

MEASUREMENTS OF BENEFIT  
AS A MEANS OF COST ANALYSIS  
AND DECISION MAKING IN EDUCATION

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A Dissertation  
Presented to  
The Faculty of the College of Education  
University of Houston

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

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by  
Lester Eugene Lantz

May, 1975

## ACKNOWLEDGMENTS

The writer of this dissertation will remain deeply indebted to Dr. Guy D. Cutting, dissertation chairperson, whose advice, interest, and understanding have made this dissertation possible. Sincere appreciation and gratitude are also extended to the members of the dissertation committee for their support and expertise in helping the writer toward completion: Dr. John L. Creswell, Dr. Richard W. Scamell, and Dr. Wallace H. Strevell.

The administrative staffs of Spring Branch Independent School District and Lamar Consolidated Independent School District are owed a debt. Mr. Cliff York of Lamar Consolidated has played an indispensable role.

A special thanks goes out to Nancy Lantz and to Diana Goodloe, who helped in untold ways.

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## ABSTRACT

Lantz, Lester E. "Measurements of Benefit as a Means of Cost Analysis and Decision Making in Education."  
Unpublished Doctoral Dissertation, University of Houston, 1975.

Committee Chairperson: Dr. Guy D. Cutting

The purpose of the study was to determine quantifiable measures of educational benefit that have the potential to facilitate educational decision making. Such measures should:

1. Reference to a realistic value system.
2. Contain criterion-measurements.
3. Provide components for the decision making process.
4. Contain options that would enable flexibility of application.
5. Fit into a framework for cost/benefit analysis.

Four subprograms were studied in two Texas school districts. The subprograms were:

1. Transportation.
2. Data processing for administration.
3. Advanced senior high mathematics.
4. Vocational data processing.

Information was gathered from computerized files, regular files, interviews, school district publications and

from a survey of bus drivers, students, teachers and administrators. With the exception of the bus drivers in District B, virtually all of the participants responded to the questionnaire. The survey asked respondents to allocate imaginary resources among possible subprogram goals as they should be allocated; then they were asked to allocate resources again as they were presently being allocated.

Analysis of the data gathered for this study revealed the following findings:

1. By adding a simple and easily administered survey to their present data bank, the school districts studied can develop the following information for each of the subprograms studied:
  - a. Costs by subprogram.
  - b. Nature of subprogram benefit.
  - c. Duration of subprogram benefit.
  - d. Characteristics of the students who are benefit recipients.
  - e. Perceptions of participants as to the desirable and actual goals of the subprograms studied.
  - f. Agreement between groups as to desirable and actual goals.
2. The following quantifiable measures of educational benefit met the criteria established.
  - a. Profiles of employees.
  - b. Time spent in class by students.
  - c. Miles that students are transported.
  - d. Time that equipment is operated.
  - e. Participant satisfaction indices as determined by correlation coefficients between perceptions of desirable resource allocation and actual resource allocation.
3. Advanced accounting methods will make a great deal of the data gathered for this study available by computer in the near future.

The experience of gathering usable cost/benefit information in the two school districts studied made possible

the following recommendations for school district administrators interested in implementing cost/benefit analysis:

1. Whenever possible, cost analysis should be goal related.
2. Longitudinal studies of educational benefit such as studies of job success of graduates should be related to the costs of subprograms.
3. District testing programs that show pupil growth as the result of subprograms should be related to per pupil costs of subprograms.
4. Subprogram costs of support subprograms, both instructional and administrative, are probably not as available and useful on a per pupil basis as they are on a more immediate goal assignment basis. Costs per time expended may be more useful for decision making.
5. Districts interested in quantifiable analysis should consider adopting a multi-purpose survey of subprogram participants such as the one developed in this study.
6. Further investigation into using computers to develop quantifiable indices of subprogram quality is suggested by the present and expected future abundance of computerized data.

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## CHAPTER I

### INTRODUCTION

#### Need for the Study

In order to make effective decisions, school administrators need comparative information about the costs and benefits of school activities. This process of weighing alternatives by examining such information is generally called cost/benefit analysis.

Through cost-benefit analysis the administrator is able to assess individually and collectively the costs, benefits, and consequences of all alternatives at a given time. As the full picture of costs and gains is revealed, questions of priority and greatest positive effect can be objectively answered.<sup>1</sup>

The Texas Education Agency has given Texas school districts the framework for ascertaining costs per subprogram. The new accounting system enables administrators to pinpoint their costs. The work that remains to be done has to do with ascertaining the measurable benefits of school subprograms. Once these two are brought together, cost/benefit analysis in education will become an effective tool.

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<sup>1</sup>Glen L. Immegart and Francis J. Pilecki, An Introduction to Systems for the Educational Administrator (Menlo Park, California: Addison-Wesley, 1973), p. 17.

With recent additions, The Texas Education Agency provides the following elements that are needed for cost/benefit analysis:

1. Cost accounting by subprogram.
2. Categorization of students.
3. Categorization of curricula.
4. Categorization of levels of instruction.
5. Fixed assets accounting.<sup>2</sup>

A sixth element is necessary to meet the requirements for cost/benefit analysis. Definition of measurable benefit accruing from school activities is necessary. That element, however, may be difficult to attain. A research project of the Association of School Business Officials has said, "Determining school district goals is probably one of the most difficult missions involving teachers, students, and citizens."<sup>3</sup> Goals must be established prior to benefits. In business applications, in cases where a stated criterion of successful programs is profits, cost/benefit analysis appears relatively easy to apply, but the goals of educational activities are not so easily defined.

A study of the literature yields several approaches, but the state of the art of measuring educational benefit

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<sup>2</sup>Texas Education Agency, Change 5 to Bulletin 679 (Austin, Texas: The Agency, 1974).

<sup>3</sup>William H. Curtis, Educational Resources Management System (Chicago: Association of School Business Officials, 1971), p. 166.

is expressed in a Phi Delta Kappa national study: "From this review, it is apparent that no definition of evaluation is available that does not have several serious disadvantages."<sup>4</sup>

### The Problem

The problem is to identify measures of benefit that will facilitate educational decision making.

Viable measures of benefit should:

1. Reference to a realistic value system.
2. Contain criterion-measurements.
3. Provide components for the decision making process.
4. Contain options that would enable flexibility of application.
5. Fit into a framework for cost/benefit analysis.

### Limitations of the Study

Two Texas school districts were studied. They were selected from among those most advanced in their applications of advanced accounting procedures.

Four subprograms were selected for this study:

1. Transportation. Both function 34 (regular transportation) and function 35 (transportation for special education) are included. The analysis includes all activities for which school buses are used.

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<sup>4</sup>Daniel L. Stufflebeam, Walter J. Foley, William J. Gephart, Egon G. Guba, Robert L. Hammond, Howard O. Merriman and Malcolm M. Provus, Educational Evaluation and Decision Making (Itasca, Illinois: Peacock, 1971), p. 16.

2. Data Processing for Administration. Function 41, Detail code 06. This is an administrative support subprogram that includes the computer operation other than for instruction.
3. Advanced mathematics. Function 11, instructional area code 19, further refined to include only the most advanced senior high math courses in each district.
4. Vocational Data Processing. Function 11, detail code 26. Instructional courses in computer operations.

### Procedures

In order to be compared, measures of benefit from different districts must be criterion-referenced. Goals and situations of different local districts cannot be assumed to be identical. The evaluation of performance must be criterion-referenced to the school district's distinct goals and problems. For this reason, this study was concerned with developing techniques that may be used in cost/benefit analysis rather than comparing school districts by arbitrarily selected indices.

It was necessary to establish the goals of each district in terms of the resources committed to each of them. A general review of goals was in order as well as goals peculiar to each district as expressed in their own literature.

Financial, personnel, and curriculum files of each district were examined to determine as much as possible about the costs and benefits associated with each activity. The subprograms were selected in such a way as to broadly

represent the activities of the district in terms of academic courses, vocational courses, administrative support activities, and instructional support activities. Further, availability of data was a major criterion.

A survey was conducted among participants in the selected subprograms in order to determine the goals to which the district was committed. The instrument developed was designed to answer the following questions:

1. What are the goals of the subprogram?
2. What commitment (resources, work load) is made toward carrying out each goal?
3. What commitment should be made toward carrying out each goal?

Cost/benefit indices were applied using appropriate measures of benefit:

1. Pupil/contact hour.
2. Resources committed by goal.
3. Student growth.
4. Participant perception of satisfaction with resources allocated.
5. Pupil service per dollar.
6. Administrative service per dollar.

A given subprogram has a number of students from several categories associated with it for a period of time. This study established the type of recipient and the duration of benefit for each subprogram. The characteristics of the students and the time involved yield costs per student/time span.



Evaluation of a given subprogram will include the opinions of the participants as to their own satisfaction. Each subprogram will be evaluated in terms of the service provided directly to students or to students through general services to the school district.

At the end of the study, we shall have advanced our knowledge about educational benefit and shall have contributed to the usefulness of cost/benefit analysis for decision making in education.

#### Definition of Terms

- Benefit:** "That which is helpful; advantage; profit"<sup>5</sup>
- Cost/Benefit Analysis:** (Defined as Cost Effectiveness Analysis) "Systematic examination of assessing feasible alternatives of a specific program by relating the cost of a particular alternative to the achievement of a goal and/or an objective. The purpose is to provide a means of comparing possible alternatives on a basis of least cost and greatest effectiveness."<sup>6</sup>
- Criterion:** "A standard or rule by which a judgment can be made; a model, a test or measure."<sup>5</sup>  
 "A statement of preferred outcomes that are used to test the relative degrees of desirability among alternatives; a standard by which a course of action is evaluated. A statement of criteria includes time, conditions, and specific results expected."<sup>6</sup>

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<sup>5</sup>Funk & Wagnalls, Standard College Dictionary (New York: Harcourt, Brace & World, 1963).

<sup>6</sup> William H. Curtis, Educational Resources Management System, p. 337-342 (Glossary).

- Goal:** "A broad statement of purpose to be achieved by society but to which the educational system will contribute by attaining related objectives."<sup>7</sup>
- Program:** "Any prearranged, proposed, or desired plan or course of proceedings."<sup>8</sup> "A series of interdependent, closely related services and/or activities progressing toward or contributing to a common objective or set of allied objectives."<sup>7</sup> Educational programs may be thought of as being either primary (concerned directly with educating students) or supportive.
- Subprogram:** A specific division of a program.
- Support Services:** "Those services which provide administrative, technical, and logistical support to facilitate and enhance learning objectives. Support services exist as adjuncts for the fulfillment of objectives."<sup>7</sup>

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<sup>7</sup>William H. Curtis, Educational Resources Management System, p. 337-342 (Glossary).

<sup>8</sup>Funk & Wagnalls, Standard College Dictionary.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

This chapter points out the current status of thought on the problem of determining educational benefit. The factors which make it both possible and necessary are discussed. Cost benefit analysis is defined more fully; its uses are pointed out.

Recent developments are reviewed which form the basis for the investigative process used in the remainder of this paper. Methods of cost analysis are discussed. The level of involvement of subprogram participants in goal-setting is discussed; and a method for determining further participants' views is given.

The concept of educational benefit is related to national, state and local educational goals in this chapter.

#### The Trend in Educational Planning and Decision Making Toward Increased Use of Quantifiable Analysis

Educational planning and decision making are concerned more and more with quantitative analysis. Frank W. Banghart and Albert Trull, Jr. have expressed

several trends as follows: "Educational planners will increasingly emphasize quantitative planning. Educational planners will make extensive use of data-coordinating and data-processing systems for quantifying the information...."<sup>9</sup> This trend reflects the need for quantifiable measures of benefit to be used for feedback in planning and decision making.

One reason for increased attention to quantifiable analysis is the trend toward increased reliance on computers for educational accounting purposes and for analysis of district performance. At Littleton, Colorado, for instance, the school district officials have suggested using computers to build their district budget.<sup>10</sup>

Many books have become available which explain the basic concerns of computer usage for school administrators. An indication of interest in computers in Texas is the guidelines that have been written for data processing in Texas schools. One example is that presented by the Gulf Schools Supplementary Education Center.<sup>11</sup>

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<sup>9</sup>Frank W. Banghart and Albert Trull, Jr., Educational Planning (New York: Macmillan, 1973), p. 260.

<sup>10</sup>Kenneth Schoonover, William Altimari, Kenneth Crosier, and James Hannasch, "District Budget on a Computer," School Management, XV, No. 12 (1971), p. 16-19.

<sup>11</sup>Gulf Schools Supplementary Education Center, Data Processing for Texas School Districts (Excerpts) (Pearland, Texas: The Center), 1971.

Sophisticated management information systems require computerization of school district information in most cases. As information is prepared for computer input, it has to be coded and/or quantified. Such a system is described by Walter J. Foley and Gordon G. Harr.<sup>12</sup> They describe in detail what information should be prepared for computer input and how it should be prepared.

E. F. Lindquist has described an elaborate computerized information system used in the state of Ohio.<sup>13</sup> The system is largely for use in keeping account of student evaluations. Such data as grades, reports, and school directories are kept up to date for every school in the state. Another thorough description of an MIS system is given by Marjorie Rapp.<sup>14</sup>

A description of characteristics desirable in an MIS system for an entire country has been written by Khateeb Hussain.<sup>15</sup> Throughout these readings, there is an implied usefulness for large amounts of quantifiable data for decision making in education.

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<sup>12</sup>Walter J. Foley and Gordon G. Harr, Management Information Systems Project (Iowa City, Iowa: Iowa Center for Research in School Administration, 1972).

<sup>13</sup>E. F. Lindquist, "Implications and Potential of Information Systems in Public Schools," Computer Concepts and Educational Administration, edited by Robert W. Marker, Peter P. McGraw, and Franklin D. Stone (Iowa Educational Information Center, University of Iowa, 1966).

<sup>14</sup>Marjorie Rapp, "Information System for Educational Management" Report Number R. 931-LACS (Santa Monica, California: Rand Corporation), December, 1971.

<sup>15</sup>Khateeb Hussain, Development of Information Systems for Education (Englewood Cliffs: Prentice Hall, 1973).

Planning programming budgeting systems use quantified computerized data. These systems are being adopted throughout the country, according to Harry J. Hartley.<sup>16</sup> Robert F. Alioto and J. A. Jungherr have written an explanation of what makes a good PPBS system.<sup>17</sup> Management by objectives is coming into its own in American school districts and with federal agencies. Terrel H. Bell has written a proposed MBO system.<sup>18</sup>

As computers come more into use, further applications for quantifiable data come into being. Sophisticated models and game-simulation techniques are beginning to be used to make evaluations of educational plans even before they are implemented. Glen Self made suggestions along these lines in 1967.<sup>19</sup> Sophisticated techniques are suggested by Andrew and Moir.<sup>20</sup> Their text explains how an educational model is created and modified to learn

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<sup>16</sup>Harry J. Hartley, "PPBS in Local Schools: A Status Report," NASSP Bulletin, (October, 1972), p. 1-5.

<sup>17</sup>Robert F. Alioto and J.A. Jungherr, Operational PPBS for Education: A Practical Approach to Decision Making (New York: Harper & Row, 1971).

<sup>18</sup>Terrel H. Bell, A Performance Accountability System for School Administrators (West Nyack, New York: Parker Publishing Company, 1974).

<sup>19</sup> Glen Self, "Quantification of Education for Planning Applications Utilizing Models for Evaluation," Rationale of Education Evaluation, edited by Wallace H. Strevell, (Pearland, Texas: Gulf Schools Supplementary Education Center, 1967).

<sup>20</sup>Gary M. Andrew and Ronald E. Moir, Information-Decision Systems in Education (Itasca, Illinois: F. E. Peacock, 1970).

the possible reactions of members of the actual school district. Again, the need for precise evaluation is implied.

### Quantifiable Evaluation is Essential to Planning

No matter what use is made of data, these readings show that there is a clear-cut need for more of it, and a need that it be presented in a more usable form. Most of the feedback to school planning systems can be termed "evaluation."

"Evaluation is the process of delineating, obtaining, and providing useful information for judging decision alternatives," according to Stufflebeam, et. al.<sup>21</sup>

Good quantifiable evaluative criteria should meet the same standards as evaluative processes already in use. Some guidelines for good assessment have been given by the Executive Committee Statement of the Association for Supervision and Curriculum Development:

- 1 Assessment must value and maintain the diversity of our people.
2. Assessment must protect and encourage uniqueness in students and citizens....

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<sup>21</sup>Stufflebeam, et. al. Educational Evaluation and Decision Making, p. 25.

3. Accurate assessment of educational outcomes requires exploration in breadth across the full range of educational objectives. This includes social, emotional, vocational, health, and artistic goals as well as basic skills and intellectual growth. Where valid procedures for assessment of these broad objectives do not exist, they must be developed. Data obtained from a limited sample of these objectives or from limited instruments can provide but a distorted picture of educational accomplishment.
4. Adequate assessment also requires exploration of learning in depth.
5. Assessment must explore the changes in students over periods of time.
6. The effect of the assessment procedures themselves on the nature and function of the educational process must be appreciated and continuously subject to scrutiny.<sup>22</sup>

Gilbert Austin<sup>23</sup> and Gene Atkinson<sup>24</sup> have given chronologies of historical trends and explanations of current practices in educational evaluation. There has been a trend toward broader evaluation criteria. The Center for Educational Services at the University of Ohio recommended, in 1952, that informal methods should supplement formal methods to measure

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<sup>22</sup>Association for Supervision and Curriculum Development, "Guidelines for National Assessment of Educational Outcomes," (American Association of School Administrators, 1966).

<sup>23</sup>Gilbert R. Austin, "Evaluation in the 60's, Accountability in the 70's," Planning & Changing, (July, 1972), p. 8-17.

<sup>24</sup>Gene Atkinson, "Evaluation of Educational Programs: An Exploration," Rationale for Educational Evaluation, p. 1-9.



student progress in the areas of social adjustment, intellectual development, work habits, and attitudes.<sup>25</sup>

Some perspective on the nature of educational evaluation can be gained by examining the criticisms of the present process.

...most evaluation is designed to control students and carries little or no useful information to the recipient. I shall not put forth the telling arguments against grades, class ratings, honor rolls and the like. Those cases have been effectively made in more than one educational journal, even though the artifacts they point to live on unimpeded by logic in schools today. I would mention only that their usage seems rather consistently to be (1) managements of students; (2) classification of students for administrative purposes, and (3) shortcuts to provide superficial attention to the need to communicate with students, their parents, and other school people about a young person's work.<sup>26</sup>

Studies have suggested that attempts to measure student achievement reveal little effect from the schools. The following is from Joseph Featherstone:

On the whole, the IEA (International Association for the Evaluation of Educational Research) studies tend to confirm earlier findings: Social class and family background seem more important than schooling in accounting for differences in children's achievement test scores. There is one major qualification, however: Schooling seems to be more important in some subjects than in others.<sup>27</sup>

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<sup>25</sup>Center for Educational Service, Evaluation (Athens, Ohio: College of Education, Ohio University, 1952), p. 23.

<sup>26</sup>Stanley C. Diamond, "Evaluation: The Dialogue of Learning," Education, XCIV, No. 3 (1974), p. 237.

<sup>27</sup>Joseph Featherstone, "Measuring What Schools Achieve," Phi Delta Kappan, (March 1974), p. 448.

The present status of school evaluation, especially as it relates to quantifiable analysis, is described as follows by Strevell:

Schools render good accountability of strictly object-related costs such as time reports of employees and auditing of invoices. Cost-utility analysis has occurred in auxiliary services such as transportation, cafeteria, and plant maintenance. But results of effects of the educational programs are more often inferred from such factors as teacher competence, modern methods, staffing ratio, and curriculum content, which generally are claimed to represent school quality or excellence. Attempted measurements of academic and other learning achievements have proven not only to be inadequate but more important to be relatively unrelated to the actual program. Today, if applied to school systems, the planning-programming-budget system offers a better promise of adequate accountability and management.<sup>28</sup>

In summary, evaluative methods have been diverse, but quantifiable measures of benefit are lacking; however, modern accounting methods are bringing us closer to meeting this need.

Strevell also tells us:

Considerable professional energy will need to go into operations analysis at the local level before school systems can produce evaluative models indigenous to their own local enterprises.<sup>29</sup>

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<sup>28</sup>Wallace H. Strevell, "Program Evaluation in Education," Rationale of Educational Evaluation, p. 51.

<sup>29</sup>Strevell, *Ibid.*, p. 53.

## Cost-Benefit Analysis in Education as a Useful Tool

If cost-benefit analysis is to be developed and used in education, it is important to begin to explain what it is. Immegart and Pilecki have the following to say in describing cost-benefit analysis:

The outcomes of an activity (that is, benefits) should ideally exceed the costs.... Although cost-benefit analysis in the OR (Operations Research) sense is fully computational, the technique in PPBS or the systems analysis framework may contain both quantitative and qualitative variables. In the latter cases quantification of costs and benefits goes as far as is possible, so that decision makers are not forced to deal solely with vague qualitative judgments or hunches. The basic process of cost-benefit analysis contributes, further, to the sophistication of these procedures in that dealing with a problem, all elements, quantitative and qualitative, are enumerated, related, and assessed.

Since educational administrators are usually confronted with limited resources--financial, human, and material--systematic analysis of all possible solutions to a problem is most relevant, particularly since problems do not arise in isolation. Through cost-benefit analysis the administrator is able to assess individually and collectively the costs, benefits, and consequences of alternatives at a given time. As the full picture of costs and gains is revealed, questions of priority and greatest positive effect can be objectively answered....<sup>30</sup>

Knezevich offers the following descriptions:

Evaluation of the decision-making process in the school situation leads to cost-effectiveness studies. Every alternative has its own set of

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<sup>30</sup>Glenn L. Immegart and Francis J. Pilecki, An Introduction to Systems for the Educational Administrator, p. 183.

resources (costs) necessary to attain a goal. These costs must be weighed against the degree of effectiveness likely to be attained in pursuing a given alternative. Cost-effectiveness analysis is held by many to be synonymous with systems analysis. Sophisticated mathematical analysis is part of the process.<sup>31</sup>

Although the terms cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis are sometimes used interchangeably, Banghart and Trull have defined them separately as follows:

Cost/effectiveness approaches are used generally in situations in which alternative outputs are designed to yield a high degree of effectiveness relative to cost. The cost/benefit approach differs from the first approach in its application to situations in which the alternative outputs are judged in terms of benefits. The assignment of the cost/utility approach requires the formulation of numerical utility values for specific activities and also the formulation and assignment of specific cost factors to those same activities. Utility in this case means the worth of the value of the activity (i.e., personal preference.)<sup>32</sup>

No matter what it is called, scientific evaluation requires measures of benefit. What Banghart and Trull call "individual preference," is called by others a value system. Van Gigch says that the benefit must accrue to society at large: "It is enough to say that just as individual decisions reflect the value

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<sup>31</sup>Stephen J. Knezevich, Administration of Public Education (New York: Harper & Row, 1969), p. 557.

<sup>32</sup>Frank W. Banghart and Albert Trull, Jr., Educational Planning, p. 311.

criteria which the individual decision maker sets for himself, decisions in the public domain must satisfy the societal value system."<sup>33</sup>

Others point out the problems involved in defining the value system that must define the benefit of education:

Scholars who defined evaluation as the congruence between performance and objectives paid little attention to the origin of the objectives except to say they were to be 'screened' through a psychology and a philosophy. This leaves untouched the question of what philosophy and what psychology should be used as screens. When this question is made explicit, it is quickly apparent that no adequate methodology exists for the determination of values, even though such a determination may constitute the most professional task the evaluator performs.<sup>34</sup>

Stufflebeam et. al. condemn the efforts of schools toward evaluation: "Despite the opportunity that has existed for four or more decades, schools have not responded to evaluation in any meaningful way."<sup>35</sup>

There are many who express doubt that educational benefit can be quantified in any helpful way. Van Gigch, as late as 1974, said:

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<sup>33</sup>John P. Van Gigch, Applied General Systems Theory (New York: Harper & Row, 1974), p. 84.

<sup>34</sup>Stufflebeam, et. al., Educational Evaluation and Decision Making, p. 18.

<sup>35</sup>Ibid., p. 5.

Many of the costs and benefits of a public project can be expressed in terms of dollars and cents. However, many cannot be expressed in economic terms. It is only in the recent past that there have been conscious efforts to subject quantifiable and non-quantifiable effects to public scrutiny.<sup>36</sup>

### Disagreement on the Feasibility of Cost/Benefit Analysis in Education

In discussing transportation, Bigham and Roberts tell us that quantifiable benefit is not possible:

The total public gain from transportation, although much in excess of the losses, is incapable of quantitative measurement. In order to estimate the total in economic terms, it would be necessary to place a monetary value on the transport service as a whole. No way seems apparent for determining what society would give for transportation of the present efficiency rather than forego service.<sup>37</sup>

A similar attitude is revealed by Elaine Exton:

Nor can it be predicted with certainty if adequate and precise enough measures to evaluate the effectiveness of educational programs can be devised to permit fair or meaningful cost-benefit comparisons. In order to know how well American schools are doing, it is necessary first to define the word, "well," and to do this requires national educational standards as well as social and economic goals.<sup>38</sup>

In fact, quantification of educational benefit might be held, by such writers as Raymond E. Callahan,

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<sup>36</sup>John P. Van Gigch, Applied General Systems Theory, p. 84.

<sup>37</sup>Truman C. Bigham and Merrill J. Roberts, Transportation Principles and Problems (New York: McGraw Hill, 1952), p. 12.

<sup>38</sup>Elaine Exton, "USOE Uses Computer-Based Models to Evaluate Education," American School Board Journal (January, 1967), p. 16.

to be undesirable in that it reflects too much of the coldness often attributed to business operations.<sup>39</sup>

Critics of education and of educational evaluation notwithstanding, the need is made evident by Thomas Hastings' writing:

If the educational establishment is to move toward the point of basing decisions about revisions and decisions about adoption on educational purpose and outcome, we need far more evaluation data of all kinds than we have had in any instance to date.<sup>40</sup>

Although the problems involved in creating cost-benefit analysis are many, the rewards are worthwhile, as we learn from K. Forbis Jordan. He tells us some of the possibilities that might emerge from assessment programs:

Program efficiency has inevitably emerged as a question; however, educators have never agreed upon the definition of either "quality education" or the techniques which can be used to measure the educational product. Increasing interest in assessment programs on the part of the Office of Education and technological advances in computers may help to bring about limited research activities which will help educators to measure the degree to which the schools are obtaining some agreed-upon educational goals or objectives. With the wide variations in educational practices found throughout the country, studies might then be conducted to determine which of several alternatives is most efficient in helping the school meet its educational objectives.

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<sup>39</sup>Raymond E. Callahan, Education and the Cult of Efficiency, A Study of the Social Forces That Have Shaped the Administration of the Public Schools (Chicago: University of Chicago), 1962.

<sup>40</sup>Thomas J. Hastings, "Curriculum Evaluation: The Why of the Outcomes," Journal of Educational Measurement (Spring, 1966), p. 27.

....Economy is not the primary criterion to be used in a study of educational expenditures, but the intent is to achieve maximum return from the educational dollar. The challenge is to define educational objectives in measurable terms, and then to compare the relative effectiveness of alternative activities which might be used to achieve the same program objective.<sup>41</sup>

As Francis Keppel tells us, there is adequate incentive to try to improve educational evaluation:

American education today is woefully short of the basic information needed to carry forward our many educational purposes, to set sound goals, and to work together to reach them.<sup>42</sup>

#### Research Leading Toward Quantifiable Measures of Benefit

Several recent studies and publications have contributed useful tools for determining quantifiable measures of educational benefit. Jordan has set down approaches to costing school district subprograms.<sup>43</sup> Further costing techniques have been developed by the Texas Education Agency for cost analysis beyond operating costs.<sup>44</sup>

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<sup>41</sup>K. Forbis Jordan, School Business Administration (New York: Ronald Press, 1969), p. 161-162.

<sup>42</sup>Francis Keppel, "National Educational Assessment: We Badly Need It!" AASA National Educational Assessment: Pro and Con (Washington, D.C.: The Association, 1966), p. 5.

<sup>43</sup>Jordan, School Business Administration, p. 161-162

<sup>44</sup>Texas Education Agency, "A Guide for Texas School Districts: Cost Analysis to Determine Indirect Cost Rates for Federal Grants and Contracts," (Austin, Texas: The Agency, 1972).



The particular problems of planning by different subprogram participants has been addressed in a Texas Education Agency bulletin in which school district superintendents were asked to identify the participants having a high degree of involvement in the planning process. 94% of the large city superintendents said that administrators and teachers each participate "very much." 19% said that lay citizens participate "very much," and pupils were held to be active at the same level by 7% of the survey.<sup>45</sup>

A survey device was developed by David J. Mullen which holds promise for discovering participants' opinions of school district goals. The Bonanza Game asks players to "Buy the kind of school program emphasis You want!" Participants are asked to attach paper clips representing money to various levels of various school goals in order to express the values of the respondent toward school subprograms.<sup>46</sup>

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<sup>45</sup>Texas Education Agency, "Assessment of Selected Educational Needs: A Local Perspective," (Austin, Texas: The Agency, 1971).

<sup>46</sup>Walden A. Ends and David J. Mullen, "Organization Development in a Public School Setting," Current Perspectives in Organization Development, edited by J. Jennings Partin (Reading, Massachusetts: Addison-Wesley, 1973), p. 226-247.

### Background for a Survey of Subprogram Goals

Prerequisite for a discussion of educational benefit, addressing the question of educational goals is necessary. To have accomplished something is not necessarily to have accomplished a desired objective. First, schools must determine the desired purpose of an activity. Schools may point to an accomplishment on the part of their students, but it will only have meaning to the extent that the accomplishments are related to district goals.

In order to ask participants in district activities for expressions of goals, it is necessary to establish background by looking to authoritative publications, not only for the school district in question, but nationwide. In order to provide such a background, a list of national, state, and local goal statements for education has been compiled in Appendix A. Math, data processing, and transportation goal statements were especially sought out.

In the following chapter, these statements of goals are utilized as background for an approach to the subprogram goals of the districts studied.

## CHAPTER III

### POPULATIONS, METHODOLOGY, AND PROCEEDINGS

#### Introduction

The study proceeded from the general to the specific. This chapter takes up descriptions of the two districts studied; then proceeds to describe the four subprograms studied in each district.

The subprograms are described in terms of type of benefit, recipients of benefit, cost, duration of benefit, desirable goals, and actual goals. The last part of the chapter takes up the question of continuity between perceptions of goals by different groups of participants in each district. This is added as a check on the goal statements made by participants in order to see if goals are perceived the same district-wide. This is considered a further description of the districts and of the subprograms studied.

Methods of data gathering are explained in this chapter. The survey instrument used is described in detail. The methods used in analyzing the data are explained.

### Overview of the Districts Studied

Both Lamar Consolidated Independent School District (District A) and Spring Branch Independent School District (District B) are advanced in their computerized accounting practices. Both were chosen for this study because they were described by officials at the Texas Education Agency Region IV Computer Center as advanced districts in the region. Although similarities and dissimilarities between the districts are pointed out, the intent of the chapter is not to compare.

The following description of District A is paraphrased from two of the district's own publications:

The Lamar Consolidated Independent School District was created in 1947 through the consolidation of twelve separate school districts. The district lies approximately fifteen miles southwest of the city limits of Houston, Texas, with which it is connected by the Southwest Freeway (U.S. Highway 59) and by U.S. Highway 90-A, and is considered a part of metropolitan Houston. The district is the largest in Fort Bend County. Eight elementary schools, one intermediate school (sixth grade), one junior and one senior high school are operated by the district on 255 acres of school-owned property. The district has been designated as an area Vocational School and serves the students of Fort Bend County who wish to pursue such vocational courses as Data Processing, Vocational Office Education, Cosmetology, Auto Mechanics, Auto Body, Building Construction Trades, Agriculture, Homemaking, Coordinated Vocational-Academic Education, and other courses such as Distributive Education and Industrial Cooperative Training that use the community as a laboratory in which to learn

vocational skills. About 43% (1971 figure) of Lamar students are enrolled in vocational courses.

The district's economy is based on agriculture and natural resources. There are six cities within the district: Beasley, Fulshear, Richmond, Rosenberg, Simonton, and Thompsons. The Richmond area was first settled in 1822 by members of Stephen F. Austin's Colony. The town site of Richmond was laid out in 1838, on land granted to Mrs. Jane Long, the "Mother of Texas." Mirabeau B. Lamar, second elected President of the Republic of Texas and the "Father of Education in Texas," is buried in Richmond.

Richmond-Rosenberg, the "twin cities" within which the high school and administrative offices of Lamar CISD are located, have a combined population of 27,000. 40% of this number is of Mexican-American descent.

The district offers free full-day kindergarten as well as special programs for the educationally gifted and for the handicapped.<sup>47</sup>

The comptroller describes the budgeting process of his district as decentralized. The present budget is summarized in Table 1. Other descriptive statistics are given in Table 2. As can be seen, District A is a large district in square mile area and in assessed valuation, but not in terms of enrollment.

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<sup>47</sup>Lamar Consolidated Independent School District, "Your Teaching Career," (Personnel Department Booklet). Lamar Consolidated Independent School District, "Unlimited Tax Schoolhouse Bonds, Series 1971," (Recent Bond Issue Literature, prepared under the supervision of Underwood, Neuhaus & Company, 724 Travis Street, Houston, Texas).

TABLE 1  
DISTRICT A  
OPERATING COSTS BUDGETED  
1974-75

	Amount	Percentage
Instruction	\$4,454,491	59.99
Instructional Administration	183,324	2.47
Instructional Resource and Media Services	281,231	3.79
Campus Administration	393,909	5.31
Guidance and Counseling	247,256	3.33
Attendance and Social Work	9,510	.13
Health Services	91,891	1.24
Pupil Transportation-Regular	456,188	6.14
Pupil Transportation- Exceptional Children	19,123	.26
Co-Curricular Activity	148,884	2.00
General Administration	332,837	4.48
Plant Operation	780,853	10.52
Laundry Services	22,446	.30
Community Services	2,834	.04
Total Budget for Operating	\$7,424,777	

DISTRICT A  
SELECTED DESCRIPTIVE STATISTICS

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Gross Average Daily Attendance	7,400
Assessed Valuation	\$434,805,000
Market Value	\$869,610,000
Square Miles	323
Number Professional Personnel	391
Local Fund Assignment as Percent of Total Foundation Cost	17.3%
Population of District	28,000
County	Fort Bend

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District B, also incorporated in 1947, is largely a bedroom district enclosed within the city limits of Houston. Highway 10 runs through the district in an East-West direction. The Memorial residential area, home of many of Houston's wealthiest citizens, lies within the school district. The top ten taxpayer's list contains three manufacturers, two utilities, three shopping centers and two apartment complexes.

The comptroller describes the district budgeting procedure as centralized. District B estimates that 85% of their graduates continue their education beyond high school.<sup>48</sup>

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<sup>48</sup>Spring Branch Independent School District, "Prospectus" (Houston, Texas: The District, 1974).

Table 5 shows the current budget summary for District B. Table 3 shows selected descriptive statistics. In order to contrast the districts included in this study, a series of selected ratios are presented in Table 4.

TABLE 3  
DISTRICT B  
SELECTED DESCRIPTIVE STATISTICS

Gross Average Daily Attendance	41,000
Assessed Valuation	\$1,418,947,860
Market Value	\$2,027,069,400
Square Miles	41
Number Professional Personnel	2,000
Population of District	195,000
County	Harris

TABLE 4  
CONTRASTS BETWEEN DISTRICTS

	District A	District B
Assessed Valuation per A.D.A.	\$59,000	\$35,000
Market Value per Square Mile	\$2,692,000	\$494,407
Operating Tax Rate	.90	1.33
Evaluation Ratio	.50	.70
Taxing Effort	.45	.93
Professional Personnel Per 1,000 A.D.A.	53	50
Ratio of Elementary (K-5) Students to Secondary	.95	.70
A.D.A. Per Square Mile	23	1,000
Operating Budget Per Pupil	\$1,000	\$850



TABLE 5  
DISTRICT B  
OPERATING COSTS BUDGETED  
1974-75

	Amount	Percentage
Instruction	\$21,049,307	61.25
Instructional Administration	781,116	2.27
Instructional Resource and Media Services	1,443,338	4.20
Campus Administration	2,046,849	5.96
Guidance and Counseling	909,130	2.64
Attendance and Social Work	11,044	.03
Health Services	242,865	.71
Pupil Transportation--Regular	1,238,941	3.61
Pupil Transportation-- Exceptional Children	152,876	.44
Co-Curricular Activity	408,363	1.19
General Administration	1,441,024	4.19
Plant Operation	3,341,262	9.72
Plant Maintenance	1,301,452	3.79
Total Budget for Operating		\$34,367,567

### The Four Subprograms Studied

The Texas Education Agency has provided, in Change 5 to Bulletin 679, an extended accounting system that will answer many of the questions necessary for effective cost/benefit analysis in education. Among other additions, a detailed code identifying student populations, a curriculum code identifying school courses, fixed asset accounting, and a grade-level code are provided. Both District A and District B are implementing this extended accounting system, but neither has implemented it yet to the degree that costs or benefits can be analyzed by specific subprograms. In many respects, this study anticipates the potential that Change 5 will bring.

For the present, it is necessary to gather data by other means. Descriptive material for this paper has been gathered by the following methods:

1. Inquiries from the Region IV computer.
2. Searches of school district files and literature.
3. Interviews with district officials.
4. Surveys of subprogram participants.

As outlined in Chapter I, the survey was designed to accomplish several purposes. One was to obtain the kind of basic information about the participants that might be available by computer at a later date. The major participants of each

subprogram were questioned: teachers, students, bus drivers, and administrators.

Another purpose of the survey was to establish the participants' perceptions of the goals of the given subprograms. No attempt was made to compare schools, districts, or subprograms; but rather to clarify goals.

In keeping with the criteria for measures of benefit that were set forth in Chapter I, it was felt that the survey instrument should be short and easily filled out in order to minimize the amount of disruption caused by administering it. The total time to be spent in administering the instrument to students is about ten minutes, including passing out the papers and explaining the directions.

Copies of the three survey instruments are in Appendix B. Each of the categories of respondents filled out more than one rating form. Each group rated the goals of transportation. Administrators rated the goals of administrative data processing; students and teachers rated their particular area.

The choice of goals to be included in the survey could be easily altered by any district wishing to use such an instrument. The goals expressed in the comprehensive literature search shown in Appendix A were condensed to the three goals used in the survey. It was considered advisable to choose a number of stems that would not divide evenly into the number

of boxes representing resources to be allocated; thus, four stems were used with ten boxes. This survey instrument might be used to inquire about participants' perceptions of goal allocations within a subprogram, as it is used here; or it might be used to find comparative values placed on different subprograms.

Essentially, only three possible goals are rated. A fourth category, "other goals," gave respondents the opportunity to add their own ideas and gave flexibility to the rating process.

It is possible to achieve ratings of subprogram goals by asking the respondent to rank the goals or to rate them on an arbitrary scale; however, a financial study concerned with the allocation of resources should, as much as possible, ask the same kind of question that is asked in the budget making process-- "How shall we allocate limited resources?"

It should also be pointed out that the resources allocated to a given subprogram goal in this rating procedure are not directly translatable as quantities assigned to goals. The dollar amounts assigned are meaningless in themselves. Measurement scales in which the values assigned to one stem are affected by the values assigned to the other stems are

said to be ipsative scores. Ipsative scores yield rankings only, as has been pointed out by Clemans:

Ipsative scores are relative scores. It is quite possible that a person obtaining a low ipsative score on a particular trait actually possesses more of the characteristic in question than a person obtaining a higher ipsative score. It is imperative that users of ipsative variables interpret them in the relative sense only.<sup>49</sup>

The survey instruments were keypunched and tallied by computer using the Statistical Package for the Social Sciences,<sup>50</sup> which is also available to school districts through Region IV. By looking at descriptions of students who are enrolled in subprograms, the question of the recipients of educational benefit shall be examined.

Descriptive statistics for the advanced mathematics classes of District A are in Table 6. The most advanced class is taught as an independent study unit by the Chairperson of the Mathematics Department. Two other advanced classes were surveyed. They represent the most advanced students in mathematics in District A. A large percentage of the students are from white-collar backgrounds, and they have not changed residences a great number of times, as indicated by the mean number of schools attended, which is 4.187. Normally, any

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<sup>49</sup>William V. Clemans, An Analytical and Empirical Examination of Some Properties of Ipsative Measures (Chicago: University of Chicago Press, 1956), p. 52.

<sup>50</sup>Chi Corporation, Statistical Package for the Social Sciences (Cleveland, Ohio: The Corporation), Statistical programs resident in computers, Version 5.01.

TABLE 6  
DISTRICT A  
ADVANCED MATHEMATICS CLASSES  
1974-75

Number teachers involved	2
Number students involved	36
Total number sections	3
Mean student age	17
Modal student age	17
Standard deviation	.567
Percent that are males	42
Percent whose families are white collar	76
Mean number of schools attended	4.187
Modal number of sch-ols attended	5
Mean grade received in previous semester (A=4.0)	3.344
Modal grade received in previous semester	3.0
Number of quarters in total course	3
Duration of class period (minutes)	55
Days of instruction per school year	180
Costs:	
Salaries	\$4,114.00
Other expenses	16.00
Total	4,130.00

child in the district would have attended four schools before reaching this level.

Table 7 displays perceptions of the goals for the subprogram as perceived by students and teachers. They used the survey from Appendix B to allocate resources among four choices.

The choices were as follows:

1. Prepare students for jobs.
2. Prepare students for further school or college.
3. Help students develop good behavior.
4. Other.

Students performed the resource allocation twice; once as they think resources should be allocated and once as they think resources are presently being allocated in their district. Four descriptive indices are displayed in Table 7. The median is the appropriate measure of central tendency for ranked scores, although the mode and mean are included. The range is the measure of dispersion indicated for ranked data. Together, the four indices give a picture of average, dispersion direction and dispersion amount. Both teachers and students agreed that the primary goal of the subprogram is to prepare students for further education. Vocational preparation ranked second; good behavior third. No pattern emerged from suggestions in the "other" category.

TABLE 7  
DISTRICT A  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS  
AND ACTUAL RESOURCE ALLOCATIONS FOR GOALS OF  
ADVANCED MATHEMATICS COURSES

		Percent of Available Resources			
Goal*		Median	Range	Mean	Mode
Desired:					
Students	1	29.00%	90.00%	27.81%	30.00%
	2	48.33	80.00	53.44	40.00
	3	13.75	40.00	13.75	20.00
	4	0.0	60.00	5.00	0.0
Teachers	1	36.25	30.00	36.00	50.00
	2	40.00	30.00	42.00	30.00
	3	20.00	10.00	16.00	20.00
	4	0.0	20.00	6.00	0.0
Actual:					
Students	1	22.50	90.00	25.00	10.00
	2	67.50	80.00	63.12	90.00
	3	6.43	40.00	10.94	0.0
	4	0.0	10.00	0.94	0.0
Teachers	1	30.00	30.00	32.00	20.00
	2	48.75	30.00	50.00	40.00
	3	10.00	10.00	14.00	10.00
	4	0.0	10.00	4.00	0.0

\*Goal 1 is "Preparing Students for Jobs"  
 Goal 2 is "Preparing Students for Further School"  
 Goal 3 is "Developing Students' Behavior"  
 Goal 4 is "Other Goals"



Three sections of vocational data processing are taught in District A. The students are about evenly divided between white-collar and blue-collar families. In comparison with mathematics students, they have attended, on the average, one more school; which indicates more mobility. The grades in vocational data processing are slightly lower than in the advanced mathematics classes; a mean of 2.42 compares to 3.344. The modal grade in both courses is 3.

The district describes the program to students in the following way:

Data processing is a program to train students in computer applications. After completion of a two-year course the students will be training in computer programming, unit-record operations, and on-line computer terminal operations. The program is designed to prepare the students for college courses if they wish to advance their education, or to qualify them for trainee jobs in business applications.<sup>51</sup>

The description of vocational data processing in District A is in Table 8. Students' and teachers' perceptions of desirable allocation of resources and actual allocation of resources in the subprogram are shown in Table 9 by percent of available funds assigned to each goal.

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<sup>51</sup>Lamar Consolidated Independent School District, "Data Processing," School Courses of Study (Counselors" pamphlet), (Richmond, Texas: The District, 1974).

TABLE 8  
DISTRICT A  
VOCATIONAL DATA PROCESSING  
1974-75

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Number teachers	2
Number students	51
Average class size	17
Mean student age	17
Modal student age	17
Standard deviation	.675
Percent that are males	43
Percent whose families are white collar	43
Mean number of schools attended	5.667
Modal number of schools attended	5
Mean grade in previous quarter (A=4.0)	2.42
Modal grade in previous quarter	3
Number of quarters in total course	6
Duration of class period (minutes)	55
Days of instruction per school year	180
Costs of the subprogram:	
Salaries	\$12,485.00
Purchased and contracted services	5,354.00
Supplies and materials	1,345.00
Other operating costs	128.31
Total	\$19,312.31

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TABLE 9  
DISTRICT A  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS  
AND ACTUAL RESOURCE ALLOCATIONS FOR GOALS OF  
THE VOCATIONAL DATA PROCESSING SUBPROGRAM

		Percent of Available Resources			
	Goal*	Median	Range	Mean	Mode
Desired:					
Students	1	45.33%	70.00%	45.12%	50.00%
	2	37.14	70.00	39.53	30.00
	3	10.36	30.00	10.47	20.00
	4	0.0	40.00	4.88	0.0
Teachers	1	55.00	10.00	55.00	55.00
	2	35.00	10.00	35.00	35.00
	3	10.00	0.0	10.00	10.00
	4	0.0	0.0	0.0	0.0
Actual:					
Students	1	40.91	80.00	40.93	40.00
	2	38.93	60.00	39.30	40.00
	3	10.91	50.00	14.42	0.0
	4	0.0	60.00	5.12	0.0
Teachers	1	45.00	30.00	45.00	45.00
	2	30.00	0.0	30.00	30.00
	3	5.00	10.00	5.00	5.00
	4	20.00	40.00	20.00	20.00

\*Goal 1 is "Preparing Students for Jobs"

Goal 2 is "Preparing Students for Further School"

Goal 3 is "Developing Students' Behavior"

Goal 4 is "Other Goals"

There are 92 drivers operating 71 bus routes in the transportation subprogram at District A. Three of the routes are for special education. District A provides free transportation to and from school for all students who live more than one-half mile from their school. In addition, students are transported if they provide their own transportation to points outside the one-half mile limit. Thirty of the drivers are also teachers in the district.

The total operating costs of the department for 1973-74 was \$345,959.00 with \$151,723 spent for salaries. They are presently budgeted for the 1974-75 school year at \$456,188, including capital outlay of \$99,631. This indicates an increase in operating costs planned at 3%. As of January 1, 1975, the transportation subprogram (both regular transportation and transportation for special education) had appropriated a total of \$516,853, including capital outlay of \$150,231.

The total mileage driven in 1973-74 was 599,032, including mileage from extra-curricular activities of 47,348. The department figured their 1973-74 cost per mile at \$.5775. The average cost per pupil transported was \$54.85. The local share of the cost was 54.87% with the state paying the remainder.

Ratings of the transportation department in District A were obtained from all the participants surveyed. Almost every group rated the goals of the subprogram in the following order:

1. Deliver students to and from school.
2. Special trips such as field trips.
3. Help students develop good behavior.
4. Other.

No significant pattern emerged from the contributions under the "other" category that could be added to a list of broad goals of the subprogram. Several respondents added the category "maintenance of equipment" to the list of goals. Ratings are shown in Table 10 and Table 11.

Data processing for administration at both school districts is done in conjunction with Texas Education Agency Region IV Computer Services. At District B, the Director of Data Processing as well as the other employees in the subprogram are not connected with vocational data processing. By contrast, the District A operation for administration is virtually indistinguishable from the vocational subprogram. The District B data processing subprogram for vocational courses is located at their career center, some miles from the central office. They operate their own mini-computer system. This

TABLE 10  
DISTRICT A  
PERCEPTIONS OF ACTUAL RESOURCE ALLOCATIONS  
FOR GOALS OF TRANSPORTATION SUBPROGRAM

	Goal *	Percent of Available Resources			
		Median	Range	Mean	Mode
Administrators	1	60.00%	50.00%	61.67%	40.00%
	2	20.00	30.00	21.67	10.00
	3	5.00	30.00	8.33	0.0
	4	0.0	40.00	6.67	0.0
Math Teachers	1	65.00	40.00	64.00	60.00
	2	31.25	30.00	30.00	40.00
	3	10.00	10.00	6.00	10.00
	4	0.0	0.0	0.0	0.0
Data Processing Teachers	1	90.00	0.0	90.00	90.00
	2	10.00	0.0	10.00	10.00
	3	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0
Math Students	1	62.50	70.00	61.56	70.00
	2	25.00	70.00	26.87	30.00
	3	0.0	30.00	8.13	0.0
	4	0.0	40.00	3.44	0.0
Data Processing Students	1	50.00	80.00	50.48	50.00
	2	31.15	50.00	32.62	30.00
	3	9.62	50.00	13.33	0.0
	4	0.0	30.00	3.33	0.0
Bus Drivers	1	58.41	90.00	57.46	60.00
	2	30.43	90.00	30.48	30.00
	3	0.0	70.00	7.62	0.0
	4	0.0	30.00	2.79	0.0

\*Goal 1 is "Delivering Students to and from School"  
 Goal 2 is "Special trips such as field trips"  
 Goal 3 is "Developing Students' Behavior"  
 Goal 4 is "Other goals"

TABLE 11  
DISTRICT A  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS  
FOR GOALS OF TRANSPORTATION SUBPROGRAM

	Goal*	Percent of Available Resources			
		Median	Range	Mean	Mode
Administrators	1	50.00%	40.00%	60.00%	50.00%
	2	25.00	30.00	23.33	10.00
	3	10.00	20.00	0.0	10.00
	4	0.0	40.00	6.67	0.0
Math Teachers	1	60.00	10.00	64.00	60.00
	2	22.50	20.00	22.00	30.00
	3	10.00	10.00	12.00	10.00
	4	0.0	0.0	0.0	0.0
Data Processing Teachers	1	90.00	0.0	90.00	90.00
	2	10.00	0.0	10.00	10.00
	3	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0
Math Students	1	62.50	70.00	61.56	70.00
	2	25.00	70.00	26.87	30.00
	3	0.0	30.00	8.13	0.0
	4	0.0	40.00	3.44	0.0
Data Processing Students	1	50.00	80.00	50.48	50.00
	2	31.15	50.00	32.62	30.00
	3	9.62	50.00	13.33	0.0
	4	0.0	30.00	3.33	0.0
Bus Drivers	1	58.41	90.00	57.46	60.00
	2	30.43	90.00	30.48	30.00
	3	0.0	70.00	7.62	0.0
	4	0.0	30.00	2.79	0.0

\*Goal 1 is "Delivering Students to and from School"  
 Goal 2 is "Special Trips such as Field Trips"  
 Goal 3 is "Developing Students' Behavior"  
 Goal 4 is "Other Goals"

represents a major difference in the two districts.

District B withdrew their data processing program from the Region IV Service in 1968. The Director of Vocational Data Processing at District B believes that their separated program offers more flexibility. The Director of Data Processing at District A believes that his program, using the giant computer at the Region IV Center, can allow students to do much more advanced computer work than would be possible on a smaller computer. It is likely that the size of the two districts is a factor.

Costs are presently assigned by Region IV by formula associated with student membership and frequency of accounting runs. Computer time used will become the basis next year. Present costs in District A are \$14,746 for salaries, \$17, miscellaneous, and \$18,009 for equipment rental and supplies. Total cost of the subprogram is \$32,772.40. Costs in District B are \$215,122. Table 12 gives the perceptions of resource allocations for the subprograms by administrators in both districts. Most respondents ranked the goals in the following order:

1. Provide information to administrators.
2. Perform clerical tasks
3. Develop research.
4. Other.



TABLE 12

PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS AND  
ACTUAL RESOURCE ALLOCATIONS FOR GOALS OF ADMINISTRATIVE  
DATA PROCESSING SUBPROGRAMS BY ADMINISTRATORS

	Goal*	Percent of Available Resources			
		Median	Range	Mean	Mode
Desired Allocation-- District A	1	35.00%	40.00%	30.00%	40.00%
	2	35.00	20.00	36.67	30.00
	3	18.33	20.00	18.33	20.00
	4	0.0	50.00	15.00	0.0
Actual Allocation-- District A	1	38.75	40.00	38.00	40.00
	2	40.00	50.00	40.00	40.00
	3	7.50	20.00	8.00	0.0
	4	0.0	60.00	14.00	0.0
Desired Allocation-- District B	1	25.00	20.00	22.50	30.00
	2	45.00	40.00	47.50	40.00
	3	20.00	30.00	27.50	20.00
	4	0.0	0.0	0.0	0.0
Actual Allocation-- District B	1	40.00	30.00	37.50	50.00
	2	55.00	50.00	55.00	50.00
	3	5.00	20.00	7.50	0.0
	4	0.0	0.0	0.0	0.0

\*Goal 1 is "Performing Clerical Tasks"

Goal 2 is "Providing Information to Administrators"

Goal 3 is "Developing Research"

Goal 4 is "Other Goals"

17,958 pupils are transported in the District B transportation subprogram. 70% of elementary students are transported; 60% of junior high, and 50% of senior high students are transported. There is no limit on the distance from school that a student must ride in order to receive free transportation. The total length of bus routes in 1973-74 was 3,659 miles, which indicates mileage of 658,620 for the school year. There are 297 routes. The total number of pupils transported in 1973-74 was 17,958. There are 236 buses. 1973-74 costs were \$1,160,354; 1974-75 budget is \$1,391,817 including capital outlay of \$187,500.

Bus drivers do not normally report to a central office daily; consequently it is difficult to reach them with a questionnaire. The method taken was attaching questionnaires on every bus steering wheel before the morning run and again before the afternoon run in order to reach every driver. Even though the Director of Transportation cooperated fully, only 11% of the drivers responded to the survey. The results of their ratings are in Table 13.

TABLE 13  
DISTRICT B  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS  
FOR GOALS OF TRANSPORTATION SUBPROGRAM

	Goal*	Percent of Available Resources			
		Median	Range	Mean	Mode
Administrators	1	65.00%	10.00%	65.00%	60.00%
	2	25.00	20.00	27.50	20.00
	3	10.00	10.00	7.50	10.00
	4	0.0	0.0	0.0	0.0
Math Teachers	1	50.00	20.00	50.00	60.00
	2	32.50	30.00	33.33	20.00
	3	17.50	30.00	16.67	20.00
	4	0.0	0.0	0.0	0.0
Data Processing Teachers	1	50.00	20.00	50.00	40.00
	2	35.00	10.00	35.00	30.00
	3	25.00	10.00	25.00	30.00
	4	0.0	0.0	0.0	0.0
Math Students	1	43.75	60.00	42.92	40.00
	2	33.00	70.00	35.42	30.00
	3	7.50	40.00	10.42	0.0
	4	10.00	30.00	11.25	0.0
Data Processing Students	1	44.67	90.00	46.32	40.00
	2	38.93	70.00	39.82	40.00
	3	7.95	50.00	10.18	10.00
	4	0.0	60.00	4.74	0.0
Bus Drivers	1	50.00	70.00	50.31	40.00
	2	23.24	40.00	23.75	20.00
	3	10.88	60.00	13.12	10.00
	4	7.50	70.00	12.81	0.0

\*Goal 1 is "Delivering Students to and from School"  
 Goal 2 is "Special Trips such as Field Trips"  
 Goal 3 is "Developing Student Behavior"  
 Goal 4 is "Other Goals"

TABLE 13  
DISTRICT B  
PERCEPTIONS OF ACTUAL RESOURCE ALLOCATIONS  
FOR GOALS OF TRANSPORTATION SUBPROGRAM

	Goal*	Percent of Available Resources			
		Median	Range	Mean	Mode
Administrators	1	70.00%	20.00%	70.00%	80.00%
	2	30.00	20.00	30.00	20.00
	3	0.0	0 0	0.0	0.0
	4	0.0	0.0	0.0	0.0
Math Teachers	1	60.00	40.00	60.00	80.00
	2	35.00	40.00	36.67	20.00
	3	0.0	10.00	3.33	0.0
	4	0.0	0.0	0.0	0.0
Data Processing Teachers	1	60.00	0.0	60.00	60.00
	2	40.00	0.0	40.00	40.00
	3	10.00	20.00	10.00	0.0
	4	0.0	0.0	0.0	0.0
Math Students	1	61.67	70.00	59.17	60.00
	2	19.62	50.00	21.25	20.00
	3	16.82	40.00	13.75	20.00
	4	0.0	50.00	15.83	0.0
Data Processing Students	1	45.38	90.00	43.64	50.00
	2	32.81	90.00	35.27	50.00
	3	15.42	80.00	19.82	0.0
	4	0.0	30.00	1.45	0.0
Bus Drivers	1	53.33	80.00	53.13	50.00
	2	33.18	70.00	32.50	30.00
	3	00.00	40.00	5.94	0.0
	4	0.0	90.00	7.19	0.0

\*Goal 1 is "Delivering Students to and from School"  
 Goal 2 is "Special Trips such as Field Trips"  
 Goal 3 is "Developing Student Behavior"  
 Goal 4 is "Other Goals"

Vocational data processing at District B has 84 students enrolled in the total two-year (6 quarter) course. They study COBOL and FORTRAN computer languages as well as operating their own computer. 86% of the students are from white-collar backgrounds. They have attended five different schools, as expressed by the mean of the group. The modal number was four. Their grades are high, with 94% of the students making either "A" or "B" in the previous quarter. The ranking of goals was different from that experienced in other groups. Both teachers and students rated "Developing good behavior" highly both as an expected goal and an actual goal. No pattern emerged from contributions made under the "other" category. Description of the subprogram is in Table 14; ratings are in Table 15.

There are eleven sections of calculus, the most advanced mathematics in District B, being taught in four separate high schools. The average class size is 24. Mean student age is 17, with mode 17 and standard deviation 1.279. 67% of the students are males; 75% of the students come from white-collar backgrounds. As was the case in District A, the mobility of the math students, shown by the number of schools that they report having attended, is slightly less among math students than among vocational data processing students. The mean is 4.292, with

TABLE 14  
DISTRICT B  
VOCATIONAL DATA PROCESSING  
1974-75

Number teachers	2
Number students	84
Average class size	21
Mean student age	17
Modal student age	16
Standard deviation of student ages	1.50
Percent that are males	46
Percent whose families are white collar	86
Mean number of schools attended	5
Modal number of schools attended	4
Percent making grade of "A" in previous quarter	28
Percent making grade of "B" in previous quarter	56
Number of quarters in total course	6
Duration of class period (minutes)	55
Days of instruction per school year	180
Costs:	
Salaries	\$22,886.00
Other expenses	8,460.00
Total	\$31,266.00

TABLE 15

DISTRICT B  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS AND  
ACTUAL RESOURCE ALLOCATIONS FOR GOALS OF  
VOCATIONAL DATA PROCESSING SUBPROGRAM

		Percent of Available Resources				
		Goal*	Median	Range	Mean	Mode
<hr/>						
Desired:						
Students	1	43.82%	80.00%	43.10%	40.00%	
	2	36.90	70.00	35.52	40.00	
	3	10.83	40.00	12.07	10.00	
	4	0.0	70.00	7.24	0.0	
Teachers	1	40.00	0.0	40.00	40.00	
	2	25.00	40.00	20.00	20.00	
	3	10.00	20.00	10.00	0.0	
	4	0.0	0.0	0.0	0.0	
Actual:						
Students	1	40.00	80.00	41.07	50.00	
	2	38.68	90.00	39.46	40.00	
	3	13.00	50.00	15.00	0.0	
	4	0.0	70.00	5.36	0.0	
Teachers	1	40.00	20.00	40.00	30.00	
	2	50.00	0.0	50.00	50.00	
	3	5.00	10.00	5.00	10.00	
	4	5.00	10.00	5.00	10.00	

\*Goal 1 is "Preparing Students for Jobs"

Goal 2 is "Preparing Students for Further School"

Goal 3 is "Developing Students' Behavior"

Goal 4 is "Other Goals"

the mode being 3. It is likely that a high school student in District B would have been in three schools without having relocated. The mean grade received in the previous quarter was 2.92, about the same as in vocational data processing.

Calculus is described by the Texas Education Agency as follows:

This course is designed for the student who has displayed both exceptional mathematical talent and diligence in his study of all of his high school courses. It requires a high degree of maturity and is designed to give such a student: (1) additional mathematical experiences in a subject area which has made one of the most fundamental contributions to mankind's knowledge: (2) if he is college-bound, an opportunity to prepare himself for possible advanced standing credit in calculus at the college level: (3) an opportunity to be exceptionally well prepared to take a college calculus course: (4) additional insight into allied subject areas such as physics, chemistry, engineering, etc.<sup>52</sup>

Description of the subprogram is in table 16; ratings are in table 17.

#### Agreement Between Groups

If the groups agree on the goals of their subprograms, it should be evident by a correlation analysis of the median rankings that each group gave. Kendall's tau, again computed by computer, was used to analyze the four rankings that each group gave.

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<sup>52</sup>Texas Education Agency, Mathematics: Level Nine Through Twelve (Austin, Texas: The Agency, 1973), p. 85.



TABLE 16  
DISTRICT B  
ADVANCED MATHEMATICS CLASSES  
1974-75

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Number teachers	6
Number of sections	11
Average class size	24
Mean student age	17
Modal student age	17
Standard deviation	1.279
Percent who are males	66.7
Percent whose families are white collar	75
Mean number of schools attended	4.292
Modal number of schools attended	3
Standard deviation	1.574
Mean grade received in previous quarter (A=4.0)	2.92
Modal grade received in previous quarter	3.0
Number of quarters in total course	3
Duration of class period (minutes)	55
Days of instruction per school year	180
Total costs	\$37,883.00

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TABLE 17

DISTRICT B  
PERCEPTIONS OF DESIRABLE RESOURCE ALLOCATIONS  
AND ACTUAL RESOURCE ALLOCATIONS FOR GOALS OF  
ADVANCED MATHEMATICS COURSES

		Percent of Available Resources			
Goal*		Median	Range	Mean	Mode
Desired:					
Students	1	26.43%	90.00%	29.58%	30.00%
	2	45.00	70.00	43.33	50.00
	3	8.00	40.00	9.17	10.00
	4	20.00	50.00	20.00	0.0
Teachers	1	18.75	30.00	20.00	10.00
	2	65.00	60.00	62.00	70.00
	3	12.50	20.00	12.00	10.00
	4	0.0	30.00	6.00	0.0
Actual:					
Students	1	21.25	60.00	22.17	10.00
	2	58.00	70.00	55.65	60.00
	3	12.50	60.00	15.22	0.0
	4	0.0	70.00	6.96	0.0
Teachers	1	27.50	90.00	36.00	10.00
	2	52.50	80.00	46.00	80.00
	3	12.50	20.00	12.00	20.00
	4	0.0	30.00	7.50	0.0

\*Goal 1 is "Preparing Students for Jobs"

Goal 2 is "Preparing Students for Further School"

Goal 3 is "Developing Students' Behavior"

Goal 4 is "Other Goals"

The average rankings of each group constitute a column only four numerals deep. The analysis will show whether or not the average ranking of a group was the same as that of another group over the four goals ranked. If there were more goals involved, there would be a higher likelihood of discovering any actual disagreement on the rankings of subprogram goals. The study revealed very little perceived disagreement between groups in the same district and between groups across districts.

In ranking perceptions of goals in the transportation subprogram as they actually are, District A bus drivers correlated less than "1" with several other groups. The coefficient was .9129, significant at the .063 level on a two-tailed test. The median ranking they gave to goal 3, "developing student behavior," and goal 4, "other" was tied at zero; whereas only two other groups gave the same rankings. District A mathematics students and District B bus drivers agreed (coefficient "1") with District A bus drivers.

District B mathematics students showed correlation coefficients of .667 significant at the .174 level with every other group in the survey on the goals of the mathematics department. They rated "other" higher than "developing student behavior." As has already been

mentioned, there was no particular pattern in their suggestions as to "other" goals for the subprogram.

Slight disagreement in perceptions was revealed between District A and District B administrators in ranking the goals of the administrative data processing subprogram. District A administrators showed a tie between goal 1 "providing information to administrators," and goal 2 "performing clerical tasks;" whereas District administrators ranked goal 2 over goal 1. Although their perceptions disagreed slightly on how the subprogram goals "should be" ranked, they agreed perfectly on perceptions of goals as they "actually are."

With these few exceptions, all groups in both districts agreed perfectly on ranking subprogram goals. The picture given is one of homogeneity in perceptions of subprogram goals.

## CHAPTER IV

### EDUCATIONAL BENEFIT: FINDINGS

#### Introduction

The characteristics of the students who benefit from the subprogram being studied have been identified. Now the question is, "In what measurable way do they benefit?" In this chapter, several possible answers to the question for each subprogram are pursued. Each measure of benefit is related to the costs involved in order to show the way that the measure would be used in cost/benefit analysis.

#### Subprogram Goals

To a limited extent, it is possible to allocate the costs of a subprogram by goals. The purpose for doing this is to be able to compare allocations with the intentions that they represent. The District A transportation subprogram, for example, kept mileage figures on extracurricular trips as opposed to regular runs in 1973-74. It is thus possible to dichotomize their 1973-74 costs as \$27,351 for extracurricular trips and \$551,674 for regular trips.

Another way to assign costs to goals is to take the survey participants' view of how he or she

perceives resources "presently are" being spent as meaning how they spend their time. As they are involved with the direct production of benefit, and as other resources support their activities, it might be reasonable to assume that resources are actually allocated to the goals in the way that respondents think they are. A strong argument for this reasoning is the high degree to which salaries dominate total subprogram costs in education. Nygaard and Roelfs have stated that three-fourths of current operating budgets in education goes for salaries.<sup>53</sup>

Generally, 94% of the District A budget for instruction services goes to salaries. 59% of the budget for the transportation department goes to drivers' salaries. Taking these arguments as valid, or at least acceptable in lieu of a better way to break down subprogram goals by cost, we may arrive at the breakdown of cost by goal that begins with Table 18. Decision-makers may review such tables in order to ascertain whether or not resources are being allocated correctly in the light of other forms of evaluation in use.

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<sup>53</sup>Joseph M. Nygaard and R.M. Roelfs, "Personnel Policies and Public School Finance," The Theory and Practice of School Finance, edited by Warren Gauerke and Jack Childress (Chicago: Rand McNally, 1967), p. 310.

TABLE 18  
DISTRICT A  
SUBPROGRAM COSTS BY GOAL

	Mean Percent	Adjusted Percent*	Amount
Mathematics:			
1. Preparing for jobs	32.00	32.00	\$ 1,322
2. Further school	50.00	50.00	2,065
3. Developing behavior	14.00	14.00	578
4. Other	4.00	4.00	165
Vocational Data Processing:			
1. Preparing for jobs	60.00	60.00	11,587
2. Further school	30.00	30.00	5,794
3. Developing behavior	10.00	10.00	1,931
4. Other	0.0	0.0	0
Administrative Data Processing:			
1. Clerical tasks	38.00	38.00	12,453
2. Providing information	40.00	40.00	13,109
3. Developing research	8.00	8.00	2,622
4. Other	14.00	14.00	4,588
Transportation:			
1. To and from school	57.46	58.42	214,195
2. Special trips	30.48	30.99	113,621
3. Developing behavior	7.62	7.75	28,405
4. Other	2.79	2.84	10,401

\*Adjusted proportionally to total 100%

TABLE 19

DISTRICT B  
SUBPROGRAM COSTS BY GOAL

	Mean Percent	Adjusted Percent*	Amount
Mathematics:			
1. Preparing for jobs	36.00	35.47	\$ 13,436
2. Further school	46.00	45.32	17,169
3. Developing behavior	12.00	11.82	4,479
4. Other	7.50	7.39	2,799
Vocational Data Processing:			
1. Preparing for jobs	40.00	40.00	12,506
2. Further school	50.00	50.00	15,634
3. Developing behavior	5.00	5.00	1,563
4. Other	5.00	5.00	1,563
Administrative Data Processing:			
1. Clerical tasks	37.50	37.50	80,671
2. Providing information	55.00	55.00	118,317
3. Developing research	7.50	7.50	16,134
4. Other	0	0	0
Transportation:			
1. To and from school	53.13	53.80	647,887
2. Special trips	32.50	32.91	396,317
3. Developing behavior	5.94	6.01	72,435
4. Other	7.19	7.28	87,678

\*Adjusted proportionally to total 100%



### Quality of Employees

Tables 20 and 21 are concerned with the quality factors that are presently available concerning the major employees in the subprograms being studied. Personnel files are already available by computer in some districts. District A has largely completed the computerization of its personnel files. When this process is complete, a great deal of information will be available about the type of employee that the district gets for a given cost. For the time being, a considerable amount of quantifiable information is already available. No single measure of benefit has been developed in the area of employee quality; consequently a profile of employees has been developed. Administrators may use this kind of approach to determine what they are getting for their money spent for salaries in any given subprogram. Different districts may weigh different qualities more than others; for example, a given district may weigh college preparation relatively more than actual teaching experience in some subprograms. No attempt is made here to interpret the figures in such a way.

It was possible to gather more information in District A than in District B, especially concerning bus drivers due to the low percentage of response to the questionnaire for bus drivers in District B.

TABLE 20

## PROFILES OF TEACHERS

Characteristic	District A				District B			
	Mathematics Teachers		Data Processing Teachers		Teachers		Data Processing Teachers	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Years Teaching	7.	5.17	2.	0.0	6.2	2.95	10.	0.0
Years in District	6.	6.93	2.	0.0	5.2	1.30	10.	0.0
Years Teaching this Subject	5.67	5.23	2.	0.0	4.2	3.96	10.	0.0
College Hours in this Subject	40.33	30.24	7.	0.0	53.8	10.11	30.	5.5
Number Students in this Subject	32.67	7.02	38.	0.0	32.0	7.91	41.	0.0
Number Sections	3.	1.73	2.	0.0	1.4	.55	2.	0.0
Age	32.	5.55	24.	0.0	29.	3.91	38.	15.55
Percent Males	80%		23%		20%		100%	
Annual Salary	\$8,915		\$9,603		\$9,558		\$11,443	

TABLE 21

## PROFILES OF BUS DRIVERS

Characteristic	<u>District A</u>		<u>District B</u>	
	Mean	Std. Dev.	Mean	Std. Dev.
Years Driving Experience	5.95	5.07	4.28	4.68
Age	37.	8.78	34.	8.72
Percent that are Male	53%		50%	
Special Education Runs:				
Average Miles Daily	16.15	25.17	49.75	25.36
Maximum Pupil Load	13.54	23.89	32.38	30.38
Regular Bus Runs:				
Average Miles Daily	36.62	8.47	22.88	17.82
Maximum Pupil Load	69.71	20.49	57.34	21.39
Hourly Wage	\$3.94	.26		
Number Preventable Accidents in Career	.54	.86		
Percent Who Teach as Well as Driving Bus	35%			

Time In Class

A student may be said to benefit from having attended a class for a specific length of time. This is a quantifiable measure of benefit that seems to relate directly to costs and to the overall purposes of school. Once the costs per year are ascertained and the number of students is known, one has only to decide on the most usable time span in order to assign costs this way. For example, the costs/student/quarter of the advanced mathematics in District A is \$38.00. Computerized enrollment files, with the finance files that are

already computerized, will make this index of benefit easy to obtain. The costs per student quarter in District B, figured the same way, is \$47.83. Costs per student quarter of the vocational data processing subprogram in District A is \$126.00. \$124.07 is the same figure for District B.

One may add a dimension of quality to the index by including measures of student growth to the cost. In this sense, District A may be said to have spent \$38.00 per student to educate students to a median grade of "B". If other measures of student growth were available, they could be applied similarly. Growth as measured by standardized tests, for example, could hypothetically show costs per month of growth in ability as measured by a particular test.

It is also possible to reduce the time span involved to another denominator which may be more desirable for comparative purposes. As both District A and District B use 55 minute class periods, further reduction of their costs to cost/pupil/minute is a simple matter. The figure for District A mathematics subprogram is \$.0115; for data processing it is \$.038. For District B: \$.0145 for mathematics and \$.038 for data processing.

When support programs do not have a better method of determining benefit associated with them, it is feasible to determine costs/student/time span as well.

The cost/pupil/quarter of administrative data processing in District A is \$1.36. The same figure for District B is \$1.75.

#### Bus Service

The cost of transporting a single pupil for a single mile is very likely the lowest common denominator of measures of benefit in school transportation. In District A, the best estimate is \$.0165, which represents the average cost per pupil divided by the average miles on a single bus route divided further by two to reflect the likelihood that the average student rode only half the route. Similarly, the best figure available for cost/student/mile in District B is \$.0583. It is not presently possible to arrive at more accurate figures. Transportation directors at both districts agree that this index may be useful if accounting procedures were such that reliable estimates could be made.

Another measure of benefit may be simply the total miles of bus travel. This can be broken down by the purpose of each trip. In District A, records available for the 1973-74 school year indicate mileage of 551,674 for route travel and 47,358 miles for extra-curricular bus runs. Costs per mile was computed at \$.5775.

The District A Director of Transportation believes that measuring costs by pupil and by mileage are less useful measures than might be available by analyzing

the cost per hour of bus operation. By using this measure, such factors as population density, traffic and road conditions, and weather affect the index less over a period of time. District A presently keeps records of bus operations in an accessible way by paying bus drivers for hours worked. Each driver is required to clock in ten minutes before their bus run in order to check out their bus. Consequently the number of hours of bus operation can be computed from the payroll. This provides an accurate and up to date measure of benefit to which costs can be applied on a regular accounting basis. District A costs/bus/hour in 1973-74 were \$9.08. Figures are not available in District B.

#### Participant Satisfaction

Perhaps the ultimate arbiter of benefit in education is the perception of the participant. It stands to reason that a certain subprogram would be worth less if the participant evaluated it poorly than it would be worth if the participant perceived it as satisfactory. A practical, common sense approach to determining the perceived satisfaction of participants is to compare their perception of the subprogram as it should be with their perception of the subprogram as it presently is. The survey instrument in Appendix B does this, and it is particularly useful because it measures perceptions in relation to resource allocation; thus the

responses are tempered by an awareness of finite resources. If a great many respondents in a certain category rank a goal the same way on both "should be" and "presently is" stems, then perceived satisfaction with the present resource allocation for the subprogram goal is inferred. This is not an arbitrary measure of what administrators should be doing in an ideal world, but a practical assessment from participants in the subprogram.

Resource allocations in both districts are strongly endorsed by their employees and their students as shown by this survey. Beginning with Table 22, an indication of participants' perception on agreement between "should be" and "presently exist" resource allocations by goals is given. Respondents whose ratings were in agreement on a certain goal are summed below the first heading. If they ranked "presently is" higher than "should be," they are summed below the "spend too much" heading. Those ranking "should be" higher are summed below the "spend too little" heading. A correlation was run between "should be" and "presently is" rankings. The index chosen was Kendall's tau. The index takes values from -1 to +1, with lack of correlation suggested by a value of zero. Other indices were computed, but the results of all tests were consistent, and only the more familiar tau is shown here. Where N was sufficiently high, levels of significance were also computed and are shown on the following tables.

TABLE 22

DISTRICT A  
COMPARISON OF PERCEPTIONS OF DESIRABLE AND ACTUAL  
RESOURCE ALLOCATIONS FOR GOALS OF TRANSPORTATION SUBPROGRAM

Respondent/Goal**		Spend Right Amount	RESPONSES		Corre- lation ratio	Signifi- cance level*
			Spend Too Much	Spend Too Little		
Bus Drivers	1	89%	3%	8%	.20207	.0091
	2	80	14	6	.24224	.0025
	3	56	13	31	.23389	.0034
	4	47	34	19	.30578	.0002
Adminis- trators	1	100	0	0	1.00000	
	2	100	0	0	1.00000	
	3	63	25	12	.44513	
	4	63	37	0	.75926	
Students	1	72	16	12	.28313	.0002
	2	60	10	30	.17969	.0118
	3	60	21	19	.26869	.0030
	4	53	21	26	.33207	.0000
Teachers	1	100	0	0	1.00	
	2	100	0	0	1.00	
	3	83	0	17	- .67	
	4	50	0	50	.60	

\*Probability that the relationship may have occurred by chance

\*\*Goal 1 is "To and from school," goal 2 is "Special trips,"  
goal 3 is "Developing behavior," and goal 4 is "Other."



TABLE 23

DISTRICT A  
COMPARISON OF PERCEPTIONS OF DESIRABLE AND ACTUAL  
RESOURCE ALLOCATIONS FOR GOALS OF STUDY SUBPROGRAMS

Respondent/Goal**		RESPONSES			Corre- lation ratio	Signifi- cance level*
		Spend Right Amount	Spend Too Much	Spend Too Little		
	1	55%	19%	26%	- .03895	.3791
Mathematics Students	2	74	10	16	.28089	.0132
	3	55	29	16	.10568	.2018
	4	55	22	23	.30605	.0078
	1	80	0	20	.66667	
Mathematics Teachers	2	60	20	20	.16667	
	3	60	20	20	- .25000	
	4	80	0	20	.37796	
	1	60	16	24	.21987	.0201
Data Processing Students	2	42	26	32	.07468	.2402
	3	34	43	23	- .03926	.3553
	4	43	33	24	.12127	.1289
	1	50	50	0		
Data Processing Teachers	2	100	0	0		
	3	50	0	50		
	4	50	0	50		

\*Probability that the relationship may have occurred by chance

\*\*Goal 1 is "Prepare for jobs," goal 2 is "Prepare for further school," goal 3 is "Developing behavior," and goal 4 is "Other."

TABLE 24

DISTRICT B  
COMPARISON OF PERCEPTIONS OF DESIRABLE AND ACTUAL  
RESOURCE ALLOCATIONS FOR GOALS OF TRANSPORTATION SUBPROGRAM

Respondent/Goal**		RESPONSES			Corre- lation ratio	Signifi- cance level*
		Spend Right Amount	Spend Too Much	Spend Too Little		
	1	82%	9%	9%	.13217	.1439
Bus Drivers	2	63	31	6	.18013	.0737
	3	47	22	31	.15432	.1072
	4	44	31	25	.17123	.0842
	1	100	0	0	1.00000	
Adminis- trators	2	100	0	0	1.00000	
	3	100	0	0	1.00000	
	4	100	0	0	1.00000	
	1	62	16	22	.17732	.0088
Students	2	50	23	27	- .12297	.0499
	3	39	44	17	- .05071	.2487
	4	42	32	26	.14044	.0301
	1	100	0	0	1.00000	
Teachers	2	100	0	0	1.00000	
	3	40	0	60	- .18237	
	4	80	0	20	.61237	

\*Probability that the relationship may have occurred by chance

\*\*Goal 1 is "To and from school," goal 2 is "Special trips,"  
goal 3 is "Developing behavior," and goal 4 is "Other."

TABLE 25

DISTRICT B  
COMPARISON OF PERCEPTIONS OF DESIRABLE AND ACTUAL  
RESOURCE ALLOCATIONS FOR GOALS OF STUDY SUBPROGRAMS

Respondent/Goal**		RESPONSES			Corre- lation ratio	Signifi- cance level*
		Spend Right Amount	Spend Too Much	Spend Too Little		
	1	66%	17%	17%	.17964	.1094
Mathematics Students	2	38	33	29	.32802	.0124
	3	21	62	17	-.16146	.1224
	4	41	17	42	.46388	.0007
	1	25	0	75	-.22361	
Mathematics Teachers	2	75	25	0	.57735	
	3	75	25	0	.57735	
	4	100	0	0	1.00000	
	1	55	11	34	.13835	.0625
Data Processing Students	2	54	23	23	.13872	.0620
	3	49	31	20	.02139	.4063
	4	41	25	34	.29477	.0005
	1	50	50	0		
Data Processing Teachers	2	50	0	50		
	3	50	0	50		
	4	50	50	00		

\*Probability that the relationship may have occurred by chance

\*\*Goal 1 is "Prepare for jobs," goal 2 is "Prepare for further school," goal 3 is "Developing behavior," and goal 4 is "Other."

Virtually all of the goals were rated the same on "should be" as on "presently are" stems by the majority of respondents. The exceptions follow.

The goal of developing good student behavior on buses caused some disagreement among teachers in each district, who thought that not enough resources were being allocated, and among students in District B, who generally thought that too much attention was paid to the goal. Math students in District A indicated that too few dollars were being allocated in the math classes to the goal of getting a job. Math teachers in District B indicated the same thing. Math students in District B indicated that resource allocations were too high for the goal of developing good student behavior in the mass classes.

With the few exceptions listed above, correlations were positive and significant at high levels; therefore it may be concluded that, in most cases, participants perceived resource allocations as being close to what they should be.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Introduction

In the previous chapters, the following questions have been examined:

1. Who benefits from educational subprograms? What characteristics define them?
2. What is the extent to which the recipients benefit? What is the actual benefit? How might it be measured?
3. What measures of benefit are available which can be used in cost/benefit analysis?

Several quantifiable measures of benefit have been identified and used meaningfully in cost/benefit analysis. The experience in developing these measurements makes it possible to summarize, make conclusions, and make recommendations.

#### Summary

Each of the measurements of benefit developed in the study has unique characteristics and applications; therefore the summary for each of them is developed independently.

#### Costs by Goals

The school districts studied do not keep cost figures by stated goals. It is possible to do this. For example,

it is possible to keep records of every bus run in terms of the time, the miles covered, population density factors, number of starts and stops, gas mileage, salary of driver, pupil load and the purpose of the trip. Costs associated with purposes could be made available. One trend in data processing might make such detailed accounting possible in the future--that is the trend toward more automatic methods of data input. In the meantime, costs by goals may be made available through a survey such as the one used in this study and displayed in Appendix B. It has the advantage of asking what the employee actually does with his or her time rather than making abstract decisions about time spent on each goal. It has the disadvantage of not covering the complete costs of the subprogram; however, the large percentage of costs taken up in salaries and the principle that support activities relate to primary activities would argue in favor of such a device.

The device was found to be flexible. It is possible to add more goals to the survey instrument without changing its usefulness or ease in handling. It is possible to evaluate time spent between different subprograms (such as time spent teaching different courses) by asking participants how they allocate resources between subprograms.

The participants surveyed in each district were in general agreement as to the goals of the subprograms studied. That is, they ranked them generally the same. This should

not be construed to mean that there are no differences in the goals of the two districts.

### Quality of Employees

The contents of computerized personnel files are accessible and usable in quantifiable analysis. No one "quality index" for indicating the quality of employees is available; however, several quantifiable aspects of an employee's background can be reported together in a profile form. The profile can be compared to costs over a period of time to help decision makers evaluate subprograms. The process could be extended to include evaluations in quantifiable form if desired.

Salaries of teachers were lower in District A, although their mathematics teachers ranked higher in terms of experience. District B mathematics teachers ranked higher in terms of college hours in their subject. Data processing teachers in District B ranked higher in experience and in college hours. Bus drivers in District A were older and more experienced than in District B.

### Time Spent in Class

Cost/student/time spent in class was found in the study to be appropriate as a measure of benefit for academic and vocational study subprograms. The data may be obtained directly from finance and curriculum files. New accounting processes make it possible to break down the types of students and grade levels involved. The entire operation

will be available by computer in the foreseeable future.

It is generally accepted that time spent in class reflects a benefit for students; however, it is not totally accepted. Studies of relationship between pupil growth and time spent in class suggest no strong relationship, according to Husen.<sup>54</sup>

Measures of student growth that could be compared for decision making were generally lacking in the subprograms studied. The only universally understood measure of student growth available in the subprograms studied were grades assigned by teachers. Administrators in both districts studied showed interest in modularized learning, but none of the subprograms studied had yet been affected.

Advanced mathematics students in District A were receiving a less costly course than in District B. Data processing costs per student/quarter were about the same.

#### Participants' Opinions

The study showed that it is possible to create a ranking of participants' perceived satisfaction with a subprogram to be used for cost/benefit analysis. A survey form such as the one used and analyzed in this study could be authorized and administered. The time spent in taking the survey was minimal. One use for such a survey is to identify sources of disagreement by

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<sup>54</sup>Torsten Husen, "Does More Time in School Make A Difference?" Educational Digest (September, 1972), p. 11-15.



population characteristics. In the study, for example, the Director of Transportation in District A was able to find out which type of bus drivers desired more resources for developing student behavior. Another use of a flexible survey is to test specific hypotheses that decision makers may want to know about. In the survey used, students were asked to indicate their satisfaction with the space allocated for their subprogram in order to test the possibility that cost/space allowance might be a meaningful measure of benefit; however, fewer than 1% of the students responded negatively, which indicated that the index would be meaningless in these cases. Participants in both districts showed a high degree of perceived satisfaction with present resource allocations.

#### Benefits of Support Subprograms

Cost/pupil/mile is the lowest common denominator of cost/benefit in transportation according to this study, and cost/enrollment/school year seems best for administrative support subprograms such as administrative data processing. However, in both of the districts studied, the relationship between the number of students served and the costs of the subprogram was not held to be the determining factor in costs. In addition, neither district studied had conclusive accounting of cost/pupil/mile.

The study indicated that costs could be expressed more meaningfully in terms of cost/time of operation. In transportation subprograms the index would be cost/hour of

bus operation, and in administrative data processing the index would be cost/minute of computer time. In District A, the hours of bus operation are presently known. District B does not have this information. Both districts will be able to account for computer time by purposes beginning next year if the present plans are implemented. Cost/pupil/mile for bus service were lower in District A than in District B according to the study.

### Conclusions

The inquiry established six viable measurements of benefit for cost/benefit analysis in program budgeting. Each has been summarized. The evidence indicates that these measures are validated by the following criteria from the problem statement (see page 3) with the exceptions noted.

#### Realistic Value System

The measurements of benefit were held to reference to a realistic value system in that they related to usual school district practices, to generally recognized educational goals (see Appendix A), to the opinions of subprogram participants; and in that they were ascertainable within the context of present accounting practices in the school districts studied.

Almost all of the measures were found to be ascertainable as demonstrated by the study. The measure "Cost/pupil/

mile was derived through indirect methods. Measurements for cost/hour of operation were not found to be available for buses in District B; nor were measurements for computer use in either district. Measurements of costs by goals and of participants' opinions referred directly to goal statements as shown in Appendix A.

#### Criterion Measurements

The measurements of benefit were found to contain criterion measurements. They were found to be comparable with norms, with pre-set goals, and with pre-set performance. Although the processes differed slightly, the measurements derived were expressed in the same ratios and units in both districts studied. The use of the concept of percent of resources allowed the measures to relate to the activities of the individual school district no matter what its dollar resources or the uniqueness of its situation. For example, District A was found to have devoted a mean perceived 32% of available resources to "preparing for jobs" in the mathematics subprogram studied whereas District B's figure was 36%--notwithstanding a much wider disparity in the dollar amounts committed to the goal.

#### Provide Components for the Decision Making Process

The measurements developed were found to provide components for the decision making process in that each was demonstrated to relate to costs and to the concept of allocation of limited resources. For example, it was found

that the costs of a single student in the advanced mathematics subprogram studied in District A was \$38.00 per quarter.

The expressions of goals used in the study were found to impose a simulated real life decision making restriction: the respondent could not emphasize one goal without taking resources from others.

#### Options that Enable Flexibility of Application

The measurements of benefit that were developed in the study were found to enable flexibility of application in that they were arbitrary, independent, and could be added to or limited in order to adjust to different school district perspectives, emphases, and goals. Processes were developed and explained in the study, then they were demonstrated on two diverse school districts. Each measurement was taken independently of the others; which demonstrates that a given school district may elect to use them or not. The criteria applied in the analysis of each of the measures may vary from district to district. For example, the profiles of employees developed did not emphasize a particular quality over another; but rather presented information in a usable form. A district may choose to ignore one or more of the measurements; for example, the measurement of cost/pupil/mile may not be held to relate directly to school district transportation costs significantly.

### A Framework for Cost/Benefit Analysis

The measurements developed were found to fit into a framework for cost/benefit analysis in that each could be related to costs for the purpose of evaluating alternatives. As comparative information accrues in the districts studied, it will become possible to ascertain desired courses of action through development of the measures of benefit used in this study. For example, both districts were found to have high degrees of perceived satisfaction by participants in the subprograms studied. Any change in the measurement or in the policies of the districts may be evaluated quantitatively.

### Recommendations

Chapter II examined the statements of several educators as to the need, usefulness, and possibility of obtaining quantifiable indices of educational benefit. Time and technological development have made such measures possible; the questions of need and usefulness can be answered only by administrators in the field. Several recommendations result from this study.

Whenever possible, cost/analysis should be related to goals. If district goals change, it should be possible to quantify the necessary changes in desired resource allocation by consulting available figures. A survey such as the one used in this study may provide a basis for scientifically determining present district goals.

If districts were to keep costs by goals, it would become possible, over a period of time, to ascertain cost trends relevant to decision making.

Longitudinal studies of performance of graduates should be incorporated into the overall cost/benefit plan. The effects of inflation can be dealt with through price indices, so that meaningful benefits of education can be appraised with respect to the costs. For example, a graduate of a vocational course may succeed more fully than another graduate who did not take the same course. Performance of students in college can be related to the courses that they took in public school.

District testing programs that show pupil growth can be related to per pupil costs. Cost/growth curves can then be established which can lead to meaningful evaluations of resource allocations.

Costs of support subprograms, both instructional and administrative, are probably not as useful on a per pupil basis as they are on a more immediate goal assignment basis such as costs per time expended. In the districts studied, the latter index was considerably easier to obtain. Furthermore, the number of students served does not seem to have a causal relationship to costs incurred.

Districts interested in quantifiable analysis

may consider adopting a multi-purpose survey that can be encoded into their computerized accounting system at regular intervals. The present state of information available in the districts studied was greatly enhanced by the survey given.

Further investigation into using computers to develop quantifiable indices of subprogram quality is suggested by the present abundance of computerized data and by plans to enlarge the scope of computerized accounting.

This study has demonstrated the feasibility of cost/benefit analysis for a diverse set of school activities in two Texas school districts. Other measures of benefit remain to be developed in other fields of educational activity.

## APPENDIX A

## STATEMENTS OF EDUCATIONAL GOALS

Introduction

Goal statements from national, state, and local sources pertinent to the study are listed in this appendix. The first part consists of a list of numbered sources of goals. They were gleaned from official publications and from the statements of experts.

Following the list of sources is the actual list of goal statements. They are arranged into eight categories. The first seven categories are the "Seven Cardinal Principles" first published in 1918.<sup>55</sup> The eighth category was added to reflect the idea that goals should be implemented "adequately and economically" in order to give perspective to the scope of educational goals. Statements from national sources are given first; they are followed by state sources, then local ones. Many statements would have fit into more than one category, but they are not repeated once listed.

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<sup>55</sup>National Education Association, Cardinal Principles of Secondary Education (Washington, D.C.: GPO, Commission on Reorganization of Secondary Education, 1918).



Sources of Goal Statements: National

1. Cooper, Shirley, ed. Imperatives in Education. Washington, D.C.: American Association of School Administrators, 1966.  
A special commission was formed in 1964 to discover the "imperatives" of education. They are not supposed to be all the needs of education; but rather the points at which educational programs must be revised and reshaped to meet the needs of the time. Nine imperatives are listed and explained.
2. Culp, D.P., and Featherstone, Glenn E., Pupil Transportation. New York: Harper and Row, 1965.  
A complete, state-by-state survey of school transportation practices is offered. The uses of school transportation are explained in the light of good educational practice.
3. Harris, James A., "Drastic Proposals for Educational Improvement," Today's Education. (November-December, 1974), p. 5.  
Harris is speaking as the President of the National Education Association. His 17 suggestions seem radical by comparison with other experts, but they represent views suggested by a powerful group affecting educational decision making.
4. Johns, Roe Lyell; Alexander, Kern; and Jordan, K. Forbis; Financing Education: Fiscal and Legal Alternatives. Columbus, Ohio: Charles E. Merrill, 1972.  
This is a summary of a national project commissioned by USOE. Thirty-six experts in school finance and economics employed in twenty universities were surveyed. Part of their task was to identify educational needs.
5. National Education Association of the United States, White House Conference on Rural Education. Washington, D.C.: The Association, 1944.  
Ten "rights" to education are listed. Although they are phrased as rights of rural children, an emphasized statement says they are rights of all American children.
6. U.S. Department of Transportation, "Pupil Transportation Safety," Highway Safety Program Standard Number 17.  
Lists safety goals for school transportation.
7. Winder, Lester C., "Apply the Facts for Better School Transportation," Nation's Schools. LXVIII, 1961.  
This is a discussion of trends and problems.

8. Chambers, Ernest W., and Cutter, Virginia, "Toward Comprehensive Educational Planning in Texas," Comprehensive Planning in State Education Agencies. edited by Bernarr S. Furse and Lyle C. Wright. Salt Lake City, Utah: Utah State Board of Education, 1968.

This is a list of "nine priority areas of concern for education in Texas."

9. Drury, Douglas S., "School Transportation," Texas Outlook. I, 1966, p. 40-41.  
Important needs in school transportation are discussed.

10. Gulf Schools Supplementary Education Center, "Data Processing for Texas School Districts (Excerpts)" Prepared for Texas Education Agency by Arthur Andersen and Company, Pearland, Texas: Gulf Schools Supplementary Education Center, 1967.

This report describes the regional data processing centers for Texas. It goes over the important needs that data processing must meet.

11. Texas Education Agency, Basic Learner Outcomes for Career Education. Austin, Texas: The Agency, (November, 1973).

Responding to the lack of information about needs of Texas students, the agency developed an extensive survey in which students were asked to identify the "basic" objectives of career education. The 177 selected statements were grouped under nine categories.

12. Texas Education Agency, "Goals for Public School Education in Texas." Austin, Texas: The Agency, (April 14, 1973).

This one-page publication lists goals for public education.

13. Texas Education Agency, "Guide for Public Schools in Planning Programs of Vocational Education for In-School Students." Austin, Texas: The Agency, (September, 1966).

This bulletin has a treatment of laboratory training programs in data processing.

14. Texas Education Agency, Mathematics: Level Nine Through Twelve. Austin, Texas: The Agency, (January 1973).

This is a recent treatment of mathematics in schools. It has goals and objectives by subprogram.

Sources of Goal Statements: Lamar CISD

15. Lamar CISD, Outline of the Policies and Regulations of Lamar Consolidated Independent School District. Richmond, Texas: The District, 1970.

Statements of policy are presented.

16. Lamar CISD, Summary of the Self-Evaluation: Lamar Consolidated High School. Richmond, Texas: The District, 1970.

Statements of goals and objectives are included in the self-evaluation. They are approved by the Southern Association evaluating committee.

17. Lamar CISD, Summary of the Self-Evaluation: Lamar Junior High School. Richmond, Texas: The District, 1971.

This report is similar to the one above, but not all of the listed goals are the same.

Sources of Goal Statements: Spring Branch ISD

18. Spring Branch ISD, Official Rules, Regulations and Policies. Houston, Texas: The District, 1969.

Statements of policy are presented.

19. Spring Branch ISD, Self-Evaluation Report: Memorial Senior High.

Statements of goals and objectives are given. Self-evaluations of other schools in the district had almost identical goals expressed.

Goal Statements Relating to "Worthy Home Membership"

<u>Statement</u>	<u>Source</u>
"To deal constructively with psychological tensions"	1
"Provide for well-trained master teachers who relate to and understand their pupils' life-styles and backgrounds."	3
"...relieve the frustration created by the vastness and impersonality of the educational bureaucracy."	3
"Provide for better health services to improve the health and well-being of economically disadvantaged families."	3
"End use of standardized testing for ability grouping and labeling of pupils."	3
"Bus safety."	2

<u>Statement</u>	<u>Source</u>
"...to reduce, to the greatest extent possible, the danger of death or injury to schoolchildren while they are being transported to and from school."	6
"Safety."	7
"Competence in Personal and Social Relations."	12
"Physical and environmental health, and ecological balance."	12
"The transportation program is concerned with safe transportation of pupils to and from school--that is its primary objective for existing."	9
"...To encourage each student to develop a strong self-concept and pursue a continuing program of self-improvement."	16
"Physical, mental, and emotional health"	18
"Zeal for continuous learning, quest and inquiry, and self-improvement."	19

Goal Statements Relating to "Command of Fundamental Processes"

<u>Statement</u>	<u>Source</u>
"To discover and nurture creative talent."	1
"...transport students to many points of educational interest in the community, in nearby regions, and perhaps throughout the state and beyond."	2
"Mathematics courses should enable the student to achieve (a) skills in the manipulations of mathematics, (b) understandings of principles and concepts of mathematics, and (c) mathematical background necessary for his place in life."	14
"...excellence in mathematics education is equally important for students in all ranges of need and ability."	14
"Language skills development, particularly among the children who speak with inadequate command of standard English."	8
"The school bus ride is inherently a learning experience."	9

<u>Statement</u>	<u>Source</u>
"...to develop personal knowledge, skills, and competence to maximum capacity, and to learn behavior patterns which will make each a responsible member of society. In terms of their individual ability, all students should achieve: (A) Intellectual Discipline...."	12
"The most important goal of mathematics instruction is the development of the student's ability to solve problems."	14
"...to create an appetite for learning through the use of teaching methods which stimulate thinking, judgment, and evaluation."	16
"...to enable students to communicate effectively."	16
"To create a desire for learning."	17
"We recognize the common concern of students--to be accepted and to find and express themselves."	16
"...need to introduce...history of mathematics."	16
"Knowledge and understanding of his natural environment."	18
"The ability to communicate ideas."	18
"In the practical application of this philosophy, opportunities shall be provided within the educational program for each individual to develop to the fullest of his capabilities: (1) The fundamental skills."	18
"The ability to think effectively and to make decisions based upon logic."	18
To acquire knowledge of and develop new materials."	18
"To improve individual knowledge of the science of learning."	18
"...to teach children to work independently and to budget their time."	18
"knowledge and understanding of his environment."	19
"development of intellectual skills."	19

Goal Statements Relating to "Worthy Use of Leisure Time"

<u>Statement</u>	<u>Source</u>
"To make the best use of leisure time."	1
"To develop within the individual the personal-social traits which will help him in relating well to other people, both on and off the job, and in making him a good citizen and one who can enjoy and appreciate the finer things in life."	4
"Use of leisure time."	12
"Appreciation of Culture, Language, and Life Style Diversities and Their Corresponding Aesthetic Values."	12
"...profitable use of leisure time."	17
"Appreciation of the Arts."	18
"Wise use of leisure time."	18

Goal Statements Relating to "Vocation"

<u>Statement</u>	<u>Source</u>
"To prepare people for the world of work."	1
"A common purpose of occupational training and education in general must be a development of students' ability to evaluate their own aptitudes, interests, and abilities in relation to the multitude of occupational opportunities in the modern economy, and to make appropriate educational and occupational decisions on the basis of this self-evaluation."	4
"Development of the individual as well as meeting the needs of the labor market."	4
"Provide job assistance to improve family income."	3
"Economic and occupational competence."	12
"(understanding) Education/career opportunity relationships."	11
"Understanding how various economic conditions affect a person."	11
"Self-investigation and evaluation..."	11

<u>Statement</u>	<u>Source</u>
"Skills in human relationships for careers."	11
"Attitudes and appreciation for a career success."	11
"Job acquisition and retention."	11
"Career information."	11
"Vocational education programs as they relate to business and industrial requirements regionally and statewide."	8
"Adult basic education programs, particularly as they relate to occupational skill development."	8
"School manpower development, both preservice and inserv ce."	8
"Career planning and decision making."	11
"Pre-employment laboratory training programs in data processing and electronics shall be designed to provide technical instruction and practical experience for students preparing to enter employment in the data processing or electronics occupations."	13
"...To develop a sense of the dignity of work, marketable skills and a desire to be self-supporting."	16
"...To encourage the student...to establish suitable career goals."	16
"...because of monumental transitions in all phases of the business world, we need to initiate a computer orientation program."	16
"...provide additional programs to more fully meet the needs of the students--especially girls."	16
"...aids in preventing school drop-outs."	16
"...gives students who intend to further their education in a technical field a basic understanding of the skills and abilities needed in that field."	16
"...gives students the opportunity to learn a trade."	16
"Economic competence as a consumer."	18
"Saleable skills and vocational competence."	18

Goal Statements Relating to "Citizenship"

<u>Statement</u>	<u>Source</u>
"To keep democracy working."	1
"To make urban life rewarding and satisfying."	1
"...right through the school to participate in community life and culture."	5
"The ghetto school must be eliminated."	3
"To make intelligent use of natural resources."	1
"Enable teachers to participate in a two-way acculturation process to overcome the misunderstanding between school staff and community."	3
"Provide the urban equivalent of the rural county and home demonstration agents to improve the quality of life for city dwellers."	3
"The bus can readily transport adults to and from school programs, as well as to many other places of educational value."	2
"Citizenship and political understanding and competence."	12
"Personal/work/societal responsibilities."	11
"The school should provide personal and positive experiences through which each young person can mature into a responsible and economically productive citizen."	16
"...To develop a sense of pride in all American heritages and traditions."	16
"...To develop in each young person a sense of civic responsibility..."	16
"...To develop an attitude of concern for the interests, needs, and abilities of others."	16
"...appreciate the necessity of law and order..."	16
"...to produce, so far as it is able, intelligent, responsible, loyal, and moral citizens."	15
"Understanding and appreciation of the American heritage."	17



Goal Statements Relating to "Ethical Character"

<u>Statement</u>	<u>Source</u>
"To strengthen the moral fabric of society."	1
"To work with other peoples of the world for human betterment."	1
"Few school services can give more emphasis to the necessity for self-discipline and regularity than the school bus."	2
"Eradicate discrimination based on sex, race, language, religion, and national origin in policy, practice, curriculum, and educational policies."	3
"Establish 'Schools of inquiry' along the lines of teaching hospitals...and offer internships whereby teacher candidates could learn from and become deeply involved in the life-style of the economically deprived, disadvantaged, and isolated people."	3
"Each must learn respect for authority and for public property."	9
"...attitudes of tolerance, understanding, and respect are essential."	16
"...strengthen moral and ethical values."	17
"...respect for authority, adherence to the rules, cooperative effort, and competitive spirit..."	17
"...realize that rights and privileges carry responsibility..."	17
"Moral and ethical values."	18

Goal Statements Relating to Adequacy and Economy

"Provide individualized instruction for students at all levels."	3
"Provide free higher-education opportunities for students."	3
"Obtain the services of more specialists--psychologists, visiting teachers, reading teachers, nutritionists."	3
"Provide public education beginning at the age of three."	3

<u>Statements</u>	<u>Source</u>
"Provide year-round lighted school buildings to educate children and adults 24 hours a day, seven days a week."	3
"Reduce the average class size to 10."	3
"To make the programs a reality, an annual per-pupil expenditure of \$4,000 will be required--compared to the 1974 average expenditure of \$1,121 per pupil."	3
"Bus adequacy"	2
"Bus economy"	2
"Transporting pupils beyond reasonable walking distance to school and even within walking distance under conditions hazardous to children when walking."	4
"providing for the integration of ethnic and socio-economic groups."	4
"...right to attend school in a satisfactory, modern building."	5
"...right through his school to health services, educational and vocational guidance, library facilities, recreational activities, and, where needed, school lunches and pupil transportation facilities at public expense."	5
"Getting qualified (bus) drivers."	7
"...permit maximum systems compatibility and interchange between districts and regions and minimize any duplication of programming effort." (data processing).	10
"...planning and evaluation should be established for measuring the performance of the public school system in terms of the competence of its staff, the performance of its pupils, and the efficiency of its structure and processes."	12
"The educational system should be organized and conducted so as to achieve maximum cost-benefit results from efficiencies in process and economies of scale within size limitations which will make units of the system responsive and accountable to parents and citizens."	12

<u>Statement</u>	<u>Source</u>
"...attract and retain highly competent people."	12
"The Public School System of Texas should be organized and operated so that the public, faculty, and students will accept and support its objectives and processes."	12
"The learning process should take into consideration the personal goals of every student and should be designed so that each can achieve the educational standards of the system and be encouraged to remain in school until ready for a post-high school career."	12
"Early childhood education programs."	8
"A desirable systems goal is to generate data relative to Texas school districts that is comparable with information being developed on a national level."	10
"Comprehensive pupil appraisal."	8
"Approach each student as an individual..."	16
"...the school is dedicated to the ideal that everyone should have the opportunity to develop his full potential."	16
"...to provide educational opportunities for all age groups."	16
"...provide the best possible educational experiences for each individual enrolled in our school."	16
"...provide physical conditions most conducive to carrying out the educational program of the schools."	18
"...opportunities for improvement in instruction and supervision."	18
"To correlate and improve understanding between departments and grade levels."	18
"The Board of Trustees of the Spring Branch Independent School District holds as its guiding principle in the operation of this school district, the welfare of the child."	18

## APPENDIX B

### SURVEY INSTRUMENT

The survey instrument was developed in order to determine characteristics of participants in school subprograms. A particular interest was the participants' opinion of the way resources should be allocated and the way resources are presently being allocated in the subprogram.

Every respondent gave their opinions on transportation, on their particular subprogram, and their own characteristics. The section on characteristics was physically cut off the copies for the transportation survey in order to attach the portion soliciting opinions to the other sheet that teachers, students, and administrators filled out. Thus, all respondents except bus drivers filled out two pages.

The following page consists of the explanation that was given to all administrators and teachers in explaining the purpose of the survey and the mechanics of administering it.

## EXPLANATION OF SURVEY

One of the goals of this survey is to get basic information about the participants (administrators, students, teachers...etc) involved in the four subprograms being studied.

The other purpose of the survey is to help establish the participants' view of the goals of a given subprogram. No attempt is made to compare schools, school districts, or subprograms; the essential purpose is to add "participants' viewpoint" to our collection of measures of educational benefit.

In order to minimize the disruption caused by the survey, the total response time has been cut to about five minutes. With time spent in distributing and explaining the instrument, about ten minutes will be needed. No names will be used in the survey. The instruments will be numbered in order to check for keypunch errors.

The instruments are to be tabulated by computer. For each participant, each response will be totaled and the mean, median, and standard deviation will be developed. Additionally, the before and after data will be correlated using the non-parametric technique known as Kendall's Tau.

Results of the survey will be used to develop quantifiable measures of educational benefit.

## STUDENTS

Year of birth \_\_\_\_\_ Sex (M or F) \_\_\_\_\_

Occupation of father \_\_\_\_\_

Occupation of mother \_\_\_\_\_

Total number of schools attended \_\_\_\_\_

Do you feel that your class has been given enough space? \_\_\_\_\_

What grade did you receive for the last quarter in this course? \_\_\_\_\_

There are ten large bills pictured below. Each of them represents thousands of dollars. Pretend that you are to spend all ten bills (and no more) to operate this course for one year. Mark each of the bills with a letter that shows the purpose that it should be used for:

Put a "J" on every bill that should be spent to prepare students for jobs.

Put an "S" on every bill that should be spent to prepare students for further school or college.

Put a "B" on every bill that should be spent to help students develop good behavior.

Put your own letter on each bill that should be spent for any other goals (explain).

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----

-----  
part two:

Below are ten more large bills. Now we want to find out how you believe money is presently being spent on goals in this course. The way that your own time is used is an important indicator. Put letters on each of the bills as you did in part one.

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----

## BUS DRIVERS

Year of birth \_\_\_\_\_ Sex (M or F) \_\_\_\_\_ Years experience \_\_\_\_\_  
 (Sp.Ed.) Average daily bus miles \_\_\_\_\_ Max. pupil load \_\_\_\_\_  
 (Reg.) Average daily bus miles \_\_\_\_\_ Max. pupil load \_\_\_\_\_  
 (Special trips) Average weekly bus miles \_\_\_\_\_ Max.  
 pupil load \_\_\_\_\_

There are ten large bills pictured below. Each of them represents thousands of dollars. Pretend that you are to spend all ten of the available bills (and no more) to operate the transportation department of your school district for one year. Mark each of the bills with a letter that shows the purpose that it should be used for:

Put a "D" on every bill that should be spent to deliver students to and from school.

Put an "S" on every bill that should be spent on special trips for band, athletics, field trips, or other activities.

Put a "B" on every bill that should be spent to help students develop good behavior.

Put your own letter on each bill that should be spent for any other goals (explain).

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

part two:

Below are ten more large bills. Now we want to find out how you believe money is presently being spent on goals in the transportation department. The way that your own time is used is an important indicator. Put letters on each of the bills as you did above.

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

## TEACHERS

Year of birth \_\_\_\_\_ Sex (M or F) \_\_\_\_\_ Years in teaching \_\_\_\_\_  
Years in this district \_\_\_\_\_ Years teaching this subject \_\_\_\_\_  
College hours in subject \_\_\_\_\_ Number of students \_\_\_\_\_  
Number of sections per day \_\_\_\_\_

There are ten large bills pictured below. Each of them represents thousands of dollars. Pretend that you are to spend all ten bills (and no more) to operate this course for one year. Mark each of the bills with a letter that shows the purpose that it should be used for:

Put a "J" on every bill that should be spent to prepare students for jobs.

Put an "S" on every bill that should be spent to prepare students for further school or college.

Put a "B" on every bill that should be spent to help students develop good behavior.

Put your own letter on each bill that should be spent for any other goals (explain).

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----

-----  
part two:

Below are ten more large bills. Now we want to find out how you believe money is presently being spent on goals in this course. The way that your own time is used is an important indicator. Put letters on each of the bills as you did in part one.

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----



## DATA PROCESSING FOR ADMINISTRATION

There are ten large bills pictured below. Each of them represents thousands of dollars. Pretend that you are to spend all ten bills (and no more) to operate the data processing department (not including data processing used for teaching). Mark each of the bills with a letter that shows the purpose that it should be used for:

Put an "M" on every bill that should be spent on the goal of performing clerical tasks.

Put a "P" on every bill that should be spent on the goal of providing information to school administrators.

Put an "R" on every bill that should be spent on the goal of developing research.

Put a letter for other goals (explain).

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----

-----  
part two:

There are ten more large bills pictured below. Now we want to find out how you believe money is presently being spent on goals in the data processing department. Mark each of the bills with a letter as you did in part one.

\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
----	----	----	----	----	----	----	----	----	----

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