to implementary

services was 42.16.

Specific Sub-problems Relating to the Project

There were seven sub-problems associated with the total project. The findings of all four researchers connected with the project were summarized in aggregate form to provide an overall range of unit costs, i.e., from grades one to twelve inclusive.

Sub-problem 1. What were the per pupil-enrolled educational costs by grade?

The average unit-cost profile by grade for the project sample was non-linear in terms of differences in costs. The highest per pupil-enrolled cost was in grade ten with an average unit cost of $1,127.02 and the lowest unit cost was in grade five with a figure of $635.65.

At the elementary level, the highest average per pupil-enrolled cost was $708.48 in grade six. The corresponding lowest unit cost was $635.65 in grade three.

The average per pupil enrolled costs increased markedly at the junior high school level (division three) with a unit cost of $821.98 in grade nine constituting the high figure, and $782.98 in grade eight the low figure.

There was a further increase in the average per pupil-enrolled costs at the high school level.

Sub-problem 2. What were the per pupil-enrolled educational costs by grade division?

The average per pupil-enrolled costs were highest in division four and lowest in division two. The unit cost in division four was $991.91, whereas in division two it was $667.84. The corresponding per pupil-enrolled cost in divisions one and three were $676.39 and $800.39 respectively. The average estimated per pupil-enrolled educational cost for the total project sample was $845.25.

Sub-problem 3. What were the per pupil-course educational costs by grade divisions in eleven curricular programs?

A cost trend by curricular program was evident at the grade-division level. At the elementary level (divisions one and two), the highest expenditure area was in the mathematics program. At the junior high school level (division three), there were three curricular programs that were accorded higher unit expenditures, namely, industrial arts, home economics, and language arts. The corresponding highest-cost group at the high school level was comprised of industrial arts, home economics, and technical education.

The lowest per pupil-course expenditures were in the physical education, fine arts, and science programs at the elementary level; physical education and business education programs at the junior high school level; and science, mathematics, and social sciences programs at the high school level.

The highest average per pupil-course expenditure over the four grade divisions combined was in the technical education curricular program, and the lowest average per pupil-course expenditure was in the physical education program.

Sub-problem 4. What were the per pupil-course educational costs by grade division in four curriculum clusters?

The curriculum clusters with the highest average per pupil-course costs were: environmental sciences in division one; humanities in division two; and general vocational education in divisions three and four. The curriculum clusters with the lowest average per pupil-course costs were: communications in divisions one and two; humanities in division three; and environmental studies in division four.

The highest average per pupil-course cost by curriculum cluster over the four grade divisions combined was in general vocational education. The humanities curriculum cluster had the lowest unit cost, followed by environmental sciences and communications. The average per pupil-course expenditure in the general vocational education curriculum cluster was approximately double that in each of the remaining clusters.

Sub-problem 5. What were the resident per pupil

costs of instructional media, guidance, and general administration programs by grade division?

The average per pupil-enrolled cost of resident instructional media at the elementary level (divisions one and two) was $13.09. At the junior high school level (division three) the unit cost was $19.91, and at the senior high school level (division four) the unit cost was $27.17.

The unit cost of resident guidance services at the elementary level was negligible. At the junior high school level the average per pupil-enrolled cost was $13.88, and at the high school level it was $28.99.

Expenditures per enrolled-pupil for general administration averaged $38.95 in division one; $43.49 in division two; $27.64 in division three; and $101.92 in division four.

The unit cost of general administration was markedly higher at the high school level.

Sub-problem 6. What were the average per pupil costs by aggregate expenditure categories?

The largest expenditure category was "Instruction" where the average per enrolled-pupil cost was $556.97. This amounted to 67.07 percent of the total operating expenditure. The next largest expenditure category was "Debt-Service and Capital from Current Funds". The average unit expenditure was $105.71, or 12.51 percent of the total

expenditure. "Plant Operation" constituted the third largest expenditure area with a unit cost of $70.54 and a proportion of 8.35 percent.

The range of the remaining average unit costs was from $0.57 in "Student Body Activites" to $33.62 in "Administration". The corresponding proportions of the total expenditure were 0.07 and 3.98 percent respectively. The unweighted average per pupil-enrolled cost for the project sample was $845.25.

Sub-problem 7. What were the average teaching qualifications, experience, and salary of teachers?

The average teaching qualifications, experience (for salary purposes), and salary of teachers computed for each study were averaged to provide an indication of these characteristics over the three groups of teachers involved.

The average training (for salary purposes) of the three groups was 3.64 years. The corresponding average number of years of experience for salary purposes was 5.77 years. The average salary, based on the arithmetic average of each group of teachers researched, was $9,088.47.

II. CONCLUSIONS AND IMPLICATIONS

This section is divided into two parts: (1) general conclusions with broad implications, and (2) specific conclusions with implications for the school system analyzed.

There were no hypotheses tested and, therefore, what follows is descriptive in nature. In several instances, the comments put forward could serve as the basis for generating researchable hypotheses.

General Conclusions

The general conclusions and related implications have been structured around the four significant contributions that this study attempted to make. These anticipated contributions were outlined on page 13 of Chapter I. The following paragraph sideheads represent a summary caption of each of them.

1. Programmatic design. This study integrated the conventional function-object accounting format with primarily a curricular program design. This approach facilitated the identification and analysis of activities in the curricular areas. Although this study was delimited to the identification of costs and cost differences, the programmatic design offered a two-dimensional view for decision-makers, and suggested further analyses needed. For example: Why are the pupil-course costs in the home economics program so high?

The classification of expenditures into direct, indirect and implementary categories proved useful. The fact that forty-three percent of the total operational expenditures went toward direct instruction was an important finding. Secondly, the indirect-cost category, often the

"hidden costs" of instruction, came to almost fifteen percent of the total expenditure. The remaining expenditures, approximately forty-two percent, were implementary in nature.

A programmatic design enabled unit costs to be reported on two bases rather than one, that is, a per pupil-course basis, in addition to the conventional pupil-enrolled basis. Both of these units provide helpful decision-making dimensions. For example, the per pupil-course cost in a curricular program may be very high, but a per high-school-enrolled pupil cost may be very low, indicating a high-cost, low-demand program. Questions relative to efficiency, emphasis, and differentiation of curricula are raised by the use of both units.

A programmatic design is the first step in the long-range development of a full PPBS decision system.

2. Baseline data. One of the purposes of the project was to provide baseline data for province-wide use, and for use by the school system. Both of these objectives were achieved. The conventional function-object unit costs were standard categories, to the extent made possible by the form of the data available. The degree of classification by object and location was more exhaustive in the urban system studied than that encountered by the majority, if not all, of the researchers in the province-wide study. However, at the higher levels of aggregation, e.g., the

total for the 100 Administration series, the respective unit costs were reasonably comparable.

This study pointed up three highly significant needs related to cost analyses in particular, and the subsequent uses and extensions of cost analysis data. First of all, there is an immediate need for a standardized accounting system in this province. Longitudinal analytical cost studies, and other related studies, are not likely to take place unless a large-scale move is made toward reasonable standardization in classifying and reporting cost data.

The second important need identified pertains to a reporting format that provides more information than the conventional, function-object budget report. A flexible programmatic design is needed to facilitate the identification of mission-oriented activities and the operationalization of goals. All decision-makers, from school administrators to the public at large, would benefit from a programmatic budget design. Furthermore, any serious attempt to relate practice to objectives will require a programmatic format.

A third need relates to the previous two. In addition to a standardized accounting system and a programmatic reporting format, there are still definitional problems which need attention. For example: Who is an administrator? How much of an administrator's salary should be charged to instruction, if any? There are many definitional problems of this kind that require further

analysis and, in some cases, arbitrary definitions need to be made where analysis is not fruitful.

3. Computerized programs. The regular use of cost-analysis findings and the extension of these data is unlikely unless some form of electronic data processing is made available to all school systems. Although the analytical aspect of this study was only partly computerized, the development of a "complete package" within the framework of a particular design, is a realistic expectation for future studies. Steps in this direction have already been taken.

The question of accessibility, storage and retrieval of cost data remains unanswered. It would appear that the answer lies in some combination of local school system, regional, and province-wide computer facilities. Steps in this direction will also require a standardized coding structure to facilitate "outside" processing.

4. Analytic capability. The matter of analytic capability goes beyond the computer aspects mentioned above. This point refers primarily to the human resources available at any level of decision-making, be it local school board, or province level. First of all, the procurement of cost data requires analytical skills, and second, perhaps much more important, the interpretation and extension of these data require a high level of technical and general analytical skills. Systems analysis may be the link between

information systems and management.

Most school jurisdictions are presently lacking personnel with these skills. A concerted effort to initiate and foster a large-scale, in-service-education program for "management teams" and other interested agencies is an immediate priority. If cost data are to become an indigenous part of planning, programming, budgeting and evaluating activities, then the analytic component is of paramount importance.

Some concerns. Concerns generally associated with cost analyses and program accounting are:

(1) That cost analysis may distort the decision making process in education by putting more emphasis on the easily-measured input side of the equation and less emphasis on the difficult-to-measure output side.

(2) That cost data in the absence of general and performance-based objectives are of little value.

(3) That a curricular program format based on current subjects may "straight-jacket" curriculum development and change for years to come.

(4) That program accounting without related objectives may become confused with the mission-oriented decision system known as PPBS.

(5) That the "non-measurable" benefits of education, e.g., learning for leisure, will not receive due consideration in a decision system that emphasizes economic

rationality.

Specific Questions and Conclusions Pertaining to the School System under Study

The descriptive nature of this study allows very few generalizable conclusions. However, the findings reported elsewhere in this study pointed up differences in costs that suggest a need for further examination. By way of illustration a number of these are repeated below in question form:

(1) Why do pupil-course costs of home economics courses tend to be markedly higher than anticipated in all high schools?

(2) Why are certain industrial arts courses appreciably more costly than others on a pupil-course basis?

(3) Is the area of technical education in need of a further differentiated analysis in the light of the great demand made on scarce resources by specific courses? For instance, the staff analysis by program strongly suggests that costs will accelerate faster in technical education than in others until the qualifications of teachers in that area are stabilized. Furthermore, not all technical education courses are costly, hence a differentiated analysis would be more meaningful.

(4) Has the cost factor in the "built-in" teacher substitute policy been sufficiently considered?

(5) What are the effects, cost and otherwise, of

different kinds of time-tabling practices, e.g., seven versus eight period days?

(6) How does full-semestering, partial semestering, and non-semestering affect unit costs?

(7) Is there a consistent policy with respect to providing support staff to high schools?

(8) How consistent are high schools in providing released teaching time to teachers?

(9) What non-teaching duties are assigned to teachers and what other alternatives could be pursued?

(10) Are implementary costs at a reasonable level?

(11) Are the current differences in the resources allocated to schools satisfactory?

(12) Are the curricular emphases, in financial terms, in line with the stated or implicit objectives of the school system?

(13) Do the current levels of resource allocations in curricular and non-curricular programs reflect the priorities of the school board?

(14) How can cost data be linked to goals, general objectives and performance-based objectives of the school system?

(15) What are the cost implications of introducing new courses in the system on a short and long-range basis?

(16) Is there a "curricular mix" that provides the best cost-effectiveness ratio?

(17) Are there "economies of scale" in large senior high schools, and if there are, where are they?

(18) What is the role of cost data in decentralizing decision making by establishing schools as cost centers. For example, can useful budgetary formulas be developed?

Turning to the accounting system, certain modifications would facilitate the gathering and processing of cost data. First of all, the number of accounts should be reduced. For instance, there are eight different accounts for home economics, primarily in connection with maintenance matters. The investigator was not able to determine the purpose of what appeared to be a proliferation of certain accounts. Second, some modifications in the coding procedures would render the data more suitable for analysis. For instance, the division level of certain administrative activities could be indicated more clearly than at present. However, the point to be particularly noted is that the accounting system is reasonably close to a program-accounting system, which is a prerequisite for program analysis on a continuing basis.

Certain modifications in the information system should also be considered. For example, if the current staff inventory reporting forms were revised to include a teacher-time profile and subject enrolments, the essential data for determining "standard" unit costs on a school basis could be fully computerized. "Sample" or "target"

schools could be fully costed when required. The current computer runs, although replete with raw data, were designed for control purposes, not analyses. It is submitted that other valuable purposes could be served with appropriate changes. If, through decentralization measures schools are to become "cost centers", changes in the gathering, processing, storing and retrieving of data are required.

An implication that extends beyond the school system under study concerns the training of educational administrators. Is the current quest for rationality, accountability, and measurability in the educational delivery system a passing phase or is it the initial phase of a mission-oriented decision system? Are the elements that make up the PPBS concept basic to educational administration in general? How much does an educational administrator need to know about systems analysis, operations research techniques, and evaluation to effectively lead the schools of tomorrow?

III. SUGGESTIONS FOR FURTHER RESEARCH

Throughout the conduct of this study, a number of pertinent extensions for research purposes were recognized as useful considerations for subsequent researchers. These have been sub-divided into two categories: (1) internal design of the study, and (2) other possibilities.

Internal Design of the Study

The research design employed in this study served the purposes held for it. However, subsequent researchers might consider the following changes.

(1) Additional programs, particularly of the non-curricular variety, should be costed.

(2) Capital costs should be included, that is, cost analyses should not be limited to current operational costs. Longitudinal studies in this respect are needed.

(3) Standard units, that is, pupil equivalents and time equivalents, should be fully incorporated into the design.

(4) A computer program that will handle, direct, indirect, and implementary costs should be developed after an initial survey of the data, but prior to the collection of it.

(5) Additional demographic data should be incorporated into a cost analysis to broaden the decision-making framework, e.g., pupil data, socio-economic data, etc.

(6) Provision should be made for the control of teacher salaries as a cost factor in some phase of the analysis.

(7) Further provision should be made to accommodate the type-of-pupil dimension and special "target group" pupils.

Other Possible Extensions

There are many possible extensions of this type of study. First of all, alternative cost-analysis research designs should be developed and tried. For instance, the design used in this study is subject oriented. What are some alternative approaches that render findings comparable in accuracy, but far less demanding with respect to the work involved?

A second possibility is the development of predictive mathematical cost models based on "standard costs" determined by periodic, longitudinal cost analyses. This type of research endeavor requires the identification of cost factors leading to the determination of relationships between and among them.

Cost-utility studies are a third possible extension of this study. Cost-utility, cost-effectiveness, and cost-benefit studies are a natural extension of cost analysis. However, it is doubtful whether current evaluative measures in the educational sphere allow for much viable research on a cost-effectiveness basis, and much less on a cost-benefit basis.

The relationships between cost data and the provincial grant system is a fourth area of study that might have strong implications for the distribution of educational funds.

A fifth possibility is the development and

application of approaches to the analysis of decision-making in education on a non-economic basis, that is, by the examination of other variables, e.g., value systems. For instance, education may be viewed primarily as a consumption commodity rather than investment.

In sum, cost analyses can serve as a starting point for other types of follow-up analyses in addition to pointing up the need for totally different approaches to the analysis of resource allocation in education.

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A P P E N D I X A

HIGH SCHOOL COURSES CATEGORIZED INTO ELEVEN CURRICULAR PROGRAMS

TABLE XXVII

HIGH SCHOOL COURSES CATEGORIZED INTO ELEVEN CURRICULAR PROGRAMS

1. ENGLISH LANGUAGE ARTS PROGRAM

GRADE 10:

English 10, English 13, English 19, Literature 11 and Occupations 10, Literature 11, Reading 10, Reading 19

GRADE 11:

English 20, English 23, English 29, Language 20, Language 21, Language 22, Literature 20, Literature 21, Reading 10/20

GRADE 12:

English 30, English 33

2. MODERN LANGUAGES

GRADE 10:

French 10, French 11, German 10, Latin 10, Ukrainian 10

GRADE 11:

French 20, French 21, German 20, Latin 20, Ukrainian 20

GRADE 12:

French 30, French 31, German 30, Latin 30, Ukrainian 30

3. MATHEMATICS

GRADE 10:

Mathematics 10, Mathematics 10X, Mathematics 10 (new), Mathematics 11, Mathematics 12, Mathematics 14, Mathematics 15, Mathematics 19.

GRADE 11:

Mathematics 20, Mathematics 21, Mathematics 22, Mathematics 25, Mathematics 29

TABLE XXVII (CONTD.)

GRADE 12:

Mathematics 30, Mathematics 31 (old), Mathematics 31 (new), Mathematics 32

4. SCIENCE

GRADE 10:

Biology 10, Chemistry 10, Chemistry 10X, Chemistry/Biology 10, Chemistry/Physics 10, Physics 10, Physics/Biology 10, Science 19, Science 11, Science 15

GRADE 11:

Biology 20, Biology 10/20, Chemistry 10/20, Chemistry 20, Chemistry 20X, Chemistry/Physics 20, Chemistry/Biology 20, Physics 20, Physics 20X, Physics 10/20

GRADE 12:

Biology 30, Chemistry 30, Chemistry 30X, Physics 30, Physics 30X

5. SOCIAL SCIENCES:

GRADE 10:

Social Studies 10, Social Studies 13, Social Studies 19

GRADE 11:

Social Studies 20, Social Studies 23, Social Studies 29, Geography 20, Psychology 20, Sociology 20

GRADE 12:

Social Studies 30, Social Studies 33, Social Studies 36, Social Studies 30/36, Economics 30

6. PHYSICAL EDUCATION

GRADE 10:

Physical Education 10

GRADE 11:

Physical Education 20

TABLE XXVII (CONTD.)

GRADE 12:

Physical Education 30, Physical Education 20/30

7. FINE ARTS

GRADE 10:

Art 10, Arts and Crafts 10, Drama 10, Drama 11, Music 10, Music 11/13, Music 11, Music 14, Music 15

GRADE 11:

Art 20/21, Arts 21, Art 20, Arts and Crafts 20, Drama 20, Music 21, Music 25

GRADE 12:

Art 30/31, Art 30, Arts and Crafts 30, Drama 30, Music 11/31, Tutorial Music, Music 10/30, Music 35, Music 11/21/31, Music 21/31

8. HOME ECONOMICS

GRADE 10:

Child Care and Home Nursing 10, Fabrics and Dress 10, Foods and Nutrition 10, Home Economics 10, Home Economics Crafts 10

GRADE 11:

Clothing Selection 20, Fabrics and Dress 20, Foods and Nutrition 20, Homes and Home Furnishings 20

GRADE 12:

Fabrics and Dress 30, Foods and Nutrition 30, Fabrics and Dress 20/30

TABLE XXVII (CONTD.)

9. INDUSTRIAL ARTS

GRADE 10:

Drafting 10, Electricity 10, Industrial Arts General 10, Industrial Arts Electronics 10, Industrial Arts Graphic Communications 10, Industrial Arts Materials 10, Industrial Arts Power Mechanics 10, Woodworking 10

GRADE 11:

Drafting 20, Industrial Arts Electronics 20, Electricity 21, Industrial Arts Graphic Communications 20, Industrial Arts Materials 20, Industrial Arts Power Mechanics 20

GRADE 12:

Industrial Arts Electronics 30, Industrial Arts Graphic Communications 30

10. BUSINESS EDUCATION

GRADE 10:

Occupations 10, Bookkeeping 10, Business Fundamentals 10, Record Keeping 10, Shorthand 10, Typing 10

GRADE 11:

Law 20, Bookkeeping 20, Clerical Practice 20, Data Processing 20, Data Processing 22, Distributive Education 20, Merchandising 20, Shorthand 20, Typing 20

GRADE 12:

Accounting 30, Business Organization and Management 30, Business Machines 30, Data Processing 32 (CLU), Secretarial Practice 35, Data Processing 32, Data Processing 32K, Distributive Education 30, Merchandising 30, Office Practice 30, Office Practice 32, Shorthand 30, Shorthand 31, STOP 31 (Shorthand 31, Typing 30, Office Practice 30), Typing 30

TABLE XXVII (CONTD.)

11. TECHNICAL EDUCATION

GRADE 10:

Automotives 12, Automotives 19, Beauty Culture 12, Building Construction 12, Building Construction 19, Commercial Art 12, Drafting 12, Electricity 12, Electricity 19, Electronics 12, Food Preparation 19, General Technology 15/16, Graphic Arts 12, Machine Shop 12, Pipe Trades 12, Vocational Experience 15/16, Welding 12, Welding 19, Sheet Metal 12/19, Food Preparation 12

GRADE 11:

Automotives 22 (Team Teaching), Automotives 22, Automotives 12/22, Beauty Culture 22, Beauty Culture 12/22, Building Construction 22, Building Construction 12/22, Commercial Art 22, Commercial Art 12/22, Commercial Foods 12/22, Drafting 22, Drafting 12/22, Electricity 22, Electricity 12/22, Electronics 22, Electronics 12/22, Food Preparation 22, Graphic Arts 22, Graphic Arts 12/22, Machine Shop 12/22, Performing Arts 12/22, Pipe Trades 22, Pipe Trades 12/22, Sheet Metal 22, Sheet Metal 12/22, Welding 12/22

GRADE 12:

Automotives 32, Automotives 22/32, Beauty Culture 32, Building Construction 32, Building Construction 22/32, Commercial Art 32, Commercial Foods 32, Drafting 32, Electronics 32, Electronics 22/32, Food Preparation 32, Food Preparation 29/32, Graphic Arts 32, Machine Shop 32, Performing Arts 32, Pipe Trades 32, Sheet Metal 32, Welding 32.

A P P E N D I X B

PUPIL ENROLMENTS AND TEACHER CHARACTERISTICS OF FIVE HIGH SCHOOLS

TABLE XXVIII

AVERAGE ENROLMENTS BASED ON DECEMBER, 1969
AND FEBRUARY, 1970 ENROLMENTS

	Grade Ten	Grade Eleven	Grade Twelve	Totals
High School A	675	824	965	2,464
High School B	446	365	394	1,205
High School C	579	492	510	1,581
High School D	613	817	592	2,022
High School E	786	716	722	2,224
Totals	3,099	3,214	3,183	9,496

TABLE XXIX

ENROLMENTS BY CURRICULAR PROGRAM AND BY CURRICULUM CLUSTER

Curricular Program	High Schools A	B	C	D	E	Totals
Language Arts	3,087	1,556	2,016	2,809	2,911	12,379
Modern Languages	1,007	772	695	1,289	964	4,727
Mathematics	2,255	1,196	1,388	1,850	2,310	8,999
Science	3,695	2,303	2,344	4,115	2,921	15,378
Social Sciences	2,523	1,367	1,765	2,875	2,209	10,739
Physical Education	1,019	683	763	878	1,084	4,427
Fine Arts	752	409	423	315	724	2,623
Home Economics	481	341	84	-	323	1,229
Industrial Arts	395	401	154	90	-	1,040
Business Education	1,686	820	1,493	1,565	1,964	7,528
Technical Education	832	-	-	-	964	1,791
Totals	17,732	9,848	11,115	15,786	16,374	70,850
Curriculum Cluster						
Communications	4,550	2,379	2,913	4,262	4,284	18,488
Environ. Sciences	6,969	4,182	4,485	6,843	6,315	28,794
Humanities	2,819	1,625	1,986	3,026	2,524	11,980
Voc. Education	3,394	1,562	1,731	1,655	3,251	11,588
Totals	17,732	9,848	11,115	15,786	16,374	70,850

TABLE XXX

AVERAGE TEACHING QUALIFICATIONS, EXPERIENCE, AND SALARY OF TEACHERS BY SCHOOL

High School	No. of Teachers	Average Salary	Average Experience (Salary Purposes)	Average Training (Years)
A	148	$10,114.07	6.47	4.6
B	68	10,514.70	6.71	4.9
C	75	9,554.80	5.12	4.5
D	90	10,068.13	5.78	4.7
E	134	9,834.39	6.16	4.3

TABLE XXXI

AVERAGE TEACHING QUALIFICATIONS, EXPERIENCE, AND SALARY OF TEACHERS BY SAMPLE

Total Number of Teacher	515
Average Salary	$10,017.22
Average Experience (for salary purposes)	6.05
Average Training (for salary purposes)	4.60

TABLE XXXII

AVERAGE TEACHING QUALIFICATIONS, EXPERIENCE AND SALARY OF TEACHERS BY CURRICULAR PROGRAM

Curricular Program	Average Training	Average Experience	Average Salary
HIGH SCHOOL A			
English Language Arts	4.9	5.7	$9,359.81
Modern Languages	4.8	3.88	9,393.75
Mathematics	4.7	6.43	10,475.00
Science	4.8	5.71	10,175.00
Social Sciences	4.8	6.00	9,848.81
Physical Education	4.5	4.88	8,381.25
Fine Arts	4.4	5.11	9,844.44
Home Economics	4.4	5.43	8,885.14
Industrial Arts	4.0	7.63	10,653.13
Business Education	4.2	6.23	9,642.30
Technical Education	3.9	7.63	10,442.10
School Average	4.6	6.47	$10,114.07
HIGH SCHOOL B			
English Language Arts	5.0	6.64	$10,368.18
Modern Languages	5.0	7.67	11,337.50
Mathematics	5.0	7.08	10,511.54
Science	4.8	6.09	10,268.18
Social Sciences	4.8	4.40	9,647.50
Physical Education	4.4	4.43	9,221.43
Fine Arts	5.0	5.50	8,950.00
Home Economics	4.3	4.67	9,550.00
Industrial Arts	4.5	5.75	10,112.50
Business Education	4.8	10.40	12,415.00
Technical Education	-	-	-
School Average	4.9	6.71	$10,514.70

TABLE XXXII (CONTD.)

Curricular Program	Average Training	Average Experience	Average Salary
HIGH SCHOOL C			
English Language Arts	4.2	4.06	$8,469.70
Modern Languages	4.6	8.00	11,210.00
Mathematics	4.4	5.67	9,922.22
Science	4.3	6.60	10,230.00
Social Sciences	4.8	4.07	9,489.29
Physical Education	4.4	2.63	8,131.25
Fine Arts	4.5	4.00	9,300.00
Home Economics	4.0	6.00	9,950.00
Industrial Arts	4.5	3.00	8,850.00
Business Education	4.2	4.64	9,007.14
Technical Education	-	-	-
School Average	4.5	5.12	$9,554.80
HIGH SCHOOL D			
English Language Arts	4.5	3.90	$9,177.38
Modern Languages	4.8	5.30	9,484.40
Mathematics	4.9	8.00	11,366.66
Science	4.8	5.95	10,345.45
Social Sciences	4.5	5.06	9,831.25
Physical Education	4.6	5.29	9,932.14
Fine Arts	4.7	4.33	7,537.66
Home Economics	-	-	-
Industrial Arts	4.0	5.00	9,500.00
Business Education	4.9	8.18	11,436.36
Technical Education	-	-	-
School Average	4.7	5.78	$10,068.13

TABLE XXXII (CONTD.)

Curricular Program	Average Training	Average Experience	Average Salary
HIGH SCHOOL E			
English Language Arts	4.5	6.09	$10,195.45
Modern Languages	4.6	4.29	9,478.57
Mathematics	4.1	5.32	9,215.91
Science	4.8	6.56	10,576.56
Social Sciences	4.7	5.93	10,198.33
Physical Education	4.1	4.25	9,034.38
Fine Arts	4.6	2.63	8,262.50
Home Economics	4.0	6.80	10,100.00
Industrial Arts	-	-	-
Business Education	3.5	4.19	8,210.94
Technical Education	3.3	7.70	9,420.66
School Average			

TABLE XXXIII

AVERAGE QUALIFICATIONS, EXPERIENCE AND SALARY OF TEACHERS BY CURRICULUM CLUSTER

Curriculum Clusters	High School A Average Training	Average Experience	Average Salary	High School B Average Training	Average Experience	Average Salary
Communications	4.8	4.88	$9,342.79	5.0	6.94	$10,411.11
Environ. Studies	4.7	5.81	9,893.05	4.9	6.58	10,388.46
Humanities	4.7	6.12	9,983.65	4.9	4.50	9,750.00
Gen. Voc. Ed.	4.0	7.07	10,090.11	4.6	7.42	10,931.25
	High School C			High School D		
Communications	4.4	5.09	9,199.32	4.6	4.53	9,182.25
Environ. Studies	4.3	5.15	9,503.84	4.8	6.74	10,724.29
Humanities	4.7	4.00	9,406.25	4.5	4.76	9,679.41
Gen. Voc. Ed.	4.2	4.53	9,044.12	4.8	7.92	11,275.00
	High School E					
Communications	4.5	5.66	9,912.50			
Environ. Studies	4.3	5.39	9,535.79			
Humanities	4.7	5.17	9,890.28			
Gen. Voc. Ed.	3.5	6.47	9,125.70			

A P P E N D I X C

LETTER AND MEMORANDUM SOLICITING COOPERATION

Faculty of Education
Department of Educational
Administration

The University of Alberta
Edmonton 7, Canada

. . . . . .
Director
Educational Research
. . . . . .
. . . . . .

Re: Resource Allocation Study

Dear . . . . . .

I am involved in one of a series of provincial studies focusing on resource allocation in school systems. This particular project, conducted by four researchers from the Department of Administration, University of Alberta, has been approved by the senior officials of the . . . . . Public School Board.

The project involves a sample of twenty-five schools, namely, five senior high schools, and the remainder to include a sampling of elementary, elementary-junior high and junior high schools. The vast majority of the data required is being provided by central office personnel, however, we have been advised that certain kinds of data, to insure maximum accuracy, must be obtained at the school level, for example, enrolments in elementary subjects and teaching time devoted to these subjects.

The project does not require any student time, nor is there any demand on the classroom teacher. Most of the information needed can be provided by the principal and/or his designate. Following consultation with the central office supervisors in such service areas as library, counselling, etc., we may consult briefly with the respective personnel in the schools, but only if it is found to be necessary.

The purpose of this letter is to request your assistance in soliciting the cooperation of the principals of the schools in the selected sample. I would like to call on these schools personally in the near future for the purpose of discussing the project with the principal to the degree desired by him, and to introduce the researcher involved.

Although this type of project does not usually require confidentiality, the schools in the sample will be identified by code number only, thereby remaining anonymous. Please assure the participants that every effort will be made to minimize the call on their time and effort.

Thanking you for your assistance in this connection, I remain,

Yours sincerely,

William R. Duke,
Doctoral Candidate
University of Alberta

WRD/jd

. . . . . Public School Board
Research, Development & Information

Date: January 20, 1970.

MEMORANDUM:

To: Principals of "Sample" Schools

From: . . . ., Director - Educational Research

Subject: PROVINCIAL STUDY OF RESOURCE ALLOCATION IN SCHOOL SYSTEMS

c.c. School system official
School system official
Dr. L. D. Stewart, University of Alberta
Dr. Peter Atherton, University of Alberta
Mr. W. R. Duke, University of Alberta

1. As per the attached letter from Mr. Duke, this is a major project approved following extensive discussion with . . . ., ..., and other senior officials

2. The project involves the analysis of data from a sample of 25 schools: 5 High Schools; 3 Junior Highs; 5 Elementary/Junior Highs; and 12 Elementary

3. Most of the data can and will be obtained from central office files and personnel. However, some data will need to be gathered from and verified by the schools themselves.

4. As the principals of one of the schools selected in the project sample, Mr. Duke will be contacting you in the near future. We know, in view of the importance of the study, that you will be able to give Mr. Duke the same excellent co-operation that you have given our office on previous requests.

5. If, following your contact with Mr. Duke, you should have any questions concerning this project please do not hesitate to call me on extension . . ..

A P P E N D I X D

THE INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

PART 1: FOR ADMINISTRATORS, COUNSELLORS AND LIBRARIANS.

SAMPLE TIME LOG (for those wishing to keep one)

TIME SPENT PER GRADE DIVISION IN PERIODS (Approx.)		
Dates	Activities Performed	Comments
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
Day 8		
Day 9		
Day 10		

PART 2: FOR ADMINISTRATORS ONLY.

ESTIMATED PERCENTAGE OF TIME SPENT IN DUTIES OTHER THAN TEACHING.

General Administratove Work spent in Grades 10-12 incl.	____%
Specific Grade 10 Administrative Duties	____%
Specific Grade 11 Administrative Duties	____%
Specific Grade 12 Administrative Duties	____%
Other Duties, e.g., Counselling etc., special curriculum duties (see next page) etc., please specify	____%
TOTAL	100%

PART 3: FOR LIBRARIANS, COUNSELLORS AND ADMINISTRATORS (where applicable)

ESTIMATED SUPERVISORY OR SERVICE TIME DEVOTED TO CURRICULUM AREAS

A. My supervisory or service time is divided equally (approx.) over all curriculum areas. _____ yes or no
(if "NO" to above)

B. My supervisory or service time is distributed over the following curriculum areas in the proportion indicated (per cent estimate).
NOTE: Please assign all administrative duties in the library such as ordering and processing books and materials to curriculum areas.

	ESTIMATED % OF SUPERVISORY OR SERVICE TIME
1. Communications	
English, Language Arts (includes reading, spelling, writing, speaking writing, speaking (language) and literature)	_____%
Music	_____%
Drama	_____%
Modern Languages (e.g., French)	_____%
Total % time for Communications	_____%
2. Environmental Studies	
Arithmetic	_____%
Science	_____%
Physical Education and Health	_____%
Total % time for Environmental Studies	_____%
3. Humanities	
Enterprise - Social Studies	_____%
Art	_____%
Total % time for Humanities	_____%
4. General Vocational Education	
Home Economics, Industrial Arts, Business Education and Technical Education	_____%
GRAND TOTAL	_____100 %

A P P E N D I X E

STAFF WORKLOAD SURVEY SHEET

STAFF WORKLOAD SURVEY WORKSHEET

School _____ Code _____

1	2	3	4	5	6	7	8
Faculty member (name)	Qualifi-cations and Experience	Total Teaching Salary $	Teaching salary (basic) $	Other Salary $	Courses taught and level and other scheduled activities	Course and activity time min./wk.	Course enrolment (where applicable)
e.g.,	4:06[a]	10,950	9,950	1000/34[b]	Mathematics 10 (2)[c]	400	71
Smith, J.R					Mathematics 20	200	34
					Dep't. Head time	200	36
					Subst. teacher[d]	200	--
					Prep. time	200	--

[a]Means four years of training and six years of teaching for salary purposes.
[b]Code for department head.
[c]Number of courses taught.
[d]Serves as a "built-in" substitute teacher.

A P P E N D I X F

PRORATION STATISTICS USED IN THE STUDY

TABLE XXXIV

PRORATIONS USED TO ALLOCATE INSTRUCTIONAL MEDIA COSTS TO CURRICULAR PROGRAMS

Curricular Programs	Per Cent of Time High Schools A	B	C	D	E
Language Arts	24.00%	35.00%	30.00%	23.00%	30.00%
Modern Languages	-	5.00	2.50	5.00	-
Mathematics	-	2.50	2.50	4.00	2.50
Science	12.50	2.50	10.00	16.50	15.00
Social Sciences	35.00	30.00	45.00	24.50	42.50
Physical Education	5.00	5.00	1.50.	5.00	2.50
Fine Arts	3.50	15.00	3.50	17.00	2.50
Home Economics	5.00	1.67	1.67	1.67	1.67
Industrial Arts	5.00	1.67	1.67	1.67	1.67
Business Education	5.00	1.67	1.67	1.67	-
Technical Education	5.00	-	-	-	1.67
Totals	100.00	100.01	100.01	100.01	100.01

TABLE XXXV

PRORATION STATISTICS USED TO ALLOCATE RESIDENT AND NON-RESIDENT IMPLEMENTARY COSTS TO CURRICULAR PROGRAMS AND CURRICULUM CLUSTERS

Curricular Program	High Schools A %	B %	C %	D %	E %	Selected Sample Average Per Cent
English Language Arts	12.32%[a]	17.60%	16.82%	19.40%	14.96%	16.22%
Modern Languages	4.63	8.68	7.82	9.65	4.83	7.12
Mathematics	9.22	11.26	10.78	12.92	8.88	10.61
Science	10.91	15.05	14.81	19.96	12.40	14.63
Social Sciences	10.55	12.53	16.27	14.69	11.09	13.02
Physical Education	5.05	7.12	6.85	5.18	5.70	5.98
Fine Arts	3.94	5.55	4.71	2.92	4.82	4.39
Home Economics	3.36	4.72	1.59	0.08	3.64	2.68
Industrial Arts	4.06	6.84	1.84	0.70	-	2.69
Business Education	8.22	10.65	18.50	14.50	9.88	12.35
Technical Education	27.74	-	-	-	23.80	10.31
Totals	100.00	100.00	100.00	100.00	100.00	100.00
Curriculum Cluster						
Communications	19.18[b]	28.61	26.52	31.60	21.10	25.40
Environmental Studies	25.23	33.26	32.61	37.99	26.97	31.21
Humanities	12.69	16.03	19.13	15.56	13.43	15.37
General Vocational Education	42.90	22.10	21.74	14.85	38.50	28.02
Totals	100.00	100.00	100.00	100.00	100.00	100.00

[a]Based on dollar volume.

[b]19.18 per cent of the direct and indirect expenditures in School A were in "Communications" courses.

TABLE XXXVI

PRORATION STATISTICS USED TO ALLOCATE RESIDENT ADMINISTRATOR COSTS TO GRADES AND CURRICULAR PROGRAMS

	School A	School B	School C	School D	School E
General Administration					
Admin. 1	70%	50%	50%	25%	25%
Admin. 2	90	18.75[a]	33.3	15	66.7
Admin. 3	90	12.5[a]	33.3	10	60
Admin. 4	65	100.0	100.0	100	100
Admin. 5	50	-	-	100	100
Admin. 6	100	-	-	-	100
Admin. 7	100	-	-	-	-
Grade Administration					
Grade 10	n/a	Admin. 1: 25%	Admin. 1: 50%	Admin. 1: 75%	Admin. 1: 75%
Grade 11	n/a	Admin. 2: 56.25	Admin. 2: 66.7	Admin. 2: 85	Admin. 2: 33.3
Grade 12	n/a	Admin. 3: 37.5	Admin. 3: 66.7	Admin. 3: 90	Admin. 3: 40
Subject or Guidance Administration		Guidance			
Admin. 1	5% Bus. Ed.	Gr. 10: 25%	n/a	n/a	n/a
	15 Phys.Ed.				
	10 Tech.Ed.				
Admin. 2	10 Tech. Ed.				
Admin. 3	10 Tech. Ed.	Gr. 10: 25			
Admin. 4	25 Science				
	10 Math				
Admin. 5	30 English				
	10 Social St.				
	10 Mod.Lang.				

[a]Admin. 2 and 3 Teach.

NOTE: For explanatory purposes, Administrator 1, in School A, spends 70 per cent of his time in general administration, 5 per cent supervising Business Education, 15 per cent supervising Physical Education and 10 per cent supervising Technical Education.

A P P E N D I X G

DIRECT INSTRUCTIONAL PER PUPIL-COURSE COSTS BY CURRICULAR PROGRAM AND BY CURRICULAR CLUSTER IN EACH SCHOOL

TABLE XXXVII

DIRECT INSTRUCTIONAL PER PUPIL-COURSE

COSTS BY CURRICULAR PROGRAM

HIGH SCHOOL A

Program Area Grade Ten	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil- Enrolled in Grade
Eng.Lang.Arts	4	15	808	$ 37,679.89	$ 46.63[a]	$ 55.82
Modern Lang.	4	20	462	21,398.63	46.32	31.70
Mathematics	4	20	1,075	59,839.15	55.66	88.65
Science	4	14	1,763	48,174.31	27.33[b]	71.37
Social Sciences	2	10	850	44,096.17	51.88	65.33
Physical Ed.	1	5	762	29,819.93	39.13	44.18
Fine Arts	5	25	408	27,690.53	67.87	41.02
Home Ec.	4	20	315	20,750.76	65.88	30.74
Industrial Arts	6	30	338	26,621.73	78.76	39.44
Business Ed.	5	21	634	30,227.75	47.68[c]	44.78
Technical Ed.	2	20	246	51,421.01	209.03[d]	76.18
Totals	41	200	7,661	$ 397,719.86	$ 736.67	$ 589.21

Average Direct Instructional Cost Per Pupil-Course in Grade 10--$ 51.92

TABLE XXXVII (cont'd)

Program Area Grade Eleven	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	5	25	1,339	$ 63,575.37	$ 47.48	$ 77.15
Modern Lang.	4	20	342	18,081.04	52.87	21.94
Mathematics	4	20	679	33,961.22	50.02	41.22
Science	3	9	1,066	28,800.32	27.02[e]	34.95
Social Sciences	5	25	1,148	55,248.29	48.13	67.05
Physical Ed.	1	5	142	7,294.54	51.37	8.85
Fine Arts	3	15	171	10,080.04	58.95	12.23
Home Ec.	3	15	122	15,213.09	124.70	18.46
Industrial Arts	4	20	47	5,271.75	112.16	6.40
Business Ed.	7	35	621	33,299.50	53.62	40.41
Technical Ed.	14	280	369	119,630.25	324.20[f]	145.18
Totals	53	469	6,046	$ 390,455.41	$ 950.52	$ 473.85

Average Direct Instructional Cost Per Pupil-Course in Grade 11--$ 64.38

TABLE XXXVII (cont'd)

Program Area Grade Twelve	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng. Lang. Arts	2	10	940	$ 50,346.20	$ 53.56	$ 52.17
Modern Lang.	4	20	203	15,277.18	75.26	15.83
Mathematics	4	20	501	27,520.79	54.93	29.84
Science	5	25	866	45,026.12	51.99	46.66
Social Sciences	3	15	525	28,603.29	54.48	29.64
Physical Ed.	1	5	115	6,713.79	58.38	6.96
Fine Arts	4	20	173	6,965.39	40.26	7.22
Home Ec.	2	10	44	5,565.00	126.48	5.77
Industrial Arts	1	5	10	5,264.39	526.44	5.45
Business Ed.	7	35	431	26,169.72	60.72	27.12
Technical Ed.	13	225	217	88,961.44	409.969	92.19
Totals	46	390	4,041	$ 306,413.31	$1,512.46	$ 318.85

Average Direct Instructional Cost Per Pupil-Course in Grade 12--$75.83

TABLE XXXVII (cont'd)

Program Area Grades Ten, Eleven, and Twelve Combined	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	10	50	3,087	$ 151,601.31	$ 49.11	$ 6.53
Modern Lang.	12	60	1,007	54,756.85	54.38	22.22
Mathematics	12	60	2,255	122,594.38	54.37	49.75
Science	12	48	3,695.	122,000.50	33.02	49.51
Social Sciences	10	50	2,523	127,947.56	50.71	58.66
Physical Ed.	3	15	1,019	43,828.27	43.01	17.79
Fine Arts	12	60	752	44,735.96	59.49	18.16
Home Ec.	9	45	481	41,528.85	86.34	16.85
Industrial Arts	11	55	395	37,157.86	94.07	15.08
Business Ed.	19	91	1,686	89,696.69	53.20	36.40
Technical Ed.	29	525	832	260,012.44	312.51	105.52
Totals	139	1,059	17,732	$1,094,588.58	$ 890.21	$

Average Direct Instructional Cost Per High School Pupil-Course--$61.73

[a]Includes Literature 11 and Occupations 10 combined for 5 credits.
[b]Includes Science 11 for 5 credits.
[c]Includes two 3-credit courses, Business Fundamentals 10 and Record Keeping 10.
[d]These are 10-credit courses, viz., Voc. Exp. 15/16 and General Tech. 15/16.
[e]These are all 3-credit courses.
[f]These are all 12/22 courses valued at 20 credits each.
[g]Includes 15 and 20-credit courses.

TABLE XXXVII (cont'd)

HIGH SCHOOL B

Program Area Grade Ten	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	3	15	478	$ 27,615.54	$ 57.77[a]	$ 61.92
Modern Lang.	2	10	348	20,607.56	59.22	46.21
Mathematics	3	15	506	25,033.88	49.47	56.13
Science	4	13	1,029	33,588.01	32.64[b]	75.31
Social Sciences	1	5	459	21,304.74	46.42	47.77
Physical Ed.	1	5	441	20,721.39	46.99	46.46
Fine Arts	3	15	194	14,355.34	74.00	32.19
Home Ec.	2	10	183	13,928.14	76.11	31.23
Industrial Arts	4	20	320	25,077.48	78.37	56.23
Business Ed.	4	20	490	30,625.97	62.50	68.67
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	27	128	4,448	$ 232,858.05	$ 583.49	$ 522.10

Average Direct Instructional Cost Per Pupil-Course in Grade 10--$52.35

TABLE XXXVII (cont'd)

Program Area Grade Eleven	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	6	30	698	$ 48,016.86	$ 68.79	$ 131.55
Modern Lang.	2	10	238	16,582.09	69.67	45.43
Mathematics	2	10	374	22,460.39	60.05	61.54
Science	3	9	682	17,866.03	26.20	48.95
Social Sciences	3	15	556	29,629.68	53.29	81.18
Physical Ed.	1	5	172	10,416.44	60.56	28.54
Fine Arts	3	15	83	6,556.07	78.99	17.96
Home Ec.	2	15	119	9,995.64	84.00	27.39
Industrial Arts	4	20	81	6,379.25	78.76	17.48
Business Ed.	5	25	208	15,724.66	75.60	43.08
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	31	149	3,211	$ 183,627.11	$ 655.90	$ 503.09

Average Direct Instructional Cost Per Pupil-Course in Grade 11--$57.19

TABLE XXXVII (cont'd)

Program Area Grade Twelve	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	2	10	380	$ 25,151.03	$ 66.19	$ 63.84
Modern Lang.	3	15	186	13,342.01	71.73	33.86
Mathematics	3	15	316	21,524.99	68.12	54.63
Science	3	15	592	34,209.13	57.79	87.83
Social Sciences	2	10	352	18,952.53	53.84	48.10
Physical Ed.	1	5	70	3,798.50	54.26	9.64
Fine Arts	4	20	132	8,865.57	67.16	23.50
Home Ec.	1	5	39	4,677.50	119.94	11.87
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	4	20	122	9,868.87	80.89	25.05
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	23	115	2,189	$ 140,390.13	$ 639.92	$ 356.32

Average Direct Instructional Cost Per Pupil-Course in Grade 12--$64.13

TABLE XXXVII (cont'd)

Program Area Grades Ten, Eleven, and Twelve Combined	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	11	55	1,556	$ 100,783.31	$ 64.77	$ 83.64
Modern Lang.	7	35	772	50,531.66	65.46	41.93
Mathematics	8	40	1,196	69,019.13	57.71	57.28
Science	10	37	2,303	85,663.13	37.20	71.09
Social Science	6	30	1,367	69,886.88	51.12	71.15
Physical Ed.	3	15	683	34,936.33	51.15	28.99
Fine Arts	10	50	409	29,776.96	72.80	24.71
Home Ec.	5	25	341	28,601.28	83.87	23.74
Industrial Arts	8	40	401	31,456.72	78.45	26.11
Business Ed.	13	65	820	56,219.50	68.56	46.66
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	81	392	9,848	$ 556,874.90	$ 631.09	$ 475.29

Average Direct Instructional Cost Per High School Pupil-Course--$56.55

[a]Reading 10 is offered for 5 credits.
[b]Includes one 5-credit course, Science 11

TABLE XXXVII (cont'd)

HIGH SCHOOL C

Program Area Grade Ten	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	4	16	794	$ 36,085.00	$ 45.45	$ 62.32
Modern Lang.	3	15	354	24,162.98	68.26	41.73
Mathematics	2	10	704	35,396.47	50.28	61.13
Science	4	14	1,146	32,636.02	28.48[a]	56.37
Social Sciences	2	10	586	30,656.17	52.31	52.95
Physical Ed.	2	8	552	31,218.73	56.56[b]	53.92
Fine Arts	3	15	204	12,849.29	62.99	22.19
Home Ec.	1	5	51	4,975.00	97.55	8.59
Industrial Arts	1	8	99	6,127.89	61.90[c]	10.58
Business Ed.	5	26	682	30,961.08	45.40[d]	53.48
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	27	127	5,172	$ 245,068.63	$ 569.18	$ 423.26

Average Direct Instructional Cost Per Pupil-Course in Grade 10--$47.38

TABLE XXXVII (cont'd)

Program Area Grade Eleven	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	5	25	770	$ 36,846.95	$ 47.85	$ 74.89
Modern Lang.	3	15	209	13,320.49	63.73	27.07
Mathematics	2	10	433	21,370.83	49.36	43.44
Science	4	12	684	20,839.93	30.47[e]	42.36
Social Sciences	5	25	790	34,224.68	43.32	69.56
Physical Ed.	1	5	159	7,337.89	46.15	14.91
Fine Arts	2	10	112	7,454.44	66.56	15.15
Home Ec.	1	5	20	3,313.35	165.67	6.33
Industrial Arts	1	5	39	3,180.15	81.54	6.46
Business Ed.	7	38	518	30,719.82	59.30[f]	62.44
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	43	150	3,734	$ 178,608.53	$ 653.95	$ 363.03

Average Direct Instructional Cost Per Pupil-Course in Grade 11--$47.83

TABLE XXXVII (cont'd)

Program Area Grade Twelve	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	2	10	452	$ 22,435.07	$ 49.64	$ 43.99
Modern Lang.	3	15	132	10,719.79	81.21	21.02
Mathematics	2	10	251	12,562.04	50.05	24.63
Science	4	20	504	28,144.63	55.84	55.19
Social Sciences	3	15	389	19,637.48	50.48	38.51
Physical Ed.	1	5	52	4,757.14	91.48	9.33
Fine Arts	5	25	107	7,843.49	73.30	15.38
Home Ec.	1	5	13	1,651.70	127.05	3.24
Industrial Arts	1	5	16	1,585.30	99.08	3.11
Business Ed.	7	50	293	31,819.22	108.609	62.39
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	29	160	2,209	$ 141,155.86	$ 786.73	$ 276.78

Average Direct Instructional Cost Per Pupil-Course in Grade 12--$63.90

TABLE XXXVII (cont'd)

Program Area Grades Ten, Eleven, and Twelve Combined	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	11	51	2,016	$ 95,366.94	$ 47.30	$ 60.32
Modern Lang.	9	45	695	48,203.25	69.36	30.49
Mathematics	6	30	1,388	69,329.25	49.95	43.85
Science	12	46	2,334	81,620.50	34.97	51.63
Social Sciences	10	50	1,765	84,518.19	47.89	61.21
Physical Ed.	4	18	763	43,313.77	56.77	27.40
Fine Arts	10	50	423	28,147.21	66.54	17.80
Home Ec.	3	15	84	9,940.04	118.33	6.29
Industrial Arts	3	18	154	10,893.34	70.74	6.89
Business Ed.	19	114	1,493	93,499.94	62.63	59.17
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	87	437	11,115	$ 564,832.43	$ 625.14	$ 365.01

Average Direct Instructional Cost Per High School Pupil-Course--$50.82

[a]Includes one 5-credit course, Science 11.
[b]Includes 3 and 5 credits.
[c]Offered for 3 and 5 credits.
[d]Includes 3-credit courses in Occupations 10 and Record Keeping 10.
[e]All 3-credit courses.
[f]Law 20 is offered for 3 and 5 credits.
[g]Includes S.T.C.P., Shorthand 30, Typing 30 and Office Practice 30 for 15 credits and Distributive Education for 10 credits.

TABLE XXXVII (cont'd)

HIGH SCHOOL D

Program Area Grade Ten	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	4	16	810	$ 41,805.43	$ 51.61[a]	$ 68.20
Modern Lang.	3	15	524	30,747.89	58.68	50.16
Mathematics	3	15	695	41,295.27	59.42	67.37
Science	5	17	1,610	47,493.71	29.50[b]	77.48
Social Sciences	2	10	636	30,824.68	48.47	50.28
Physical Ed.	1	5	686	31,436.73	45.83	51.28
Fine Arts	3	11	236	11,119.29	47.12[c]	18.14
Home Ec.	n/o	n/o	n/o	n/o	n/o	n/o
Industrial Arts	1	5	90	4,750.00	52.78	7.75
Business Ed.	5	24	607	32,606.77	53.72[d]	53.19
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	27	118	5,894	$ 272,079.77	$ 447.13	$ 443.85

Average Direct Instructional Cost Per Pupil-Course in Grade 10--$46.16

TABLE XXXVII (cont'd)

Program Area Grade Eleven	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	5	25	1,450	$ 88,424.56	$ 60.98	$ 108.23
Modern Lang.	2	10	452	27,551.54	60.95	33.72
Mathematics	2	10	708	46,687.07	65.94	57.14
Science	5	15	1,622	48,671.41	30.01[e]	59.57
Social Sciences	5	19	1,715	61,192.50	35.68[f]	74.90
Physical Ed.	2	8	177	8,944.39	50.53[g]	10.95
Fine Arts	3	15	79	6,430.05	81.39	7.87
Home Ec.	n/o	n/o	n/o	n/o	n/o	n/o
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	7	33	735	43,651.76	59.39[h]	53.43
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	31	135	6,938	$ 331,553.28	$ 444.87	$ 461.77

Average Direct Instructional Cost Per Pupil-Course in Grade 11--$47.79

TABLE XXXVII (cont'd)

Program Area Grade Twelve	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	2	10	549	$ 37,399.99	$ 68.12	$ 63.18
Modern Lang.	2	10	313	26,089.29	83.35	44.07
Mathematics	2	10	447	29,565.68	66.14	49.94
Science	4	20	883	69,190.13	78.36	116.88
Social Sciences	3	15	524	33,026.38	63.03	55.78
Physical Ed.	1	5	15	1,817.70	121.18	3.07
Fine Arts	n/o	n/o	n/o	n/o	n/o	n/o
Home Ec.	n/o	n/o	n/o	n/o	n/o	n/o
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	6	30	223	24,587.87	110.26	41.53
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	20	100	2,954	$ 221,677.04	$ 590.44	$ 374.45

Average Direct Instructional Cost Per Pupil-Course in Grade 12--$75.04

TABLE XXXVII (cont'd)

Program Area Grades Ten, Eleven, and Twelve Combined	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	11	51	2,809	$ 167,629.75	$ 59.68	$ 82.90
Modern Lang.	7	35	1,289	84,388.63	65.47	41.74
Mathematics	7	35	1,850	117,547.94	63.54	58.13
Science	14	52	4,115	165,355.00	40.18	81.78
Social Sciences	10	44	2,875	125,043.31	43.59	71.94
Physical Ed.	4	18	878	42,198.82	48.06	20.87
Fine Arts	6	26	315	17,549.34	55.71	8.68
Home Ec.	n/o	n/o	n/o	n/o	n/o	n/o
Industrial Arts	1	5	90	4,750.00	52.78	2.35
Business Ed.	18	87	1,565	100,846.19	64.44	49.87
Technical Ed.	n/o	n/o	n/o	n/o	n/o	n/o
Totals	78	353	15,786	$ 825,308.98	$ 493.45	$ 418.26

Average Direct Instructional Cost Per High School Pupil-Course--$52.28

[a]Includes 3-credit courses, Literature 11 and Reading 10.
[b]Includes the 5-credit course (Science 11).
[c]Drama 10 and Art 10 are 3-credit courses.
[d]Includes 3-credit courses, Typing 10, Record Keeping 10, and Business Fundamentals 10.
[e]All 3-credit courses.
[f]Includes 3-credit courses, Geography 20, Psychology 20, Sociology 20.
[g]Physical Education 10 offered for 3 and 5 credits.
[h]Includes Law 20 for 3 credits.

TABLE XXXVII (cont'd)

HIGH SCHOOL E

Program Area Grade Ten	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	5	25	959	$ 51,981.45	$ 54.20[a]	$ 66.14
Modern Lang.	3	15	487	27,087.23	55.62	34.46
Mathematics	5	25	1,100	50,009.36	45.46	63.63
Science	8	36	1,188	51,986.50	43.76[b]	66.14
Social Sciences	3	15	837	41,323.13	49.37	52.57
Physical Ed.	1	5	891	46,545.44	52.24	59.22
Fine Arts	5	25	367	23,689.63	64.55	30.14
Home Ec.	3	15	191	19,552.36	102.37	24.88
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	4	20	883	36,212.84	41.01	46.07
Technical Ed.	19	95	615	78,376.56	127.44	99.72
Totals	56	276	7,518	$ 426,764.50	$ 636.02	$ 542.96

Average Direct Instructional Cost Per Pupil-Course in Grade 10--$56.77

TABLE XXXVII (cont'd)

Program Area Grade Eleven	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	7	35	1,267	$ 74,748.38	$ 59.00	$ 104.40
Modern Lang.	3	15	276	16,543.39	59.94	23.11
Mathematics	5	25	707	30,728.93	43.46	42.92
Science	7	33	927	43,805.57	47.26[c]	61.18
Social Sciences	6	30	951	56,735.71	59.66	79.24
Physical Ed.	1	5	97	7,312.44	75.39	10.21
Fine Arts	3	15	178	11,271.94	63.33	15.74
Home Economics	4	20	94	14,672.48	156.09	20.49
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	7	35	602	34,605.22	57.48	48.33
Technical Ed.	15	170	266	72,395.38	272.16[d]	102.46
Totals	58	383	5,365	$ 362.819.44	$ 896.77	

Average Direct Instructional Cost Per Pupil-Course in Grade 11--$67.63

TABLE XXXVII (cont'd)

Program Area Grade Twelve	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	2	10	685	$ 38,979.73	$ 56.90	$ 53.99
Modern Lang.	2	10	201	12,147.84	60.44	16.83
Mathematics	3	15	503	27,143.73	53.96	37.60
Science	4	20	806	40,607.13	50.38	56.24
Social Sciences	4	20	421	19,855.53	47.16	27.50
Physical Ed.	2	10	96	7,001.04	72.93	9.70
Fine Arts	6	30	179	17,087.69	95.46	23.67
Home Economics	3	15	38	5,834.90	153.55	8.08
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	10	50	479	33,761.31	70.48	46.76
Technical Ed.	13	170	83	49,077.89	591.30	64.58
Totals	49	350	3,491	$ 251,496.79	$1,252.56	$ 344.94

Average Direct Instructional Cost Per Pupil-Course in Grade Twelve--$72.04

TABLE XXXVII (cont'd)

Program Area Grades Ten, Eleven, and Twelve Combined	No. of Courses	No. of Credits	No. of Pupils in Courses	Total Direct Instructional Costs	Average Costs Per Pupil-Course in Program	Average Cost Per Pupil-Enrolled in Grade
Eng.Lang.Arts	14	70	2,911	$ 165,709.31	$ 56.93	$ 74.51
Modern Lang.	8	40	964	55,778.46	57.86	25.08
Mathematics	13	65	2,310	107,882.02	46.70	48.51
Science	19	89	2,921	136,399.20	46.70	61.33
Social Sciences	13	65	2,209	117,914.13	53.38	53.02
Physical Ed.	4	20	1,084	60,858.93	56.14	27.36
Fine Arts	14	70	724	53,049.26	71.89	23.85
Home Economics	10	50	323	40,059.73	124.02	18.01
Industrial Arts	n/o	n/o	n/o	n/o	n/o	n/o
Business Ed.	21	105	1,964	104,579.00	53.25	47.02
Technical Ed.	46	435	964	199,849.13	207.31	89.19
Totals	162	1,009	16,374	$ 1,041,079.17	$ 774.18	

Average Direct Instructional Cost Per High School Pupil-Course--$63.58

[a]Reading 10 is combined with Health and Personal Development 10 for 5 credits.
[b]Two 3-credit courses are included, Biology 10 and Chemistry 10.
[c]Includes one 3-credit course, Biology 20.
[d]Some vocational courses are partially combined.

TABLE XXXVIII

DIRECT INSTRUCTIONAL PER PUPIL-COURSE COSTS BY CURRICULUM CLUSTER

School A					
Grade Ten	No. of Courses	No. of Credits	No. of Pupils	Total Direct Expenditures	Average Cost per Pupil-Course
Communications	12	55	1,487	$72,158.88	$ 48.53
Environ. Studies	9	39	3,600	138,141.63	38.37
Humanities	3	15	1,041	58,706.21	56.39
Gen. Voc. Ed.	17	91	1,533	129,021.13	84.16
Totals	41	200	7,661	397,719.41	227.45
Grade Eleven					
Communications	10	50	1,763	85,990.50	48.78
Environ. Studies	8	34	1,887	70,682.88	37.46
Humanities	7	35	1,237	60,993.98	49.31
Gen. Voc. Ed.	28	350	1,159	173,414.44	149.62
Totals	53	469	6,455	402,674.86	285.17
Grade Twelve					
Communications	9	45	1,300	71,239.63	54.80
Environ. Studies	10	50	1,482	79,260.56	53.48
Humanities	4	20	541	29,952.29	55.36
Gen. Voc. Ed.	23	275	702	125,960.44	179.43
Totals	46	390	4,021	307,686.55	343.07
Grades Ten, Eleven and Twelve Combined					
Communications	31	150	4,550	229,388.63	50.42
Environ. Studies	27	123	6,969	288,084.50	41.34
Humanities	15	75	2,819	149,652.19	53.09
Gen. Voc. Ed.	70	756	3,394	428,394.81	126.22
Totals	143	1,104	17,732	1,095,520.13	271.07

TABLE XXXVIII (CONTD.)

School B					
Grade Ten	No. of Courses	No. of Credits	No. of Pupils	Total Direct Expenditures	Average Cost per Pupil-Course
Communications	7	35	902	$ 54,254.91	$ 60.16
Environ. Studies	8	33	1,976	79,343.19	40.15
Humanities	2	10	577	29,628.26	51.35
Gen. Voc. Ed.	10	50	993	69,631.56	70.12
Totals	27	128	4,448	232,857.92	221.77
Grade Eleven					
Communications	9	45	945	65,305.40	69.11
Environ. Studies	6	24	1,228	50,742.85	41.32
Humanities	5	25	630	35,479.29	56.32
Gen. Voc. Ed.	11	55	408	32,099.54	78.68
Totals	31	149	3,511	191,652.27	245.43
Grade Twelve					
Communications	7	35	632	42,745.94	67.64
Environ. Studies	7	35	978	59,532.62	60.87
Humanities	4	20	418	23,565.20	56.38
Gen. Voc. Ed.	5	25	161	14,546.37	90.35
Totals	23	115	2,189	140,390.13	275.24
Grades Ten, Eleven and Twelve Combined					
Communications	23	115	2,479	162,305.81	65.47
Environ. Studies	21	92	4,182	189,618.25	45.34
Humanities	11	55	1,625	88,672.56	54.57
Gen. Voc. Ed.	26	130	1,562	116,277.00	74.44
Totals	81	392	9,848	556,873.62	239.82

TABLE XXXVIII (CONTD)

School C					
Grade Ten	No. of Courses	No. of Credits	No. of Pupils	Total Direct Expenditures	Average Cost per Pupil-Course
Communications	9	44	1,220	$ 65,868.25	$ 53.99
Environ. Studies	8	22	2,402	99,251.13	41.32
Humanities	3	15	718	37,885.17	52.76
Gen. Voc. Ed.	7	39	832	42,063.97	50.56
Totals	27	120	5,172	245,068.52	198.63
Grade Eleven					
Communications	9	45	1,024	53,330.93	52.08
Environ. Studies	7	27	1,276	49,548.65	38.83
Humanities	6	30	857	38,515.62	44.94
Gen. Voc. Ed.	9	48	577	37,213.31	64.49
Totals	31	150	4,014	187,504.90	200.34
Grade Twelve					
Communications	8	40	669	38,068.44	56.90
Environ. Studies	7	35	807	45,463.81	56.34
Humanities	5	25	411	22,567.37	54.91
Gen. Voc. Ed.	9	60	322	35,056.22	108.87
Totals	29	160	2,209	141,155.84	277.02
Grades Ten, Eleven and Twelve Combined					
Communications	26	129	2,913	157,267.00	53.99
Environ. Studies	22	84	4,485	194,263.19	43.31
Humanities	17	70	1,986	98,967.94	49.83
Gen. Voc. Ed.	34	147	1,731	114,333.06	66.05
Totals	99	430	11,115	564,831.19	213.18

TABLE XXXVIII (CONTD.)

School D					
Grade Ten	No. of Courses	No. of Credits	No. of Pupils	Total Direct Expenditures	Average Cost per Pupil-Course
Communications	9	39	1,451	$ 78,844.00	$ 54.34
Environ. Studies	9	37	2,991	120,225.56	40.20
Humanities	3	13	755	35,653.18	47.22
Gen. Voc. Ed.	6	29	697	37,356.77	53.60
Totals	27	118	5,894	272,079.51	195.36
Grade Eleven					
Communications	9	45	1,949	119,991.81	61.57
Environ. Studies	9	33	2,507	104,302.75	41.60
Humanities	6	24	1,747	63,606.75	36.41
Gen. Voc. Ed.	7	33	735	43,651.76	59.39
Totals	31	135	7,517	348,494.76	198.97
Grade Twelve					
Communications	4	20	862	63,489.28	73.65
Environ. Studies	7	35	1,345	100,573.50	74.78
Humanities	3	15	524	33,026.38	63.03
Gen. Voc. Ed.	6	30	223	24,587.87	110.26
Totals	20	100	2,954	221,677.03	321.72
Grades Ten, Eleven and Twelve Combined					
Communications	22	104	4,262	262,324.75	61.55
Environ. Studies	25	105	6,843	325,101.63	47.51
Humanities	12	52	3,026	132,286.00	43.72
Gen. Voc. Ed.	19	92	1,655	105,596.19	63.80
Totals	78	353	15,786	825,308.57	216.58

TABLE XXXVIII (CONTD.)

School E					
Grade Ten	No. of Courses	No. of Credits	No. of Pupils	Total Direct Expenditures	Average Cost per Pupil-Course
Communications	12	60	1,643	$ 92,813.19	$ 56.49
Environ. Studies	14	66	3,179	148,540.94	46.73
Humanities	4	20	1,007	51,267.96	50.91
Gen. Voc. Ed.	26	130	1,689	134,141.31	79.42
Totals	56	276	7,550	437,758.85	233.55
Grade Eleven					
Communications	12	60	1,633	97,035.81	59.42
Environ. Studies	13	63	1,731	81,846.81	47.28
Humanities	7	35	1,039	62,263.41	59.93
Gen. Voc. Ed.	26	225	962	121,672.81	126.48
Totals	58	383	5,693	373,299.53	293.11
Grade Twelve					
Communications	9	45	981	60,693.01	61.87
Environ. Studies	9	45	1,405	74,751.81	53.20
Humanities	5	25	478	25,782.93	53.94
Gen. Voc. Ed.	31	235	595	88,673.81	147.79
Totals	54	350	3,459	247,449.13	316.80
Grades Ten, Eleven and Twelve Combined					
Communications	33	160	4,284	252,136.50	58.86
Environ. Studies	35	174	6,315	305,139.19	48.32
Humanities	16	80	2,524	139,313.94	55.20
Gen. Voc. Ed.	77	590	3,251	342,999.69	105.96
Totals	161	1,004	16,374	1,039.589.32	268.34

A P P E N D I X H

MINIMUM AND MAXIMUM PER PUPIL-COURSE-EQUIVALENT PROGRAM-ROUTE DIRECT INSTRUCTIONAL COSTS

TABLE XXXIX

MINIMUM AND MAXIMUM PER PUPIL-COURSE-EQUIVALENT PROGRAM-ROUTE DIRECT INSTRUCTIONAL COSTS

Program One - Academic: No Restrictions

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$45.48	Eng.10	$44.48	Soc.20	$50.58	Soc.20	$50.58	Eng.30	$57.95	Eng.30	$57.95
Soc.10	53.78	Soc.10	53.78	Lang.21	39.37	Lit.21	49.72	Soc.30	53.86	Soc.30	53.86
P.E.10	39.13	P.E.10	39.13	Eng.23	45.14	Lang.22	50.83	Math.31 (Old)	47.27	Math.30	54.08
Math.10	51.94	Math.10	51.94	Math.20	45.80	Math.20	45.80	Chem.30X	44.20	Phys.30X	85.85
Phys./		Chem./		Phys./		Chem./		German		French	
Biol.10	45.16	Phys.10	49.34	Biol.20	50.53	Biol.20	55.27	30	43.39	31	97.03
						French		Typ.30	33.55		
Ukr.10	35.26	French 11	63.05	Ukr.20	42.17	21	75.67	Music		Elec.30	526.44
Typ.10	38.16	[a]Voc.Exp.		Clerical		Geog.20	171.08	21/31	27.82	Fab.&	
Mus.11	48.05	15/16	258.86	Prac.20	44.39	I.A.		Econ.30	32.70	Dress 30	135.11
				Psych.20	38.08	Power 20	154.87			Food &	
										Nuts 30	112.76
Totals for 40 Credits	$356.96		$560.58		$356.06		$653.82		$340.74		$1,123.08

[a]10 credits

TABLE XXXIX CONTD.

Academic: No Restrictions

High School B

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$48.95	Eng.10	$48.95	Soc.20	$48.87	Soc.20	$48.87	Eng.30	$62.85	Eng.30	$62.85
Soc.10	46.42	Soc.10	46.42	Lang.22	62.71	Lit.20	95.99	Soc.30	50.30	Soc.30	50.80
P.E.10	46.99	P.E.10	46.99	Eng.20	63.07	Lang.21	92.13	Math.30	65.80	Math.31 (Old)	76.00
Math.10	45.93	Math.10	45.93	Math.20	56.81	Math.20	56.81			Phys.30	60.09
Chem./ Biol.10	49.14	Chem./ Phys.10	71.82	Chem./ Biol.20	51.79	Chem./ Phys.20	53.94	Biol.30	55.90	Latin 30	240.89
French 10	57.63	French 11	61.85	French 21	51.30	French 20	77.02	French 31	59.84	Foods & Nuts 30	119.94
Typ.10	56.58	Music 11	126.66	Psych. 20	55.30	I.A. Elec.	135.38	P.E.30	54.26	Short. 30	119.94
Math.11	56.16	Bus. Fund.10	109.16	I.A. Mats.20	60.96	I.A. Pow.20	109.07	Music 11/21/ 31	61.15		
								Arts & Cr.30	66.36	Drama 30	88.31
Totals for 40 Credits	$407.80		$557.78		$450.81		$669.21		$476.46		$818.32

TABLE XXXIX CONTD.

Academic: No Restrictions

High School C

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$45.99	Eng.10	$45.99	Soc.20	$46.39	Soc.20	$46.39	Eng.30	$46.26	Eng.30	$46.26
Soc.10	53.31	Soc.10	53.31	Lang.21	42.32	Lit.21	47.36	Soc.30	50.62	Soc.30	50.62
P.E.10	47.89	P.E.10	47.89	Eng.20	45.28	Eng.23	59.08	Math.30	48.55	Math.31 (Old)	59.02
Math.10	48.50	Math.10	48.50	Math.20	47.60	Math.20	47.60	Phys.30X	33.30	Chem.30	68.25
Chem./ Phys.10	43.20	Chem./ Biol.10	49.34	Phys./ Biol.20	56.52	Chem./ Biol.20	62.20	French 30	72.70	Latin 30	113.43
German 10	63.11	French 11	71.22	French 20	44.98	Latin 20	145.84	Mus.21/ 31	30.89	Arts & Crafts 30	157.70
Occup.10	38.58	Fab & Dress10	97.55	Psych.20	34.80	Merch. 20	118.57	Econ.30	37.16	Short. 31	135.29
Typ.10	49.54	Lit.11	112.64	Clerical Prac.20	37.14	Fab.& Dress20	165.67	Bus.Org. & Mgmt. 30	46.25	Music 11/21/ 31	185.37
Totals for 40 Credits	$390.12		$526.44		$355.03		$692.71		$365.73		$815.94

TABLE XXXIX CONTD.

Academic: No Restrictions

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$56.45	Eng.10	$56.45	Soc.20	$49.57	Soc.20	$49.57	Eng.30	$69.59	Eng.30	$69.59
Soc.10	48.89	Soc.10	48.89	Lang.22	55.35	Lang.21	115.72	Soc.30	57.65	Soc.30	57.65
P.E.10	45.83	P.E.10	45.83	Eng.20	55.62	Eng.23	78.80	Math.30	63.70	Math.31	
Math.10	61.40	Math.10	61.40	Math.20	62.75	Math.20	62.75	Biol.30	65.42	(Old)	79.01
Chem./		Chem./		Chem./		Chem.20X/		French		Phys.30X	91.48
Biol.10	49.07	Phys.10	80.39	Biol.20	55.93	Phys.20X	84.62	31	73.80	French	
German		French		French		French		Econ.30	73.07	30	88.11
10	44.08	11	68.62	21	56.54	20	62.68	Math.31	79.01	Bus.Org.	
Rec.Kpg.		Music		Psych.20	45.16	Short.20	110.03	Phys.30	83.35	& Mgmt.	
10	42.60	11	108.92	Socy.20	48.30	Bkkpg.20	99.36			30	121.78
Art 10	40.58	Short.20	110.03							P.E.30	121.18
										Typ.30	146.76
Totals for 40 Credits	$388.90		$570.53		$429.22		$663.53		$565.59		$775.56

TABLE XXXIX CONTD.

Academic: No Restrictions

High School E

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$44.51	Eng.10	$44.51	Soc.20	$46.24	Soc.20	$46.24	Eng.30	$69.59	Eng.30	$69.59
Soc.10	44.21	Soc.10	44.21	Eng.20	56.11	Eng.29	120.11	Soc.30	57.65	Soc.30	57.65
P.E.10	52.24	P.E.10	52.24	Lang.22	54.24	Lang.21	57.57	Math.30	52.41	Math.31	
Math.10	39.97	Math.10	39.97	Math.20	36.67	Math.20	36.67	Biol.30	48.90	(Old)	58.29
Chem./		Chem./		Chem./		Chem./		French		Phys.30X	59.53
Biol.10	48.29	Phys.10	89.56	Phys.20	49.97	Biol.20	55.45	30	57.46	German	
French		French		French		German		Typ.30	45.10	30	78.85
10	48.51	11	69.85	21	64.43	20	64.43	Short.30	49.10	Secret.	
Typ.10	39.27	Elec.19	254.74	Psych.20	38.54	Fab.&		Office		Prac.30	255.99
Short.		Food		Law 20	32.57	Dress 20	212.82	Prac.30	32.56	Fab.&	
10	35.52	Prep.19	303.99							Dress	
										20/30	177.07
Totals for 40 Credits	$352.52		$899.07		$378.77		$765.74		$412.77		$915.50

TABLE XXXIX CONTD.

Program Two - Academic: English - Social Studies Restriction

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
Eng.13 Lit.11& Occup. 10	$43.71 291.10	Eng.13 Lit.11& Occup. 10	$43.71 291.10	Eng.23	$45.14	Eng.23	$45.14	Eng.33	$48.86	Eng.33	$48.86
Soc.13	47.49	Soc.13	35.27	Soc.23	32.57	Geog.20	171.08	Math.31 (Old)	42.72	Math.30	54.08
P.E.10	39.13	P.E.10	39.13	Math.20	45.80	Math.20	45.80	Biol.30	45.48	Phys.30X	85.85
Math.10	51.94	Math.10X	63.67	Phys./ Biol.20	50.53	Chem./ Biol.20	55.27	Chem30X	44.20	Chem.30	48.22
Phys./ Biol.10	45.16	Chem./ Phys.10	49.34	Psych.20	38.08	Arts 21	103.77	Econ.30	32.70	Soc.36	79.55
Typ.10	38.16	Voc.Exp. 15/16	258.86	Lang.21	39.37	I.A. Power 20	154.87	Typ.30	33.55	I.A. Elec.30	526.44
Ukr.10	35.26			Cleric. Prac.20	44.39	Foods & Nuts 20	134.37	Music 21/31	27.82	Foods & Nuts 30	112.76
				Ukr.20	42.17	I.A. Elec.20	119.28	Merch.30	41.42	Fab.& Dress 30	135.11
Totals for 40 Credits	$591.95		$781.08		$338.05		$829.58		$316.75		$1,090.87

TABLE XXXIX CONTD.

Academic: English - Social Studies Restriction

High School B

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.13	$103.17	Eng.13	$103.17	Eng.23	$63.50	Eng.23	$63.59	Eng.33	$91.03	Eng.33	$91.03
Rdg.10	105.13	Rdg.10	105.13	Psych.20	55.30	Socy.20	72.53	Math.30	65.80	Math.31 (Old)	76.00
Soc.13	92.70	Soc.13	92.70	Math.20	56.81	Math.20	56.81	Biol.30	55.90	Chem.30	58.25
P.E.10	46.99	P.E.10	46.99	Chem./ Biol.20	51.79	Chem./ Phys.20	53.94	Chem.30	58.25	Phys.30	60.09
Math.10 (N)	41.18	Math.10	48.50	French 21	51.30	I.A. Elec.20	135.38	Econ.30	83.96	Econ.30	83.96
Chem./ Biol.10	49.14	Chem./ Phys.10	71.82	Math.21	56.81	I.A. Power 20	109.07	P.E.30	54.26	Foods & Nuts 30	119.94
Typ.10	56.58	Mus.11	126.66	P.E.20	60.56	Lit.20	95.99	Music 11/21/ 31	61.15	Short 30	119.94
Math.11	56.16	Bus. Fund	109.16	I.A. Mats.20	60.96			Arts & Crafts 30	66.36	Drama 30	88.31
Totals for 40 Credits	$551.05		$704.13		$457.03		$679.35		$536.71		$697.52

TABLE XXXIX CONTD.

Academic: English - Social Studies Restriction

High School C

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
Eng.13	$50.65	Eng.13	$50.65	Eng.23	$59.08	Eng.23	$59.08	Eng.33	$56.44	Eng.33	$56.44
Rdg.10	117.26	Rdg.10	117.26	Soc.23	41.40	Geog.20	55.65	Math.30	48.55	Math.31 (Old)	59.02
Soc.13	49.61	Soc.13	49.61	Math.20	47.60	Math.20	47.60	Phys.30X	33.30	Chem.30	68.52
P.E.10	47.89	P.E.10	47.89	Phys./		Chem./		Chem.30X	57.52	Biol.30	67.58
Math.10	48.50	Math.10	48.50	Biol.20	56.52	Biol.20	62.20	Econ.30	37.16	Soc.33	61.82
Chem./		Chem./		Cleric.		Merch.20	118.57	Music		Short.31	135.29
Phys.10	43.20	Biol.10	49.34	Prac.20	37.14	Fab.&		21/31	30.89	Arts &	
Typ.10	49.54	Fab.&		Psych.20	34.80	Dress 20	165.67	Bus.Org.		Crafts	
Occup.10	38.58	Dress 10	97.55	Lang.21	42.32	Draft 20	81.54	& Mgmt.		30	157.70
		Lit.11	112.64	Short 20	39.58	Latin		30	46.25	Mus.11/	
						20	145.84	Typ.30	55.07	21/31	185.37
Totals for 40 Credits	$445.23		$573.44		$358.44		$736.15		$365.18		$791.74

TABLE XXXIX CONTD.

Academic: English - Social Studies Restriction

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.13	$76.71	Eng.13	$76.71	Eng.23	$78.80	Eng.23	$78.80	Eng.33	$60.34	Eng.33	$60.34
Rdg.10	52.00	Rdg.10	52.00	Psych.20	45.16	Soc.23	49.71	Math.30	63.70	Math.31 (Old)	79.01
Soc.13	44.21	Soc.13	44.21	Math.20	62.75	Math.20	62.75	Biol.30	65.82	Phys.30X	91.48
P.E.10	45.83	P.E.10	45.83	Chem./		Chem.20X/		Phys.30	83.35	Chem.30	90.19
Math.10	61.40	Math.10	61.40	Biol.20	55.93	Phys.20X	84.62	Econ.30	73.07	Soc.36	106.56
Chem./		Chem.10X/		Lang.22	55.35	Short.20	110.03	Office		Bus.Org.	
Biol.10	49.07	Phys.10	80.39	Socy.20	48.30	Bkkpg.20	99.36	Prac.30	90.13	& Mgmt.	
Art 10	40.58	Music 10	108.92	Geog.20	49.26	Lang.21	115.72	Math.31	79.01	30	121.78
Rec.		Short.		P.E.20	50.53	Math.21	95.00	(Old)		P.E.30	121.18
Kpg.10	42.60	10	110.03					French		Typ.30	146.76
								31	73.80		
Totals for 40 Credits	$412.40		$579.49		$446.08		$695.99		$589.22		$817.30

TABLE XXXIX CONTD.

Academic: English - Social Studies Restriction

High School E

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.13	$70.08	Eng.19	$145.84	Eng.23	$57.78	Eng.29	$120.11	Eng.33	$83.96	Eng.33	$83.96
Rdg.10	63.84	Rdg.19	128.00	Psych.20	38.40	Geog.20	163.77	Math.30	52.41	Math.31 (Old)	79.01
Soc.13	59.69	Soc.19	92.81	Math.20	36.67	Math.20	36.67	Biol.30	48.90	Soc.36	62.45
P.E.10	52.24	P.E.10	52.24	Chem./		Chem./		Phys.30	51.63	Phys.30X	59.53
Math.10	39.97	Math.10	39.97	Phys.20	49.97	Biol.20	55.45	Econ.30	52.03	Chem.30	52.37
Chem./		Chem./		Law 20	32.57	German		Typ.30	45.10	Secy.	
Biol.10	48.29	Phys.10	89.56	Cleric.		20	64.43	Short.		Prac.32	255.99
Typ.10	39.27	Fd.Preo.		Prac.20	49.59	Fab. &		30	49.10	Fab. &	
Short.10	35.52	19	303.99	Math.21	43.87	Dress		Office		Dress	
		Electy		French		20	212.82	Prac.30	32.56	20/30	177.07
		19	254.74	21	56.86	H.F. &				Food &	
						Homes	172.45			Nuts	
						Clothing				30	158.53
						Sel.20	132.80				
						Food &					
						Nuts					
						20	106.00				
Totals for 40 Credits	$408.90		$1,107.15		$365.71		$1,064.50		$415.69		$928.91

TABLE XXXIX CONTD.

Program Three - Academic: Math - Science Restriction

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$45.48	Eng.10	$45.48	Soc.20	$50.58	Soc.20	$50.58	Eng.30	$57.95	Eng.30	$57.95
Soc.10	53.78	Soc.10	53.78	Eng.23	45.14	Lang.22	50.83	Soc.30	53.86	Soc.36	79.55
P.E.10	39.13	P.E.10	39.13	Lang.21	39.37	Lit.21	49.72	Germ.30	43.39	Fr.31	97.03
Math.14	49.64	Math.15	63.55	Ukr.20	42.17	Fr.21	75.67	Econ.30	32.70	I.A.	
Scien.11	42.32	Scien.11	42.32	Psych.20	38.08	Geog.20	171.08	Math.20	45.80	Elec.30	526.44
Ukr.10	35.26	Fr.11	63.05	Cleric.		I.A.		Phys./		Foods &	
Typ.10	38.16	[a]Voc.Exp.		Prac.20	44.39	Power 20	154.87	Biol.20	50.53	Nuts 30	112.76
Mus.11	48.05	15/16	258.86	Typ.20	46.92	Foods &		Music		Math.25	98.93
				Phys./		Nuts 20	134.37	21/31	27.82	Chem./	
				Biol.10	45.16	I.A.		Typ.30	33.55	Biol.20	55.17
						Elec.20	119.28			Fab.&	
										Dress 30	135.11
Totals for 40 Credits	$351.82		$566.17		$351.81		$806.40		$345.60		$1,162.94

[a]Ten Credits

TABLE XXXIX CONTD.

Academic: Math - Science, Restriction

High School B

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
Eng.10	$48.95	Eng.10	$48.95	Soc.20	$48.87	Soc.20	$48.87	Eng.30	$62.85	Eng.30	$62.85
Soc.10	46.52	Soc.10	46.52	Lang.22	62.71	Lang.21	92.13	Soc.30	50.30	Econ.30	83.96
P.E.10	46.99	P.E.10	46.99	Eng.20	63.07	Lit.20	95.99	Fr.31	59.84	Latin 30	240.89
Math.11	56.16	Math.11	56.16	Fr.21	51.30	Fr.20	77.02	P.E.30	54.26	Foods &	
Scien.11	68.98	Scien.11	68.98	Psych.20	55.30	I.A.		Music		Nuts 30	119.94
Fr.10	57.63	Fr.11	61.85	Math.21	56.81	Elec.20	135.38	11/21/31	61.15	Short.	
Typ.10	56.88	Mus.11	126.66	P.E.20	60.57	I.A.		Math.20	56.81	30	119.94
I.A.		Bus.		Chem./		Power 20	109.07	Chem./		Math.21	74.91
Mats.10	64.68	Fund.10	109.16	Biol.20	49.14	Foods &		Biol.20	51.79	Chem./	
						Nuts 20	89.82	Arts &		Phys.20	53.94
						Arts &		Crafts		Drama	
						Crafts		30	66.36	30	88.31
						20	86.78				
Totals for 40 Credits	$446.79		$565.27		$447.76		$735.06		$463.36		$844.74

TABLE XXXIX CONTD.

Academic: Math - Science Restriction

High School C

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
Eng.10	$45.99	Eng.10	$45.99	Soc.20	$46.39	Soc.20	$46.39	Eng.30	$46.26	Eng.30	$46.26
Soc.10	53.31	Soc.10	53.31	Lang.21	42.32	Eng.23	59.08	Soc.30	50.62	Soc.33	61.82
P.E.10	47.89	P.E.10	47.89	Eng.20	45.28	Lit.21	47.36	Fr.30	72.70	Latin 30	113.43
Math.15	53.45	Math.15	53.45	Fr.20	44.98	Latin 20	145.84	Music 21/31	30.89	Music 11/21/	
Scien.11	51.55	Scien.11	51.55	Cleric.		Merch.		Econ.30	37.16	31	185.37
Germ.10	63.11	Fr.11	71.22	Prac.20	37.14	20	118.57	Math.20	47.60	Arts &	
Typ.10	49.54	Fab. &		Short.		Fab.&		Phys./		Crafts	
Occup.10	38.58	Dress 10	97.55	20	39.58	Dress		Biol.20	56.52	30	157.70
		Lit.11	112.64	Psych.20	34.80	20	165.67	Bus.Org.		Math.21	54.22
				Socy.20	43.67	Draft.		& Mgmt.		Chem./	
						20	81.54	30	46.25	Biol.20	62.20
						Drama				Short.	
						20	70.30			31	135.29
Totals for 40 Credits	$403.42		$533.60		$334.16		$734.75		$388.00		$816.29

TABLE XXXIX CONTD.

Academic: Math - Science Restriction

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$56.45	Eng.10	$56.45	Soc.20	$46.24	Soc.20	$46.24	Eng.30	$69.59	Eng.30	$69.59
Soc.10	48.89	Soc.10	48.89	Lang.22	53.54	Lang.21	115.72	Soc.30	57.65	Soc.36	106.56
P.E.10	45.83	P.E.10	45.83	Eng.20	56.11	Eng.23	78.80	Fr.31	73.80	Fr.30	88.11
Math.15	38.85	Math.11	62.60	Fr.21	56.54	Fr.20	62.86	Off.		Bus.Org.	
Scien.11	65.37	Scien.11	65.37	P.E.20	50.53	Cleric.		Prac.30	90.13	& Mgmt.	
Germ.10	44.08	Fr.11	68.62	Psych.20	45.16	Prac.20	86.99	Econ.30	73.07	30	121.78
Art. 10	40.58	Mus.10	108.92	Socy.20	48.30	Short.		Math.20	63.70	Typ.30	146.76
Record		Short.		Chem./		20	110.03	Chem./		Math.21	95.00
Kpg.10	42.60	10	110.03	Biol.10	49.07	Bkkpg.		Biol.20	55.93	Chem.20X/	
						20	99.36	Data		Phys.20X	84.62
								Proc.		P.E.30	121.18
								32	95.91		
Totals for 40 Credits	$382.65		$566.71		$405.49		$715.54		$833.60		$579.78

TABLE XXXIX CONTD.

Academic: Math - Science Restriction

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
Eng.10	$44.51	Eng.10	$44.51	Soc.20	$46.24	Soc.20	$46.24	Eng.30	$60.56	Eng.30	$60.56
Soc.10	44.21	Soc.10	44.21	Lang.22	54.24	Eng.29	120.11	Soc.30	40.67	Soc.36	62.45
P.E.10	52.24	P.E.10	52.24	Eng.20	56.11	Eng.23	57.78	Fr.30	57.46	Germ.30	78.85
Math.15	45.80	Math.19	92.38	Fr.21	56.86	Germ.20	64.43	Off. Prac.30	32.56	Sec. Prac.32	255.99
Scien.11	54.59	Scien.19	112.64	Law 20	32.57	Fab. & Dress 20	212.82	Typ.30	45.10	Fab.& Dress 21/31	177.07
Fr.10	48.51	Fr.11	69.85	Psych.20	38.54	Homes & H.F.	172.45	Math.20	36.67	Math.29	124.99
Typ.10	39.27	Elect. 19	254.74	Math.21	43.87	Geog. 20	163.77	Chem./ Biol.10	48.29	Chem./ Phys.10	89.56
Short. 10	35.52	Food Prep.19	303.99	Cleric. Prac.20	49.59	Cloth. Sel.20	132.80	Short. 30	49.10	Foods & Nuts 30	158.83
Totals for 40 Credits	$364.65		$974.56		$378.02		$970.40		$370.41		$1,008.30

TABLE XXXIX CONTD.

Program Four - General Diploma

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$39.13	P.E.10	$39.13	Lang.21	$39.37	Lang.22	$50.83	Eng.33	$48.86	Eng.30	$57.95
Eng.13	43.71	Eng.10	45.48	Soc.23	32.57	Geog.20	171.08	Econ.30	32.70	I.A.	
Soc.13	47.49	Soc.10	53.78	Psych.20	38.08	I.A.		Music		Elec.	
Math.14	49.64	Math.10X	63.67	Ukr.20	42.17	Graph		21/31	27.82	30	526.44
Scien.11	42.32	Chem./		Cleric.		Com.20	99.40	Phys./		Fab.&	
Typ.10	38.16	Phys.10	49.34	Prac.20	44.39	I.A.		Biol.10	45.16	Dress	
Mus.11	48.05	[a]Voc.Exp.		Typ.20	46.92	Power		Ukr.10	35.26	30	135.11
Fr.10	46.42	15/16	258.86	Math.20	45.80	20	154.87	Lit.21	49.72	Math.25	98.93
		Lit.11		Eng.23	45.15	Foods &		P.E.20	51.37	Wood.10	96.13
		&				Nuts 20	134.37	Socy.20	51.25	Draft.20	97.03
		Occup.				I.A.				Short.	
		10	291.10			Elec.20	119.28			20	82.96
						Fab.&				Mus.10	128.69
						Dress					
						20	114.13				
						Art 21	103.77				
Totals for 40 Credits	$354.92		$801.36		$334.45		$947.73		$342.14		$1,223.24

[a]Ten Credits

TABLE XXXIX CONTD.

General Diploma

High School B

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$46.99	P.E.10	$46.99	Lang.22	$62.71	Lit.20	$95.99	Eng.30	$62.85	Eng.33	$91.03
Eng.10	48.95	Eng.13	103.17	Soc.23	41.40	Socy.20	72.53	Soc.30	50.30	Foods &	
Soc.10	46.42	Soc.13	92.70	Psych.20	55.30	I.A.		P.E.30	54.26	Nuts 30	119.94
Math.10	41.18	Math.11	56.16	Math.20	56.81	Elec.20	135.38	Drama 10	68.69	Short.	
(New)		Chem./		P.E.20	60.56	I.A.		Bkkpg.10	69.40	30	119.94
Chem./		Phys.10	71.82	I.A.		Power 20	109.07	Homes &		I.A.	
Biol.10	49.14	Mus.11	126.66	Mats.20	60.96	Foods &		H.F.20	70.03	Elec.10	98.14
Typ.10	56.88	Bus.		Bkkpg.20	61.99	Nuts 20	89.82	Scien.11	68.98	I.A.	
Fr.10	57.63	Fund.10	109.16	Fr.21	51.30	Lang.21	92.13	Fab. &		Power 10	76.39
I.A.		Rdg.10	105.13			Arts &		Dress 10	68.99	Drama 20	78.49
Mats.10	64.68					Crafts				Law 20	80.65
						20	86.78			I.A.	
						Cleric.				Graphic	
						Prac.20	85.85			Com.10	80.75
Totals for 40 Credits	$411.87		$711.79		$451.03		$767.55		$513.15		$745.33

TABLE XXXIX CONTD.

General Diploma

High School C

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$47.89	P.E.10	$47.89	Lang.21	$42.32	Eng.23	$59.08	Eng.30	$46.26	Eng.33	$56.44
Eng.10	45.99	Eng.13	50.65	Soc.23	41.40	Geog.20	55.65	Music 12/31	30.89	Mus.11/ 21/31	185.37
Soc.13	49.61	Soc.19	53.31	Cleric. Prac.20	37.14	Fab. & Dress 20	165.67	Econ.30	37.16	Arts & Crafts 30	157.70
Math.10	48.50	Math.15	53.45	Short. 20	39.58	Merch. 20	118.57	Bkkpg. 20	51.88	Bkkpg. 10	60.19
Chem./ Phys.10	43.20	Scien.11	51.55	Fr.20	44.98	Draft 20	81.54	P.E.20	46.15	Fr.11	71.22
Occup.10	38.58	Fab.& Dress 10	97.55	Socy.20	43.67	Drama 20	70.30	Short. 10	52.07	Typ.20	59.82
Typ.10	49.54	Mus.11	92.68	Eng.20	45.28	[a]Distrib. Ed.20	138.35	Math.20	47.60	Art 20	64.04
Record Kpg.10	50.46	Lit.11	112.64	Psych.20	34.80			Law 20	47.93	Rdg.10	77.60
Totals for 40 Credits	$373.77		$559.72		$329.17		$689.16		$359.94		$732.38

[a]Ten Credits

TABLE XXXIX CONTD.

General Diploma

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$45.83	P.E.10	$45.83	Lang.22	$55.35	Lang.21	$115.72	Eng.33	$60.34	Eng.30	$69.59
Eng.10	56.45	Eng.13	76.71	Psych.20	45.16	Soc.23	49.71	Math.30	63.70	Bus. Org.& Mgmt.30	121.78
Soc.10	44.21	Soc.10	48.89	Soc.20	49.57	Short. 20	110.03	Soc.30	57.65	P.E.30	121.18
Math.15	38.85	Math.11	62.60	Geog.20	49.26	Bkkpg. 20	99.36	Fr.10	45.00	Drama 20	83.92
Chem./ Biol.10	49.07	Chem.10X/ Phys.10	80.39	Socy.20	48.30	Math.21	95.00	Draft 10	52.78	Mus.21	86.39
Art 10	40.58	Bkkpg. 10	100.66	P.E.20	50.53	Cleric. Prac.20	86.99	Drama 10	53.32	Merch. 20	70.85
Record Kpg.10	42.60	Short. 10	110.03	Eng.20	55.62	Mus.21	86.39	Mus.11	54.46	Art 20	75.45
Germ.10	44.08	Mus.10	108.92	Biol.20	46.72	Phys.20X	91.00	Lit.11	47.74	Chem./ Phys.20	71.70
Totals for 40 Credits	$361.67		$634.03		$400.51		$734.20		$434.99		$700.86

TABLE XXXIX CONTD.

General Diploma

High School E

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$52.24	P.E.10	$52.24	Lang.22	$54.24	Eng.29	$120.11	Eng.30	$60.56	Eng.33	$83.96
Eng.10	44.51	Eng.19	145.84	Psych.20	38.54	Soc.29	145.84	Off. Prac.30	32.56	Secret. Prac.32	255.99
Soc.10	44.21	Soc.19	92.81	Law 20	32.57	Fab.& Dress 20	212.82	Soc.30	40.67	Fab.& Dress 20/30	177.07
Math.10	39.97	Math.19	92.38	Math.21	43.87	Home & H.F.20	172.45	Chem./ Biol.20	53.36	Bldg. Constr. 12	182.24
Chem./ Biol.10	48.29	Scien.19 Bldg.	112.64	Math.20	36.67	Geog.20	163.77	Scien.11	55.78	Pipe Tr.12	178.45
Typ.10	39.27	Cons.19	201.31	Cleric. Prac.20	49.59	Soc.29	145.84	Art 10	58.50	Graphic Arts 12	133.38
Short. 10	35.52	Food Prep.19	303.99	Chem./ Phys.20	49.97	Cloth. Sel.20	132.80	Fr.21	56.86	Beauty Cult.12	132.25
Bus. Fund.10	46.62	Elec.19	254.74	Soc.20	46.24	Math.29	124.99	Lang.21	57.57	Fd. Prep.12	121.76
Totals for 40 Credits	$350.63		$1,255.95		$351.69		$1,218.62		$415.86		$1,265.10

TABLE XXXIX CONTD.

Program Five - Technical

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$39.13	P.E.10	$39.13	Lang.21	$39.37	Lang.22	$50.83	Eng.33	$48.86	Eng.30	$57.95
Eng.13	43.71	Eng.10	45.48	Soc.23	32.57	Geog.20	171.08	Math.31	48.02	Math.32	55.15
Soc.13	47.49	Soc.10	53.78	Math.20	45.80	Math.25	98.93	(New)		Phys.30X	85.85
Math.14	49.64	Math.10X	63.67	Phys./		Chem./		Chem.30X	44.20	Soc.36	79.55
Scien.11	42.32	Chem./		Biol.20	50.53	Biol.20	55.27	Econ.30	32.70	Pipe	
[a]Gen.Tech.		Phys.10	49.34	Auto.		Sht.Mtl.		Beauty		Tr.32	752.06
15/16	159.96	[b]Voc.Exp.		12/22	237.34	12/25	681.74	Cul.32	322.40		
Typ.10	38.16	15/16	258.86								
		Wood.10	96.13								
Totals for 40 Credits	$420.41		$606.39		$405.61		$1,057.85		$496.18		$1,030.56

[ab]Ten credits

TABLE XXXIX CONTD.

Technical Education

High School E

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$52.24	P.E.10	$52.24	Lang.22	$54.24	Eng.29	$120.11	Eng.30	$60.56	Eng.33	$83.96
Eng.10	44.51	Eng.19	145.84	Psych.20	38.84	Soc.29	145.84	Math.30	52.41	Math.31	58.29
Soc.10	44.21	Soc.19	92.81	Math.20	36.67	Math.29	124.99	Biol.30	48.90	(Old)	
Math.10	39.97	Math.19	92.38	Chem./		Chem./		Soc.30	40.67	Phys.30X	59.53
Chem./		Scien.19	112.64	Phys.20	49.97	Biol.20	55.45	Food		Social	
Biol.10	48.29	Bldg.		Elec.22	179.74	Food		Prep.32	121.60	30/36	48.69
Draft. 12	90.81	Cons.19	201.31	Law 20	32.57	Prep.22	1,115.02			Elec. 32	1,638.36
Elec.12	73.47	Food				I.A.					
Com.		Prep.19	303.99			Power					
Art 12	68.93	Elec.19	254.74			20	154.87				
Totals for 40 Credits	$462.48		$1,255.95		$392.03		$1,716.28		$424.14		$1,888.83

TABLE XXXIX CONTD.

Program Six - Business Education

High School A

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$39.13	P.E.10	$39.13	Bkkpg.20	$67.69	Bkkpg.20	$67.69	Eng.33	$48.86	Eng.30	$57.95
Eng.13	43.71	Eng.10	45.48	Typ.20	46.92	Typ.20	46.92	Math.31	48.02	Math.30	54.08
Soc.13	47.49	Soc.10	53.78	Lang.21	39.37	Lang.22	50.83	(New)		Phys.30X	85.85
Math.14	49.64	Math.10X	63.67	Soc.23	32.57	Geog.20	171.08	Chem.30X	44.20	Soc.36	79.55
Scien.11	42.32	Chem./		Math.20	45.80	Math.25	98.93	Econ.30	32.70	Acct.30	99.19
Typ.10	38.16	Phys.10	49.34	Cleric.		Short.20	82.96	Bus.		Off.	
Short.10	49.83	Bkkpg.10	68.51	Prac.20	44.39	Merch.20	65.37	Mach.30	66.49	Prac.30	75.54
Bus.		Bus.		Data		Law 20	56.18	Merch.30	41.42	Bus.	
Fund.10	39.59	Fund.10	59.59	Proc.22	53.80			Typ.30	33.55	Mach.30	66.49
		Record		Law 20	56.18			Data		Short.31	86.15
		Kpg.10	112.42					Proc.32	57.32		
Totals for 40 Credits	$349.87		$491.92		$386.72		$636.96		$372.56		$604.80

TABLE XXXIX CONTD.

Business Education

High School B

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$46.99	P.E.10	$46.99	Bkkpg.20	$61.99	Bkkpg.20	$61.99	Eng.30	$57.95	Eng.33	$91.03
Eng.10	48.95	Eng.13	103.17	Typ.20	73.73	Typ.20	73.73	Math.30	65.80	Math.31 (New)	75.54
Soc.10	47.88	Soc.13	92.70	Lang.22	62.71	Lit.20	95.99	Biol.30	55.90	Phys.30	60.09
Math.10 (New)	41.18	Chem./ Phys.10	71.82	Psych.20	55.30	Socy.20	72.53	Soc.30	50.30	Econ.30	83.96
Short.10	86.41	Bkkpg.10	69.40	Math.20	56.81	Math.21	74.91	Bus. Mach.30	73.03	Bus. Mach.30	73.03
Chem./ Biol.10	49.14	Short.10	86.41	Law 20	80.65	Short.20	83.96	Off. Prac.30	75.54	Off. Prac.30	75.54
Typ.10	56.88	Bus. Fund.10	109.16	Short.20	83.96	Cleric. Prac.20	85.85	Short.30	119.94	Short.30	119.94
Bkkpg.10	69.40	Math.11	56.16	Cleric. Prac.20	85.85	Law 20	80.65	Typ.30	86.55	Typ.30	86.55
Totals for 40 Credits	$446.83		$635.81		$561.00		$629.61		$585.01		$665.68

TABLE XXXIX CONTD.

Business Education

High School C

Grade Ten				Grade Eleven				Grade Twelve			
Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost	Min.	Cost	Max.	Cost
P.E.10	$47.89	P.E.10	$47.89	Bkkpg.20	$51.88	Bkkpg.20	$51.88	Eng.30	$46.26	Eng.33	$56.44
Eng.10	45.99	Eng.13	50.65	Typ.20	59.82	Typ.20	59.82	Math.30	48.55	Math.31 (Old)	59.02
Soc.13	49.61	Soc.10	53.31	Lang.21	42.32	Eng.23	59.08	Phys.30X	33.30		
Math.10	48.50	Math.15	53.45	Soc.23	41.40	Geog.20	55.65	Econ.30	37.16	Chem30	68.25
Chem./		Scien.11	51.55	Math.20	47.60	Math.21	75.13	Acct.30	66.40	Soc.33	61.82
Phys.10	43.20	Short.10	52.07	Cleric.		Merch.20	118.57	Bus.Org.		[a]STOP 31	312.92
Typ.10	49.54	Bkkpg.10	60.19	Prac.20	37.14	[b]Distr.		& Mgmt.		[c]Distr.	
Occup.10	38.55	Record		Short.20	39.58	Ed.20	138.36	30	46.25	Ed.30	111.75
Record		Kpg.10	50.46	Law 20	47.93			Typ.30	55.07		
Kpg.10	50.46							Bus. Mach.30	73.57		
Totals for 40 Credits	$373.74		$419.57		$367.67		$558.49		$404.56		$670.20

[a]Fifteen credits.
[b]Ten credits.
[c]Five credit equivalent.

TABLE XXXIX CONTD.

Business Education

High School D

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$45.83	P.E.10	$45.83	Bkkpg.20	$99.36	Bkkpg.20	$99.36	Eng.33	$60.34	Eng.30	$69.59
Eng.10	56.45	Eng.13	76.71	Typ.20	60.17	Typ.20	60.17	Math.30	63.70	Math.31 (Old)	79.01
Soc.13	44.21	Soc.10	48.89	Lang.22	55.35	Lang.21	115.72	Biol.30	65.42	Phys.30X	91.48
Math.10	61.40	Math.15	38.85	Psych.20	45.16	Soc.23	49.71	Soc.30	57.65	Soc.36	106.56
Chem./ Biol.10	49.07	Chem./ Phys.10	80.39	Math.20	62.75	Math.21	95.00	Bus. Mach.30	98.42	Bus.Org. & Mgmt. 30	121.78
Art 10	40.58	Bus. Fund.10	60.18	Data Proc.22	69.13	Short.20	110.03	Off. Prac.30	90.13	Typ.30	146.76
Record Kpg.10	42.60	Bkkpg.10	100.66	Law 20	32.49	Cleric. Prac.20	86.99	Data Proc.32	95.91	Short. 30	111.83
Bus. Fund.10	60.18	Short.10	110.03	Merch.20	70.85	Merch.20	70.85	Short.30	111.83	Data Proc.32	95.91
Totals for 40 Credits	$400.32		$561.54		$490.26		$687.83		$643.40		$822.92

TABLE XXXIX CONTD.

Business Education

High School E

Grade Ten				Grade Eleven				Grade Twelve			
Min. Cost		Max. Cost		Min. Cost		Max. Cost		Min. Cost		Max. Cost	
P.E.10	$52.24	P.E.10	$52.24	Bkkpg.20	$74.19	Bkkpg.20	$74.19	Eng.30	60.56	Eng.33	83.96
Eng.10	44.51	Eng.19	145.84	Typ.20	59.79	Typ.20	59.79	Math.30	52.41	Math.31	58.29
Soc.10	44.21	Soc.19	92.81	Lang.22	54.24	Eng.29	120.11	Biol.30	48.90	(Old)	
Math.10	39.97	Math.19	92.38	Psych.20	38.40	Geog.20	45.16	Soc.30	40.67	Soc.36	62.45
Chem./		Scien.19	112.64	Math.20	36.67	Math.29	124.99	Off.		Phys.30X	59.53
Biol.10	48.29	Typ.10	39.27	Law 20	32.57	Data		Prac.30	32.56	Secy.	
Typ.10	39.27	Bus.		Cleric.		Proc.	67.10	Typ.30	45.10	Prac.32	255.99
Short.10	35.52	Fund.10	46.62	Prac.20	49.59	Merch.20	62.41	Short.30	49.10	Secy.	
Bus.		Bkkpg.10	47.34	Short.20	59.01	Short.20	59.01	Bus.		Prac.35	146.28
Fund.10	46.62							Mach.30	61.49	O.P.32	120.35
										Acct.30	116.55
Totals for 40 Credits	$350.63		$629.14		$404.46		$612.76		$390.79		$903.40

A P P E N D I X I

TOTAL COSTS IN EACH OF THE FIVE HIGH SCHOOLS BY A FUNCTION-OBJECT EXPENDITURE CLASSIFICATION

TABLE XL

TOTAL COSTS IN EACH OF THE FIVE HIGH SCHOOLS BY A MODIFIED FUNCTION-OBJECT EXPENDITURE CLASSIFICATION

Expenditure series	COST BY SCHOOL A	B	C	D	E	Totals
100 ADMINISTRATION	$ 82,754.43	$ 40,470.41	$ 53,098.52	$ 67,909.68	$ 74,693.93	$ 318,926.97
200 INSTRUCTION						
210 Salaries						
211 Teachers[a]	1,095,860.67	556,874.90	564,832.43	825,308.98	1,041,079.17	4,083,956.00
212 Administrators	113,805.50	48,395.26	57,565.66	80,840.00	94,740.00	395,346.42
213 Dept. Heads	42,831.38	16,769.90	24,168.75	22,117.70	53,955.01	159,842.74
214 Other Instr. Staff						
a. Library	29,085.00	18,030.10	29,514.43	31,811.00	24,200.00	132,640.53
b. AV & TV	15,001.60	1,821.15	2,041.80	3,150.00	9,778.81	31,793.36
c. Guidance	79,199.75	46,836.34	30,500.00	46,836.34	71,644.20	275,016.63
d. Other						
1. Sub Teacher	128,119.60	25,445.56	29,622.90	37,832.70	—	221,020.76
2. Gen. Super.	32,502.53	13,488.09	7,266.50	2,821.25	38,571.14	94,649.51
3. Special Super.[b]	9,907.00	2,840.25	1,967.10	1,660.00	8,144.39	24,519.24
215 Clerical & Bus. Support Staff	81,176.54	25,275.62	23,928.75	39,022.00	63,182.69	232,585.60
230 Library Equip. & Supplies	13,837.60	9,841.01	10,949.98	19,888.51	17,157.96	71,675.06
235 AV Equip. & Supplies	2,658.60	1,616.77	3,277.70	1,395.91	1,678.20	10,627.18
240 Instr. Equip. & Supplies (Curric.)	173,870.97	32,382.78	39,356.69	44,798.06	121,329.51	411,738.01
242 General CR Equip. Supplies & Texts	7,685.58	5,101.22	5,993.36	11,173.54	9,908.89	39,862.59
250 Other	1,393.85	460.57	488.91	628.24	3,420.32	6,391.89
Non-Resident Instr. costs	97,318.14	47,592.68	62,443.18	79,860.91	87,839.10	375,054.01

TABLE XL. CONT.

Expenditure series	COST BY SCHOOL A	B	C	D	E	Totals
500 PUPIL TRANS.						
High School	$ 93,291.97	$ 45,623.71	$ 59,859.82	$ 76,556.96	$ 84,205.09	$ 359,537.55
600 PLANT OPERATION						
610 Salaries	145,477.00	52,100.00	41,631.00	76,666.00	88,090.00	403,964.00
640 Utilities[c]						
a. Fuel	22,638.54	7,563.31	7,008.04	10,655.78	14,369.88	62,235.55
b. Light & Power	42,170.26	12,952.77	11,147.51	18,351.66	27,310.76	111,932.96
c. Telephones	7,799.95	1,946.26	1,956.90	2,368.68	5,976.75	20,048.54
d. Water	7,617.84	4,720.35	1,312.65	2,211.96	2,055.63	17,918.43
650 Supplies						
a. Custodial	7,937.71	3,366.09	2,269.30	3,643.66	3,082.18	20,298.94
Non-Resident Exp.	30,176.61	14,757.64	19,362.51	24,763.43	27,237.33	116,297.52
700 PLANT MAINTENANCE						
Non-Resident Exp.	63,433.22	31,021.52	40,701.26	52,054.37	57,254.66	244,465.03
720 Repair & Replacement of Gen. Equip. & Furn.	1,115.36	836.76	543.09	1,136.63	516.53	4,148.37
800 FIXED CHARGES	43,452.64	21,250.18	27,880.94	35,657.97	39,220.24	167,461.97
900 FOOD SERVICES						
910 Salaries	25,359.00	1,479.00	--	17,708.00	24,267.00	68,813.00
1000 STUDENT BODY ACT.	2,158.22	1,055.46	1,384.80	1,771.07	1,948.00	8,317.55
1300 DEBT SERVICE & CAPITAL FROM CURRENT FUNDS	260,538.43	127,414.29	167,171.78	213,802.24	235,161.31	1,004,088.05

TABLE XL CONTD.

Expenditure series	COST BY SCHOOL A	B	C	D	E	Totals
TOTAL RESIDENT EXP.	$2,087,051.83	$ 890,144.06	$ 897,343.45	$1,302.026.60	$1,724,459.52	$6,901.025.46
TOTAL NON-RES. EXP.	673,123.66	329,185.89	431,902.81	552,376.63	607,559.66	2,594,148.65
TOTAL COSTS	2,760,175.49	1,219,329.95	1,329,246.26	1,854,403.23	2,332,019.18	9,495,174.11
COST PER PUPIL ENROLLED	1,120.21	1,011.89	840.76	917.11	1,048.57	999.91

[a]Net basic salaries, e.g., gross academic salaries less Series 212, 213, 214(a), (b), (c), (d)1 and 2.

[b]Indirect costs of teacher supervision.

[c]To be reduced by $9,291.71 in School A and by $11,423,16 in School B.