A COMPARISON OF THE EFFICIENCY AND EFFECTIVENESS OF TWO MODELS FOR DETERMINING THE COST OF SPECIAL EDUCATION PROGRAMS

by

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(Abstract)

Providing services to handicapped children is more expensive than educating nonhandicapped children. Previous studies have estimated the cost of special education to be approximately twice that of regular education. However, these studies have produced a number of problems in providing accurate cost data including a lack of data at the local level to make meaningful determinations, difficulties in treating shared and indirect costs, problems in making cost comparisons across districts, and variances in the cost of resources over time.

This study evaluated the Larson (1985) model, a new methodology for calculating special education program costs, by comparing it to the Rossmiller (1970) model, a widely used method for calculating

special education program costs. Judgments were made by comparing the efficiency and effectiveness of each model to the other. Efficiency was appraised by comparing input and process considerations in computing special education program costs in a select school district in Virginia. Effectiveness was appraised by comparing each model's ability to produce comprehensive and accurate special education program costs from the sample school district.

Findings indicated that the Larson model had several advantages over the Rossmiller model. First, the Larson model was more efficient as less information from the regular budget was needed to complete indirect cost calculations. Second, the Larson model was more efficient in dealing with shared costs as they could be prorated through the use of a multiplier. Third, the Larson model was considered more accurate in its treatment of related services costs.

However, several qualifications needed to be made in judging the Larson model as a better product over the Rossmiller model. Conducting a cost determination was a lengthy process no matter which model was used

and is more dependent upon the availability of data in a school district than the model used. Also, both models tended to produce similar cost figures when related services costs were taken into account.

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CHAPTER I

INTRODUCTION

The rights of the handicapped to a public education have been affirmed by both legislation and litigation. Two precedent setting cases involving the handicapped have been PARC v. Pennsylvania (1972) and Mills v. the Board of Education (1972). In PARC a consent agreement was made between the Association and the Commonwealth of Pennsylvania to identify and evaluate all retarded children and subsequently to provide publicly supported education programs for all retarded children between the ages of 6 and 21 inclusive. The Mills case extended this right of an education to all handicapped children. The Mills court ruled that failure to provide exceptional children with a free and suitable publicly supported education could not be excused by a claim of insufficient public funds. Thus, as a result of court action, not only were handicapped children required to be placed in public schools; but public schools also were obligated to finance the costs of educating these handicapped children. More recent cases (e.g., Georgia Association of Retarded Citizens v. McDaniel (1983) and Roncker v.

Walters (1983)) have amplified the cost issue spoken to in Mills.

Legislative action also assured the right of handicapped children to a public education. The passage of the Education Amendments of 1974 (P.L. 93-380) and the Education for All Handicapped Children Act of 1975 (P.L. 94-142) by the United States Congress marked significant events toward guaranteeing certain civil rights to handicapped children. One purpose of P.L. 94-142 was to ensure that handicapped children would be provided with "a free, appropriate education" at public expense to meet their unique, individual needs (20 U.S.C. 1401). The Act is a comprehensive document dealing with many issues related to the education of handicapped children, including finance. Another purpose of the Act was to assist the states in financing the cost of providing educational services to handicapped children (20 U.S.C. 1401). Certain fiscal arrangements and financial policies are specified throughout the Act. One requirement is that Federal money allocated to states under the Act is intended to be used used for the "excess cost" of educating handicapped children (20 U.S.C. 1401(20)). The total

amount of money allocated to states from the federal government has risen from $252 million in fiscal year 1977 to $1.07 billion in fiscal year 1984 (Seventh Annual Report to Congress, 1985). Due to the increased support of the Federal government for special education this amounts to a growth in the average share per child from $72 to $251. Although in absolute terms this trend is impressive, it should be noted that the Federal government provides only a small portion, about eight percent, of the excess cost of providing services to handicapped children (Annual Evaluation Report, 1983). The remaining costs are shared by state and local governments.

Kakalik (1978) stated, "The most imperative special education issue today is finance and the insufficiency of funds to implement court ordered and legislatively mandated special education services". Educating handicapped students is an expensive venture which requires more money than that needed to educate the "regular" student. Unequal amounts of money need to be spent to ensure equal opportunities and protection under the law for handicapped students (Hartman & Haber, 1981). However, placing an exact

figure on the cost is extremely difficult. Vasa and Wendel (1982) report in a survey of 375 school districts conducted through the National School Boards Association that the total costs for more than three out of four school districts ranged from $1,500 to $4,000 per pupil. Hartman (1979) provided a "most likely" estimate of the total cost of special education and related services for the 1980-81 school year at $7.926 billion. However, high and low estimates were calculated for the same school year by increasing and decreasing estimated handicapped pupil incidence rates, handicapped pupils per unit of instruction, and school-aged population. The high estimate was calculated to be $20.488 billion, while the low estimate was calculated to be $3.89 billion.

Four central issues to the financing of special education have been the level of funding, funding formulas, programing, and the determination of costs (Bernstein et al., 1976). Although accurate information regarding the costs of special education is needed, there is a lack of accurate means available to make this determination. Information about the cost of special education is needed to determine the levels of

financing required to provide an appropriate education for handicapped children. Accurate cost information would facilitate setting policies on service requirements and related matters by enhancing understanding of the costs of different types of services and educational placements, and allow adjustment of state and federal special education finance formulas to match local need and reduce fiscal incentives for inappropriate classification (Kakalik et al., 1981).

Systems of cost accounting need to be developed which will allow the analysis of special education expenditures so that varying costs of programs can be viewed in clear and consistent terms. Knowledge of individual program costs is necessary for planners and policymakers who make resource allocation decisions and projection of funding requirements. Accurate information on the cost of special education would improve policymakers' ability to make informed choices on the allocation of resources and also meet legal reporting requirements established by the federal government.

A number of studies have attempted to describe the costs of educating handicapped children. One of the

first cost studies was conducted by Rossmiller, Hale, & Frohreich (1970). In this study cost data were collected in twenty-four "exemplary" special education programs in five states. "Exemplary" programs were selected by authorities in the field of exceptional children education as providing high quality programs to handicapped students. Cost data were collected by program. Expenditures were calculated by management, instruction, instructional support, institutional operations, services, and transportation.

The Rossmiller Model (1970) is a classic in the field as most studies proceeding it have adopted this model for determining special education costs (e.g, National Educational Finance Project, 1973(Florida); 1973(Delaware); 1973(Kentucky); 1973(South Dakota)). Marriner (1977) in calculating the cost of special education programs in New York City concluded, ". . . the projections based on the Rossmiller indices are an indicator, however flawed, of an adequate cost for a special education program (p. 97)".

An alternate procedure of note was a recent study conducted by Kakalik et al. (1981) for the Rand Corporation. The Kakalik procedures, however, were

very complex requiring the use of an expert in cost accounting to perform the functions necessary to obtain an accurate analysis. A major problem in using the procedure was that a significant number of estimations needed to be made. In addition, the study has never been replicated. Both Rossmiller and Kakalik estimated the cost of special education to be approximately twice the cost of regular education.

Although previous studies have shed some light on determining the costs of special education, the results are far from illuminating due to problems which have been inherent in analyzing special education financial data. In many cases reliable cost data simply were not available (Kakalik, 1979). Findings in previous cost determination studies have often been problematic because: 1)costs of educating the handicapped can vary greatly by category of handicapping condition, by age of the student, and by the severity of the handicap; 2)estimates of actual costs are often necessary because the type of service each handicapped child receives is not obtainable; 3)special education costs are often commingled with regular education costs; 4) aggregate figures, if available, often do not include indirect

charges or lack apparent specificity to permit informed decisions; and 5)costs vary greatly from district to district and from state to state due to the differing costs of resources.

A model was recently developed by Larson (1985) for determining the cost of special education to handicapped students. The Larson Model, called the Larson Framework for Descriptive and Comparative Cost Analysis of Public and Nonpublic Special Education Programs, is composed of five different cost components: discrete costs, transportation costs, overhead costs, fixed assets costs, and related services costs. Each component is divided into specific cost centers.

The Larson Model appears to have several advantages over other procedures, specifically the Rossmiller model, used in previous studies to calculate special education costs. First, costs under the Larson Model are calculated by category of the handicapping condition and severity of the handicap. One criticism of the Rossmiller Model has been that it does not take into account the type of environment (for example, resource or self-contained) in which handicapped

children may be served. Second, The Larson Model is a fine-grain analysis which should yield more accurate cost data as less estimation is needed. For example, direct costs associated with each personnel position are calculated under the Larson Model, whereas averages or more prorated costs may be used under Rossmiller. Third, The Larson Model appears to be more comprehensive in including commingled and indirect costs into determining the total costs for special education. For example, under the Rossmiller procedure capital outlay and debt service are not directly figured into special education costs. Fixed assets are included as a cost component in the Larson Model.

The Larson Model was developed through a research and development process. In order to design the product the developer tested the model in a limited number of sites and under limited circumstances. The model was actually tested in six sets of LEAs and private schools using one particular handicapping condition and environment in each set.

A major limitation of the Larson Model is that the product has not been adequately evaluated and validated. No attempt has been made to examine the use

of the Larson Model for determing the entire cost of special education programs across all handicapping conditions and environments. In addition, the superiority of the product may be questioned until its efficiency and effectiveness are compared to other significant cost determination methods, namely Rossmiller.

Statement of Purpose

The purpose of this study was to determine the efficiency and effectiveness in establishing the costs of special education programs in a select Virginia school district by comparing the Larson Model to the Rossmiller Model. Efficiency in this study was defined as a comparison of the inputs and process costs in time and energy involved in computing special education costs between the two studies. Effectiveness was defined in this study as the ability to produce the desired outcome, namely comprehensive and accurate cost data. The research questions to be considered were:

1. How do the Rossmiller and Larson Models compare in efficiency?

2. How do the Rossmiller and Larson Models compare in effectiveness?

Limitations of the Study

This study was limited to expenditure data provided by the sample school district. It did not attempt to establish the accuracy of the expenditure data. Norfolk Pupil Schools was selected for evaluation because of the availablity of centralized expenditure data collection procedures in order to help by-pass the problem of having readily available data to calculate costs. This was important in order to assess the models and not the problems associated with poor expenditure collection procedures. The usefulness of the Larson and Rossmiller Models may be less feasible for other school districts which do not track expenditures through a centralized computer cost accounting system.

A certain number of costs may need to be estimated in order to make a cost determination. This type of information was kept in order to evaluate the effectiveness of each model. However, the more estimations each procedure used, the less accurate the "actual" costs of special education were considered to be.

Definition of Terms

Cost accounting--A business term describing a process used to evaluate the operating costs of an organization for external reporting and internal planning of ongoing operations.

Cost Index--The ratio of average per pupil expenditures for children in special education (or a particular program) to the average per pupil expenditures for children in a basic regular education program.

Developmentally Delayed--A term used in Virginia to denote a noncategorical placement for preschool handicapped children from ages 2 to 5 years.

Effectiveness--Producing the desired outcome, namely comprehensive and accurate cost data.

Efficiency--The time and energy involved in computing special education costs.

Environment--Refers to the intensity of service required by a child receiving special eduation (i.e., itinerant, resource, self-contained, and separate school).

Excess costs-- The costs for special education that are over and above the normal costs of educating nonhandicapped children.

Handicapped children--Means children who are mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, other health impaired, deaf-blind, multi-handicapped, or who have specific learning disabilities and who, because of those impairments, need special education and related services (34 C.F.R. 300.5).

Handicapping Condition--The disability associated with a handicapped child requiring special education.

Related services--Means transportation and such developmental, corrective, and other supportive services as are required to assist a handicapped child to benefit from special education. . . (34 C.F.R. 300.13(a)).

Special education--Means specially designed instruction, at no cost to the parent, to meet the unique needs of a handicapped child, including classroom instruction, instruction in physical education, home instruction, and instruction in hospitals and institutions (34 C.F.R. 300.14 (a)(1)).

CHAPTER II

REVIEW OF RELATED LITERATURE

History and Development of Special Education Finance

Special education has changed dramatically over the years, especially since the passage of P.L. 94-142 in 1975. Developments in methods of financing special education have lagged behind changes in instructional programs (McLure, 1975). The financing of special education has evolved along with the programs and services used to treat handicapped children. McLure (1975) identifies three distinct periods in the development of special education: pre-1950, 1950-70, and 1970-2000.

Early programs around the turn of the century were predominantly for the severely handicapped in need of 24-hour care. The introduction of special education in public schools also tended to be for the most severely handicapped pupils. It was the practice of the time to keep these individuals isolated from the rest of the community. Under permissive legislation prior to P.L. 94-142 most states established the practice of earmarking special appropriations to assist local

school districts in providing for the extra costs entailed in operating programs for the handicapped. These funds were essentially "add-on" aids in recognition of the extra costs that might impose hardships on districts. The earliest forms of funding consisted of three sources: regular state funds based on counting each special pupil along with others, a flat dollar amount of state aid for a portion of the salary of the special education teacher, and the remainder from local district taxes. State aid was a supplement to help districts, and an incentive to establish special programs.

The middle era saw much development and expansion in professional knowledge and skill to attend to individual pupil needs. The early concept of one teacher for one group gave way to a variety of instructional strategies backed up by a broad range of services. Students became less isolated and mildly handicapped students were provided with supplementary instruction. This stage was a growth of state responsibility as seen in mandated programs and administrative structures. Additional state aid became available for other program components, such as partial

costs of transportation and allowances for support services like social workers, psychologists, and administrators.

The structure since 1970 is emerging as a structure which can be totally adaptive to the individual needs of all handicapped students. The purpose of special education is to meet the goal of providing a full appropriate public education to the handicapped. Evidence of these trends can be seen in new stimulative federal grants for special groups, state legislation, court decisions on individual rights, and the rise of public concern for equal educational opportunities. Funds for special education have increased with state government taking on an increased burden of the costs. Up to 1975 and probably since then changes throughout the years have tended to be incremental, expanding bit by bit as future needs were identified. The measurement of essential resources to accommodate programs to meet pupil needs has grown by trial and error. The resulting structure in many states has turned into a process produced more out of a remnant of history than a product of planning and reason. However, each state

has developed at their own pace and in their own way so that the picture is not clear as to how states are developing in general.

Systems of finance for special education are derived from identifying student needs and the costs of supplying a program related to the identified needs. Programatic decisions, choices relating to students served and programs, and services provided to them determine special education costs (Hartman, 1980).

One important assumption of special education is that educating the handicapped is more expensive than educating regular students. Additional costs are evident for handicapped students for a number of reasons: additional services for mildly handicapped students placed in regular education classrooms; special classes for handicapped students with smaller class sizes; related and support services; multiple special education services for some students; identification, assessment and educational planning requirements; other mandated procedures, such as due process; additional staff support and training; and a greater age span of students served (Hartman, 1980).

Sources of Revenue

Funds to educate handicapped children are derived from a variety of sources. The basic purpose of these sources is to provide the economic resources to back up the assessed individual needs and excess costs of educating handicapped children (Marinelli, 1975). Sufficient economic resources need to be allocated to deliverers of services to purchase adequate and appropriate human and material resources. These resources must be effectively combined to produce efficient delivery systems, programs, and services to ensure that the needs and rights of the handicapped are met as well as to fulfill legal and statutory mandates.

Special education tends to be a state responsibility depending upon individual state constitutions. However, in each instance the local educational agency is the provider of services with the state supervising and regulating the local prerogative to educate students within the local boundaries. Financial systems tend to be unique within each state and within each local agency. Each local system tends to be different in regard to the amount of money it spends, the distribution of funds, the needs of its

handicapped students, and the type of programs it offers. The arrangement of financing special education is a marriage of federal, state, and local revenues producing a package that is not necessarily the same from one place to another.

One purpose of P.L. 94-142 was to provide monetary assistance to the states for educating handicapped children (20 U.S.C. 1401). As has been noted, not only did the federal government set down specific rights for handicapped children and corresponding regulations; but it authorized grants to be paid directly to states to help offset the costs incurred in providing special education and related services to handicapped children. Appropriated funds have increased dramatically to over one billion dollars for the 1983-84 school year. Although this figure represents a large amount of money, the federal share of paying for excess costs has remained at approximately eight percent of the total cost of special education (Annual Evaluation Report, 1983). There may be some variation in this figure because the "true" costs of special education can only be estimated. Kakalik (1978) and National School Boards Association (NSBA, 1979) report

the federal share at 14% or 10% to 11%, respectively. P.L. 94-142 establishes a payment formula based upon a gradually escalating percentage of the national average expenditure per school children (20 U.S.C. 1411(a)(1)). As of 1982 the Act calls for the federal reimbursement to be at the 40% level. Clearly, this goal has not been met as Congress has failed to appropriate the amount of money required to meet the 40% goal; thus, placing a heavier burden on state and local governments to pay for services which the federal government has mandated. In practice states have also tended to pass the responsibility of funding special education on down to the local government often resulting in a financial vacuum.

The National School Boards Association (1979) conducted a survey of its members regarding the cost of special education to the local district. Financial information from the respondents showed a striking rise in special education budgets at approximately twice the rate of the school districts' operating and instructional budgets. Special education budgets grew from approximately 10.1% of the instructional budget in 1976-77 to 11.5% of the instructional budget in 1978-

79. Vasa and Wendel (1982) report a similar finding estimating school district budgets rising twice as fast for special education (14% yearly) as compared to instructional budgets (7% to 8% yearly).

The primary source of revenue for special education has remained the state government. In funding the cost of special education the federal share has remained at a relatively low level. The NSBA (1979) estimated the ratio between state and federal aid at about five or six to one. Vasa and Wendel (1982) report more than 38% of the districts sampled in their survey received 51% or more of their special education funding from the state. In contrast, local sources provided 52.8% of the districts with less than one-fourth of their funds for special education. Kakalik (1978) estimated the state share at 55%, the local share at 31%, and federal share at 14% for financing the costs of special education. These data would seem to clearly point to the state as being the primary funding source for special education with local districts and the federal government falling a distant second and third. However, it should be noted that to the extent state and federal revenues fall short of

funding the additional costs of educating the handicapped, local funds are usually required to make up the difference.

State Funding Formulas

In addition to flow-through monies from P.L. 94-142 state governments are responsible for transferring state funds to local school districts for special education. This is accomplished through each state's funding formula which is the method for distributing funds for payment of special education costs. Many differences can be seen between states which make cost comparisons difficult. These differences include: 1)different funding formulae; 2)various purposes for which cost data are collected, such as providing reimbursements to districts, auditing, and reporting; and 3) differing state definitions and interpretations of special education and related services (Sixth Annual Report to Congress, 1984).

Any particular state's funding formula becomes the mechanism by which funds are transferred from a higher governmental agency to the local district. The choice of one particular formula over another becomes

important for the incentives and disincentives it may create for school districts in providing adequate programs to exceptional children. Thomas (1975) described six different funding formulas which are practiced by states for distributing funds for special education. These six are:

1. Unit. A fixed amount of money is provided for each unit of instruction, administration, or transportation. The funding is the cost (or percentage) of resources necessary to operate a unit. For example, $10,000 may be provided for a classroom consisting of eight EMR students.

2. Personnel. Funding is provided for all or a portion of the salaries of personnel necessary to run a program. It is similar to the unit formula except it is limited to personnel costs.

3. Weight. Funding is provided on a per pupil basis. Each handicapped child receives monies based upon an amount equal to the regular per pupil reimbursement times a factor (weight) which usually varies by handicap.

4. Straight sum. A fixed amount is allotted for each handicapped child. The amount may vary according to handicap.

5. Percentage. A percentage of the approved costs for educating handicapped children is provided. For example, the state assumes the payment of 50% of costs of a child's education.

6. Excess costs. The additional costs (above those payed for a normal child) are assumed in full or part.

These six types of formulas can be grouped according to the main factor used for allocation of

funds: resources, children, or costs (Hartman, 1980). Resource based formulas include the unit and personnel formulas. These formulas are based upon the payment of resources, such as teachers, aides, and equipment. Allowable resources tend to be restricted so that districts do not have a blank check on the state treasury. Child based formulas include weight and straight sum. These are based on the number and type of children served so that a set amount of money is provided per pupil. Cost based formulas include percentage and excess cost. These are based upon the exact amount of money spent serving handicapped children.

Each funding formula has certain advantages and disadvantages which influence the way in which handicapped children are served. It can have an impact on such important issues in special education as class size, classification, cost controls, and least restrictive environment, just to name a few.

Under resource-based formulas a minimum and maximum number of children must be placed in a program to qualify for funding. Positive aspects include: 1)A reduced incentive for overclassification since a unit

may be ten, twenty, or thirty students. 2)Labeling a child is not directly a condition of funding. Funds are based on the number and type of personnel while labeling tends to be dealt with by eligibility standards. 3)Record keeping is fairly simple since most of the records are generated through normal record keeping procedures. Disadvantages include: 1)A minimum number of children are needed to qualify for a full unit. This can be a problem in small districts with small numbers of pupils or with low incidence handicaps. However, cost effectiveness may be achieved if districts are encouraged to develop cooperative arrangements. 2)It has been reported that unit and personnel formulas tend to discourage mainstreaming because a full unit is made up of a certain number of full-time children. However, Hartman (1980) contends that this is more a failure of associated regulations than a fault of the formula since mainstreaming could also be funded by defining eligible mainstreaming units. 3)Districts may tend to place children in a unit up to the maximum as a cost reduction measure. This may not be a problem if the maximum is held low so that the formula becomes an incentive to reduce class

size and caseloads. 4)An added disadvantage of the personnel formula is that funds for other program costs such as supplies, equipment, and transportation are not provided for.

Reimbursement for child based formulas, straight sum and weighted, are directly linked to the number of children identified and served. Advantages of these formulas include: 1)An incentive to include unserved children in special programs since the more children identified, the more money the district receives. 2)All levels of service and the cost of mainstreaming are provided for. 3)Reimbursement is received for every child identified so that there is no minimum number of students needed for funding. This may not necessarily be an advantage as programs can become fragmented without an incentive for cooperative arrangements. The disadvantages with child based formulas include: 1)A tendency to accentuate labeling since the more children a district identifies, the more money it receives. Inequalities, such as with the straight sum formula, encourage the identification of more mildly and fewer severely handicapped children. 2)Class sizes tend to be maximized since the district

receives more revenue per unit cost when caseloads are increased. 3)Weights can encourage districts to place children in higher reimbursement programs, or, if costs are not covered, to place children in programs with the lowest cost to the district. 4)Record keeping can be quite cumbersome if, for example, a time accounting system is necessary, as in Florida, which utilizes a full time equivalency base.

Cost based formulas (percentage and excess cost) reimburse districts for the monies they spend educating their exceptional children. The advantages of these systems include: 1)There does not tend to be an incentive to overclassify as only money spent is returned. Children are theoretically provided with an education best suited to their needs. There may be a tendency to place children in programs which are less costly as the district's expenses go up on a percentage formula. 2)There is a direct link between the actual cost of service and reimbursement. The disadvantages of cost based formulas include: 1)There is a need to keep an extensive cost accounting system so that expenditures may be reimbursed. 2)Reimbursement tends to come after funds are spent so the the districts must

carry the financial burden until funds arrive. 3)Cost control can become difficult as the state must theoretically provide money for funds requested. If a lid is placed on the amount the districts may receive, then the formula loses its neutrality; thus encouraging the districts to minimize costs while maximizing reimbursement.

McQuain (1984) conducted an analysis of the various funding formulas based on equity, administrative efficiency, adequacy, objectivity, and flexibility. Finance formulas were divided into five types: flat grants, minumum foundation program, percentage equalizing, percentage matching, and full state funding. Fiscal equalization was found to be an important factor in classifying formulas and in formula performance, particularly when funding was limited. The study found that full state funding of the excess cost of special education was most advantageous formula and achieved the most satisfactory overall performance.

No formula is inherently the best means for redistributing funds to the local level. Bernstein et al. (1976) point out that when programing, cost

determination, and level of funding issues are resolved, the choice of funding formula does not affect the amounts received by districts. The type of formula used is often less important than the constraints and regulations that accompany the formula, or the total amount of funds available for distribution with the formula.

Virginia's Current System of Funding of Education

Virginia's current public school finance program consists of a fiscal equalization program entitled Basic State Aid which is used to distribute monies to local districts. It is an equalization program which measures the fiscal capacity of districts through true valuation of property, personal income, and sales taxes. The measure of local fiscal capacity is referred to as the Local Composite Index. Basic State Aid allocated to each local school division is calculated by multiplying a fixed amount (Standards of Quality figure) times the number of pupils in ADM anticipated by the school division. From this product, the one-cent sales tax is deducted and the remainder multiplied by the Local Composite Index in order to

determine the state/local contribution. Basic State Aid per pupil amounts were $1,605 for 1984-85; $1,776 for 1985-86 (Superintendents Memo #5, March 15, 1984). Norfolk City Schools received 24.865 million dollars during the 1984-85 school year from Basic State Aid.

During the 1982-83 school year Salmon (1984) reported that 32 percent of funding for education in Virginia was paid by the state as compared to 61% by local and seven percent by the federal government. This would point to the fact that Virginia relies heavily on local governments to pay for the costs of education. Virginia has traditionally made a less than average fiscal effort to fund schools (Salmon and Shotwell, 1978).

The state provides additional funds to local districts through a series of categorical flat grants which includes special education. Special education funding is allocated on a per pupil basis with reimbursement four times a year. A dollar amount per pupil is specified for each handicapping condition served in a specific service configuration. Minimum and maximum class sizes are specified. Preschool funding, transportation, homebound instruction,

tuition, and regional services are reimbursed at 60 percent of the cost up to a set maximum (McQuain, 1984).

Methods for Determining Special Education Costs

In order to provide a complete program to handicapped learners, a need for service has to be established, the source(s) of funds selected, and an acceptable means of distributing the resources in relationship to the needs discovered (McCarthy & Sage, 1982). To identify the need of service not only does the method of service, i.e., the instructional program offered to students, need to be selected; but the amount of funds needed to support the service identified.

Funding systems that have linked varying amounts of extra funds to varying categories of handicapping conditions have been based upon the assumption that, at least on an average, the cost differential between regular education and that appropriated for a variety of handicapping conditions could be determined (McCarthy & Sage, 1982). The problem of determining the cost of a special education program is one of first

specifying the resources (such as facilities, types of staff, equipment, materials, and transportation) needed to conduct the program and then translating these resource requirements into an estimate of program costs (Kakalik, 1979).

Special education presents unique problems to policymakers because there are many types and severities of handicapping conditions (Bernstein et al., 1976). Different programing arrangements need to be made for different handicapping conditions which are likely to translate into significantly different costs. In addition, the amount or intensity of service a handicapped child receives will dictate higher or lower costs. For example, the cost of a residential placement will be dramatically different from that of a child requiring resource placement for one hour per day.

Empirical studies on the costs of categorical programs tend to be of three types: 1)an examination of the average per pupil expenditure patterns (cost per student; 2)determination of supplemental, replacement, and common costs of the program; and 3)the specification and costing out of the components that make up the program (Chambers et al. 1981).

The cost per student approach has taken several forms. First, the average dollar per student has been calculated by summing over all the costs directly associated with programs for a particular type of student and those indirect costs that may be allocated to the programs and dividing the total program costs by the number students involved. Another form of cost per student approach has been the development of cost factors for programs.

The cost index is the primary example of a cost factor. A cost index is calculated by figuring the ratio of the average cost per student in a special education program to the average cost per student in the regular education program. This second method has several advantages over the cost per student approach in that comparisons between programs are possible because costs over time and between different programs are taken into account. One criticism of the cost index is that the index reflects the aggregate program costs without being sensitive to the amount of services provided. For example, a student with a learning disability may need 1/2 hour of service or the entire school day in a self-contained classroom. Attempts to

alleviate this problem have been accomplished by figuring the amount of time or delivery method used to service a handicapped student (Essigs & Engle, 1976). The amount of time a student spends in special education is broken down into service units so that a full-time equivalency may be figured, as in the weighted funding formula. Costs may then be computed by the amount of student time in special education rather than by the number of students who participate in a program.

A second model which can be used to recognize the costs of categorical programs focuses on specifying the supplemental, replacement, and common costs for programs. The emphasis is on specifying which activities, resources, and costs are appropriate for each classification and making adjustments to the regular and categorical program costs to reflect these changes. Supplemental services are those that are in addition to the regular education program, like special education resource room and vocational education. These costs are additional since the students receiving them attend the regular education program while receiving the services. Replacement costs are for

those services that are substituted for the regular education program. The general procedure for determining these costs is to total the direct costs of the replacement program and then deduct the costs of the regular education programs that are replaced. Indirect costs are generally allocated to all students on a prorated basis.

The final cost model is the resource-cost model (Hartman, 1979). The focus of this approach is the specification in programmatic terms of the program to be provided. Program costs are derived directly from the structure of the educational program. There are three components to the resource-cost model: 1)assessment of student needs, 2)specification of input configurations, and 3)determination of resource prices. This approach is feasible for estimating special education costs on a macro level. It is oriented toward predicting future costs for planning purposes but is not particularly useful for determining direct and indirect costs for special education in context of the general education budget.

A majority of previous studies have used the first model, cost per student, to determine the costs of

special education. Two different approaches have been used to determine these costs. One approach has been to look at the macro level building from the top down. Under this approach state level data are documented and information collected at the state level. A second approach has been to look at the micro level building from the bottom up. Under this approach detailed information is collected and analyzed at the district level.

Generally, information collected at the state level has been conducted to help document compliance with provisions of P.L. 94-142 to Congress. Metz et al. (1975) performed a comparative study on the costs of educating handicapped and nonhandicapped pupils in nine states. Information was collected on the number of regular and handicapped children in the states, costs of educating each group of children, an excess cost was calculated, and a cost ratio determined. The authors reported a cost ratio per pupil ranging from .99 to 2.00 with a mean of 1.56. However, several qualifications needed to be made. No state surveyed had all the data needed for a detailed analysis of excess costs. None of the states maintained an

information system on the resources used for educating handicapped children. Costs were not comparable because cost categories were not exclusive. Few states could provide cost data on institutionalized children under the care of other state agencies. In the Sixth Annual Report to Congress (1984) the Department of Education selected six states to collect actual expenditure data, rather than estimates, from existing sources. Because of congressional concerns, excess-cost formula states were selected. While all states had extensive expenditure data, most had difficulty providing the requested information. Available state data were not comparable and varied substantially in how they were reported; therefore a case study approach was used. The Seventh Annual Report to Congress (1985) continued this evaluation of expenditures. A sample of nine states was used with 1982-83 school year data. Disparity in the types and amounts of data maintained by states on special education expenditures was evident. No state had prepared data by all possible expenditure breakdowns, i.e., age, grade, handicapping condition, and placement. Some states estimated certain expenditures, but their estimation techniques

were dissimilar. Given these problems, cost figures by state were reported for direct expenditures based upon what information each state was able to report.

Studies into the costs of special education at the state level have demonstrated more problems than answers. The most glaring problems evident are the discrepancies in prices of resources which can be seen between different geographic locations and a hodgepodge of state funding systems which has resulted in figures compiled for a variety of reasons.

A number of cost studies have been completed at the local district school level. These studies are perhaps best reflective of the actual costs of educating handicapped children since the local district is the level at which decisions, responsibilities, and the ultimate price of educating handicapped children rests.

One of the earliest studies was conducted by Rossmiller, Hale, and Frohreich (1970) under the National Education Finance Project. The study involved collection and analysis of cost data in twenty-four "exemplary" special education programs in five different states. The states and the specific schools

were selected by a group of experts as having comprehensive programs which were providing services for all categories of handicapped children. Cost data were gathered by program for gifted, intellectually handicapped, auditorily handicapped, visually handicapped, speech handicapped, physically handicapped, neurological and/or mental disorders, emotionally disturbed, special learning disorders, and multiply handicapped. Expenditure data were also collected by management (administrative, clerical, and secretarial), instruction (teachers and teacher aides), instructional support (supplies and equipment, guidance and counseling, and other), institutional operations (operation and maintenance), services (health and food), and transportation (cost per pupil in average daily membership).

In calculating indirect costs, the authors assumed the cost for handicapped and nonhandicapped children was the same unless additional expenditures were reported for special education. The amount of space provided per pupil was used to help calculate the per pupil costs for operation and maintenance. Capital outlay and debt service were reported but not included

in the per pupil cost figures. In order to avoid the problem of "time-bound" and "place-bound" data a cost index was calculated by calculating the ratio of the average cost of a special education program per pupil divided by the average cost of regular education per pupil.

Rossmiller et al. (1970) advocated using the median cost index because it was found that extremely high cost districts were developing new programs or serving small numbers of children within a specific exceptionality. In more established programs, the range between the highest and lowest cost index usually remained within two or three to one. The median cost index ranged from 1.14 for programs for the intellectually gifted to 3.64 for programs for the physically handicapped.

Two main criticisms have been leveled at the Rossmiller et al. study. First, the study was completed over fifteen years ago before changes in law, especially the passage of P.L. 94-142, mandated certain services to handicapped children. Thus, the data compiled by Rossmiller et al. may be dated. Another problem is that the study did not take into account

different programing arrangements within each exceptionality making the assumption that the category of disability could adequately describe the service need (McCarthy & Sage, 1982). It should also be noted that cost indices used show the cost of educating exceptional children in relation to the cost of educating children in a regular education program. Variations in the indices could occur for identical special program costs due to differences in regular program costs.

Since 1970 several studies have been conducted using methodology similar to Rossmiller's. The National Education Finance Project conducted studies in Florida, Delaware, Kentucky, and South Dakota (1973). A summary of the cost indices can be found in Table 1. Perhaps the most notable feature in these studies is the wide variations in specific cost indices among the various state studies.

Marriner (1977) studied the costs for all special education programs and general programs for the New York City Public School system. Actual cost data were compared with projected costs based upon the Rossmiller et al. indices developed previously.

TABLE 1

COST INDICES FOR NEFP STUDIES BY TYPE OF HANDICAPPING CONDITION

Program	Rossmiller Index 1971	Florida Study 1973	Delware Study 1973	Kentucky Study 1973	South Dakota 1973
Speech	1.18	--	--	1.62	--
EMR	1.87	2.47	1.49	1.68	1.5-2.5
TMR	2.10	3.77	1.67	1.73	1.6-3.0
Phy.	3.64	4.73	1.76	--	1.5-4.0
Home	--	1.57	--	2.36	2.4-2.6
Deaf	2.99	3.79	3.03	1.65	--
Visual	2.97	4.33	1.83	1.79	--
ED	2.83	3.98	--	1.60	1.6-3.7
LD	2.16	2.05	2.29	1.52	1.5-2.5
Mult.	2.73	--	--	1.65	--

Key
EMR- Educable mentally retarded
TMR- Tranable mentally retarded
Phy- Physically handicapped
Visual- Visually impaired
ED- Emotionally disturbed
LD- Learning disabled
Mult- Multi-handicapped

Rossmiller (1982) conducted a study of school districts in Idaho with data collected from district reports on file with the Idaho State Department of Education. A full time equivalent (FTE) was figured into the cost indices thus permitting an accurate determination of program costs. The cost index per FTE pupil in exceptional child programs across all districts was 4.8.

One of the most recent and comprehensive studies was completed by the Rand Corporation (Kakalik, Furry, Thomas, and Carney, 1981). The study used 1977-78 data to determine 1)the total costs of special education and related services for different age levels, different handicapped populations, various educational placements, and various sizes of school districts; 2)the costs of assessment and placement, instructional services, related services, and administrative services; and 3)the added costs of special education and related services above the cost of regular education.

A national stratified probabilistic sample of education agencies was selected to be representative of the nation. Empirical data were collected from 14

states with 46 localities in these states. Districts which were not providing even minimally comprehensive programs for handicapped children were screened out of the study.

Kakalik et al. (1981) calculated total costs by estimating the minutes in each type of service per pupil in average daily membership in each district by each type of personnel, each age level, handicapping condition, and type of educational placement. Sample weights for salaries and fringe benefits per full time equivalency staff member were used to estimate a national average cost for that particular service and type of personnel. Support services and nonpersonnel costs were estimated by age level, handicapping condition, and type of educational placement. Added costs for special education were determined by estimating the total cost of regular education per non-handicapped student and subtracting that amount from the total cost of special education and related services per handicapped student.

By age level, the costs were a total of $3526 ($3526 added cost) at the preschool level, a total of $3267 ($1617 added cost) at the elementary level, and a

total of $4099 ($2449 added cost at the secondary level) per handicapped child in 1977-78.

By type of handicap, the range in the total cost per child was from a low of $2253 ($603 added cost) for speech impaired children up to $9664 ($8014 added cost) for functionally blind children. The more severe the handicap of the average child in a category, the higher the average cost. For example, providing an education for severely retarded children cost $5926, while serving educable mentally retarded children cost $3795.

By type of educational placement, the range in total cost from a low of $901 (a savings of $749 instead of an added cost) per handicapped child who worked full time under the auspices of the special education program rather than attending classes, up to $5352 ($3702 added cost) per child in a special day school only for handicapped children.

A cost index was also calculated by comparing the cost of educating handicapped children to the cost of educating nonhandicapped children. It was estimated that it cost 2.17 times as much to educate the average handicapped child as it did to educate the average nonhandicapped child in 1977-78. The cost weighting

factor varied by age level from 1.98 at the elementary level to 2.48 at the secondary level. It varied by type of handicap from 1.37 for speech impaired children up to 5.86 for functionally blind children. It varied by type of educational placement from 0.55 for students working full time under the auspices of the special education program rather than attending classes, up to 3.24 for students in special day schools for only handicapped pupils. Weights for handicapping conditions are reported in Table 2 for comparison purposes.

It should be noted that much of the information provided in the Rand Study was an estimation of the total costs. This is a particular problem since much of the exact information needed was simply not available. In calculating comparisons Kakalik et al. also computed national averages which will tend to mask the true picture. This can especially be a problem when calculating a cost index since a national average cost of educating nonhandicapped children was used in the denominator.

The information supplied in the Rand Study does provide some insights into the added costs of educating

TABLE 2

COST INDICES FOR KAKALIK STUDY BY TYPE OF HANDICAPPING CONDITION

Handicapping Condition	All Age Levels
LD	2.74
EMR	2.30
TMR	3.34
SMR	3.59
Emotionally disturbed	3.81
Deaf	4.43
Partial hearing	3.09
Blind	5.86
Partial sight	2.74
Orthopedic	2.15
Other health impaired	1.52
Speech	1.37
Multiple handicapped	4.63

handicapped children. "The message is that if only age level, or only handicapping condition, or only type of placement, is considered in estimating the average total cost per child, the estimate will not indicate the thousands of dollars of variation in cost per child within each of the age level, handicap, and placement categories, and therefore will not differentiate among districts whose needs may depart from the average (Kakalik et. al, 1981, p. x)."

Problems Associated With Cost Studies

Five problems have been associated with conducting cost studies in special education. These five problems need to be overcome before accurate cost determination and comparisons can be made.

The first problem arises with the computation of joint or shared resources. While certain elements of costs can be directly identified with specific programs, other elements cannot be readily and directly identified with a single specific service or program. Transportation, fixed assets, and vocational education are example of such services. In these instances costs need to be prorated, depending on how joint costs are shared.

A second set of problems has to do with the treatment of time. This is evident on two different levels: the amount of time a resource is used, and the adjusted costs of resources over time. Inflation may increase the value of a resource, such as teacher salaries, which would not make costs comparable. Children may require differing lengths of service during the day so that adjustments, like weights, need to be made in order to accurately depict the amount of resources used.

A third set of problems deals with making comparisons between programs in different locales. Costs are not standardized so one resource may cost an entirely different amount depending on the geographic location. Costs can vary between different regions of the country or between city and rural areas. An example of this is the "economy of scale" effect on costs. A small rural district may not have enough handicapped students to make a particular program efficient, have transportation costs to transport children to a program, or may simply not be able to offer a quality program. Because of basic cost of living variances, everything that goes into the

operation of schools may cost more in one location than another. Such factors as teacher salary differences, transportation, food service, and maintenance can vary significantly (McCarthy & Sage, 1982).

Some costs may simply not be meaningful expressed by dollar amounts. Although there may be no direct expenditures of funds, certain resources may be utilized which have an effect on the quality of education offered to handicapped youngsters. Take, for example, the time spent by a volunteer in the classroom, supplies donated to a classroom by a local business, or a swimming program which can be offered because the YMCA has a pool available in the area. These are examples of assets on which it is difficult to place a dollar value.

Perhaps the biggest problem in conducting a meaningful cost analysis is the lack of readily available data (Kakalik, 1979). Accounting records for educational institutions are diverse and tend to be maintained for the purpose of daily operation. State and local revenues are typically combined into a general fund making it difficult to determine the source of money (Seventh Annual Report, 1985). Local

school districts often use differing definitions of handicaps and costs, and shift money from one cost category to another. The National School Boards Association (1979) survey found many small school districts either did not have separate budgets for handicapped children or had not been allocating the full costs of special education to appropriate accounts.

CHAPTER III

METHODOLOGY

The Larson Model (1985) was designed through a research and development framework to determine the costs of special education programs. Through this process the Larson Model was tested in six sets of LEAs and private schools using one particular handicapping condition and environment in each set. For example, Set 1 consisted of a comparison between a multi-handicapped self-contained day program and residential multi-handicapped nonpublic program. Further evaluation of the model is needed to validate the model outside the context of the research and development phase.

The purpose of this study, as presented in Chapter I, was to evaluate the efficiency and effectiveness of the Larson Model (1985) to determine the costs of special education programs in a select Virginia school district by comparing the Larson Model to the Rossmiller Model (1970). The Rossmiller Model was chosen for comparative purposes because it is the original cost determination system in the field and

because many studies following it have adopted the Rossmiller procedures.

There were two research questions to consider in comparing the two models. Research Question 1: How do the Rossmiller and Larson Models compare in efficiency? Research Question 2: How do the Rossmiller and Larson Models compare in effectiveness? Efficiency in this study was defined as the input and process costs in time and energy involved in computing special education costs. Effectiveness in this study was defined as producing the desired outcome, which was more comprehensive and accurate cost data than the Norfolk Public Schools had available prior to this study.

Description of the Rossmiller Model

The Rossmiller Model (1970) is comprised of six broad expenditure categories. These are:

1) Management (administration, clerical, and secretarial)

2) Instruction (teachers and teacher aides)

3) Instructional Support (supplies and equipment, guidance and counseling, and other)

4) Institutional Operations (operation and maintenance, fringe benefits, and other)

5) Services (health and food)

6) Transportation Costs

Direct costs are gathered for each exceptionality and are isolated for each of the six categories whenever possible. Indirect costs, which are leftover after direct costs are isolated, are added to direct costs in order to obtain a total per-pupil expenditure figure. In allocating indirect costs, the Rossmiller Model assumes the the cost per-pupil in general education and special education remain the same unless additional expenditures are reported for special education programs. Capital outlay and debt service are not included in per-pupil cost figures but reported as accounting memoranda.

Description of the Larson Model

The Larson Framework for Descriptive and Comparative Cost Analysis of Public and Nonpublic Special Education Programs (Figure 1) is comprised of two levels. The first level, Identification of Public Special Education Costs (IPSEC), analyzes the costs of

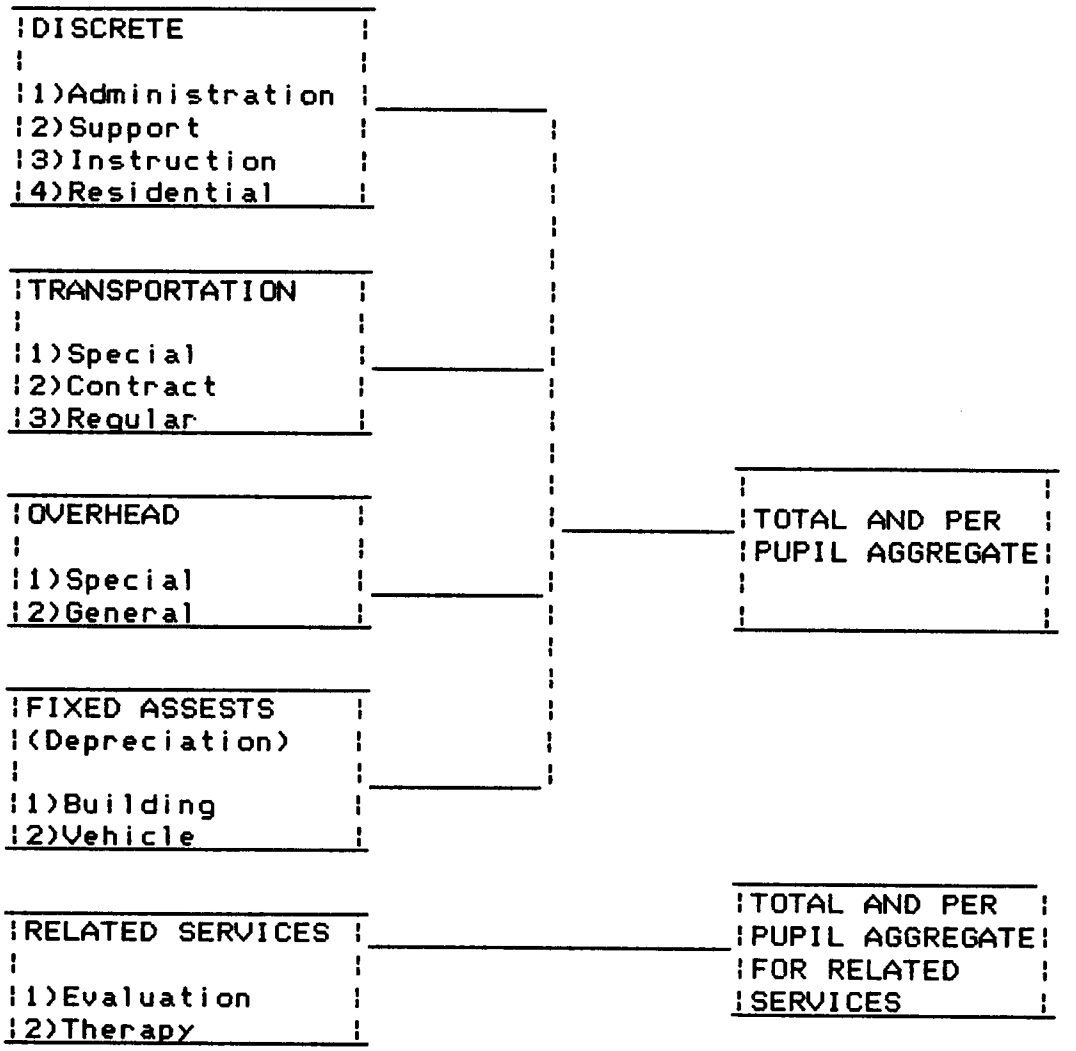

Figure 1

Larson Framework For Descriptive And Comparative Cost Analysis Of Public Special Education Programs

public special education programs by handicapping condition and environment. Handicapping conditions are deafness, deaf-blindness, hearing impaired, mental retardation, multihandicapped, orthopedic impairment, other health impaired, serious emotional disturbance, specific learning disability, speech impairment, and visual impairment. Environments are defined as itinerant, resource, self-contained, and separate school. The second level, Identification of Nonpublic Special Education Costs (INSEC), allows for the analyses of the costs to the public for private special education programs. Each level is comprised of two tiers. Tier one is for use with day school programs and tier two for use with residential programs. For the purposes of this study tier one/level one, IPSEC day programs, was the appropriate portion of the model and was used for the cost analysis of Norfolk Public Schools.

IPSEC tier one is made up of the following components: 1)discrete costs, 2)transportation costs, 3)overhead costs, 4)fixed assets costs, and 5)related services costs. Discrete costs are defined as those costs which may be directly attributed to the special

education program by handicapping condition and environment. Expenditures are allocated to administration/supervision, support, and instruction cost centers. Each cost center is categorized by salaries, benefits, materials, supplies, texts, equipment, travel, and contract services. Costs are determined in the administrative/supervision and support cost centers through the use of a multiplier. The multiplier is found by determining the percentage of time to duties within special education by position multiplied by the portion of special education instructional personnel assigned to each position within each handicapping condition and environment. The multiplier for the instructional cost center is derived from the percentage of time the instructional position spends to duties within special education multiplied by the portion of handicapped pupils assigned to the position within each handicapping condition and environment. The multiplier is multiplied by expenditures within each cost center by position. Total expenditures are calculated by summing the previously calculated expenditures by handicapping condition and environment.

The second component in IPSEC is transportation costs. Cost centers within the transportation

component are: regular transportation, special transportation, and contract transportation. Contract transportation costs are those costs for payments to parents or others in lieu of providing transportation for special education pupils. Special transportation costs are those costs for transporting special education pupils apart from general education pupils. Regular transportation costs are those costs for transporting special education pupils with general education pupils.

The third component is overhead costs. Overhead costs are divided into two categories: general overhead and special education overhead. General overhead costs are those costs which cannot be attributed to any specific program, but must be incorporated into the costs of educational programs as these costs benefit all students. Special education overhead costs are those costs which cannot be identified with any specific program, but are known to benefit special education students. General overhead costs are found by extracting those elements for the budget that involve indirect services to all pupils including administration, maintenance and operation,

and adult education. Special education overhead is calculated by extracting and totaling those elements which involve indirect services to handicapped pupils.

The fourth component is fixed assets. Fixed assets are defined as the cost of capital depreciation for buildings and vehicles. Depreciation is calculated on buildings over a thirty year period and vehicles over a twelve year period. A proportion is figured by calculating the number of special education instructional personnel to instructional personnel and multiplying the figure by the number of students within each handicapping condition and environment.

Related services are the final component of the IPSEC model. Related services are those services which are required to assist the handicapped pupil to benefit from special education. They include speech pathology, audiology, psychological services, physical and occupational therapy, recreation, early identification and assessment, counseling services, medical evaluation services, school social work services, school health services, and parent counseling and training. Costs are calculated for each related service by evaluation and therapy cost centers by the percentage of time

devoted to each activity by each position. The same cost center categories and multipliers are utilized for the related services component as the discrete cost component.

A final aggregate cost per-pupil is derived by summing the first four components. Related services are treated separately. The total cost of special education for any handicapping condition or environment may be found by multiplying the number of handicapped children per environment and handicapping condition by the per-pupil aggregate costs.

Site Selection

Norfolk Public Schools was used as the select Virginia school district for comparing the two models. Two considerations were made in making this selection: 1)the access and availability of financial data, and 2)the size and comprehensive nature of the special education program. Norfolk Public Schools has utilized a computerized automated system for collecting financial data since 1980. As was pointed out in Chapter I, this was an important consideration since readily available data must be available in order to

evaluate the models. Norfolk Public Schools is also one of the largest school districts in Virginia providing a wide array of services to handicapped children in various environments. Financial data were collected for the 1984-85 school year, the most recent data available.

Evaluation of the Larson Model

Kandaswamy (1980) outlines a chronology of steps for the evaluation of a product. These steps include: self-evaluation, professional jurying, individual testing, group testing, field testing, and extended testing. The Larson Model has gone through the first four steps up to the field testing phase in the research and development process utilized by the developer. The developer modified the model through feedback from a panel of experts while testing the model in six sample school districts. As Larson (1985) noted, the limitation of the research and development process is that the product is only applicable to the sample tested. Further field and extended testing is needed to validate the Larson Model.

The next phase in evaluation of the product is the process of obtaining and providing useful information for judging decisions and alternatives concerning the revision, disposition, and adaptation of the product. During the field testing phase the total package is tested under actual use situations without the active participation of the developer. Data collected during this stage can be used for summative purposes for demonstrating the efficiency and effectiveness of the material.

Research Question 1: How do the Rossmiller and Larson Models compare in efficiency?

The product of both models are dollar figures which describe the cost components of various handicapping conditions and environments. In order to reach a final dollar product each model goes through a series of steps which include inputs from various expenditure sources and analyses of the data through the processes unique to each model. The efficiency question was addressed by comparing the energy, effort, time and ease with which inputs and processes are used in both models.

One important consideration in measuring the efficiency of the models was the amount of data which

needed to be inputted and the effort and ease of obtaining the data. If the time and effort necessary to generate the data were excessive, then the usefulness of the model in the field was determined to be problematic. The more data required, the less efficient the model became as the time and effort required to obtain the input increased. Each piece of data also required a certain amount of effort to obtain. A checklist (Appendix A) describes the various data inputs for each model. A comparison between the data elements was made in terms of the ease of obtaining the information and the amount of time and effort needed to complete each model.

At this point the Larson Model has only been used by the developer. Another efficiency consideration was the ability of an outsider to use the model. In order to implement the model, it was important to determine the ability of someone not involved with the development of the Larson Model to carry out the procedures outlined by the model. If the procedures were ambiguous, then changes needed to be made. The experimenter noted the clarity of directions and the ability of data inputs to fit into each model in order to evaluate implementation considerations (Appendix B).

Research Question 2: How do the Rossmiller and Larson Models compare in effectiveness?

In examining effectiveness the concern is that each model produced accurate data concerning special education costs. If a model was not effective, then efficiency became a moot issue.

An important effectiveness consideration was the accuracy of the information. Cost figures for special education produced by both models were compared in order to assess their similarity. Dissimilar figures were examined in order to establish the basis on which differences occured and to judge which model produced the most accurate cost figures. Another basis in determining the effectiveness of the models was to consider the amount and type of estimations which necessary under both models (Appendix A). Accuracy was also measured by asking members of the school administration to give their opinion regarding the accuracy of the cost figures obtained by each model.

The purpose of providing cost data was to provide school officials with the information necessary to plan and make decisions about special education programs. After costs were determined, the information was

supplied to the Director of Special Education and the Budget Director in Norfolk Public Schools. An interview was conducted to obtain their feedback as to the relative merits of the cost figures supplied by each model (Appendix C).

CHAPTER IV

RESULTS

Results of the study are presented in the following sections. The first section describes the sample used to compute program costs. In the second section data collection procedures are outlined. The final section deals with the research findings in relationship to the research questions.

Site and Program Description

The city of Norfolk is Virginia's largest city with a population just below 300,000. Norfolk is at the center of a large metropolitan area located on Virginia's coastal plain, known as the Tidewater area.

Norfolk Public Schools is one of the larger, but not the largest, school divisions in Virginia. Student enrollment in Norfolk Public Schools has declined from over 60,000 to 34,680 for the 1984-85 school year. There are forty elementary schools, eight junior high schools, and five senior high schools. In addition, there is a vocational-technical school for high school students, a vocational training center for adults, two

schools for the handicapped, and three alternative education programs. Approximately 2,200 teachers are employed by Norfolk Public Schools.

During the 1984-85 school year over $122 million were budgeted to Norfolk Pubic Schools. The City of Norfolk provides approximately 55% of the funds used to operate Norfolk Public Schools. The remainder comes from state (27%) and federal (18%) sources. The majority of funds (55%) are expended for instruction. Administrative costs comprise 2%; transportation consumes 5%; and school plant operation and maintenance total 15% of the expenditures. The remaining 23% includes attendance and health services, fixed charges, food services, and equipment.

The number of handicapped children in Norfolk Public Schools from Federal Child Count on December 1, 1984, was 4,404. A categorical listing of the number of handicapped children analyzed in this study is presented in Appendix D. It should be noted that the handicap total is lower than the Federal Child Count because children were removed from analysis who were served in regional and residential programs. This number includes handicapped children from ages 2 thru

21, as mandated by state statute. Services include programs for mentally retarded, hard of hearing, deaf, speech impaired, seriously emotionally disturbed, orthopedically impaired, specific learning disabled, deaf blind, multihandicapped, and noncategorical. A wide range of service models are available including resource, separate class, separate facility, and residential. Norfolk Public Schools employed 306 teachers and 132 aides to provide educational services to handicapped children during the 1984-85 school year.

Two separate facilities, Lakewood Education Center and St. Mary's Infant Home Center for severely handicapped children, and a regional program for seriously emotionally disturbed children serve handicapped children in need of more intensive treatment.

Approximately $13 million were directly spent by Norfolk Public Schools during the 1984-85 school year to provide services to handicapped children. The local school division received $235 per child from federal Flow Through (EHA, Part B) Funds. State reimbursement levels were based on a per pupil basis within each exceptionality amounting to approximately 29% of the

excess cost of educating handicapped students. The local school division paid for 59% of the excess cost.

Expenditure data for Norfolk Public Schools are collected through the Financial Management Information System (FMIS). FMIS is an automated system relying on the capabilities of a computer to process a variety of financial information. The system is capable of supplying budgetary information and monitoring expenditure data. FMIS was initiated on July 1, 1980.

The heart of the FMIS system is a sixteen digit expense code number which allows expenditures to be sorted and summarized as needed. The sixteen digits in the expense code number identifies six specific components for classifying expenditures. The components for classifying expenditures are: fiscal year, fund, expenditures (budget) account, function/location, program, and subprogram. The fiscal year is coded by a single digit for the year the expenditure occurred. The fund is a sum of the money appropriated or allocated from specific sources and used for authorized purposes. The expenditure (budget) account denotes the service or commodity obtained as the result of a specific expenditure (e.g. salaries,

supplies, utilities, etc). The location of an expenditure is identified both by function and site (physical location). A program is a plan of activities and procedures designed to accomplish a predetermined objective or set of related objectives. For the purposes of this study, the primary program area was Special Education. A subprogram is a component or specific activity of a program and is identifiable as an integral part of the program. This permitted, for example, identification of special education expenses both by exceptionality and related services.

Data Collection Procedures

The collection of expenditure data for Norfolk Public Schools was conducted during an on-site visit for a one week period of time. Norfolk Public School records were researched or reviewed to obtain the expenditure data needed to compute costs using both models. Whenever possible, data were cross-checked with other sources to ensure the reliability of the information obtained. The researcher also confirmed data by checking information with appropriate school personnel.

The source of data for direct costs was obtained through the Special Education Department. Direct program expenditures were found on summary computer print-outs produced through the FMIS. Special education personnel and assignments were found in class roles and FMIS print-outs. Special education pupil assignments were found on class roles, the State Reimbursement Form, and the Federal Child Count Form. Duties and case loads for related services personnel were obtained through state reports or interviews.

Data needed to compute indirect and regular education costs were obtained from the Accounting and Budget Office. The primary source for this information was the Annual School Report which is sent to the Virginia State Department of Education by August 1 of each year.

It should be noted from the onset that $1,352,799 of expenditures were removed from analysis. This was necessary because the special education budget included expenditures for nonhandicapped students who were not in special education programs or because the expenditures involved handicapped children who were not in programs directly managed by Norfolk Public

Schools. An example of the former was the Continuing Education Program which is conducted for pregnant teenagers who are eligible for educational assistance. An example of the latter was tuition assistance for handicapped pupils educated in regional or private programs.

Research Findings

The following section describes the results of the study in relationship to the research questions formulated to evaluate the Rossmiller and Larson Models.

Research Question 1: How do the Rossmiller and Larson Models compare in efficiency?

Efficiency in this study was defined as the input and process costs involved in computing special education costs under each model. Input and process factors were analyzed for each model separately. Modifications in procedures for each model are described.

Larson Model

Discrete Costs. Discrete costs are those costs which may be directly attributed to special education

programs including instruction, administration, and support. Expenditures were to be collected under the Larson Model based upon positions within each exceptionality and environment. Although this procedure was possible under the FMIS, it proved to be tedious and unnecessary given the fact that expenditures were aggregated on summary print-outs by subprogram. Calculation of costs by position was necessary only under special circumstance when the position was shared between programs.

The acquisition of discrete cost information required a majority of data collection time and effort. Data regarding the number of pupils in each program, the number of personnel assigned to each program, and program expenditures comprised the necessary data needed to complete this component. Precise information was available from various sources although some variation in data could be found depending primarily upon the point in time in which the report was completed. Programs tend to be in a state of flux as students were added (or removed) and teachers were hired (or resigned). In cross-checking data it became necessary to pick the "best" figure

based upon consultation with knowledgeable personnel and a preponderance of evidence.

The Larson Model is purported to allow for the calculation of costs by handicapping condition and environment. Calculating costs by environment was only possible in the speech and learning disabilities (LD) programs. In the LD program the difference in cost was due to the assumption that aides would serve self-contained students. The calculation of costs by environment was also hampered by the fact that the model for providing services in Norfolk Pupil Schools tended to be through a single type of environment. For example, students assigned to the EMR program are assumed to be self-contained environment and are mainstreamed out of the classroom into the regular program according to student needs.

One feature unique to the Larson Model is the proration of shared costs using a multiplier based upon the proportionate number of teachers (or students) assigned to a program. So, for example, an administrator whose duties involved all programs under special education would have costs associated to that position assigned to each program based upon the number

of teachers in each program. This proved to be a systematic and logical means of figuring shared costs.

Transportation. Transportation costs under the Larson Model are divided into regular, special, and contract centers. Data for these centers were available through the Transportation Department. Expenditures for transportation and the number of students receiving transportation were immediately accessible. This information may have been easier to obtain in Norfolk Public Schools than other school districts because regular transportation was contracted out to a private carrier while only special transportation was run directly by Norfolk Public Schools. However, some difficulty was experienced when an attempt was made to identify special transportation costs by handicapping condition. Although the Transportation Department was able to supply the number of handicapped students who were transported by condition, data for the multi-handicapped and physically impaired were not consistent with feedback provided by staff so that an adjustment upward was necessary for both programs.

Forms provided to calculate transportation costs under the Larson Model are systematic and costs are

easy to calculate after basic input data were obtained. One unique feature of the Larson Model is that costs for handicapped students transported in regular transportation are calculated by the use of a multiplier which is calculated on a prorated basis by the number of regular students receiving transportation compared to the district enrollment. This feature adds on the cost of regular transportation for less severely handicapped students who do not receive special transportation.

A conceptual error was discovered in calculating the aggregate costs of transporting handicapped students. Under the Larson Model contract, special, and regular per-pupil costs are added together to provide an aggregate per-pupil figure. Unfortunately, this procedure grossly overestimates transportation costs as a different base is used for each cost center. In order to accurately calculate an aggregate per-pupil cost the Larson Model had to be modified. Total transportation costs were calculated for each of the three cost centers by condition and environment, the total costs were added together, and the total figure was then divided by the number of handicapped

children in each condition and environment to provide a per-pupil cost for transportation.

Overhead Costs. Overhead costs are those costs that involve indirect or shared costs to all pupils and which cannot be identified with a specific program. Under the Larson Model these services include administration, maintenance and operation, and adult education. Data for these components were obtained from the Annual School Report.

Forms provided to calculate overhead costs were a systematic and understandable basis for figuring this component. As with shared costs under Discrete Costs a multiplier based upon the number of instructional personnel was utilized to calculate differences between regular and special education.

Fixed Assets. Fixed assets are the costs of capital depreciation. Under the Larson Model this component is divided into building and vehicle cost centers. Furniture and equipment were added as an extra cost center as it was evident that these items contributed to the value of the school property. Furniture and equipment amounted to $25.7 million which was depreciated over eight years. Cost data for fixed

assets were obtained from the Annual School Report.

The allocation of fixed assets is computed through the use of a multiplier based upon the number of instructional personnel. This provided for a systematic and deliberate method of calculating fixed assets costs.

Related Services. Related services are those services which are required to assist the handicapped student to benefit from special education. Each related service is analyzed in isolation to provide a per-service per-pupil cost. Costs were not figured into the aggregate per-pupil costs because the developer found that the data to calculate related services within each handicapping condition and environment were not available. Information for this component was the most difficult of all components to obtain. Expenditure data were available for services such as psychological, visiting teacher, and educational diagnostic services. However, positions which provided both program (resource) and related service (itinerant), such as speech, occupational therapy, and physical therapy, had to be prorated based upon the percentage of time spent for each position in

related services as compared to program services. In addition, the number of children served in related services had to be estimated.

The Larson Model theoretically separates each related service into a therapy and evaluation cost center. However, data were not available to make this distinction. In most cases a related service was either predominantly therapy or evaluation. Psychologists typically preformed evaluations for placement while speech therapists spent a majority of their time providing therapy.

Related services costs are calculated in a manner similar to discrete costs with the exception of the therapy and evaluation distinction. The model does not take into account the fact that a position may not be entirely within special education. Visiting teachers, for example, performed attendance duties which were not associated with special education. Similarly, psychologists performed duties, such as crisis intervention, which were not associated with special education. A multiplier was added to the related services component to take into account time which may have been devoted to duties outside special education.

Rossmiller Model

Administration. Administrative costs are those costs associated with salaries and fringe benefits for basic administrative services. Enrollment figures in each program and total administrative costs for each program were needed to complete this component. A composite figure was available from the Annual School Report. Costs for exceptional programs were subtracted from the composite figure in order to partition costs by program. The Rossmiller Model does not require costs to be reported by position but uses full-time equivalences (FTEs) to partition shared costs. In order to partition costs, the percentage of time spent in each program by position needed to be known, which would have been a complex undertaking. Costs were prorated based upon the number of instructional personnel in each program, as was the procedure used under the Larson Model.

The calculation of administrative costs was a relatively simple routine once expenditures were partitioned between programs. Per pupil costs were calculated for regular programs and the per pupil cost

was added on to per pupil costs for each exceptional program to yield a total per pupil figure.

Clerical and Secretarial. Clerical and secretarial costs are those costs associated with salaries and fringe benefits for basic clerical and secretarial services. Inputs for this component were similar to the administrative component. A composite cost needed to be partitioned between regular and exceptional programs. Costs were to be divided between programs by FTEs but this was not done due to the complexity and lack of information to complete the task. As with administrative costs, clerical and secretarial costs were prorated based upon the portion of instructional personnel allocated to each program.

The calculation of clerical and secretarial costs was accomplished quickly once costs were partitioned between programs. Per pupil costs were calculated for the regular program and added to the per pupil costs for each exceptional program to provide a total per pupil figure.

Teachers and Aides. Costs for teachers and aides included the costs associated with salaries and fringe benefits for direct instruction to students. Inputs

necessary for this component included student enrollment figures for each program and instructional salary costs. A composite instructional expenditure figure was available from the Annual School Report. From the composite figure it was necessary to subtract instructional costs for exceptional children, guidance, and library services. Instructional costs associated with the calculation of exceptional programs was a time consuming task. This information was identical to the information needed under the Larson Model.

Calculation of this component was relatively simple once costs were partitioned between programs. A separate per-pupil cost was computed for the regular and each exceptional program. Exceptional program costs are not added on, as with the administrative and clerical cost components.

Fringe Benefits. Fringe benefits include added costs to employee salaries for retirement, insurance, and social security. An average cost per certificated and non-academic employee was to be calculated and reported under the Rossmiller Model. This component was modified since necessary data were not available and an alternate procedure was considered more

accurate. A composite fringe benefit figure was reported on the Annual School Report. Fringe benefits were calculated by creating a ratio based on the salary for a particular staff category to the total salary for all personnel. The ratio was multiplied by the total amount spent for fringe benefits and added on the salary figure. As a result, fringe benefits were reported within the appropriate component rather than as a separate component.

Instructional Support: Supplies and Equipment. Costs for this component were those expenditures associated with supplies and equipment for instruction, exclusive of major capital equipment. Inputs for this component included costs for supplies and equipment for each program and enrollment figures. A composite figure was available from the Annual School Report by summing appropriate categories. Costs associated with exceptional programs needed to be subtracted from this composite figure.

Again the calculation of this component was easy once costs were partitioned between programs. A per-pupil cost for the regular program was calculated by dividing the expenditure for the regular program by the

regular district enrollment. Per-pupil costs for each exceptional program were added to the regular program per-pupil costs in order to produce an aggregate per-pupil cost for each program.

Instructional: Support Staff. Instructional support staff costs were those salary expenditures associated with library, guidance, and related services. Library and guidance costs were separated out when calculating instructional costs. Costs for related services needed to be prorated between exceptional programs based upon which exceptionalities were likely to benefit from the service. For example, it was assumed that all handicapped children would be evaluated at some point by a psychologist; therefore costs for psychological services were divided among exceptional programs based upon the number of handicapped children in each program. For occupational and physical therapy costs were assigned to the multi-handicapped, physically impaired, and part of the preschool program. This method of allocating related services costs was felt to be somewhat imprecise and possibly inaccurate method of assigning costs since it was not based upon actual pupil caseloads.

The calculation was accomplished quickly once input data were assigned. Per-pupil costs for guidance and library produced an average per-pupil cost which was shared equally among all programs. Per-pupil costs for related services by exceptionality were added on to create an aggregate per-pupil cost.

Institutional: Operation and Maintenance. This component included expenditures for plant operation and employee salaries. Input data could be found on the Annual School Report by summing a number of exclusive categories to produce a composite cost.

Calculation of this component was not possible using procedures outlined under the Rossmiller Model. Per-pupil costs for each exceptional program were to be based upon the reported number of square feet allocated each pupil in that program. This information was simply not available. An average per-pupil cost was calculated based upon the composite cost for operation and maintenance divided by the total district enrollment so that costs were shared equally.

Institutional Operations: Other. This component included items not previously reported in other components such as substitutes, adult education, and

prekindergarten. Input data were those costs remaining after other components were calculated.

Per-pupil costs were figured by dividing the composite cost by the district enrollment. This produced an average cost per-pupil which was shared equally among all programs.

Services. Services included health, attendance, and food. Although attendance was to be included in instructional support under the Rossmiller Model, it was decided to place attendance with health since the two categories were aggregated together in the Annual School Report.

Calculation of service components involved dividing the composite figure by the district enrollment to produce an average per-pupil cost. This cost was shared equally among all programs.

Transportation. Transportation costs were divided into inputs for special and regular transportation. Information regarding the number of students receiving regular and special transportation by program were also needed. These data were available and obtained from the Transportation Department within Norfolk Public Schools.

Calculation of this component was relatively easy although some assumptions were made due to a lack of clarity in directions. For exceptional student programs a total cost for each program was calculated based upon the number of children receiving special transportation. For handicapped children not receiving special transportation a prorated figure was added in based upon the regular per-pupil cost. This was necessary because it was obvious that some handicapped children received regular transportation.

Capital Outlay and Debt Service. Capital outlay and debt service involved costs for capital improvements. Under the Rossmiller Model these costs are not calculated into the total aggregate per-pupil costs but reported separately. Input data for these components were in separate categories on the Annual School Report and were easily calculated.

Summary and Comparison of Efficiency Considerations Between Models

Each model requires a considerable amount of time, energy, and effort to calculate special education program costs. Most of the effort was devoted to calculating discrete or direct costs. All these

expenditures must be separated by program in order to make accurate calculations of per-pupil costs. Both models require the same information in order to make these calculations. Raw data for pupils in programs, personnel assignments to programs, and expenditures by program are needed to complete a direct determination. In this respect the Larson and Rossmiller Models are similar with neither model having an advantage in efficiency.

Differences are seen mostly in the information necessary to compute indirect costs associated with the regular budget. The Rossmiller Model essentially uses a macro approach dividing costs between special education and regular education. A per-pupil cost for regular education is calculated and any additional costs for special education costs are added onto the regular per-pupil costs. Dividing these costs up and placing them into appropriate categories for calculation requires time and effort which is not needed under the Larson Model. For indirect costs under the Larson Model only overhead costs, which include administration, operation and maintenance, adult education, and fixed assets, which includes

capital depreciation of buildings, vehicles, and equipment, are needed. These data are readily available requiring no manipulation and are calculated as separate components rather than add-ons. For indirect costs the Larson Model appears to be more efficient.

In examining the processes of calculating costs under both models, it is evident that the Larson Model tends to be more sophisticated and complex as compared to the Rossmiller Model. The Larson Model presents a step-by-step approach for each line item. One feature unique to the Larson Model is the use of a multiplier for allocating shared costs. This is an important feature as it produces a systematic means of dividing shared costs. Under the Rossmiller Model shared costs are allocated by determining the percentage of time that a person spends in a program. This is a difficult method for distributing costs because allocation of expenditures for each position would have to be determined, for example, by a log. Although the Larson Model tends to be longer and more complex in making calculations, it appears to provide more clarity for the user; thus giving the Larson Model an edge in

efficiency for the processes involved in making program calculations.

Research Question 2: How do the Rossmiller and Larson Models compare in effectiveness?

Effectiveness in this study was defined as producing the desired outcome which was comprehensive and accurate cost data. Effectiveness was considered to be an important aspect in evaluating the two models as accurate and reliable information is needed in order to make informed decisions regarding special education programs. Three comparisons were made between the two models in order to judge effectiveness. First, a comparison was made between the actual cost data produced by the models. Second, a comparison of the estimations, lack of data to complete the models, and missing components were made. Third, feedback from school personnel comparing the two models is reported.

A summary of aggregate per-pupil costs by program under the Larson Model are presented in Table 3. Aggregate per-pupil costs are comprised of the four cost components: Discrete Costs, Transportation Costs, Overhead Costs, and Fixed Assets (Appendix E). Related

Table 3

SUMMARY OF AGGREGATE PER PUPIL COSTS USING LARSON MODEL

	Per Pupil Costs
Deaf	$8615
Multi-handicapped	8513
Dev. Delayed (2-5 years)*	6954
Emotionally Disturbed	6280
Trainable MR	6005
Speech (self-contained)	5489
Hearing Impaired	4913
Educable MR	4240
Learning Disabled (self-contained)	3734
Physically Impaired	3300
Visually Impaired	3193
Learning Disablity (resource)	3173
Homebound/Other Health	2851
Speech (resource)	1984

*noncategorical placement

Services are not figured into the aggregate per-pupil cost but are reported separately (Appendix F). Discrete costs are divided into Instruction, Administration, and Support Cost centers. Each cost center is further subdivided into salaries and fringe benefits for personnel and miscellaneous, which includes materials and supplies, equipment, travel, and contract services. Components are added together to produce the aggregate per-pupil cost by program.

Per-pupil costs by program under the Larson Model range from a low of $1984 for Speech (resource) to a high of $8615 for Deaf programs. It should be noted that these costs are those which may be attributed to special education and are not necessarily the total educational costs for children in certain programs. For example, for handicapped children who are served on a resource or itinerant basis the cost figure reflects an add-on to the cost of the regular education program and not the entire cost of a child's educational program. This is important to note as costs for some special education programs, such as Speech (resource), may actually be less expensive than costs associated with children in the regular program.

A summary of aggregate per-pupil costs by program under the Rossmiller Model are presented in Table 4. Aggregate per-pupil costs are comprised of six components: Management, Instruction, Instructional Support, Institutional Operation, Services, and Transportation (Appendix G). Components are added together to produce an aggregate per-pupil cost by program. Capital Outlay and Debt Service are reported but not calculated in total per-pupil costs.

Per-pupil costs by program under the Rossmiller Model range from a low of $2293 for Speech (resource) to a high of $11030 for Multi-handicapped programs. Per-pupil costs for the regular program were calculated at $3200. The cost differential was computed by dividing each special education per-pupil cost by the regular education per-pupil cost. The cost differential reflects the degree to which a special education program was more (or less) expensive than the regular program. For example, a cost differential of 2.00 would indicate that the special education program was twice as expensive as the regular program.

In order to make a judgment regarding the effectiveness of the models a comparison of cost

Table 4

SUMMARY OF AGGREGATE PER PUPIL
COSTS USING ROSSMILLER MODEL

	Per Pupil Costs	Cost Differential
Multi-handicapped	$11030	3.44
Deaf	9090	2.84
Dev. Delayed (2-5 years)*	7945	2.48
Emotionally Disturbed	6774	2.12
Trainable MR	6311	1.97
Speech (self-contained)	6048	1.89
Hearing Impaired	5430	1.69
Educable MR	4744	1.48
Learning Disabled	3906	1.22
Physically Impaired	3818	1.20
Visually Impaired	3676	1.15
Speech (resource)	2293	.72
Regular	3200	

*noncategorical placement

figures produced by the models was made. When comparing the per-pupil costs calculated by both models two observations were made. First, when comparing the relative position of the programs as to cost, the rank order between programs remains the same for the two models with the exception of Multi-handicapped and Deaf (i.e., Developmentally Delayed is more expensive than Emotionally Disturbed, Emotionally Disturbed is more expensive than Trainable MR, and so on). Second, the Rossmiller Model shows higher costs for programs as compared to the Larson Model. A significant difference between the two models is that related services are figured into the Rossmiller Model under the Support component, while related services are calculated separately and are not figured into the aggregate per-pupil cost under the Larson Model. A cost difference is computed by subtracting per-pupil costs for each program under the Larson Model from the per-pupil costs for each program under the Rossmiller Model (Table 5). The per-pupil costs of related services assigned to the Support component under the Rossmiller Model are also reported. An analysis of these two figures indicates that approximately 91% of the difference

Table 5

AN ANALYSIS OF COST DIFFERENCES BETWEEN THE ROSSMILLER AND LARSON MODELS

	Difference Score* (Rossmiller minus Larson)	Assigned Related Services Costs to Rossmiller Model
Multi-handicapped	2517	2506
Deaf	557	439
Dev. Delayed	991	1011
Emotionally Disturbed	494	439
Trainable MR	306	438
Speech (self-contained)	560	338
Hearing Impaired	517	438
Educable MR	504	438
Physically Impaired	518	358
Visually Impaired	483	358
Speech (resource)	309	339

*LD and Homebound programs not included

between the two models can be accounted for by related services costs. In conclusion, it would appear that both models produce essentially the same cost figures for special education if related services costs are taken into account.

A second comparison in judging the effectiveness of the two models was the availability of precise data to make computations and an evaluation of any missing data elements. Precise data were available for calculation of special costs under the Larson Model. The only difficulty using the Larson Model arose in making calculations for related services. The cost for related services is to be divided between therapy and evaluation. The information necessary to make this distinction was not available. In addition, caseloads for related services personnel had to be estimated.

Precise data to make special education cost calculations were also available for the Rossmiller Model. The only piece of information not available was number of square feet allocated to each pupil in programs so that calculations for Operation and Maintenance could be made. As a result operation and maintenance costs were allocated equally across all programs.

A comparison was also made between the two models in terms of budget elements which were included in one model but not in the other. One striking difference is the inclusion of fixed assets under the Larson Model. This element added $413 per pupil costs to the Larson Model result which was not included in the Rossmiller Model product. A capital outlay and debt service figure were calculated under the Rossmiller Model but per-pupil costs were not figured into to total per-pupil figure.

A number of elements were included in the Rossmiller Model which were not included into the Larson Model. These elements included costs for food service ($212), health and attendance ($42), supply and material costs from regular education which were added into special education ($79), and guidance and library ($75). These elements came to a total of $408. Apparently these differences tended to offset each other when calculating total costs.

A third comparison in making a judgement regarding the effectiveness of the two models was feedback from key school personnel regarding the information produced by the two models. Interviewees indicated that the

cost data provided for special education programs were currently not available. The information was felt to be valuable for a number of reasons. First, cost data regarding special education programs would be most helpful for defending budgetary decisions and projected needs for the following school year. Budgeting for the next school year is typically based upon the current budget, a projection of increased costs, and any additions which may be needed to programs for the following year. The process is political in that needs must be defended before approval is received. Cost data would appear to be valuable in defending the special education budget in light of the significantly higher costs which are incurred by special education. Second, cost data for special education programs would assist decision makers in determining cost-effectiveness issues and setting tuition charges. Handicapped children are sent by other districts on a tuition basis so that a charge needs to be assessed. Cost data would help in determining how much should be assessed. Third, decisions need to be made for some handicapped children regarding placement in private schools or placements in residential or day programs

run by the school district. Cost data would assist in making a judgment regarding the most cost effective way to do this. Fourth, available cost data would provide cross-checks for reports prepared for state and federal governments.

The interviewees expressed difficulty in making judgments regarding the accurateness of cost data produced by the study as there was little information within the school district to make a comparison. It was noted that per-pupil cost for regular education students calculated under the Rossmiller model was within $100 of what the district calculated the per-pupil cost to be. Since the per-pupil cost for regular education is used as a base for add-ons to project special education costs, it may be assumed that aggregate cost figures are reasonably accurate. A judgment between the two models was necessary since the cost data produced by the two models were nearly identical. One interviewee did indicate that the information produced by the Larson Model did make more sense as the actual cost for any one child could be determined by the base cost plus any related services costs. Per-pupil costs under the Rossmiller Model

could mask the actual cost for any one child as the total costs for related services were averaged across all handicapped children within a program rather than allocated to those children directly served by any particular related service.

Summary and Comparison of Effectiveness Considerations Between Models

In making comparisons between the two models effectiveness was judged according to the following criteria: actual cost figures produced by both models, evaluation of estimations and differences in data content between models, and interview feedback. The actual dollar amount for special education programs was judged to be similar between models, when the cost of related services was taken into consideration. This was probably the most important consideration to note when making an effectiveness evaluation of the two models.

Few estimations were needed to make calculations under both models. Related services was the most difficult area to calculate because estimations of caseloads and proration of expenditures was necessary using both models. Related service costs were figured

into the Rossmiller model tending to make aggregate per-pupil costs higher than under the Larson model. However, this method of allocating was considered less precise by interviewee opinion. This was because related service costs were spread across program and estimations had to be made in regard to which program the related service was assigned. Operation and maintenance costs under the Rossmiller model could not be assigned by the average number of square feet utilized by each special education program. On the basis on this criterion the Larson model was superior.

Some differences between components were evident when comparison were made for data elements between models. The Larson model included costs for fixed assets which were not included in the Rossmiller Model. The Rossmiller Model included costs for food service, health and attendance, supplies and materials from regular education, and guidance and library. Over one-half of the difference was due to food services, which may be argued as to whether or not it constitutes an actual cost to the school district. These differences tend to offset each other in producing an actual aggregate per-pupil cost. On the basis of this

criterion no particular conclusion regarding effectiveness may be made.

Information gathered through the interviews would indicate that actual cost data are not available but would be useful for the budget process, for determining cost-effectiveness issues, for determining charges for tuition, and as a validation check on reports which need to be prepared for the state and federal governments. The accuracy of the cost figures produced by both models was hard for the interviewees to judge, although it should be noted that costs calculated for regular education were similar to those calculated by the school district. Both models may be judged equally effective on the basis of this criterion with each apparently producing accurate and needed information.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to evaluate the efficiency and effectiveness of the Larson Model for determining special education costs by comparing it to the Rossmiller Model. The first part of this chapter is devoted to discussing issues relating the results of this study to previous research and issues which arose in the process of conducting this study. Conclusions are drawn from comparisons of the two models in the second section of the chapter. Finally, recommendations for modifying the Larson Model and recommendations for further research are offered in the last section.

Discussion

The 1975 Federal Education for All Handicapped Children Act, P.L. 94-142, as well as other legislation and federal and state court rulings, have stimulated the provision of appropriate special education for all handicapped children. Litigation and legislation have not only influenced special education service delivery

but also the cost of special education. By law handicapped children must be served in the public school if at all possible and by virtue of their special needs special arrangements must be made to provide educational services. This entails a higher cost. Burrello and Sage (1979) suggest that the only way to treat children equally is to disperse funds unequally in order to meet handicapped children's unequal needs for differing objectives or outcomes.

Despite the overwhelming need for accurate cost data regarding the cost of special education, a dearth of systems are available to compute costs. Howe (1981) notes that few well-designed research studies on the financing of special education exist. A number of problems associated with making cost determinations have contributed to this situation.

The biggest problem in the past has been the lack of data to make meaningful cost analyses (Kakalik, 1979). Bernstein et al. (1976) in discussing the National Education Finance Project (NEFP) studies, which followed the Rossmiller methodology, note that the researchers had to reconstruct school district records in order to allocate expenditures to the

various programs because most districts accounted for expenditures by function (for example, salaries, supervision, etc.) rather than by program. With the push toward better accounting procedures and more sophisticated ways of collecting data this problem should be alleviated. One consideration in choosing a site for the present study was that expenditures for special education programs were available. The Financial Management Information System utilized by Norfolk Public Schools was found to be sufficient for providing accurate cost data as few estimations were needed to make calculations. The only exception was in the related services area which was also identified by Larson (1985) in the formation of his model as an area deficient of accurate data in the districts sampled. The implication of this problem is that school districts may need to utilize better information collection procedures for related services in order to accurately assign costs.

A second problem associated with making cost determinations of special education programs has been the treatment of shared and indirect costs. Shared or joint costs are those costs which may not be attributed

directly to any one special education program but are direct costs to special education in general. For example, secretarial and administrative costs for special education contribute to the direct costs of special education and, yet, need to be divided between programs. Indirect costs are those costs which are diffused throughout the regular and special education budgets as, for example, fixed assets and plant operation and maintenance.

In comparing the models, indirect and joint costs are best addressed by the Larson Model. The Larson Model provides a systematic means for prorating these costs through the use of a multiplier. The multiplier varies depending upon which cost is being prorated, but it is typically calculated by creating a ratio based upon the number of instructional personnel (or children) in a program divided by the total number of instructional personnel (or children) in regular (or special) education. For example, when allocating the shared cost of a special education administrator a multiplier is created by dividing the number of special education personnel in a program by the total number of special education personnel across all programs. The

costs associated with that position can be divided between programs by applying the multiplier for each program by the total costs.

A third problem associated with cost studies has been the difficulty in making cost comparisons across districts and variances in the cost of resources over time. This is essentially a problem in standardization which is helpful in viewing cost data from a broader perspective. Rossmiller et al. (1970) addressed this problem through the use of a cost index. The cost index was figured by calculating the ratio of the average cost of a special education program per-pupil by the average cost of regular education per-pupil. The main criticism of this procedure is that by tying the index to the cost of regular education, the cost index could depict variations in the regular education program rather than variations in special education costs. For example, two districts which spend the same amount of money for special education would have different cost indices if regular education expenditures varied. Although some caution should be used when making comparisons using cost indices, this method is probably the best system available to make

comparisons across time and district boundaries.

The Rossmiller Model may have one slight advantage over the Larson Model because the per-pupil cost of regular education is calculated under the Rossmiller Model which in turn permits the calculation of cost indices for special education programs. However, it should be noted that the Larson model could be easily modified to calculate regular education per-pupil costs by discounting special education and vocational education from the budget and dividing the remainder by the number of regular students.

Kakalik et al. (1981) noted wide variances in the cost of programs for special education depending upon the condition, environment, and age of the children being served. One criticism leveled at the Rossmiller study was that it only computed costs by condition, or the category of disability, without taking into account other factors, like age and environment, in describing special education program costs (McCarthy & Sage, 1982). The Larson Model is more sensitive to this problem in that the model is designed to calculate costs by condition and environment, although it should be noted that the Rossmiller Model could be easily

modified to provide this information. The difficulty in making models for determining special education costs more sensitive to age, condition, and environment comes back to the problem of data availability. Either the Rossmiller or Larson Models could be modified to delineate these factors if costs can be determined for each programing arrangement. Only two conditions (Speech and LD) could be determined by environment (resource and self-contained). The collection of data through the use of full-time equivalences (FTEs) would greatly facilitate the calculation of special education program costs, although it should be noted that the collection of such information is not required in Virginia.

The purpose of this study was to evaluate the efficiency and effectiveness of the Larson Model in determining special education costs by comparing it to the Rossmiller Model. In terms of effectiveness the most striking finding is that both models produce similar costs, if the cost of related services is taken into account. Under the Rossmiller Model related service costs are figured directly into the aggregate cost per-program, while related services are figured

separately under the Larson Model. Clearly, the cost of these supportive services is a significant factor in the higher cost of special education programs. Unfortunately, data in regard to the number and, especially, the handicapping condition of the pupils served by related services made calculations less precise. Under the Rossmiller Model it was necessary to make a "best guess" as to where and how much of a related service cost should be assigned to each program. This was less of a problem using the Larson Model since it was not necessary to assign costs by handicapping condition of the pupils served, only by caseload.

Efficiency was an important consideration in making a comparison between the Rossmiller and Larson Models. The Larson model was judged slightly more efficient in this study. Two factors were important in arriving at this conclusion. First, indirect costs were easier to calculate using the Larson Model. The Rossmiller Model required the calculation of regular education costs for each component as a base before special education costs could be aggregated. This tended to be a cumbersome and lengthy process in

dividing costs from reports which aggregated special and regular education expenses. For the Larson Model less information and more clarity was evident as indirect costs required fewer components which were easier to access. Indirect costs for transportation, overhead, and fixed assets were the only components needed to complete the Larson Model. Second, the Larson Model tended to be an easier process to use as calculations follow a step-by-step approach. The use of the multiplier, which was previously mentioned, contributed to the ease of assigning costs and making calculations.

Even though the Larson Model was judged to be slightly more efficient it is important to note that both models require a considerable amount of time and effort to compile the information necessary to determine the direct costs of special education. Information regarding personnel assignments, pupil assignments to programs, and expenditures by program were necessary to complete direct cost calculations under both models. Two-thirds to three-fourths of the time needed for data collection was involved in compiling direct cost information and in the process of

making calculations for determining special education costs. When viewed from this perspective, neither model would appear to more efficient than the other.

The usefulness of either model in the field must be analyzed by the time and effort involved in determining special education costs versus the utility of such information. Making a cost determination study is a complex undertaking which may be beyond many local districts' capabilities or needs. Certainly an important factor in undertaking such an enterprise would be the sophistication of the data collection procedures utilized by the LEA. Larson (1985) notes in recommendations based upon his study that a less precise, less complex procedure may be needed for gross estimations of costs if the model is determined inefficient.

McClure et al. (1975) found that the instructional unit (the number of students assigned to a certified teacher) was the only important factor in examining cost differentials. The disability label made no difference except in such areas as transporting the physically handicapped. McClure recommended that the pupil-teacher ratio be used as the measure to compute

costs. Rossmiller et al. (1970) also analyzed the cost by function and found that the largest single component for the cost of special education programs was instruction.

In examining the cost data obtained using the Larson Model it is clear that personnel costs contributed to a large percentage of the total cost of special education. An analysis of the percentage of per-pupil cost which can be directly attributed to special education personnel is presented in Table 6. Personnel costs for special education range from 93% to 99% of the discrete costs. This includes salaries and benefits for instructional, administrative, and support personnel. For the total aggregate per-pupil costs 31% to 69% of the costs are related to personnel costs, not including salaries for personnel associated with indirect costs. The variance in total costs are primarily dependant upon the pupil/teacher ratio. For example, multi-handicapped has the highest percentage of personnel costs while speech (resource) has the lowest percentage.

An important finding in evaluating the efficiency of the models was that neither model was particularly

Table 6

THE PERCENTAGE OF PER-PUPIL COSTS ATTRIBUTABLE TO PERSONNEL UNDER THE LARSON MODEL

Program	Percentage of Discrete	Percentage of Total
Emotionally Disturbed	99	68
Trainable MR	98	59
Deaf	93	68
Dev. Delayed	98	65
Educable MR	96	57
Multi-handicapped	96	69
Hearing Impaired	94	58
LD (resource)	97	54
LD (self-contained)	98	61
Visually Impaired	99	57
Speech (self-contained)	99	57
Speech (resource)	99	31

efficient when examined in terms of the time and effort involved in making a cost study of all special education programs in a school district. Most of the effort was directed toward computing discrete costs while indirect costs took a relatively short amount of time and effort. The fact that personnel costs constitute a very large percentage of discrete costs may prove a means of making gross calculations of special education cost as other discrete costs do not make a large contribution. This would appear to be an area open for further study.

Obtaining accurate and comprehensive cost data for special education programs is important for a number of reasons. First, cost data are needed to help improve policymaker's ability to make informed choices regarding the allocation of resources (Kakalik et al., 1981). This information is important to help determine the amount of funds for the budget, to set policies which encourage the most cost-effective practices, and to help federal and state policymakers adjust funding formulae to match local needs and to reduce incentives for inappropriate classifications. Second, cost data are required for reporting purposes. In order to

receive federal flow-through monies, local school districts must submit an application to the state education agency which include assurances regarding excess cost requirements (34 C.F.R. 300.229), nonsupplanting of local funds (34 C.F.R. 300.230), and the use of Part B funds (34 C.F.R. 300.238). Congress and the Office of Special Education Programs in the U.S. Department of Education have been particularly interested in determining the costs of special education and related services (Sixth Annual Report, 1984).

Rossmiller (1970) noted that his cost indices were valid to the extent that data were retrievable given the sophistication of school district accounting procedures at the time of the study. He further reported what he considered to be "reasonable" ranges which could be used for local school district budgeting and planning for new programs. The Larson (1985) Model utilizes more sophisticated data, in most instances, subject the electronic data processing capabilities developed in the past 15 years. The budgeting and planning process at the local school district level should be enhanced by the more sophisticated accounting

systems of today. While the Larson Model still relies on some estimation and arbitrary decisions, far fewer decisions were required than in the Rossmiller study. Cost data such as that yielded by the Larson Model should be, for example, extremely useful in setting tuition costs in those districts which serve handicapped children from other districts and for evaluting placement of handicapped children in other placements, such as residential settings.

Conclusions

The cost of special education programs in Norfolk Public Schools was computed using two models, the Rossmiller and Larson Models. The Rossmiller et al. (1970) study developed a method which has been used in numerous studies. The Rossmiller Model is a macro approach calculating special education costs by separating special education costs from regular education costs. Special education costs tend to become add-ons to regular education. Larson (1985) developed a model which takes a micro approach constructing special education costs around five components: discrete, fixed assets, overhead, transportation, and related services. Comparisons were made between the two models by evaluating effectiveness

and efficiency considerations. The following conclusions were derived from the study:

1) Determining the cost of special education programs is a lengthy and involved process. Both the Rossmiller and Larson Models require that expenditures be separated for special education programs, pupil counts be established, and personnel assignments determined. The availability of the data is an important consideration in this area. The cost accounting system utilized by the school district determines how much time and effort are involved. This is an efficiency issue which must be determined on a case-by-case basis.

2) The Larson Model is more efficient in calculating indirect costs. Fixed assets, transportation, and overhead costs for administration, operation and maintenance, and adult education are the only components which need to be obtained in order to make calculations for indirect costs. The Rossmiller Model requires that regular and special education costs be separated for the entire budget with special education being added to regular education costs.

3) Generally speaking the Larson Model is more sophisticated in making calculations as compared to the

Rossmiller Model. This would appear to be an advantage for the Larson Model because it presents a step-by-step approach to calculations that requires less of a conceptual understanding of the processes involved. The biggest advantage that the Larson Model holds over the Rossmiller Model is the use of a multiplier for prorating shared costs. The multiplier is derived by creating a proportion based upon the number of personnel or students in a program to the total number of personnel or students in special or regular education, depending upon which position is being prorated. Costs are allocated under the Rossmiller Model by determining the percentage of time positions are assigned to any particular program, which was found to be an impratical method for determining shared costs.

4) Both models tended to produce similar cost data when related service costs were taken into consideration. Related service costs are calculated directly into aggregate per-pupil figures under the Rossmiller Model. The Larson Model treats related services as a separate component. The Larson Model appeared to be a better method of dealing with related

service costs because costs reflected caseloads rather than spreading the costs across special education programs program enrollment, as under the Rossmiller Model. Costs to any one individual student can be more accurately projected by adding onto the basic cost of the program and any extra related services that the student may receive.

5) Few estimations were required using either model. Related services were the most difficult area to calculate under both models because of the lack of data and the need to divide costs between programs and related services. For example, a speech therapist may provide direct speech services to children identified as speech impaired and at the same time provide related services to children served in other special educational programs. Operation and maintenance costs could not be divided by square foot usage per-pupil in each program under the Rossmiller model. Costs had to be assigned on an equal basis.

6) Some differences were evident between elements calculated under each model. The Larson Model figures fixed asset costs into aggregate per-pupil costs while the Rossmiller Model does not. Food services, health

and attendance, library and guidance, and supplies and material as a base for regular education are included in the Rossmiller Model but not in the Larson Model. However, the costs appear to offset each other in the final aggregate.

7) Information regarding the cost of special education was not available to the school district used as the sample for this study. Interviewees questioned during the course of the study indicated that special education program costs were important for defending the special education budget, validating reports which must be filed to the state and federal governments, establishing tuition payments, and evaluating the cost-effectiveness of similar programs.

Recommendations

The Larson Model appears to have an advantage over the Rossmiller Model when comparisons were made between the two models. In terms of effectiveness both models produced similar cost figures for special education programs but the Larson Model requires fewer estimates be made and treats related service costs in a more representative fashion, as related services are

calculated as a separate cost component. The area of greatest advantage for the Larson Model is efficiency as long as the needed data are available. Under the Larson Model indirect costs are easier to calculate and shared costs are easier to allocate through the use of the multiplier, which is unique to the Larson Model. The following recommendations are made in order to improve the Larson Model:

1) The calculation of transportation costs should not be calculated by summing together per-pupil costs from the three cost centers since each cost center uses a different base. Total costs for each cost center per-program should be aggregated initially and then divided by the number of handicapped children by program in order to create aggregate per-pupil program costs.

2) Furniture and equipment should be added to Fixed Assets as another cost center. For the present study over $25 million were added into the Fixed Assets component and depreciated over eight years. Furniture and equipment constituted a significant factor which needed to be figured in along with vehicles and school plant. Furniture and equipment should be added as another cost center to the Fixed Assets component.

3) Related services is an added (and significant) cost to the program of some handicapped children. Not all handicapped children benefit from related services. Rather than have the cost of related services diffused across programs, the Larson Model calculates related services on a per-service basis without figuring the cost into aggregate per-pupil costs. This would appear to be a sensible approach. However, related services was also an area for which accurate data was difficult to obtain. A therapy and evaluation cost center is to be calculated which appears to be beyond the type of information available. In most cases a related service, such as speech or diagnostic services, is predominantly either therapy or evaluation so that the distinction of therapy or evaluation becomes meaningless. To improve the efficiency of the Larson Model it is recommended that related services be calculated without breaking the costs into therapy and evaluation cost centers unless it is predetermined that the data are available and the information is needed.

4) Several differences were noted in costs that were included in the Rossmiller Model but not in the

Larson Model. These differences included food services, health and attendance, library and guidance, and the base cost for materials and supplies from regular education. These differences should be examined to determine whether or not these costs should be added to the model.

5) Kakalik et al. (1981) determined that condition environment, and age of the child all contributed to significant variations in costs of special education programs. The Larson Model currently is equipped to calculate special education costs by condition and environment. With some rather simple modifications the Larson Model could be changed to also calculate special education costs by age. Of course, the usefulness of this modification would be contingent upon data availability.

The following recommendations are offered for further study:

1) The Larson Model was developed to determine the cost of special education programs in Virginia. The model should be tested in other states to see if it can be applied to other settings. Another study is currently being conducted in Maryland.

2) One finding of the study was that cost determinations are not particularly efficient when viewed from a broad context. Most special education directors and their staff do not have the resources availabled to conduct an in-depth cost determination. Simplified methods of determining special education costs should be explored. The relatively high proportion of personnel costs for special education may be a means for making gross estimations, as was noted in the discussion section.

3) The Larson Model should be packaged with directions, forms for data collection, and computer software if the model is to be a useful technique for field use. Further evaluation of user skills and training is needed to determine the practicality of the models use in the field.

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APPENDICES

Appendix A

DATA COLLECTION CHECKLISTS FOR THE LARSON AND ROSSMILLER MODELS

Data Collection Checklist for Larson Model

Student Data

1. Number of students in special education

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Number of special education students per condition and environment

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Number of students receiving special ed. transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Number of students receiving special ed. transportation per condition and environment

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

5. Number of students receiving special ed. transportation from parents

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

6. Number of students receiving special ed. transportation from parents per condition and environment

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

7. Number of students receiving regular transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

8. Number of students enrolled in school district

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

9. Number of students receiving related services evaluation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

10. Number of children receiving related services therapy

Personnel Data

1. Number of instructional personnel

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Number of special ed. instructional personnel

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Number of teachers/aids assigned to each supervisor/administrator

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Number of pupils assigned to each teacher

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

5. Percentage of time to duties in special ed. by each supervisor, administrator, and support personnel

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

6. Percentage of time to duties between evaluation and therapy for related services personnel

Cost Data

1. Gross salaries for personnel

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Fixed charges for personnel

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Expenditures for general administration

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Expenditures for general maintenance and operation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

5. Expenditures for general adult education

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

6. Appraised value of all buildings

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

7. Appraised value of all buses

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

8. Expenditures for materials and supplies per spec. ed position

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

9. Expenditures for equipment per spec. ed. position

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

10. Expenditures for travel per spec. ed. position

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

11. Expenditures for contract services per spec. ed. position

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

12. Total expenditures for special transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

13. Contract payments to parents for special transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

14. Total expenditures for transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

Data Collection Checklist for Rossmiller Model

Student Information

1. Total district pupil membership

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Pupil membership per spec. ed. program

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Number of pupils receiving transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Number of spec. ed. students receiving transportation

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

Personnel Information

1. Salaries for personnel per spec. ed. program

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Salaries for certified personnel in regular ed.

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Salaries for noncertified personnel in regular ed.

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Total number of classroom teachers

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

5. Number of certified staff (administration, counselors, psychologists, social work, health

services, mantenance, food service, transportation)

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

6. Number of certified staff

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

7. Number of noncertified staff

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

8. Average fringe benefits

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

9. Salary payments to persons on leave of absense and to substitutes

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

Operating Costs

1. Total expenditues for instructional supplies

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

2. Total expenditure for maintenance exclusive of salaries

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

3. Total transportation operating costs exclusive of salaries

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

4. Total cost for food service exclusive of salaries

____available ____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

5. Total debt service expense

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

6. Total expenditure for capital outlay

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

7. Space allocated per spec. ed. program

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

8. Total expenditure for operation of plant

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

9. Equipment and material costs per spec. ed. program

_____available _____estimation

Source_____

Difficulty and/or ease of obtaining information_____

_____

Appendix B

IMPLEMENTATION EVALUATION OF LARSON AND ROSSMILLER MODELS

1. Are there expenditures which do not fit into the model?_____

_____

2. Is it clear where all data fit in the model?_____

_____

3. Are pieces of data represented more than once in the model?_____

_____

4. Are the steps or procedures to be used in the model ambiguous?_____

_____

Appendix C

INTERVIEW EVALUATION OF LARSON AND ROSSMILLER MODELS

1. On what basis do you currently make budgetary decisions for special education?

2. Is present information sufficient to make planning and budgetary and planning decisions?

3. Based upon your experience in working with special education budgets which of the two data reports given to you appears to be the most accurate? Why?

4. Do the cost data supply you with the necessary information for internal reports (budget planning, reports to superintendent & school board)?

5. Do the cost data supply you with the necessary information for external reports (e.g., state dept., feds)?

6. What kinds of decisions could you make with this information?

7. How different is this information from the information base you currently use?

8. Is the information supplied more detailed than you really need?

9. Do the cost data supplied give you any information which you did not already know?

10. Assuming that you had control, what changes would you make in special education program given the information provided?

Appendix D

CATEGORICAL LISTING OF HANDICAPPED PUPILS SERVED IN NORFOLK PUBIC SCHOOLS BY CONDITION

Handicapped Pupil Count in Norfolk Public Schools

	Number of Pupils
Learning Disabilities	1784
Speech (resource)	1087
Educable Mentally Retarded	554
Emotionally Disturbed	282
Trainable Mentally Retarded	157
Developmentally Delayed (2-5 years)*	117
Multi-handicapped	93
Visually Impaired	51
Hearing Impaired	45
Deaf	34
Physically Impaired	31
Speech (self-contained)	30
Homebound	21
TOTAL	4286

*noncategorical placement

Appendix E

SUMMARY OF COMPONENT COST PER PUPIL USING LARSON MODEL

Larson Model Component Costs

	Deaf Cost/Pupil	Multi Cost/Pupil
Discrete Costs		
Instruction		
Salaries	5387	4924
Misc	334	160
Administration		
Salaries	363	580
Misc	26	30
Support		
Salaries	129	440
Misc	24	27
Transportation Costs	1124	1124*
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	8615	8513

* adjusted upward

Larson Model Component Costs

	Dev. Delay Cost/Pupil	ED Cost/Pupil
Discrete Costs		
Instruction		
Salaries	4084	3978
Misc	22	45
Administration		
Salaries	292	214
Misc	24	21
Support		
Salaries	158	102
Misc	22	19
Transportation Costs	1124	673
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	6954	6280

Larson Model Component Costs

	TMR Cost/Pupil	Speech (self-contained) Cost/Pupil
Discrete Costs		
Instruction		
Salaries	2773	3004
Misc	24	11
Administration		
Salaries	226	54
Misc	17	10
Support		
Salaries	598	49
Misc	15	9
Transportation Costs	1124	1124
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	6005	5489

Larson Model Component Costs

	Hearing Im. Cost/Pupil	EMR Cost/Pupil
Discrete Costs		
Instruction		
Salaries	2764	2249
Misc	168	67
Administration		
Salaries	67	116
Misc	9	11
Support		
Salaries	43	56
Misc	8	10
Transportation Costs	626	503
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	4913	4240

Larson Model Component Costs

	LD (self-contained) Cost/Pupil	Physically Im. Cost/Pupil
Discrete Costs		
Instruction		
Salaries	2153	1296
Misc	27	32
Administration		
Salaries	106	69
Misc	10	13
Support		
Salaries	46	99
Misc	9	13
Transportation Costs	155	550*
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	3734	3300

* adjusted upward

Larson Model Component Costs

	Visually Im. Cost/Pupil	LD (resource) Cost/Pupil
Discrete Costs		
Instruction		
Salaries	1737	1592
Misc	3	27
Administration		
Salaries	29	106
Misc	5	10
Support		
Salaries	29	46
Misc	5	9
Transportation Costs	105	155
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	3193	3173

Larson Model Component Costs

	Home./Other Cost/Pupil	Speech (resource) Cost/Pupil
Discrete Costs		
Instruction		
Salaries	1401	588
Misc	17	2
Administration		
Salaries	103	40
Misc	19	3
Support		
Salaries	70	14
Misc	13	3
Transportation Costs	0	106
Overhead Costs	815	815
Fixed Assets Costs	413	413
Aggregate Costs	2851	1984

Appendix F

AGGREGATE PER PUPIL COSTS FOR STUDENTS RECEIVING RELATED SERVICES USING LARSON MODEL

Related Services Costs Using Larson Model

	Cost Per Pupil Served
Vocational Education	
Salary	945
Misc. (travel, supplies, etc.)	16
Speech	
Salary	579
Misc. (travel, supplies, etc	11
Occupational Therapy	
Salary	542
Misc. (travel, supplies, etc.)	23
Physical Therapy	
Salary	527
Misc. (travel, supplies, etc.)	23
Psychologists	
Salary	223
Misc. (travel, supplies, etc.)	2
Ed. Diagnosis	
Salary	215
Misc. (travel, supplies, etc.)	2
Psychiatric	160
Visiting Teachers	
Salary	154
Misc. (travel, supplies, etc.)	0
Health	
Salary	57
Misc. (travel, supplies, etc.)	2

Appendix G

SUMMARY OF COST COMPONENTS PER PUPIL USING ROSSMILLER MODEL

Rossmiller Model Component Costs

	Multi-handicapped Cost/Pupil	Deaf Cost/Pupil
Management		
Administration	803	584
Secretarial	564	254
Instruction		
Teachers & Aides	4899	5387
Instructional Support		
Supplies & Mat.	296	464
Staff (guidance & library; related services)	2581	514
Institutional Oper.		
Oper. & Maint.	430	430
Other (subs, adult ed.,etc)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	1124	1124
Total-- current operation	11030	9090
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	Dev. Delay Cost/Pupil	ED Cost/Pupil
Management		
Administration	515	437
Secretarial	283	227
Instruction		
Teachers & Aides	4028	3958
Instructional Support		
Supplies & Mat.	146	164
Staff (guidance & library; related services)	513	514
Institutional Oper.		
Oper. & Maint.	430	430
Other (subs, adult ed., etc)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	1124	711
Total-- current operation	7945	6774
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	TMR Cost/Pupil	Speech (self-contained) Cost/Pupil
Management		
Administration	450	450
Secretarial	206	174
Instruction		
Teachers & Aides	2773	3005
Instructional Support		
Supplies & Mat.	141	119
Staff (guidance & library; related services)	854	413
Institutional Oper.		
Oper. & Maint.	430	430
Other (subs, adult ed.,etc)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	1124	1124
Total-- current operation	6311	6048
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	Hearing Impaired Cost/Pupil	EMR Cost/Pupil
Management		
Administration	290	338
Secretarial	168	180
Instruction		
Teachers & Aides	2764	2227
Instructional Support		
Supplies & Mat.	264	168
Staff(guidance & library; related services)	513	513
Institutional Oper.		
Oper. & Maint.	430	430
Other(subs, adult ed ,etc.)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	668	555
Total-- current operation	5430	4744
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	Learning Disabled Cost/Pupil	Physically Impaired Cost/Pupil
Management		
Administration	329	293
Secretarial	171	219
Instruction		
Teachers & Aides	1776	1296
Instructional Support		
Supplies & Mat.	116	141
Staff(guidance & library;related services)	514	430
Institutional Oper.		
Oper. & Maint.	430	430
Other(subs, adult ed, etc.)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	237	673
Total-- current operation	3906	3818
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	Visually Impaired Cost/Pupil	Speech Cost/Pupil
Management		
Administration	304	252
Secretarial	154	138
Instruction		
Teachers & Aides	1736	448
Instructional Support		
Supplies & Mat.	94	87
Staff(guidance & library; related services)	430	413
Institutional Oper.		
Oper. & Maint.	430	430
Other(subs, adult ed, etc)	79	79
Services		
Health & Attendance	42	42
Food	212	212
Transportation	192	192
Total-- current operation	3676	2293
Capital Outlay/ADM	37	37
Debt Service/ADM	76	76

Rossmiller Model Component Costs

	Regular Cost/Pupil
Management	
Administration	223
Secretarial	125
Instruction	
Teachers & Aides	1743
Instructional Support	
Supplies & Mat.	79
Staff(guidance & library; related services)	75
Institutional Oper.	
Oper. & Maint.	430
Other(subs, adult ed, etc.)	79
Services	
Health & Attendance	42
Food	212
Transportation	192
Total-- current operation	3200
Capital Outlay/ADM	37
Debt Service/ADM	76

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