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Cost analysis of selected high school vocational courses in relation to academic offerings

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COST ANALYSIS OF SELECTED HIGH SCHOOL VOCATIONAL COURSES IN RELATION TO ACADEMIC OFFERINGS

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INTRODUCTION

Chapter I contains an introduction which provides the background and setting of cost analysis in secondary education, a statement of the problem, the purpose of the study, a listing of key terms and definitions, the sources of data, the delimitations of the study, and a description of the organization of the study.

Background and Setting

The problem of providing adequate financial support for the state's public schools is becoming increasingly acute. Wells summarizes the problem succinctly (27, p. 5):

> Rising costs of education and of all aspects of government are creating concern among taxpayers . . . It is clearly becoming more necessary to assure the judicious use of tax funds for educational purposes.

Data on the increases in educational costs abound. Total expenditures for public education in the United States in 1968-69 were $34,721,185,000, an average of $680 per pupil in average daily attendance, and an increase of 93.7 per cent since 1958-59, and 7.5 per cent since 1967-68. (14, p. 20) In Iowa, expenditures totaled $479,000,000 in 1968-69, of which 4.2 per cent was federal aid, 32.6 per cent state aid, and 63.2 per cent local aid. (14, p. 32) Iowa taxpayers spent an

average of $707 per pupil in 1968-69. At the same time, Iowa ranked ninth, spending $161.53, in the United States in per capita property tax revenues of local government, of which school districts are the primary beneficiary, and thirty-fourth in per capita state expenditures for all public education, spending $97.61 in 1967. It ranked twentieth in expenditures for public elementary and secondary schools per pupil in 1967-68, and twenty-sixth in expenditures per student enrolled in federally aided vocational programs, spending $104 per student. (14, p. 40) To further explore costs in vocational programs, Table 1 presents data showing the expenditures of federal, state, and local funds for vocational education, fiscal year 1968, for Iowa.

Table 1. Expenditure of federal, state, and local funds in Iowa for vocational education, fiscal year 1968.[a]

Federal	$ 4,402,000
State	$10,107,000
Local	$12,220,000
Total	$26,729,000

[a]14, p. 57.

Table 2 presents data showing the growth in expenditures of federal, state, and local funds for vocational education in the United States.

Table 2. Expenditure of federal, state and local funds for vocational education by year.[a]

Year	Total	Expenditure (in thousands of dollars) Federal	State	Local
1920	$ 8,535	$ 2,477	$ 2,670	$ 3,388
1956	175,886	33,180	61,821	80,884
1960	238,812	45,313	82,466	111,033
1964	332,785	55,027	124,975	152,784
1966	799,895	233,794	216,583	349,518
1967	1,003,370	261,297	312,100	429,973

[a] 14, p. 61.

At the same time, enrollment in the vocational education programs has greatly increased, as shown in Table 3.

Table 3. Enrollment in federally aided vocational education classes.[a]

Class	Year 1966	1967	1968	% change 1966-68
Agriculture	$510,279	$508,675	$528,146	+ 3.5
Distributive Education	101,728	151,378	175,816	+ 72.8
Home Economics	1,280,254	1,475,235	1,558,004	+ 21.7
Trades and Industries	318,961	367,789	421,719	+ 32.2
Office	798,368	985,398	1,059,656	+ 32.7

[a]19, p. 61.

In addition to other factors, vocational education at the secondary level has come under increasing scrutiny because of the cost. The growth of the two-year vocational-technical school in Iowa has prompted the argument that perhaps vocational education is unnecessary on the secondary level and that the taxpayer is needlessly supporting overlapping, even duplicating, programs. The increased concern for the disadvantaged, the slow learner, the potential drop-out, and the non-college-bound student of any ability has given rise to a demand for more vocational education encompassing a wider variety of programs and beginning at an earlier age (26). Other authorities have: (1) demanded the up-dating of traditional vocational education programs to meet the

changing needs of the labor market (12, 23), (2) suggested the use of more programs involving practical on-the-job experience (6, 16), (3) suggested an emphasis on practical and specific skills (6, 4, 20, 23) or (4) recommended an emphasis on general groups to evaluate budgets or direct costs. No one seems to know the unit costs involved in answering the following questions: How much does it cost to educate a student in a vocational program? In an academic program? Do instructional costs differ significantly between academic and vocational programs? What part does enrollment of the school and enrollment in a particular program play in unit costs? Are unit costs for vocational programs disproportionate to those of academic programs because of expense for equipment and pupil-teacher ratio?

The search for the answers to these and other questions led to a study of the following problem.

Statement of the Problem

The problem of this study was concerned with the development of a cost analysis for selected vocational and academic educational programs in grades 9-12 of nine high schools of Iowa. Attention was focused on deriving cost per unit credit and cost per unit credit per contract day for communicative skills, mathematics, social studies, and science courses

as compared to the unit costs for the following vocational programs: distributive education, home economics, office education, trades and industries, and vocational agriculture.

The different courses offered in any one high school in an area (for example, algebra, general math, trigonometry, geometry) were grouped by the appropriate department (in this case, mathematics). All courses offered by any high school would obviously not fit into one of these four areas, and these courses were not considered in the analysis. Naturally, all high schools offered courses in each of the four academic areas. The high school's designation of a course as being science, mathematics, social studies, or communicative skills, as indicated by the Annual Evaluation Guide (see Appendix A), submitted to the Department of Public Instruction by individual schools, was accepted.

Cost data concerning any school costs are virtually nonexistent in Iowa. In order to encourage efficient administration and funding of programs, cost data should be compiled. The derivation of the cost per unit credit and cost per unit credit per contract day would be a basic source of the necessary information, since it would yield a single, objective, readily comparable figure.

The rationale for this study is expressed in the following assumption: cost per Carnegie unit credit for particular curricular offerings is

dependent upon the factors of enrollment, costs of instruction, equipment replacement costs, costs of support of instruction, outlay for the equipment, and fringe benefits.

Purpose of the Study

The purpose of the study was:

1. To collect and report input data (costs).
2. To collect financial data, convert collected data into comparable data, and report financial data.
3. To determine the variance between school districts in costs per Carnegie unit credit.
    a. A relative comparison of cost per Carnegie unit credit for the participating school districts with each of the other participating school districts.
    b. An explanation of the causes for the difference between cost per Carnegie unit credit of each participating school district and every other participating school district.

Definition of Terms

In order to clarify the meaning of terms used in this study, the following operational definitions were made:

1. Carnegie unit: Academic credit granted for a course meeting 55 minutes, five days per week for two semesters.
2. Cost per Carnegie unit credit: The expense per student per two semesters (one Carnegie unit credit) for any particular course or program in the current fiscal year.
3. Contract day: A fraction of the total contract length derived by placing one day of the contract over total contract length, e.g., one contract day for a history teacher equals 1/190 of a 190 day contract.
4. Cost per Carnegie unit credit per contract day: The expense per student per two semesters (one Carnegie unit credit) per contract day of each instructor of the course or program in the current fiscal year.
5. Vocational program: The programs considered in this study were distributive education, home economics,

office education, trades and industries, and vocational agriculture.

6. Academic course: The courses considered in this study were communicative skills, mathematics, social studies and science.

7. Indirect costs: All costs that are not direct costs.

8. Direct costs: Teachers salaries, teacher fringe benefits, costs of equipment maintenance, replacement, repair, and acquisition of supplies.

Sources of Data

Data were sought pertaining to the 1968-69 fiscal year and were obtained from the following sources:

1. Annual Evaluation Guide, Statement of Secondary Program, 9-12, completed by the principals of each school and submitted to the Department of Public Instruction. (See Appendix A)
2. Iowa Professional School Employees Data Sheet, completed by individual teachers and forwarded to the Department of Public Instruction. (See Appendix B)
3. Printout from Department of Public Instruction - Vocational Reimbursement 1968-69.
4. Budgets prepared by individual schools reporting actual expenditures.

It is assumed throughout this study that all data submitted were accurate.

Delimitations

The investigation was limited to nine selected school districts in Iowa because only nine school districts in the state met the criteria of (1) offering 4 vocational programs eligible for federal reimbursement and (2) willingness to participate in the study by supplying the needed data. Programs investigated were limited to the academic areas of communicative skills, mathematics, social studies and science, and the vocational programs of distributive education, home economics, office education, trades and industries, and vocational agriculture. Costs surveyed included only direct costs. Home economics and vocational agriculture costs include cost of adult education programs.

Organization of the Study

The material composing this study was divided into five chapters. Chapter I included an introduction and the setting and background for cost analysis in secondary education, a statement of the problem, the purpose of the study, definition of terms, the sources of data, the delimitations of the study, and the organization of the presentation. A summary and analysis of pertinent literature and related research is contained in Chapter 2. The method of procedure is presented in Chapter 3. Chapter 4 includes the

presentation and discussion of the data collected. The fifth chapter presents a summary of the findings, conclusions, and recommendations for further study.

REVIEW OF LITERATURE

The literature reviewed in this chapter was related to the problem, that of developing and reporting a system of unit cost accounting for selected vocational and academic programs in nine Iowa high schools. Two general categories of literature were required: (1) the need for and use of unit cost studies and (2) the place of vocational education at the secondary level. These two categories will provide a background from which to evaluate this study.

The Need for Studies of Unit Costs

Previous studies concerning unit cost analysis have dealt almost exclusively with higher education. On the secondary level, Glaspey (9) criticized the school accounting system for remaining solely a means for recording historical data. While the school districts have grown in size and complexity, the line items have remained fixed for half a century and serve as a tool for concealing information regarding policy decisions. He suggests the following revisions in current accounting procedures:

1. More fund support for public services results in a need for more accurate information for evaluating the relative cost of various public services.

2. People at policy-making levels need more information to provide a rational basis for allocating funds between various school programs and services.
3. Need for a more adequate method of evaluating the effectiveness of new federal programs.
4. Need to evaluate the new teaching techniques and their effectiveness in the present school systems.

Glaspey predicts the challenges for the coming decade will include:

1. Development of better management information systems for intelligent decision-making.
2. Improvement in the decision-making process.
3. Development of a system of accounting and budgeting that will enable explanation of costs of education in terms of services rendered.
4. An attempt to achieve organization goals through the entire employee group.
5. Finding ways to increase productivity, thus partially offsetting increasing labor costs.

The three basic steps in any cost analysis were outlined by Hubbard (12):

1. Determining faculty time or energy spent for different services.
2. Converting each time or energy element to a percentage in order to reflect the portion given to each course and to each other service.
3. Multiplying the percentage of time given to each course by the appropriate individual's salary in order to assign a dollar value to each course.

Hubbard (12) also predicted the increasing use of computers as an aid in cost analysis, and believes that their use to do the complex and time-consuming analysis necessary for determination of unit costs will encourage cost analysis.

Hanson (10) discovered a curvilinear size-cost relationship in his study of the relationship between district size and unit costs in the public schools. Citing evidence that studies among small districts were numerous because of the concern for consolidation of these allegedly inefficient units, he maintained that larger school districts may be just as inefficient but the influence of size on cost is easily lost among a multitude of other cost determinants varying with the "varied tastes and resource endowments

of the district's population" (9, p. 4064). The sample used consisted of 589 districts in ten states, each with a grade 1-12 enrollment ranging from 1,500 to 846,616 pupils. The results of a multiple regression and correlation analysis were used to compute a predicted expenditure for each district in the sample from eight previously determined characteristics of its population. The prediction was then deducted from the actual expenditures, leaving a residual unit cost per average daily attendance (ADA) from which their effects upon expenditures had been removed. The unit cost residuals were found to decline consistently with increasing district size up to enrollments of at least 20,000 students. The optimum scale varied considerably in different states, with a median of approximately 50,000 pupils. He concluded that the optimum size may have an upper limit beyond which public schools do encounter rising unit costs.

A cost analysis system just beginning to be used in educational cost analysis shows wide applicability in the decision-making process. Called the Program Planning Budget System (PPBS), it involves five basic steps (8, p. 51):

1. Developing a program budget. Gibbs asserts this is the first and easiest step in which all costs are restated by program instead of the traditional legal classification.

2. Identification of specific objectives within each program.
3. Measuring gains toward each objective, the most difficult step of PPBS. It requires that the objectives be stated in such a way that measurement is possible and presupposes that instruments of measurement have been developed.
4. Developing long-range planning in detail.
5. Considering, systematically, the most effective means of obtaining stated objectives.

Gibbs admits there are characteristics of PPBS which are open to criticism (8, p. 55):

1. It might not be practical. Is it just a sophisticated efficiency analysis?
2. The over-all plan might call for activities that would appear wasteful or unnecessary to the staff.
3. It would be expensive to implement.

He counters with arguments in favor of PPBS:

1. Any system that helps maximize organizational gains within available resources deserves high priority.

2. There is a growing need for staff, board, parents, and students to participate in educational decision-making, a need which PPBS can help fulfill.
3. PPBS provides a systematic means for considering and implementing educational innovations.

PPBS embraces five other concepts in addition to the program budget, as explained by Rath (19):

1. Systems analysis.
2. Multiyear planning. Rath suggests several possible planning spans based on measurable objectives.
3. Objective-based programs. Each program is that level of activities which are grouped together to carry out a specific objective.
4. Program budget. This is the yearly grouping of all revenues and expenditures for a year.
5. Cost inclusiveness. PPBS must cover all parts and all costs of a school system.
6. Administrative commitment. Three specific criteria must be met:
   a. A formal system of budgeting;

b. An organization-wide and coordinated system;

c. A programming updating system.

Project FACT is an experimental program being conducted at the University of Iowa by George Chambers and his staff and may also have wide applicability to cost analysis in Iowa schools. It was reported to have the following goals:

1. To collect financial data, convert collected data into comparable data, and report financial data.
2. To collect and report input data.
3. To collect and report output data.
4. To report and explain the variance between school districts in expenditures per pupil.
5. To start development of a computer system designed to assist school districts in long-and short-range budget planning.

No other information was available at the time of this study.

Williams (30) in his study of institutions of higher education in Michigan reported the following conclusions which may be applicable to secondary schools:

1. Instructional costs increase with the advance in the class level of the student.
2. Any curriculum with a small enrollment will have high unit costs.
3. Actual instructional expenditures are of more importance than the cost ratio.
4. To be meaningful, cost studies should describe costs at each student level for each program.
5. Cost studies are only one means designed to help management understand the nature of the processes involved.
6. Low instructional costs are not necessarily correlated with high quality or with instructional efficiency. (Maybe costs are too low.)

Anderson (2) expanded the idea of the role of the number of students enrolled in considering unit costs of a vocational program: (2, p. 4)

> The cost of specialized components of vocational and technical curricula in comprehensive institutions will necessarily be higher than the liberal arts components because of the small student-staff ratio in shops and laboratories and the greater quantity of facilities and

> instructional materials utilized per student . . . These differences in cost between the general and the specialized curricula raise fundamental questions in the planning, development, and operation . . . When state policy permits, there seems to be a tendency for local boards of control to establish and operate the least expensive curricula rather than the curricula for which the students and society have the greatest need.

He further stated that unit cost data are necessary in planning for the most economical number of students for a particular curriculum.

Wells (27) suggested use of cost analysis as a means of evaluation:

> In some cases a costly course may be a necessity and should, therefore, be offered. In other cases such analysis . . . may identify a "high cost" offering which can appropriately be dropped--or perhaps taught at occasional intervals.

The Need for Vocational Education at the Secondary Level According to Barlow (4), the vocational education of today is the natural result of the apprenticeship system of earlier times and the American goal of education for all the children of all the people. He cited freedom of occupational choice as an American ideal, and set forth the commonly accepted justifications for new or improved programs of vocational education as being (4, p. 2):

1. The right of each individual to a total education, that is, liberal and vocational training treated as "two essential

and complementary aspects of the total preparation of the individual for his life,"

2. The responsibility of society to provide such instruction through the public education system, and
3. The effect of vocational education on the economic strength of the nation.

Wenrich (28) points out the change from the early American high school, which had the role of preparing students for college. The question is now: "Should the comprehensive high school, in addition to providing a general education for all, meet the specialized needs of both those youth who will attend college and those youth who will seek employment after graduation?" (28, p. 16)

He shares a growing concern that youth need some sort of specialized education which will prepare them for employment because: (1) technological advances emphasize the need for trained manpower; (2) psychological studies show that a major concern of youth is vocational choice and preparation; (3) laymen, especially parents, expect education to contribute directly to preparation for employment; and (4) while the percentage of non-college-bound youth may not be increasing, the number is sizeable. Wenrich also asks us to consider the problems created by

failure to meet these needs:

> School administrators and counselors . . . are especially concerned with the slow learners who lack the aptitudes for training in a skilled occupation in business or industry and yet who do not require special education classes. These youth, more than ever before, need help in finding their places in the labor force.

He also comments on one of the traditional arguments against providing vocational education at the secondary level:

> The old argument that high school youth are too immature and uncertain about their vocational futures to be given specialized education is losing its force. Through more adequate guidance services, youth can be helped to identify their interests and aptitudes, their strengths and weaknesses, and to view these in relation to their career plans.

Wenrich says the country needs both the secondary level vocational education and specialized vocational schools, perhaps with a county or area secondary level vocational school being established where the small high schools cannot meet the needs. He emphasizes the need for a balanced program of general and specialized courses, especially in the skills and insights needed to make a satisfactory initial adjustment.

Nearly all literature found concurred with the idea of offering vocational education in the high schools. The differences in opinion were evident concerning when this training should begin, to whom it should be

directed, what training should be given, and how the program should be evaluated.

Walsh and Selden (25) enumerated the basic needs and activities of a vocational program at the high school level:

1. Labor market information.
2. Guidance and counseling beginning at the elementary school level.
3. Early warning of change in trends and requirements of the labor market to allow changing of training programs.
4. Continuing research to improve accuracy of information on current and projected occupational requirements.
5. Thorough general education to serve as a base for acquiring specific occupational skills.
6. Vocational education (training and retraining) to provide a range of needed skills in a competitive labor market.
7. Apprenticeship programs initiated through high school for post high school training.
8. Placement services.

They also emphasized the need for continuing curriculum development and evaluation, using success in placement of graduates and their ability to

hold jobs and move ahead as the criteria for success. They summarized six principles necessary for this success (25, p. 92):

1. Proximity between vocational education and the time of application of the skills learned, i. e., at the secondary level, concentrated in eleventh and twelfth grades.
2. Sufficient concentration of work in each area to enable the student to develop competence to hold an entry job in a given occupation on completion of the curriculum.
3. A well-planned integration of vocational education and general education.
4. Diversity of curriculum offerings to provide for individual needs and to give flexibility to the program.
5. Teaching of those skills which form the core of the occupation and which are necessary for entry into the occupation, since all aspects of an occupational area cannot possibly be included in the curriculum.
6. Instruction geared to the times, preparing for the world of work today and tomorrow.

Swanson (23) cites the increasing interest of the federal government in vocational education as evidenced by the 25 acts for vocational-technical education enacted by Congress from 1961 through 1965,

compared with 17 acts in the 1900 to 1959 time span. New trends in federal legislation which may be worth watching, according to Swanson, include the following (23, p. 103):

1. Occupational categories not specified.
2. Severe restrictive limitations have been deleted.
3. A close relationship between labor market needs, course content, and numbers in training is required.
4. Local and state matching funds are not required.
5. Multi-agency responsibilities are common at the federal level.
6. Agencies other than state and local schools may be involved.
7. Provisions for research, experimentation, and pilot projects are permitted, encouraged, and often required.
8. Evaluation and detailed reporting are mandated.
9. Ancillary services and programs are permitted and often required.
10. Private schools have been opened for federally subsidized vocational programs.
11. Basic education subjects have been made a part of vocational education.
12. Financial support to the trainee at the post high school level is becoming increasingly common.

13. Federal funds are made available for supplies, equipment, etc.

14. Greater emphasis is being placed on vocational-technical training beyond high school.

In deciding for whom the vocational program should be directed, Pucel (18) emphasizes the need for vocational programs for the slow learner, though not necessarily in existing programs. Cost usually keeps educators from considering programs for the slow learner, and this should be changed, since special education programs do not prepare a student to enter the job market. He points out that the need is for programs requiring neither high mental ability nor high mental dexterity. The slow learner is best at a task where routine becomes habit. He says that if the high school doesn't train these people, someone must, and the high school is best equipped. There is a need for these people because routine jobs are more capably filled by a slow learner rather than by someone with high mental ability to whom the routine quickly becomes monotonous. Pucel says a person should be trained for the place he can fill in society, and the slow learner is well equipped for this place.

Asbell (3) agreed that vocational educational programs should be offered at the high school level and cited his study of a program in the Bay Area of California where science, math, English and vocational

programs are integrated. He particularly pointed out the need for vocational education to reach the average and bright student whose high school grades bordered on failure, but who could, if given help, progress in a college-level technical school. The Ford Foundation has recently granted this program one-half million dollars to "help spread demonstrations of the plan into schools with students of all sorts of social, economic, and ethnic backgrounds." (3, p. 1) Asbell continued, "If there is any unifying theme in these studies, it is that each community is attempting to provide flexible educational systems to meet the needs of youngsters of various backgrounds and ability levels." (3, p. 2)

Corazzini (7) studied costs and benefits of two competing vocational programs, one at the high school level, the other at the post high school level, and concluded,

> The graduate of post high school vocational training has made a relatively poor investment if he chose to train in the same skilled trades open to vocational high school students. (4, p. 41)

The question of what should be taught in high school vocational programs has been examined by various authors. Hubbard (12) insisted that teaching methods and curricula must be developed to meet the needs of changing occupations. Curricula aimed at specific skill development, according to him, deny the reality of an ever-changing working world. The real need is for flexibility.

Casey (6), in a study of business and industry attitudes toward vocational education, concluded the demand was for "vision, imagination and skill, in that order". (6, p. 45)

The need for more highly skilled and educated workers is pointed out by Hare (11), who contends: (11, p. 20)

> The new technologies will not only increase the demand for skilled and highly educated personnel and decrease demand for lower skilled workers, but will also accelerate the obsolescence of jobs. The rapid obsolescence of jobs creates a need for a work force adaptable to the requirements of the new technologies. An adaptable work force is primarily obtained by education and training ... Industrial progress is, therefore, directly related to the education of the work force.

Van Raalte (24) reports that, since nearly one-half of the graduates of Wisconsin high schools never continue their formal education, combined with the decreasing demand for unskilled labor, the comprehensive high school must provide many of its graduates with the opportunity to learn skills that will help them enter into gainful employment. He points out the need for establishment of close working relationships with state and federal agencies, labor unions and management groups. He also states: (24, p. 23)

> The comprehensive high school must use a great deal of creativity in determining what kinds of work-oriented vocational experiences they can handle well in each community. Some vocational courses should be limited to only large vocational schools. We should not over-

> look the fact that vocational education in the comprehensive high school represents an opportunity to work with students who would otherwise, most likely, drop out.

McClure (13) sees vocational education at the high school level assuming increasing importance as preparation for employment in an increasingly technical society. Changes in present concepts and programs may be necessary to meet the challenge, among them the following:

1. Consolidation of school districts into larger units in order to provide the numbers and financial backing necessary for some programs.
2. Shared programs among existing districts, with part-time attendance at the regional center.
3. Redefining vocational education as a broad concept and allocating funds, at local, state, and federal levels accordingly, rather than in fragmented or narrowly defined categories as has been the practice in the past.
4. Developing retraining programs for adults. The high school may be the appropriate place because of its proximity to the people desiring training.
5. Increased emphasis on counseling.

Three experimental programs were found in the literature. The study by Asbell (3) concerning the integrated program of academic and vocational subjects reported the following:

1. The program does retain students in school.
2. Although this type of student generally would never go on in their formal education, the survey showed that at least 78 per cent were interested in going on following their inclusion in the program.
3. Grades are still questionable because social sciences are not included in the program. If the students' social science grades improve at the college level, they are confident that results represent a change in the learning behavior as a result of technical training.

Sims (22) lists several groups from Kansas City, Missouri, who would particularly benefit from vocational education. These include 144,000 unemployed with less than a high school diploma, 16,000 employed persons without a high school diploma, and 9-10,000 persons categorized by the federal government as "hard-core unemployed", with less than an eighth grade education (12, p. 11). The "Golden Opportunity" program, involving Vendo Company and interested high school dropouts, was designed in Kansas City to aid these people. Beginning in 1967, the

participants took an eight-week course at the plant, and studied after hours to prepare themselves to take the state General Educational Development (GED) tests. Schedules were flexible. Course work concentrated on areas of language arts, history, science, and mathematics, and were taught by highly qualified instructors. Of the 140 employees originally enrolled, 110 completed all the training sessions, 100 took the GED tests, and 60 per cent of those taking the tests passed. The organizers are presently involved in encouraging other companies to try a similar program. Benefits reported included:

1. Students returning reported feeling no intimidation previously experienced at trade high schools.
2. The students stayed right in the plant with fellow workers in a casual atmosphere, and reported a total lack of self-consciousness.
3. Students were not required to provide their own motivation, tuition, and transportation, as is frequently the situation with traditional courses.
4. The in-plant feeling helped employees overcome the natural fear that some of them have of failure which is enhanced by even entering a public school.

Walsh (26) investigated the role of vocational education in preventing students from dropping out of school. In a sample of 1,040 tenth graders in Missouri with a grade point average in the lower fourth of their class and no recorded participation in extra-curricular activities, Walsh found potential dropouts were more likely to remain in school and graduate if enrolled in a practical arts or vocational course. He concluded that:

1. Potential dropouts can and should be identified early in high school. The criteria of grade point average in the lower fourth of the class and no recorded participation in extra-curricular activities were found to be significant indicators of potential dropouts.
2. Participation in extra activities should be encouraged.
3. A wide range of vocational and practical arts courses should be made available which will meet the needs and interests of students and the labor market.
4. Enrollment in vocational and practical arts courses in line with students' aptitudes, abilities, and interests should be encouraged.

Summary

The review of literature for this study was divided into two areas: (1) studies concerning the need for and use of unit cost and (2) studies concerning the place of vocational education at the secondary level.

Studies concerning unit cost analysis dealt primarily with higher education. One exception was Glaspey (9), who suggested many revisions to make secondary school accounting a factor in planning, rather than strictly a historical record. Glaspey sees cost accounting as an important trend for the coming decade. Hubbard (12) outlined the basic steps in cost analysis at any level, and predicted the computer's emergence as an aid and encouragement to cost analysis.

In his study of the relationship between school district size and costs, Hanson (10) suggested that large schools may be able to obscure their inefficiency in the multitude of costs and resources of the district.

The potential of the PPBS was explored by Gibbs (8) and Rath (19). Requiring careful statement of objectives, long-term commitment, and evaluation, it is a complete decision-making scheme rather than just a cost analysis system. Costs are grouped by program rather than by legal classifications.

Williams (30) studied institutions in Michigan and suggested that high costs for vocational education may be inevitable because of the low

pupil-teacher ratio and high cost of equipment, but that cost must not be the only criterion for measuring educational quality. Anderson (2) also investigated enrollment as a factor in unit costs. Wells (27) suggested that unit cost data be considered in evaluation of programs.

In the literature related to the place of vocational education in the secondary curriculum, Barlow (4) pointed out the importance of vocational education to the economy of the country and the responsibility of the society to provide such education. Wenrich (28) agreed on the value of vocational education for all youth, especially the slow learner. Pucel (18) stated that the high cost of educating the slow learner may be low compared to the cost of not educating him.

Walsh and Selden (25) pointed out the basic needs and activities of a successful vocational program; cost analysis was not mentioned. Swanson (23) cited trends in federal legislation concerning vocational education, some of which were similar to those of Walsh and Selden, but which included the cost aspect.

In research surveyed, all emphasized the necessity of meeting individual needs, no matter what the ability or background of the student. Asbell (3), Corazzini (7), Casey (6), Hare (11), and Van Raalte (24) all elaborated on the theme of individualization and flexibility.

Sims (22) and Walsh (26) reported research results on the role of vocational education in aiding and preventing high school dropouts. Both had studied experimental programs which had favorable results.

The competing forces of strict economy in education versus wider vocational education (allegedly much more expensive) seem to have little factual data to support their respective positions. No literature was found on either unit cost analysis or vocational education which offered the information which this researcher believes is needed in decision-making. In the absence of this information, it is believed the need for this study is further sustained.

METHODS AND PROCEDURES

Introduction

The problem of this study was to develop a formula of cost analysis based on data from nine Iowa high schools for selected educational programs. The analysis focused on the academic courses of communicative skills, mathematics, social studies, and science, and the vocational courses of distributive education, home economics, office education, trades and industries, and vocational agriculture.

This chapter describes the procedures and methods used to collect and analyze the required data. In order to compare the unit costs of the selected vocational courses with the selected academic courses, an attempt was made to determine the cost of educating a student in a specified curriculum. No studies were found which compared the costs of educating a student on the secondary level in a particular vocational program as compared to the costs of educating students in an academic course. Since many high school students are enrolled in a combination of academic and vocational work, this breakdown is necessary to produce an accurate representation of costs.

The study was originally proposed as a survey of 75 school districts and their costs for 1967-68. The districts were randomly selected and a

detailed questionnaire was sent to each, developed from that used by Cage (5) in his study of the 16 newly established area-vocational schools of Iowa. The cost-benefit aspects were discussed with George Chambers, Associate Provost of the University of Iowa. Modifications were suggested by Ray Bryan, Professor in Charge of Graduate Studies, College of Education, Iowa State University. Most schools replied that the data desired were not available in the detailed form needed and returned a copy of their budgets. These proved to be useless as the data were still incomplete. In an attempt to gain further information, 12 of the schools were personally visited and 53 were telephoned. This did not yield much useable data. A second questionnaire was then sent to all 75 school districts. Again copies of the budget were submitted from most schools with comments complaining of lack of time for such a questionnaire and mentioning that the Department of Public Instruction, auditors, and the school board had always found this information acceptable.

The sample was then reduced to 10, according to procedures outlined later. At this time, 1968-69 data were sought. However, when a third form was sent asking for verification of the data, one school refused to participate any further, and the sample was further reduced to nine. All schools insisted that they not be identified by name.

Statistical analysis through use of chi-square and student's t computation was considered at various stages of this study, but this had to finally be rejected because of the small number in the sample.

Selection of the Sample

Nine schools, grades 9-12, were selected in two groups. The first group consisted of four schools selected from those school districts in Iowa having an enrollment in grades 9-12 greater than 1500 and having at least four vocational programs approved for federal aid and willing to participate in the study. The second group consisted of five schools selected from Iowa districts enrolling 450 to 1500, grades 9-12, offering at least four vocational programs meeting the criteria for receipt of federal aid, and willing to participate in the study.

General Design

A cost per unit credit and cost per contract day were to be calculated in order to determine the cost of educating a student in a specified course.

The data were collected from the following sources.

1. A list from the Guidance Services Section of the Department of Public Instruction furnished the names of those schools having at least four vocational programs. The schools qualifying for federal reimbursement were

then obtained from a printout of the Department of Public Instruction - Vocational Reimbursement 1968-69. The sample was then randomly selected.

2. The Annual Evaluation Guide, Secondary Program, 9-12, (See Appendix A) a Department of Public Instruction form completed by individual school principals, furnished the course name, number of sections, enrollment, grade level, and unit value for each academic course. Information for vocational programs was not taken from this form, since it did not indicate which vocational programs qualified for federal reimbursement.

3. Data pertaining to the vocational programs of the schools were obtained from the printout of the Department of Public Instruction - Vocational Reimbursement 1968-69.

4. The Iowa Professional School Employees Data Sheet (See Appendix B), completed by individual teachers and submitted to the Department of Public Instruction, furnished the names of the teachers in each course, both academic and vocational, the total semester hours of education of each teacher, the salary of each teacher, the position held, the contract period in days, and the total years of experience.

5. The report of actual expenditures, 1968-69, from individual schools was requested from each of the schools in the sample. Data pertaining to the direct costs were sought:

a. Salaries for each instructor in each of the four academic areas and in the vocational programs in each of the schools.

b. Fixed charges, specifically, IPERS, F.I.C.A., and hospitalization insurance.

c. Operation and maintenance of equipment used in vocational courses, including replacement of equipment.

d. Capital outlay for equipment in the current year, useful life estimates were not available for capital outlay.

e. Federal reimbursement.

f. Cost of supplies

g. Mileage reimbursement.

Indirect costs, which were available, were not used in the cost analysis. These included "other" educational costs of the General Fund, pupil transportation costs, costs of administration, costs of student services, community services, and debt service. It was assumed these costs do not vary significantly with the individual program, and it was thought that they would not yield meaningful information related to the purpose of the study. Mileage costs were included when related to a specific program, such as mileage for a supervising instructor's travel.

Maintenance and debt retirement services will vary primarily with the age of the building, not with the use of the building. Administration costs vary primarily with the size of the district and experience of the administrators, not with the individual programs.

Treatment of the Data

Data obtained for each school were entered on a tally sheet (Composite of Statistical Data). From this data, the cost per unit credit and cost per unit per contract day were computed for each school, for each of the two size groups, and for each program. The cost per unit credit was found by dividing the total expenditures by the equivalent enrollment, or the actual enrollment multiplied by the unit credit of the program. The cost per contract was then found by dividing the cost per unit credit by the number of contract days of the instructors. Thus the cost per unit credit per contract day is the cost of instruction for one student in the course or school designated for one day.

The results of the computations are reported in Chapter 4.

FINDINGS

The findings of this study are presented in the following order: 1. Personnel information, 2. Data obtained for each school for each program offered, 3. Totals by group for the academic areas and for the vocational areas, 4. Rank order according to costs by group for each academic area and for each vocational area, 5. Composite data for each group. All data were for the 1968-69 school year. Complete information for each area is found in the Composite of Statistical Data.

Personnel Information

Table 4 is a summary of personnel information for all instructors teaching in the subject areas surveyed in the study. In the academic areas, the teachers of communicative skills had the highest average salary of $8,899 and the most experience, an average of 14 years. Science teachers reported the most college preparation, averaging 171 semester hours of education.

Table 4. Personnel Information:

Academic	Vocational . . . . .
1. Communicative Skills	1. Distributive Education
Average Salary - $8899	Average Salary - $8640
Average Experience - 14 years	Average Experience - 13 years
Average Sem. hrs. - 160	Average Sem. hrs. - 160
2. Social Studies	2. Home Economics
Average Salary - $7568	Average Salary - $10,340
Average Experience - 9 years	Average Experience - 15 years
Average Sem. hrs. - 152	Average Sem. hrs. - 162
3. Science	3. Vocational Agriculture
Average Salary - $7855	Average Salary - $9850
Average Experience - 10 years	Average Experience - 9 years
Average Sem. hrs. - 171	Average Sem. hrs. - 156
4. Mathematics	4. Office Education
Average Salary - $7735.	Average Salary - $10,839
Average Experience - 11 years	Average Experience - 17 years
Average Sem. hrs. - 142	Average Sem. hrs. - 171

Table 4. Personnel Information: (continued)

Vocational	
5. Trades and Industries	
Average Salary - $9,713.10	
Average Experience - 12 years	
Average Sem. hrs. - 155	

Individual School Results

The nine schools comprising the sample were originally selected from two groups, based on the grades 9-12 enrollment. Four schools with an enrollment greater than 1500 or group A, with five schools in group B, all having enrollments 470 to 975.

Inspection of Table 5 shows the data obtained pertaining to the academic and vocational programs in the largest school of the sample with an enrollment of 2,228. Total expenditures were greatest in the area of communicative skills, $121,475.73 and least in science, $68,294.58, but cost per unit credit was highest in science, $64.79 and lowest in social studies, $47.65. Cost per unit credit per contract day was therefore highest in science with $.332 and lowest in social studies, $.244.

The average cost per unit credit for the academic areas in this school was $52.64; the average cost per unit per contract day was $.269. Agriculture was not part of the vocational curriculum. Home economics showed the greatest enrollment, 367 students, greatest total expenditures, $24,004.89, lowest cost per unit credit, $65.40, and lowest cost per unit per contract day, $.312. Next highest total expenditures were reported by the trades and industries program, which in turn had the next lowest cost per unit credit, $245.29, and cost per unit per contract day, $1.173. The program with the lowest total expenditures, the DE program, also had the lowest enrollment, and highest cost per unit per contract day, $1.516. The average for all the vocational programs was $123.41 per unit credit and $.590 per unit per contract day.

Table 5. Summary of data for academic and vocational programs, group A, school 1.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of/ Unit Credit	Cost Unit Credit/ Contract days
Academic					
C. Skills	$121,475.73	2,447	1	$49.64	$ .254
Math	89,252.64	1,586	1	56.28	.288
Science	68,294.58	1,054	1	64.80	.332
Soc. St.	106,784.28	2,241	1	47.65	.244
Total	$385,807.23	7,328		$52.64(avg.)	.269(avg.)
Vocational					
D E	$ 8,247.29	13	2	$317.20	$ 1.516
H. E.	24,004.89	367	1	65.40	.312
Ag.	---------	-----	-	------	----
O. E.	8,369.73	14	2	298.91	1.432
T & I	22,812.51	31	3	245.29	1.173
Total	$ 63,434.39	425		$123.41(avg.)	.590(avg.)

Table 6 shows the data for the second largest of the group A high schools, with an enrollment of 1,872. Examination of the table reveals that the average cost per unit credit of the academic areas was $67.04; the average

cost per unit credit per contract day was $.352. The science program had the lowest enrollment, 1,008, and the highest cost per unit credit, $75.35 and per contract day, $.396. The lowest cost per unit credit, $58.62 and cost per unit contract day, $.308, were in the communicative skills courses. Math courses were next lowest, $.354 per unit credit per contract day, followed by social studies with $.368.

Data concerning the vocational programs in the second largest of the group A schools show a total enrollment of 330 students, the total average cost per unit credit of $230.84 and the average cost per unit credit per contract day of $1.110. Vocational agriculture was not offered in this school. The highest total expenditure for any individual program was that of home economics, $37,056.06. Combined with the highest enrollment, this resulted in the lowest cost per unit credit, $161.11 and per unit credit per contract day, $.797. The highest cost per unit per contract day was in office education with $2.256.

Table 6. Summary of data for academic and vocational programs, group A, school 2.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$104,172.66	1,777	1	$58.62	$ .308
Math	74,866.04	1,111	1	67.39	.354
Science	75,954.97	1,008	1	75.35	.396
Soc. St.	149,183.37	2,132	1	69.97	.368
Total	$404,177.04	6,028		$67.04(avg.)	.352(avg.)
Vocational					
D E	$ 18,492.02	44	1	$420.27	$ 1.991
H. E.	37,056.06	230	1	161.11	.797
Ag.	---------	-----	-	------	-----
O. E.	10,000.20	21	1	476.20	2.256
T & I	18,707.85	35	2	267.26	1.266
Total	$ 84,256.13	330		$230.84(avg.)	1.110(avg.)

The data for the third largest high school in group A, enrollment of 1,601, are shown in Table 7. Academic course information shown reveals that communicative skills had the highest total expenditure, but the lowest cost per unit credit of $63.56 and the lowest cost per unit credit per contract day, $.324. Mathematics reported the next highest total expenditures and the highest cost per unit credit, and per unit per contract day. The average for the academic courses at this school was $70.35 per unit credit and $.361 per unit per contract day. The data for the vocational programs in the group A school having an enrollment of 1,601 show that home economics had the greatest enrollment, highest total expenditure, and the lowest cost per unit credit, $83.43 and cost per unit credit per contract day, $.410. Office education had the lowest total expenditure, $11,006.80, and lowest total enrollment, 15, and the highest cost per unit credit of $244.595 and cost per contract day, $1.175. The average cost per unit credit was $127.05 and per unit per contract day was $.617.

Table 7. Summary of data for academic and vocational programs, group A, school 3.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$111,928.75	1,761	1	$63.56	$ .324
Math	111,506.60	1,258	1	88.64	.445
q Science	78,532.02	1,154	1	68.05	.350
Soc. St.	81,559.97	1,279	1	63.77	.328
Total	$383,527.34	5,452		$70.35(avg.)	.361(avg.)
Vocational					
D E	$ 11,202.60	34	3	$109.83	$ .528
H. E.	17,017.74	204	1	83.42	.410
Ag.	---------	---	-	------	----
O. E.	11,006.80	15	3	244.60	1.175
T & I	11,466.18	16	3	238.88	1.148
Total	$ 50,693.32	269		$127.05(avg.)	.617(avg.)

Table 8 summarizes the data for the smallest of the large schools, having an enrollment of 1,541. The lowest total expenditures, lowest cost per unit credit, and lowest cost per unit credit per contract day of the academic courses were all those of the mathematics courses. The highest cost per unit per contract day and lowest enrollment were found in the science courses. The average cost per unit credit for the academic areas was $66.66, while the average cost per unit per contract day was $.342.

Table 8. Summary of data for academic and vocational programs, group A, school 4.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 114,804.48	1,671	1	$ 68.70	$ .352
Math	49,636.65	913	1	54.37	.278
Science	60,641.58	838	1	72.36	.371
Soc. St.	76,344.75	1,100	1	69.40	.355
Total	$ 301,427.46	4,522		$ 66.66(avg.)	.342(avg.)
Vocational					
D E	$ 14,963.83	51	2	$ 146.70	$ .682
H. E.	20,965.23	117	1	179.20	.833
Ag.	12,690.29	47	1	270.01	1.058
O. E.	13,254.48	51	2	129.95	.618.
T & I	7,095.67	14	2	253.42	1.206
Total	$ 68,969.50	280		$ 174.17(avg.)	.788(avg.)

Data pertaining to the smaller of the large high schools in the sample for the vocational programs show that all five vocational programs

were offered. The lowest total expenditure was by the trades and industries program, which had the highest cost per unit credit and per unit per contract day. The highest total expenditure was by office education: office education also had the lowest cost per unit credit, $129.95 and per unit per contract day, $.618. The average cost per unit credit was $174.17 and was $.788 per unit per contract day.

The five group B schools were selected from those having an enrollment of 450 to 1499 and offering at least four of the five vocational programs eligible for federal reimbursement. Tables 9-19 report the data found concerning the academic and vocational courses in these schools.

Table 9 summarizes data of the largest of the group B schools, and shows that average cost per unit credit for the academic areas was computed to be $78.96, with an average cost per unit credit per contract day of $.415. The highest cost per unit credit per contract day was $.551, in communicative skills, while math had the lowest cost per unit credit per contract day with $2.85, followed by social studies with a cost per unit credit per contract day of $.352.

The data for the vocational programs of the group B school with an enrollment of 975, the largest group B high school reveals that the average cost per unit credit was $196.25, while the average cost per unit credit per contract day was $.947. The highest cost was $1.107, reported

by distributive education. The lowest cost per unit credit per contract day was in trades and industries with $.231, followed by office education with a cost per unit credit per contract day of $.447. These two programs also had the lowest enrollments of 13 and 12 respectively. The program with the highest enrollment, home economics with 152 students, had the middle cost of the five programs, with a cost per unit credit per contract day of $.583.

Table 9. Summary of data for academic and vocational programs, group B, school 1.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 70,098.60	669	1	$104.78	$ .551
Math	34,426.71	634	1	54.30	.285
Science	49,334.63	516	1	95.61	.503
Soc. St.	57,582.81	859	1	67.03	.352
Total	$211,442.75	2,678		$ 78.96 (avg.)	.415 (avg.)
Vocational					
D E	$ 5,872.57	28	1	$209.73	$ 1.107
H. E.	18,640.27	152	1	122.63	.583
Ag.	11,874.18	62	1	191.52	.736
O. E.	10,119.23	12	1	84.33	.447
T & I	5,892.60	13	1	45.33	.231
Total	$ 52,398.85	267		$196.25 (avg.)	.947 (avg.)

Table 10 summarizes data for the second of the group B schools with an enrollment of 918, grades 9-12. The academic course data shown reveals an average cost per unit credit of $57.17, and an average cost per unit credit per contract day of $.295. The lowest cost per unit per contract day, $.192, was computed to be that of social studies, which had the second largest enrollment. The courses with the largest enrollment, communicative skills, had the second highest cost per unit credit per contract day, $.318. The highest cost per unit credit per contract day was that of mathematics, $.396, which had the lowest enrollment.

In the vocational programs of the second school of group B, the total expenditures were $67,917.27 for 347 students, or an average cost per unit credit of $195.73 and an average cost per unit credit per contract day of $.897. The highest cost per unit credit per contract day was that of office education, $2.964, having the smallest enrollment. The lowest cost was for home economics, with the highest enrollment, and a cost per unit credit per contract day of $.541.

Table 10. Summary of data for academic and vocational programs, group B, school 2.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 60,710.60	1,003	1	$60.53	$ .318
Math	33,465.55	444	1	75.37	.396
Science	30,057.80	533	1	62.02	.326
Soc. St.	29,827.62	816	1	36.55	.192
Total	$157,061.57	2,796		$57.17(avg.)	.295(avg.)
Vocational					
D E	$----------	------	-	$-----	$ ----
H. E.	16,235.15	142	1	114.33	.541
Ag.	15,024.78	107	1	140.42	.561
O. E.	14,231.43	24	1	592.98	2.964
T & I	22,425.91	74	1	303.05	1.436
Total	$67,917.27	347		$195.73(avg.)	.897(avg.)

Data in table 11 summarizes the reports for the third school in group B, with an enrollment of 823. As can be seen in the summary of the academic course data, the lowest cost per unit credit per contract day was $.229, in social studies, with the highest cost per unit credit per contract day that of communicative skills with $.459. The averages for the academic areas in this school were $68.73 cost per unit credit and $.352 cost per unit credit per contract day. Social studies had the largest enrollment and the lowest cost per unit credit per contract day, while the mathematics courses had the lowest enrollment and the second lowest cost. The average cost per credit of the vocational programs in the third of the group B schools was $187.17 with an average cost per unit credit per contract day of $.858. All five vocational programs were offered, with agriculture having the lowest cost per unit credit per contract day of $.559 and the second largest enrollment. The home economics program, reporting the largest enrollment, had the second lowest cost, $.773 cost per unit credit per contract day. The highest cost was that of trades and industries, with a cost per unit credit per contract day of $1.119.

Table 11. Summary of data for academic and vocational programs, group B, school 3.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 66,411.95	741	1	$89.62	$ .459
Math	30,101.37	418	1	72.01	.369
Science	47,602.04	582	1	81.79	.419
Soc. St.	45,440.68	1,017	1	44.68	.229
Total	$189,556.04	2,758		$68.73(avg.)	.352(avg.)
Vocational					
D E	$ 6,530.67	15	2	$217.69	$ 1.012
H. E.	18,839.27	116	1	162.41	.773
Ag.	8,060.48	60	1	134.34	.559
O. E.	8,492.55	15	2	283.09	1.348
T & I	10,111.20	21	2	240.74	1.119
Total	$ 52,034.17	227		$187.17(avg.)	.858(avg.)

Table 12 shows the data pertaining to school four in group B schools, with a high school enrollment of 737. The average cost per unit credit of the academic programs was found to be $68.36, with an average cost per unit credit per contract day of $.350. The lowest cost per unit credit per contract day was that of social studies, $.268, which reported the highest enrollment, 814. The lowest enrollment of 371 was in mathematics which had a cost per unit credit of $.377. The highest cost per unit credit per contract day was that of science, $.485.

Vocational programs' costs for the fourth of the group B schools are with a total enrollment of 147, an average cost per unit credit of $134.57 and an average cost per unit credit per contract day of $.631. Agriculture had the highest cost per unit credit per contract day of $1.012 and the second highest enrollment. Home economics had the largest enrollment, while distributive education had the smallest number of students enrolled. The lowest cost per unit credit per contract day was that of office education, $.341. Trades and industries was not offered.

Table 12. Summary of data for academic and vocational programs, group B, school 4.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 49,056.33	703	1	$69.78	$ .357
Math	27,274.80	371	1	73.52	.377
Science	36,641.48	387	1	94.68	.485
Soc. St.	42,553.90	814	1	52.28	.268
Total	$155,526.51	2,275		$68.36(avg.)	.350(avg.)
Vocational					
D E	$ 8,786.08	20	3	$146.43	$ .665
H. E.	9,517.67	67	1	142.05	.645
Ag.	8,272.36	38	1	217.69	1.012
O. E.	4,508.90	22	3	68.32	.341
T & I	----------	-----	-	------	-----
Total	$ 31,085.01	147		$134.57 (avg.)	.631(avg.)

The smallest of the group B schools had an enrollment of 470, grades 9-12. Data for this school are shown in table 13. Summarizing the academic course costs, the average cost per unit credit was $56.43 and the average cost per unit credit per contract day was $.289. Social studies had the lowest cost per unit credit per contract day of $.201 while science had the highest cost per unit credit per contract day of $.445. The largest enrollment was 511 in social studies, while science had the lowest enrollment of 226. The data for vocational education programs in the smallest of the group B schools reveals an average cost per credit of $222.59 and an average cost per unit credit per contract day of $.989. Total enrollment in all of the vocational programs offered was 158, with home economics having the largest enrollment and office education the smallest. Among the individual programs, home economics had the lowest cost per unit credit per contract day of $.610. Trades and industries had the highest cost per unit credit per contract day of $1.767.

Table 13. Summary of data for academic and vocational programs, group B, school 5.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Academic					
C. Skills	$ 29,115.58	400	1	$63.29	$ .324
Math	14,857.97	286	1	51.95	.266
Science	19,634.00	226	1	86.88	.445
Soc. St.	20,077.94	511	1	39.29	.201
Total	$ 83,685.49	1,483		$56.43(avg.)	.289(avg.)
Vocational					
D E	$ ---------	-----	-	$-----	$ ----
H. E.	10,900.42	83	1	131.33	.610
Ag.	16,690.04	56	1	298.04	1.168
O. E.	3,447.34	8	2	215.46	1.002
T & I	8,361.63	11	2	380.07	1.767
Total	$ 39,399.43	158		$222.59(avg.)	.989(avg.)

Totals by Groups: Academic Programs

Tables 14-18 show the totals for each group in rank order according to costs for each academic program.

In table 14 it can be seen that costs in the communicative skills programs of group A schools varied inversely to enrollment. The largest school had a cost per unit credit per contract day of $.254, though it made the largest total expenditure, $121,475.73. The next highest expenditure was made by the smallest school of the group, which had the highest cost per unit credit per contract day of $.352.

Table 14. Rank order by cost per unit credit per contract day by group: Communicative Skills program.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Group A					
1,541	$114,804.48	1,671	1	$68.70	$ .352
1,601	111,928.75	1,761	1	63.56	.324
1,872	104,172.66	1,777	1	58.62	.308
2,228	121,475.73	2,447	1	49.64	.254
Group B					
975	$70,098.60	669	1	$104.78	$ .551
823	66,411.95	741	1	89.62	.459
737	49,056.33	703	1	69.78	.357
470	29,115.58	460	1	63.29	.324
918	60,710.60	1,003	1	60.52	.318

Among the group B schools, analysis of expenditures for communicative skills show that the highest total expenditure and the highest cost per unit credit per contract day of $.551 were found in the largest school of the group. The lowest cost per unit credit per contract day of $.318 was found in the second largest school.

Comparing groups A and B one finds no consistent results. The highest cost per unit credit per contract day of the group B schools for communicative skills, $.551, was that of the largest school of the group, while the lowest cost per unit credit per contract day was the $.254 of the largest group A school. The smallest total expenditure was made by the smallest school in the sample, school 5 of group B.

Table 15 summarizes data concerning the costs of the mathematics programs in each school. Observing the costs of the group A schools, one sees that the smallest group A school had the lowest cost per unit credit per contract day of $.278. The highest cost per unit credit per contract day, $.445, was that of school 3. Group B schools generally have a cost per unit credit per contract day directly proportional to their size. These schools had a narrower range of cost per unit credit per contract day, than did those in group A, with the range in group B fitting within that of group A.

Table 15. Rank order by cost per unit credit per contract day by group: Mathematics.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Group A					
1,601	$111,506.60	1,258	1	$88.63	$ .445
1,872	74,866.04	1,111	1	67.38	.354
2,228	89,252.64	1,586	1	56.27	.288
1,541	49,636.65	913	1	54.36	.278
Group B					
918	$33,465.55	444	1	$75.37	$ .396
737	27,274.80	371	1	73.51	.377
823	30,101.37	418	1	72.01	.369
975	34,426.71	634	1	54.30	.285
470	14,857.97	286	1	51.95	.266

Table 16 discloses data for the costs of the science courses in the two groups. The range in group A, was from $.396 to $.332, with the largest school having the lowest cost per unit credit per contract day, and the second lowest total expenditure. The cost data for the science programs

of the group B schools shows a cost per unit credit per contract day range from $.503 to $.326. Four of the group B schools had a cost per unit credit per contract day higher than the highest of the group A schools.

Table 16. Rank order by cost per unit credit per contract day by group: Science.

Enroliment	Total Expenditure	Enroll-ment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Group A					
1,872	$75,954.97	1,008	1	$75.35	$ .396
1,541	60,641.58	838	1	72.36	.371
1,601	78,532.02	1,154	1	68.05	.350
2,228	68,294.58	1,054	1	64.79	.332
Group B					
975	$49,334.63	516	1	$95.60	$ .503
737	36,641.48	387	1	94.68	.485
470	19,634.00	226	1	86.87	.445
823	47,502.04	582	1	81.79	.419
918	33,057.80	533	1	62.02	.326

Costs of social studies programs are summarized in table 17. The range in cost per unit credit per contract day in group A was from $.244 to $.368. The highest total expenditure also resulted in the highest cost per unit credit per contract day but the next highest expenditure resulted in the lowest cost per unit credit per contract day. Group B schools had a computed cost per unit credit per contract day range of $.192 to $.352.

Table 17. Rank order by cost per unit credit per contract day by group: Social Studies.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract days
Group A					
1,872	$149,183.37	2,132	1	$69.97	$ .368
1,541	76,344.75	1,100	1	69.40	.355
1,601	81,559.97	1,279	1	63.76	.328
2,228	106,784.28	2,241	1	47.65	.244
Group B					
975	$57,582.81	859	1	$67.03	$ .352
737	42,553.90	814	1	52.27	.268
823	45,440.68	1,017	1	44.68	.229
470	20,077.94	511	1	39.29	.201
918	29,827.62	816	1	36.55	.192

Table 18 summarizes the totals of all the academic programs, and are shown in rank order by the size of enrollment. The largest school has the lowest cost per unit credit per contract days, $.269, but the smallest school has the next lowest cost per unit credit per contract day, $.342. All of the costs per unit credit per contract day are within a range of $.092. The costs per unit credit per contract day of group B schools, shown in table 19, have somewhat wider range, $.126. In the group B schools, the largest school has the highest cost per unit credit per contract day, $.415, while the lowest cost per unit credit per contract day, $.289, was reported by the second largest school.

Table 18. Rank order by cost per unit credit per contract day by group: Total Academic Costs.

Enrollment	Total Expenditure	Student Equivalent Enrollment	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Group A				
2,228	$385,807.23	7,328	$52.64	$ .269
1,872	404,177.04	6,028	67.04	.352
1,601	383,527.34	5,452	70.35	.361
1,541	301,427.46	4,522	66.66	.342
Group B				
975	$211,442.75	2,678	$78.96	$ .415
918	157,061.47	2,796	56.17	.295
823	189,556.04	2,758	68.73	.352
737	155,526.51	2,275	68.36	.350
470	83,685.49	1,483	56.43	.289

Totals by Groups: Vocational Programs

Tables 19-24 summarize the costs of each vocational program, listing the schools in each group in rank order according to costs.

As seen in Table 19, only one of the group A schools offered agriculture. This school has a cost per unit credit per contract day of $1.058. Comparing this figure to the data in table 20, showing the group B schools, it would be the second highest cost. The lowest cost per unit credit per contract day of the group B schools was $.559, that of the middle school in size. The highest cost per unit credit per contract day was that of the smallest school, $1.168.

Table 19. Rank order by cost per unit credit per contract day by group: Agriculture.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit Contract day
Group A					
1,541	$12,690.29	47	1	$270.01	$ 1.058
2,228	None				
1,872	None				
1,601	None				
Group B					
470	$16,690.04	56	1	$298.04	$ 1.168
737	8,272.36	38	1	217.69	1.012
975	11,874.18	62	1	191.52	.736
918	15,024.78	107	1	140.42	.561
823	8,060.48	60	1	134.34	.559

Table 20 reports the data for the distributive education programs in the two groups. The range of the cost per unit credit per contract day of the four group A schools was $1.463, the highest being that of the second largest school, $1.991, the lowest that of the third largest school, $.528. The expense for instruction - salaries, F.I.C.A. and IPERS - was the obvious difference between the high cost per unit credit per contract day and the low cost per unit credit per contract day. Only three of the group B schools offered the distributive education program.

Table 20. Rank order by cost per unit credit per contract day by group: Distributive Education.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Group A					
1,872	$ 18,492.02	44	1	$ 420.27	$ 1.991
1,541	14,963.83	51	2	146.70	.682
1,601	11,202.60	34	3	109.83	.528
2,228	8,247.29	13	2	317.20	1.516
Group B					
975	$ 5,872.57	28	1	$ 209.73	$ 1.107
823	6,530.67	15	2	217.69	1.012
737	8,786.08	20	3	146.43	.665
918	None				
470	None				

In table 21 are shown the data for the home economics programs in the group A & B schools. The range in the cost per unit credit per contract day was from $.312 to $.833, with the largest school having the smallest cost per unit per contract day, and the third largest school the highest cost per unit credit per contract day. The comparatively small enrollment

of the third school would seem to account for the high cost per unit credit per contract day, despite having only the third highest expenditure.

The data for the home economics programs of the group B schools shows the difference between the highest and lowest cost per unit credit per contract day was $.232, ranging from $.773 to $.541.

Table 21. Rank order by cost per unit credit per contract day by group: Home Economics.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Group A					
1,541	$20,965.23	117	1	$179.19	$ .833
1,872	35,056.06	230	1	161.11	.797
1,601	17,017.74	204	1	83.42	.410
2,228	24,004.89	367	1	65.40	.312
Group B					
823	$18,839.27	116	1	$162.40	$ .773
737	9,517.67	67	1	142.05	.645
470	10,900.42	83	1	131.33	.610
975	18,640.27	152	1	122.63	.583
918	16,235.15	142	1	114.33	.541

Table 22 summarizes data of the office education programs of the two groups of schools. The data of the group A schools show that the largest school of the group had the smallest total expenditure, lowest enrollment, and lowest cost per unit credit per contract day. The range of cost per unit credit per contract day was $1.638, with the second largest school having the highest cost per unit credit per contract day of $2.256. Of the group B schools, the highest cost per unit credit per contract day was $2.964, reported by the second largest school. The range of costs per unit credit per contract day was $2.623, from $2.964 to $.341.

Table 22. Rank order by cost per unit credit per contract day by group: Office Education.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Group A					
1,872	$10,000.20	21	1	$476.20	$ 2.256
1,601	11,006.80	15	3	244.60	1.175
1,541	13,254.48	51	2	129.95	.618
2,228	8,369.73	14	2	298.91	1.430
Group B					
918	$14,231.43	24	1	$592.98	$ 2.964
823	8,492.55	15	2	283.09	1.348
470	3,447.34	8	2	215.46	1.002
975	10,119.23	12	1	84.33	.447
737	4,508.90	22	3	68.32	.341

Table 23 shows the data and computations pertaining to the trades and industries programs. The range of cost per unit credit per contract day for the group A schools was from $1.266 to $1.148 or $.118. The largest school of the group had next to the smallest cost per unit credit per contract day and the highest expenditure; the second largest school had the highest cost, and the second highest total expenditure. The range of cost per unit credit per contract day for the group B schools was $1.536, from a low of $.231 to a high of $1.767. No program was offered in the school in group B with an enrollment of 737. The largest school of group B had a sharply lower cost per unit credit per contract day than the other three schools offering the trades and industries program, with the smallest school reporting the highest cost per unit credit per contract day, despite expending the second lowest total amount.

Table 23. Rank order by cost per unit credit per contract day by group: Trades and Industries.

Enrollment	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Group A					
1,872	$ 18,707.85	35	2	$267.25	$ 1.266
1,541	7,095.67	14	2	253.42	1.206
2,228	22,812.51	31	3	245.29	1.173
1,601	11,466.18	16	3	238.88	1.148
Group B					
470	$ 8,361.63	11	2	$380.07	$ 1.767
918	22,425.91	74	1	303.05	1.436
823	10,111.20	21	2	240.74	1.119
975	5,892.60	13	1	45.33	.231
737	None				

The summary of the totals of all the costs of all of the vocational programs is shown in table 24 showing the range of cost per unit credit per contract day for the group A schools is $.520, with the largest school having the low cost per unit credit per contract day of $.590 and the second largest school the high cost per unit credit per contract day of

$1.110. The lowest cost per unit credit per contract day was that of the largest school, while the highest cost per unit credit per contract day was that of the second largest school. The range was $.520.

Table 24. Rank order by enrollment by group: Total Vocational Costs.

Enrollment	Total Expenditures	Student Equivalent Enrollment	Cost of Unit Credit	Cost/ Unit Credit Contract day
Group A				
2,228	$63,434.39	425	$123.41	$ .590
1,872	84,256.13	330	230.84	1.110
1,601	50,693.32	269	127.05	.617
1,541	68,969.50	280	174.17	.788
Group B				
975	$52,398.85	267	$196.25	$ .947
918	67,917.27	347	195.73	.897
823	52,034.17	227	187.17	.858
737	31,085.01	147	134.57	.631
470	39,399.43	158	222.59	.989

Composite of Groups A and B

Tables 25 and 26 summarize the cost data by program for all the schools in the group. In table 25, showing group A data for academic programs, the average cost per unit credit per contract day was $.325 with an average cost per credit of $63.22. The range was $.056 for the costs per unit credit per contract day. Science programs had the highest composite cost per unit credit per contract day, followed by mathematics, social studies, and communicative skills. Total expenditures and enrollment were highest in communicative skills, followed by social studies, mathematics, and science. Costs per unit credit per contract day were in inverse proportion to both total expenditures and enrollment.

The average cost per unit credit per contract day for the vocational programs in group A schools was $.732, with an average cost per credit of $159.71. The variance in costs per unit credit per contract day was from $.521 in home economics to $1.202 in trades and industries. Ranked from highest cost per unit credit per contract day to lowest, trades and industries is first, followed by agriculture, office education, distributive education, and home economics. Home economics reported the highest enrollment, followed by distributive education, trades and industries, office education, and agriculture. Consideration of total expenditures

ranked home economics first, followed by trades and industries, distributive education, office education, and agriculture.

Table 25. Composite of Group A schools.

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Academic					
C. Skills	$452,381.62	7,656	1	$59.09	$ .304
Math	325,261.93	4,868	1	66.82	.344
Science	283,423.15	4,054	1	69.91	.360
Soc. St.	413,872.37	6,752	1	61.30	.315
Total	$1,474,939.07	23,330		$63.22(avg.)	.325(avg.)
Vocational					
D E	$ 52,905.74	274	1	$193.09	$ .919
H. E.	99,043.92	918	1	107.90	.521
Ag.	12,690.29	47	1	270.01	1.058
O. E.	42,631.18	196	1	217.51	1.040
T & I	60,082.21	239	1	251.40	1.202
Total	$267,353.34	1,674		$159.71(avg.)	.746(avg.)

The composite data for group B schools in table 26 shows an average cost per unit credit per contract day of $.334 for academic areas and $.732 for the vocational areas. The range for the academic cost per unit credit per contract day was $.155, for vocational cost per unit credit per contract day $.768. The science courses were the most expensive academic offerings, with a cost per unit credit per contract day of $.402, followed by communicative skills, social studies, and mathematics. The largest total expenditure was that of communicative skills, then social studies, science and math, with math having the smallest enrollment and social studies the highest.

Data pertaining to the vocational programs of the group B schools show the average cost per unit credit per contract day was $.732, with a range of $.624 (home economics) to $1.37 (office education). Home economics also had the highest total expenditures and enrollment.

Table 26. Composite of group B schools

Program	Total Expenditure	Enrollment	Unit Credit	Cost of Unit Credit	Cost/ Unit Credit/ Contract day
Academic					
C. Skills	$341,557.82	4,580	1	$74.58	$ .388
Math	172,642.10	2,694	1	64.08	
Science	214,862.00	2,778	1	77.34	.402
Soc. St.	240,343.16	5,048	1	47.61	.247
Total	$969,405.08	15,100		$64.20(avg.)	.334(avg.)
Vocational					
D E	$ 21,189.32	118	1	$179.57	$ .875
H. E.	74,132.78	560	1	132.38	.624
Ag.	59,921.84	323	1	185.51	.754
O. E.	40,799.45	148	1	275.67	1.37
T & I	46,791.34	215	1	217.63	1.07
Total	$212,834.72	1,364		$156.04(avg.)	.732(avg.)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to develop a method of cost analysis for selected vocational and academic courses in nine selected high schools in Iowa. It was thought that cost analysis presented a promising method of aiding in decision-making and cost control in public schools. The review of literature disclosed no studies of unit costs at the secondary level, but various researchers urged the implementation of such procedures.

Schools were chosen from two groups, one having enrollment, grades 9-12, of 1500 or more, and the second with enrollment of 450 to 1500, all offering at least four vocational programs eligible for federal reimbursement. Data were obtained from (1) Annual Evaluation Guide, State of Secondary Program, (2) Iowa Professional School Employees Data Sheet, (3) Printout of Vocational Reimbursement-State Department of Public Instruction, 1968-69, (4) budgets of the individual schools. All data pertained to the 1968-69 school year.

On the basis of the review of literature and discussion with other authorities in the field, the following formula was developed and used in

the analysis of costs:

$$\text{cost/unit credit/contract day} = \frac{\frac{\text{total direct cost}}{\text{equivalent enrollment}}}{\text{number of contract days}}$$

Total direct cost = the total expenditure for teacher's salaries, fringe benefits, costs of equipment maintenance, replacement, repair, and acquisition of supplies.

Equivalent enrollment = the number of students enrolled in the course multiplied by the number of unit credits offered for successful completion of the course.

Number of contract days = the total number of days a teacher works (including days spent in classroom teaching, inservice training, conventions, etc.) as specified in his contract.

Summary of Findings

The single most obvious finding of the study was the lack of consistency and clear trends. Perhaps the most valid observations are those of what was not found.

1. Size of the school did not appear to be a factor in the cost per unit credit per contract day. Tables 25 and 26 show this. The group A schools would necessarily have the larger enrollments and totals for expenditures, but

their composite cost per unit credit per contract day was only $.009 lower than that of the group B schools. The average cost per unit credit per contract day of the group A schools for vocational programs was higher than that of the group B schools, $.746 as compared to $.732 for the group A schools.

2. No vocational program had consistently lower or higher costs than the others. Home economics tended to have the lowest cost per unit credit per contract day of the vocational programs and did have the lowest composite in both groups. However, it was third high in school 4 of group A and in school 1 of group B, second lowest in school 2 of group B, school 3 of group A, and school 4 of group A. It did consistently have the highest enrollment and total expenditure. The highest composite cost per unit credit per contract day was in office education in group B schools and in trades and industries in group A.

3. No academic program was consistently the most or least expensive as judged by the cost per unit credit per contract day. Science courses had the composite high cost per unit credit per contract day in both groups , but

not in every school. Communicative skills had the lowest composite cost per unit credit per contract day of the group A schools, while social studies in the group B schools had the lowest composite cost per unit credit per contract day.

4. Capital outlay for equipment was not a major factor in the higher costs per unit credit per contract day of the vocational programs. Many schools reported no capital outlay for equipment, yet still had a higher cost per unit credit per contract day than that of schools reporting outlays of $1,000 or more.

5. Vocational programs did have a consistently higher cost per unit credit per contract day than did the academic programs. This appeared to be primarily the result of the low pupil-teacher ratio as evidenced by high instructional costs combined with low enrollments.

Limitations

1. The study was confined to nine school districts in Iowa offering at least four vocational education programs eligible for federal aid. It is not known whether the data would be validly applicable to smaller schools, those offering fewer vocational programs, or those offering programs that do not meet the criteria for federal reimbursement.
2. It was assumed that all the data submitted to the Department of Public Instruction and that the budgets submitted by the individual schools to the researcher were accurate.
3. No evaluation of programs was attempted or implied.
4. Only direct costs were considered in the cost analysis.
5. No separate analysis of any program by grade level was computed.
6. The cost of educating one student in his total program, that is, a combination of courses, was not investigated.
7. This analysis examined only one point on the cost curve; actually the total possible cost curve with varying enrollments would be more meaningful.

Conclusions

1. Cost analysis as presented in this study provides a single, readily comparable cost for any program in a school district.

2. Large schools did not have lower instructional costs. This may be the result of more courses being offered in many of the programs, an occurrence which would not be indicated in this study. Or perhaps large schools are not more efficient than smaller schools. The larger schools may be offering courses carrying the same names but using more expensive equipment (though equipment cost did not seem to be significant) or they may be retaining more experienced and educated teachers, contributing to high instructional costs. It may be that the gross variable of total high school enrollment should be replaced by "program enrollment" when examining the economy of scale in high school programs.

3. A stated purpose of the study was to explain the causes for the difference between cost per unit credit of each

participating school district and every other participating school district. The data proved to be so inconsistent that this was not done in every case.

Recommendations

The following recommendations for implementation of the results of this study and for further research are suggested:

1. Better methods of budget planning and accounting should be developed and enforced in Iowa school districts. The difficulty of finding all of the information sought for this study and the many sources consulted, suggest that a major overhaul of budgeting procedures is in order. Conditions revealed by this investigation indicate that a uniform budget procedure for all school districts is a primary need. The present guide furnished by the Department of Public Instruction is not specific enough for cost benefit analysis nor was it followed by all districts in this sample. The precisely defined outline of FACT should be investigated as a solution to this problem.
2. The uniform procedures should include provision for the breaking down of costs into more detailed information. Information such as that used in this study should be readily available from a single source. The present system of cost accounting seems to be used because

(1) it is easy and (2) it has always been done that way. Neither is an acceptable reason for continuing an obsolete procedure, if indeed it ever was adequate. Computers are being implemented in inventory control in many school districts, and would be invaluable in unit cost analysis.

3. Future unit cost research such as this study might consider the following:

   a. Wenrich's (28) assumption that cost studies should describe costs at each student level for each program, because costs will advance with the class level of the student.

   b. The relationship of quality instructional efficiency.

   c. The relationship between program enrollment and cost efficiency. It may be that enrollment may be too high (as when another instructor or more classrooms or equipment must be added for a comparatively small increase in students) as well as too low.

d. The cost per unit credit per contract day of the academic programs ranged from $.551 to $.192. Academic programs should not be exempted from critical cost analysis.

e. Research concerning the appropriateness of courses offered and efficient use of funds in each program should be done. A low-cost program training a student for a non-existent job is no bargain.

f. Data should be examined from other states, from vocational programs other than the five of this study, perhaps even from similar programs at the post high school level.

4. Data and procedures of this study and subsequent research should be implemented in planning and funding to meet the identified needs of the students.

5. One of the limitations of this research was the dependence upon "one point" on the cost curve. If several different enrollments for each program were considered, a cost curve would have been evident. Further research may well determine that several cost curves for even vocational

programs exist. Multiple regression analysis could then be used to explain costs, especially if variables of enrollment, quality, and time could be included.

Cost analysis, coupled with identification of specific needs of students in individual school districts, can help lead to efficient quality instruction for all the children of Iowa.

BIBLIOGRAPHY

1. American Association of School Administrators. Hot line: Vocational education up. American Association of School Administrators Newsletter 2, No. 8. September 1969.

2. Anderson, Ernest F. Differential costs of curricula in comprehensive junior colleges. Unpublished Ed. D. dissertation. Urbana, Ill., Library, University of Illinois. (Microfilm Order No. 67-6543, Ann Arbor, Michigan, University Microfilms). 1966.

3. Asbell, Bernard. New directions in vocational education. U. S. Department of Health, Education, and Welfare OE-80047. 1967.

4. Barlow, Melvin L. The challenge of vocational education. The Sixty-fourth Yearbook of the National Society for the Study of Education. Chicago, University of Chicago Press. 1965.

5. Cage, Bobby N. Cost analysis of selected educational programs in the area schools of Iowa. Unpublished Ph. D. dissertation. Ames, Iowa, Library, Iowa State University. 1968.

6. Casey, J. E. What do business and industry want from vocational education? American School Board Journal 153, No. 4: 44-45. Oct. 1966.

7. Corazzini, A. J. When should vocational education begin? The Journal of Human Resources 2: 41-50. Winter 1967.

8. Gibbs, Wesley F. Program budgeting filters down to education. Nation's Schools 82, No. 5: 51-53. November 1968.

9. Glaspey, J. L. The challenge to school business management in the coming decade. Association of School Business Official Annual Meeting Proceedings 1966: 205-217. 1966.

10. Hanson, N. W. Economy of scale in education: an analysis of the relationship between district size and unit costs in the public school. Unpublished Ed. D. dissertation. Berkeley, Calif., Library, Stanford University. 1963.

11. Hare, V. H. Industrial assistance to education. Personnel Administrator 13, No. 1: 19-22. January-February 1968.

12. Hubbard, Robert L. Instructional cost studies in perspective. College and University Business 26: 28-29. 1959.

13. McClure, William P. Rationale for organizing, administering, and financing vocational education. The Sixty-fourth Yearbook of the National Society for the Study of Education. Chicago, University of Chicago Press. 1965.

14. Mood, A. M. and Powers, R. Cost-benefit analysis of education. Unpublished paper presented at the Washington Operations Research Council's Second Cost-Effectiveness Symposium, Marriott Twin Bridge Motor Hotel, March 13-15, 1967. Washington, D. C., Office of Education. 1967.

15. National Education Association. Research Division. Estimates of school statistics, 1968-69. National Education Association Research Report 1968-R16. 1968.

16. National Education Association. Research Division. Rankings of the states, 1969. National Education Association Research Report 1969-R1. 1969.

17. Pennsylvania State University. Institute for Research and Human Resources. An analysis of the comparative costs and benefits of vocational versus academic education in secondary schools. U. S. Department of Health, Education, and Welfare Preliminary Report OE-512. October 1967.

18. Pucel, David J. Vocational education is learning how to work. American School Board Journal 153, No. 4: 40-41. October 1966.

19. Rath, Gustave J. PPBS is more than a budget: It's a total planning process. Nation's Schools 82, No. 5: 53-55. November 1968.

20. Simon, Kenneth A. and Grant, W. Vance. Digest of Educational Statistics. U. S. Department of Health, Education, and Welfare OE-10024-68. 1968.

21. Simon, Kenneth A. and Grant, W. Vance. Digest of Educational Statistics. U. S. Department of Health, Education, and Welfare OE-10024-69. 1969.

22. Sims, James K. They go back to school without leaving the plant. Personnel Administrator 13, No. 6: 9-10, 12. November-December 1968.

23. Swanson, J. Chester. Development of federal legislation for vocational education. Chicago, Illinois, American Technical Society. 1966.

24. Van Raalte, Robert C. A challenge to school boards. The American School Board Journal 153, No. 4: 42-45. October 1966.

25. Walsh, John Patrick and Selden, William. Vocational education in the secondary school. The Sixty-fourth Yearbook of the National Society for the Study of Education. Chicago, the University of Chicago Press, 1965.

26. Walsh, Raymond J. Relationship of enrollment in practical arts and vocational courses to the holding power of the comprehensive high school. Unpublished Ed. D. dissertation. Columbia, Mo., Library, University of Missouri. 1965.

27. Wells, John K. A study of the net expense of selected curricular programs at the East Los Angeles College. Unpublished Ed. D. dissertation. Berkeley, Calif., Library, University of California. 1966. (Microfilm Order No. 66-5323, Ann Arbor, Michigan, University Microfilms Inc.).

28. Wenrich, Ralph C. Vocational education. National Education Association Journal 50, No. 2: 16-18. February 1961.

29. Wert, James E., Neidt, Charles O., Ahmann, J. Stanley. Statistical methods in educational and psychological research. New York, Appleton-Century-Crofts, Inc. 1954.

30. Williams, Roger L. A study of unit costs of selected vocational programs in Michigan junior colleges. Unpublished Ph. D. dissertation. Ann Arbor, Mich., Library, University of Michigan. (Microfilm Order No. 65-1776, Ann Arbor, Michigan, University Microfilms, Inc.).

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APPENDIX A

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ANNUAL EVALUATION GUIDE

(19____ - 19____ SCHOOL YEAR)

☐☐☐☐ School District Code Number ☐☐ County Code Number

☐☐☐☐ Non-Public School Code Number _____ County Name

School District: _____ Address: _____

Superintendent: _____ Board Secretary: _____

Non-Public School Principal: _____ Address: _____

School Organization: ☐ K-8-4 ☐ K-6-3-3 ☐ Other – Explain _____

NCA: Yes ☐ No ☐

The information in this report is correct and complete to the best of our knowledge.

_____
(Signature of Superintendent or Non-Public School Principal) *Date Signed*

_____
(Signature and Address of Board President) *Date Signed*

ENROLLMENTS

ELEMENTARY ENROLLMENTS AS OF SEPTEMBER 15

GRADE	K	1	2	3	4	5	6	Ungraded
Enrollment								
Sections								

SECONDARY ENROLLMENT AS OF SEPTEMBER 15

GRADE	7	8	9	10	11	12	Ungraded
Enrollment							
Sections							

TOTALS: Elementary _____ Junior High _____ High School _____

PB-15376

Secondary Program 9-12

(Each High School in the District)

Subject Field	Units	Course Name	TOTAL		Grade	Unit Value	Comments
			Sections	Students			
SCIENCE Four (4) units of science including physics and chemistry shall be offered and taught. Physics and chemistry may be taught in alternate years, but four (4) units each year.	4	General Science					
		Biology					
		Physical Science					
		Chemistry					
		Physics					
		Earth Science					
		Physics (PSSC)					
		Chemistry (CHEMS)					
		Chemistry (CBA)					
		Biology (BSCS)					
		Earth Science (ESCP)					
		Physical Science (IPS)					
SOCIAL STUDIES Four (4) units of social science shall be offered and taught each year. The following must be taught annually: American history, American government, and economics.	4	American History					
		American Government					
		Economics					
		Geography					
		World History					
		Sociology					
		Civics					
		Social Studies 9					
		Psychology					
ENGLISH Four (4) units of English including language arts shall be offered and taught each year.	4	English I					
		English II					
		English III					
		English IV					
		American Literature					
		English Literature					
		World Literature					
		Speech I					
		Speech II					
		Journalism					
		Remedial English					
		Creative Writing					
		Debate					
MATHEMATICS Four (4) units of sequential mathematics, and one unit of general mathematics shall be offered and taught each year, or a total of five (5) units.	5	General Mathematics I					
		General Mathematics II					
		Algebra I					
		Algebra II					
		Geometry					
		Plane					
		Solid					
		Fused					
		Analytic					
		College Mathematics					
		Trigonometry					

Subject Field	Units	Course Name	TOTAL		Grade	Unit Value	Comments
			Sections	Students			
FOREIGN LANGUAGE Two (2) units of one foreign language shall be taught each year.	2	French I					
		French II					
		French III					
		French IV					
		German I					
		German II					
		German III					
		German IV					
		Spanish I					
		Spanish II					
		Spanish III					
		Spanish IV					
		Latin I					
		Latin II					
		Latin III					
PHYSICAL EDUCATION One (1) unit of physical education with one-eighth unit each semester required of each pupil.	1	Physical Education I					—
		Physical Education II					
		Physical Education III					
		Physical Education IV					
PRACTICAL ARTS Five (5) units required. Subjects in this area may include business education, industrial arts, homemaking, agriculture, distributive education, and office education.	5	Bookkeeping I					
		Bookkeeping II					
		Business Law					
		General Business					
		Office Practice					
		Secretarial Practice					
		Business Arithmetic					
		Personal Typing					
		Typing I					
		Typing II					
		Machine Practice					
		Shorthand I					
		Shorthand II					
		Industrial Arts I					
		Industrial Arts II					
		Industrial Arts III					
		Industrial Arts IV					
		Drafting I					
		Drafting II					
		Metals I					
		Metals II					
		Woodworking I					
		Woodworking II					
		Power Mechanics					
		Graphic Arts					
		Industrial Plastics					
		Electronics					

Subject Field	Units	Course Name	TOTAL Sections	TOTAL Students	Grade	Unit Value	Comments
PRACTICAL ARTS (continued)		Distributive Education					
		Office Education					
		Trades and Industry					
		Homemaking I					
		Homemaking II					
		Homemaking III					
		Homemaking IV					
		Agriculture I					
		Agriculture II					
		Agriculture III					
		Agriculture IV					
SPECIAL EDUCATION		Special Education					
FINE ARTS More than one (1) course shall be taught in the fine arts division. This means that two (2) of the three (3) areas, namely art, music, and dramatics shall be taught.	2	Art I					
		Art II					
		Art III					
		Music					
		Vocal					
		Instrumental					
		Dramatics					
DRIVER EDUCATION	1/2	Driver Education					

Total Units Taught in Each High School 9 - 12 - - - - - - - - - - - - _____

Number of Units Required for Graduation - - - - - - - - - - - - - _____

PLEASE ATTACH SCHEDULE OF JUNIOR HIGH AND HIGH SCHOOL CLASSES

APPENDIX B

IOWA PROFESSIONAL SCHOOL EMPLOYEES

1 CO. NO.	2 DIST. NO.	3 HOME SCH. NO.	4 SOCIAL SECURITY NUMBER	5 FOLDER NUMBER

6 NAME LAST, FIRST, MAIDEN OR MIDDLE	7 TOTAL SEM. HRS.

8 DECLARED MAJORS UNDERGRADUATE	9 DECLARED MAJORS GRADUATE	10 HIGHEST DEGREE	11 YR. RCVD.	12 INSTITUTION CODE

13 INST. GRANTING HIGHEST DEGREE	14 SALARY IN WHOLE $'S	15 TYPE EXTRA COMP.	16 EXTRA COMP. NOT IN CONT. IN WHOLE $'S	17 POSITION TITLE

18 YRS. TITLE HELD	19 CONTRACT PERIOD	20 PERCENT OF TIME	21 MARITAL STATUS AND SEX	22 BIRTH DATE MO.	22 BIRTH DATE YR.	23 YRS. EXP. THIS DIST.	23 YRS. EXP. TOTAL	24 OCCUP. PREV. YR.	25 NO. YRS. WORK EXP. IN VOCATIONAL AREA

26 ASSIGNMENT	27 ASSIGN CODE	28 SEM. HRS.	29 SCH DUTIE PERF.

For D.P.I. Use Only

Distribution of Forms:

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Yellow copy-Principal or Dean

STATE OF IOWA DEPARTMEN

SCHOOL EMPLOYEES DATA SHEET

26 ASSIGNMENT	27 ASSIGN CODE	28 SEM. HRS.	29 SCH. DUTIES PERF. IN	30 GRADE LEVEL	
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	50
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	51
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	52
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	53
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	54
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	55
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	56
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	57
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	58
				PK K 1 2 3 4 5 6 7 8 9 10 11 12 UNGR. SP.ED AREA SCH AD.ED SYSWIDE	59

COMPOSITE OF STATISTICAL DATA

Summary of data for academic and vocational programs, Group A, School 1.
High School Enrollment - 2,228.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$112,987.00	$ 365.00	None	None	$3,314.44	$4,809.29
Math	83,010.00	20.65	None	None	2,713.69	3,508.30
Science	62,840.00	1,203.29	None	None	1,808.94	2,442.35
Soc. St.	99,230.00	467.00	None	None	3,044.16	4,043.12
TOTAL	$358,067.00	$2,055.94	None	None	$10,881.23	$14,803.06

Summary of data for vocational program, Group A, School 1.
High School Enrollment - 2,228.

VOCATIONAL						
D E	$ 6,105.00	None	$304.00	None	$ 213.67	$ 268.62
H. E.	22,075.79	73.00	26.90	None	490.00	343.20
Ag.	None					
O. E.	7,440.00	None	None	None	245.00	343.20
T & I	17,740.00	141.89	180.10	None	490.00	686.40
TOTAL	$ 53,360.79	$214.89	$511.00	None	$ 1,438.67	$ 1,641.42

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
None	None	$121,475.73	2,447	1	$49.64	195	$ .254
None	None	89,252.64	1,586	1	56.28	195	.288
None	None	68,294.58	1,054	1	64.80	195	.332
None	None	106,784.28	2,241	1	47.65	195	.244
None	None	$385,807.23	7,328		$52.64(avg.)		$ .269(avg.)
None	$1,356.00	$ 8,247.29	(26) 13	2	$317.20	209	$ 1.516
None	996.00	24,004.89	367	1	65.40	209	.312
None	341.50	8,369.73	(28) 14	2	298.91	209	1.432
None	3,574.12	22,812.51	(93) 31	3	245.29	209	1.173
None	$6,267.62	$ 63,434.39	(514) 425		$123.41(avg.)		$ .590(avg.)

Summary of data for academic program, Group A, School 2.
High School Enrollment - 1,872.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 96,362.00	$ 632.86	$ 62.30	None	$3,047.17	$4,068.33
Math	69,250.00	None	113.76	None	2,086.00	2,842.40
Science	54,375.00	569.49	301.10	None	3,038.88	3,998.50
Soc. St.	140,550.00	None	203.05	None	2,709.00	3,610.20
TOTAL	$360,537.00	$1,202.35	$700.21	None	$10,881.05	$14,519.43

Summary of data for vocational program, Group A, School 2.
High School Enrollment - 1,872.

VOCATIONAL						
D E	$ 16,794.00	$ 223.62	$ 298.00	None	$ 490.00	$ 686.40
H. E.	33,261.00	509.26	45.90	None	918.19	1,258.71
Ag.	None					
O. E.	9,017.00	None	244.00	None	245.00	343.20
T & I	11,749.00	None	244.65	None	245.00	343.20
TOTAL	$ 70,821.00	$732.88	$832.55	None	$1,898.19	$2,631.51

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
None	None	$104,172.66	1,777	1	$58.62	190	$ .308
None	553.88	74,866.04	1,111	1	67.39	190	.354
305.00	13,367.00	75,954.97	1,008	1	75.35	190	.396
None	2,111.12	149,183.37	2,132	1	69.97	190	.368
$305.00	$16,032.00	$404,177.04	6,028		$67.04(avg.)		$ .352(avg.)
None	None	$18,492.02	44	1	$420.27	211	$1.991
307.00	756.00	37,056.06	230	1	161.11	202	.797
None	151.00	10,000.20	21	1	476.20	211	2.256
863.00	5,263.00	18,707.85	35 (70)	2	267.26	211	1.266
$1,170.00	$6,170.00	$84,256.13	330 (365)		$230.84(avg.)		$1.110(avg.)

Summary of data for academic program, Group A, School 3.
High School Enrollment - 1,601.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$102,750.00	$ 165.00	$127.00	$1,377.60	$3,211.32	$4,297.83
Math	103,072.00	121.00	22.00	1,377.60	2,954.00	3,960.00
Science	62,214.00	2,870.00	62.00	639.60	1,581.65	2,199.56
Soc. St.	75,977.00	256.00	None	885.60	1,889.72	2,551.65
TOTAL	$344,013.00	$3,412.00	$211.00	$4,280.40	$9,636.69	$13,009.04

Summary of data for vocational program, Group A, School 3.
High School Enrollment - 1,601.

VOCATIONAL						
D E	$ 9,655.00	$ 321.00	$540.00	$ 98.40	$ 245.00	$ 343.20
H. E.	13,679.00	789.13	25.00	196.80	393.37	529.72
Ag.	None					
O. E.	8,104.00	76.20	250.00	98.40	245.00	343.20
T & I	10,393.00	30.10	356.48	98.40	245.00	343.20
TOTAL	$ 41,831.00	$1,216.43	$1,171.48	$492.00	$1,128.37	$1,559.32

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	None	$111,928.75	1,761	1	$63.56	196	$ .324
None	None	111,506.60	1,258	1	88.64	199	.445
396.78	8,568.43	78,532.02	1,154	1	68.05	194	.350
None	None	81,559.97	1,279	1	63.77	194	.328
$396.78	$8,568.43	$383,527.34	5,452		$70.35(avg.)		$ .361(avg.)
None	None	$ 11,202.60	(102) 34	3	$109.83	208	$ .528
1,204.72	200.00	17,017.74	204	1	83.42	203	.410
None	1,890.00	11,006.80	(45) 15	3	244.60	208	1.175
None	None	11,466.18	(48) 16	3	238.88	208	1.148
$1,204.72	$2,090.00	$50,693.32	(399) 269		$127.05(avg.)		$ .617(avg.)

Summary of data for academic program, Group A, School 4.
High School Enrollment - 1,541.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$104,176.00	$ 119.29	$249.20	$1,627.92	$3,306.21	$4,413.86
Math	45,034.00	79.18	123.00	697.28	1,449.00	1,912.68
Science	51,330.00	1,663.39	169.00	697.68	1,475.25	1,995.40
Soc. St.	69,581.00	223.14	67.00	1,046.52	2,159.85	2,899.82
TOTAL	$270,121.00	$2,085.00	$608.20	$4,069.40	$8,390.31	$11,221.76

Summary of data for vocational program, Group A, School 4.
High School Enrollment - 1,541.

VOCATIONAL						
D E	$ 10,102.00	$ 353.35	$213.00	$ 116.28	$ 245.00	$ 343.20
H. E.	18,721.20	628.87	128.40	232.56	490.00	686.20
Ag.	10,556.25	372.94	630.32	116.28	245.00	343.20
O. E.	12,350.00	200.00	None	116.28	245.00	343.20
T & I	5,910.98	210.00	18.56	58.14	206.85	260.04
TOTAL	$ 57,640.43	$1,765.16	$990.28	$639.54	$1,431.85	$1,975.84

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$123.00	$ 789.00	$114,804.43	1,671	1	$68.70	195	$ .352
None	341.51	49,636.65	913	1	54.37	195	.278
401.70	2,909.16	60,641.58	838	1	72.37	195	.371
87.42	280.00	76,344.75	1,100	1	69.40	195	.355
$612.12	$4,319.67	$301,427.46	4,522		$66.66(avg.)		$ .342(avg.)
None	$3,591.00	$ 14,963.83	51 (102)	2	$146.70	215	$ .682
None	78.00	20,965.23	117	1	179.20	215	.833
103.30	323.00	12,690.29	47	1	270.01	255	1.058
None	None	13,254.48	51 (102)	2	129.95	210	.618
None	431.10	7,095.67	14 (28)	2	253.42	210	1.206
$103.30	$4,423.10	$ 68,969.50	280 (396)		$174.17(avg.)		$ .788(avg.)

Summary of data for academic program, Group B, School 1.
High School Enrollment - 975.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 62,670.00	$ 629.15	$ 173.00	None	$1,985.34	$2,620.11
Math	30,982.00	28.00	64.00	None	973.98	1,300.73
Science	42,102.00	138.50	213.00	None	1,334.48	1,748.65
Soc. St.	52,107.00	53.00	179.00	None	1,419.53	1,912.28
TOTAL	$187,861.00	$ 848.65	$ 629.00	None	$5,713.33	$7,581.77

Summary of data for vocational program, Group B, School 1.
High School Enrollment - 975.

VOCATIONAL						
D E	$ 5,311.00	$ None	$ 142.00	None	$ 185.89	$ 233.68
H. E.	15,706.00	423.60	116.27	None	490.00	686.40
Ag.	8,121.00	650.16	815.82	None	245.00	343.20
O. E.	6,813.00	None	125.00	None	238.46	299.77
T & I	4,805.00	None	88.00	None	168.18	211.42
TOTAL	$ 40,756.00	$1,073.76	$1,287.09	None	$1,327.53	$1,774.47

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$2,021.00	None	$ 70,098.60	669	1	$104.78	190	$ .551
1,008.00	70.00	34,426.71	634	1	54.30	190	.285
3,005.00	793.00	49,334.63	516	1	95.61	190	.503
123.00	1,789.00	57,582.81	859	1	67.03	190	.352
$6,157.00	$2,652.00	$211,442.75	2,678		$78.96(avg.)		$ .415(avg.)
None	None	$ 5,872.57	28	1	$209.73	190	$1.107
788.00	430.00	18,640.27	152	1	122.63	210	.583
1,506.00	193.00	11,874.18	62	1	191.52	260	.736
513.00	2,130.00	10,119.23	12	1	84.33	190	.447
64.00	556.00	5,892.60	13	1	45.33	190	.231
$2,871.00	$3,309.00	$ 52,398.85	267		$196.25(avg.)		$ .947(avg.)

Summary of data for academic program, Group B, School 2.
High School Enrollment - 918.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 55,141.00	None	$ 27.00	None	$1,878.14	$2,426.20
Math	29,933.00	446.97	89.00	None	979.90	1,292.81
Science	24,856.00	2,631.86	113.00	None	870.03	1,093.75
Soc. St.	26,642.00	685.20	None	None	886.97	1,163.45
TOTAL	$136,572.00	$3,764.03	$229.00	None	$4,615.04	$5,976.21

Summary of data for vocational program, Group B, School 2.
High School Enrollment - 918.

VOCATIONAL

D E	$ None	$	$	$	$	$
H. E.	14,108.75	909.40	None	None	490.00	616.00
Ag.	10,710.65	1,097.31	850.62	None	245.00	343.20
O. E.	9,310.00	52.23	337.00	None	245.00	343.20
T & I	20,530.00	None	719.51	None	490.00	686.40
TOTAL	$ 54,659.40	$2,058.94	$1,907.13	None	$1,470.00	$1,988.80

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$ 659.13	$ 579.13	$ 60,710.60	1,003	1	$60.53	190	$ .318
239.00	484.87	33,465.55	444	1	75.37	190	.396
463.16	3,030.00	33,057.80	533	1	62.02	190	.326
None	450.00	29,827.62	816	1	36.53	190	.192
$1,361.29	$4,544.00	$157,061.57	2,796		$ 57.17(avg.)		$ .295(avg.)
$	$	$			$		$
111.00	None	16,235.15	142	1	114.33	211	.541
490.00	1,288.00	15,024.78	107	1	140.42	250	.561
None	3,944.00	14,231.43	24	1	592.98	200	2.964
None	None	22,425.91	74	1	303.05	211	1.436
$601.00	$5,232.00	$67,917.27	347		$195.73(avg.)		$ .897(avg.)

Summary of data for academic program, Group B, School 3.
High School Enrollment - 823.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 61,614.00	$ 194.77	$ 79.00	None	$1,937.64	$2,586.54
Math	27,859.00	129.34	33.00	None	875.00	1,205.03
Science	43,126.00	1,334.42	121.20	None	980.00	1,711.42
Soc. St.	42,473.00	50.00	34.00	None	1,215.20	1,668.48
TOTAL	$175,072.00	$1,708.53	$267.20	None	$5,007.84	$7,171.47

Summary of data for vocational program, Group B, School 3.
High School Enrollment - 823.

VOCATIONAL						
D E	$ 5,418.00	$ 93.65	$165.00	None	$ 189.63	$ 238.39
H. E.	16,253.00	523.27	126.55	None	490.00	686.40
Ag.	6,000.00	512.25	532.79	None	210.00	264.00
O. E.	5,519.00	56.00	145.00	None	193.17	242.84
T & I	9,394.00	129.00	None	None	245.00	343.20
TOTAL	$ 42,584.00	$1,314.17	$969.34	None	$1,327.80	$1,774.83

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
None	None	$ 66,411.95	741	1	$89.62	195	$ .459
None	None	30,101.37	418	1	72.01	195	.369
329.00	None	47,602.04	582	1	81.79	195	.419
None	None	45,440.68	1,017	1	44.68	195	.229
$329.00	None	$189,556.04	2,758		$68.73(avg.)		$ .352(avg.)
None	$ 426.00	$ 6,530.67	15 (30)	2	$217.69	215	$1.012
456.85	303.20	18,839.27	116	1	162.41	210	.773
212.30	329.14	8,060.48	60	1	134.34	240	.559
None	2,336.54	8,492.55	15 (30)	2	283.09	210	1.348
None	None	10,111.20	21 (42)	2	240.74	215	1.119
$669.15	$3,394.88	$ 52,034.17	227 (278)		$187.17(avg.)		$ .858(avg.)

Summary of data for academic program, Group B, School 4.
High School Enrollment - 737.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 45,050.00	$ 219.00	$ 71.10	None	$1,424.50	$1,918.40
Math	25,150.00	96.00	129.00	None	721.00	976.80
Science	31,850.00	902.48	16.00	None	966.00	1,320.00
Soc. St.	38,500.00	346.00	27.60	None	1,165.50	1,570.80
TOTAL	$140,550.00	$1,563.48	$243.70	None	$4,277.00	$5,786.00

Summary of data for vocational program, Group B, School 4.
High School Enrollment - 737.

VOCATIONAL						
D E	$ 7,096.00	$ 158.86	$387.00	None	$ 245.00	$ 312.22
H. E.	7,883.00	484.72	29.75	None	245.00	343.20
Ag.	5,857.00	222.65	100.00	None	205.00	257.71
O. E.	3,534.00	93.71	64.00	None	123.69	155.50
T & I	None					
TOTAL	$ 24,370.00	$ 959.94	$580.75	None	$ 818.69	$1,068.63

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$ 17.33.	$ 356.00	$ 49,056.33	703	1	$69.78	195	$ .357
114.00	88.00	27,274.80	371	1	73.52	195	.377
26.00	1,561.00	36,641.48	387	1	94.68	195	.485
153.00	791.00	42,553.90	814	1	52.28	195	.268
$310.33.	$2,796.00	$155,526.51	2,275		$68.36(avg.)		$ .350(avg.)
$ 312.22	$ 587.00	$ 8,786.08	(60) 20	3	$146.43	220	$ .665
65.00	467.00	9,517.67	67	1	142.05	220	.645
310.00	1,320.00	8,272.36	38	1	217.69	215	1.012
275.00	263.00	4,508.90	(66) 22	3	68.32	200	.341
$1,237.00	$2,050.00	$ 31,085.01	(231) 147		$134.57(avg.)		$ .631(avg.)

Summary of data for academic program, Group B, School 5.
High School Enrollment - 470.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$ 27,017.00	$ 35.00	$ 39.00	None	$ 881.37	$1,143.21
Math	13,226.00	26.00	None	None	462.91	581.94
Science	16,149.00	1,174.00	170.00	None	490.00	660.00
Soc. St.	17,269.00	53.00	10.81	None	980.00	1,302.40
TOTAL	$ 73,661.00	$1,288.00	$219.81	None	$2,814.28	$3,687.55

Summary of data for vocational program, Group B, School 5.
High School Enrollment - 470.

VOCATIONAL

D E	$None	$	$	$	$	$
H. E.	8,608.00	895.67	25.55	None	245.00	343.20
Ag.	9,637.00	4,916.71	892.13	None	245.00	343.20
O. E.	2,952.00	15.13	247.00	None	103.32	129.89
T & I	6,850.00	586.78	104.70	None	239.75	301.40
TOTAL	$ 28,047.00	$6,414.29	$1,269.38	None	$ 833.07	$1,117.69

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
None	None	$ 29,115.58	460	1	$63.29	195	$ .324
None	561.12	14,857.97	286	1	51.95	195	.266
None	991.00	19,634.00	226	1	86.88	195	.445
None	462.73	20,077.94	51	1	39.29	195	.201
None	$2,014.85	$ 83,685.49	1,483		$56.43(avg.)		$ .289(avg.)
$	$	$			$		$
None	783.00	10,900.42	83	1	131.33	215	.610
None	656.00	16,690.04	56	1	298.04	255	1.168
None	None	3,447.34	(16) 8	2	215.46	215	1.002
None	279.00	8,361.63	(22) 11	2	380.07	215	1.767
None	$1,718.00	$ 39,399.43	(177) 158		$222.59(avg.)		$ .989(avg.)

Rank order by cost per unit per contract day of Group A Schools: Communicative Skills Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,541	$104,176.00	$119.29	$249.20	$1,627.92	$3,306.21	$4,413.86
1,601	102,750.00	165.00	127.00	1,377.60	3,211.32	4,297.83
1,872	96,362.00	632.86	62.30	None	3,047.17	4,068.33
2,228	112,987.00	365.00	None	None	3,314.44	4,809.29

Rank order by cost per unit per contract day of Group B Schools: Communicative Skills Program.

975	$ 62,670.00	$629.15	$173.00	None	$1,985.34	$2,620.11
823	61,614.00	194.77	79.00	None	1,937.64	2,586.54
737	45,050.00	219.00	71.10	None	1,424.50	1,918.40
470	27,017.00	35.00	39.00	None	881.37	1,143.21
918	55,141.00	None	27.00	None	1,878.14	2,426.20

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
$ 123.00	$789.00	$114,804.48	1,671	1	$68.70	195	$ .352
None	None	111,928.75	1,761	1	63.56	196	.324
None	None	104,172.66	1,777	1	58.62	190	.308
None	None	121,475.73	2,447	1	49.64	195	.254
$2,021.00	None	$ 70,098.60	669	1	$104.78	190	$ .551
None	None	66,411.95	741	1	89.62	195	.459
17.33	356.00	49,056.33	703	1	69.78	195	.357
None	None	29,115.58	460	1	63.29	195	.324
659.13	579.13	60,710.60	1,003	1	60.52	190	.318

Rank order by cost per unit per contract day of Group A Schools: Mathematics Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,601	$103,072.00	$121.00	$22.00	$1,377.60	$2,954.00	$3,960.00
1,872	69,250.00	None	133.76	None	2,086.00	2,842.40
2,228	83,010.00	20.65	None	None	2,713.69	3,508.30
1,541	45,034.00	79.18	123.00	697.23	1,449.00	1,912.68

Rank order by cost per unit per contract day of Group B Schools. Mathematics Program.

918	$29,933.00	$446.97	$ 89.00	None	$979.90	$1,292.81
737	25,150.00	96.00	129.00	None	721.00	976.80
823	27,859.00	129.34	33.00	None	875.00	1,205.03
975	30,982.00	28.00	64.00	None	973.98	1,300.73
470	13,226.00	26.00	None	None	462.91	581.94

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
None	None	$111,506.60	1,258	1	$88.63	199	$.445
None	553.88	74,866.04	1,111	1	67.38	190	.354
None	None	89,252.64	1,586	1	56.27	195	.288
None	341.51	49,636.65	913	1	54.36	195	.278
$ 239.00	$484.87	$ 33,465.55	444	1	$75.37	190	$.396
114.00	88.00	27,274.80	371	1	73.51	195	.377
None	None	30,101.37	418	1	72.01	195	.369
1,008.00	70.00	34,426.71	634	1	54.30	190	.285
None	561.12	14,857.97	286	1	51.95	195	.266

Rank order of Group A Schools by cost per unit per contract day: Science Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,872	$ 54,375.00	$ 569.49	$301.10	None	$3,038.88	$3,998.50
1,541	51,330.00	1,663.39	169.00	697.68	1,475.25	1,995.40
1,601	62,214.00	2,870.00	62.00	639.60	1,581.65	2,199.56
2,228	62,840.00	1,203.29	None	None	1,808.94	2,442.35

Rank order of Group B Schools by cost per unit per contract day: Science Program.

975	$ 42,102.00	$ 138.50	$213.00	None	$1,334.48	$1,748.65
737	31,850.00	902.48	16.00	None	966.00	1,320.00
470	16,149.00	1,174.00	170.00	None	490.00	660.00
823	43,126.00	1,334.42	121.20	None	980.00	1,711.42
918	24,856.00	2,631.86	113.00	None	870.03	1,093.75

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
$ 305.00	$13,367.00	$ 75,954.97	1,008	1	$75.35	190	$.396
401.70	2,909.16	60,641.58	838	1	72.36	195	.371
396.78	8,568.43	78,532.02	1,154	1	68.05	194	.350
None	None	68,294.58	1,054	1	64.79	195	.332
$3,005.00	$ 793.00	$ 49,334.63	516	1	$95.60	190	$.503
26.00	1,561.00	36,641.48	387	1	94.68	195	.485
None	991.00	19,634.00	226	1	86.87	195	.445
329.00	None	47,602.04	582	1	81.79	195	.419
463.16	3,030.00	33,057.80	533	1	62.02	190	.326

Rank order of Group A Schools by cost per unit per contract day: Social Studies Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,872	$140,550.00	None	$203.05	None	$2,709.00	$3,610.20
1,541	69,581.00	223.14	67.00	1,046.52	2,159.85	2,889.82
1,601	75,977.00	256.00	None	885.60	1,889.72	2,551.65
2,228	99,230.00	467.00	None	None	3,044.16	4,043.12

Rank order of Group B Schools by cost per unit per contract day: Social Studies Program.

975	$ 52,107.00	$ 53.00	$179.00	None	$1,419.53	$1,912.28
737	38,500.00	346.00	27.60	None	1,165.50	1,570.80
823	42,473.00	50.00	34.00	None	1,215.20	1,668.48
470	17,269.00	53.00	10.81	None	980.00	1,302.40
918	26,642.00	685.20	None	None	886.97	1,163.45

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	$2,111.12	$149,183.37	2,132	1	$69.97	190	$.368
87.42	280.00	76,344.75	1,100	1	69.40	195	.355
None	None	81,559.97	1,279	1	63.76	194	.328
None	None	106,784.28	2,241	1	47.65	195	.244
$123.00	$1,789.00	$ 57,582.81	859	1	$67.03	190	$.352
153.00	791.00	42,553.90	814	1	52.27	195	.268
None	None	45,440.68	1,017	1	44.68	195	.229
None	462.73	20,077.94	511	1	39.29	195	.201
None	450.00	29,827.62	816	1	36.55	190	.192

Rank order by Group A Schools by size of enrollment:
Academic Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
2,228	$358,067.00	$2,055.94	None	None	$10,881.23	$14,803.06
1,872	360,537.00	1,202.35	700.21	None	10,881.05	14,519.43
1,601	344,013.00	3,412.00	211.00	4,280.40	9,636.69	13,009.04
1,541	270,121.00	2,085.00	608.20	4,069.40	8,390.31	11,221.76

Rank order of Group B Schools by size of enrollment:
Academic Program.

975	$187,861.00	$ 848.65	$629.00	None	$5,713.33	$7,581.77
918	136,572.00	3,764.03	229.00	None	4,615.04	5,976.21
823	175,072.00	1,708.53	267.20	None	5,007.84	7,171.47
737	140,550.00	1,563.48	243.70	None	4,277.00	5,786.00
470	73,661.00	1,288.00	219.81	None	2,814.28	3,687.55

Replace q Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	None	$385,807.23	7,328		$52.64		$ .269
305.00	16,032.00	404,177.04	6,028		67.04		.352
396.78	8,568.43	383,527.34	5,452		70.35		.361
612.12	4,319.67	301,427.46	4,522		66.66		.342
$6,157.00	$2,652.00	$211,442.75	2,678		$78.96		$ .415
1,361.29	4,544.00	157,061.57	2,796		56.17		.295
329.00	None	189,556.04	2,758		68.73		.352
310.33	2,796.00	155,526.51	2,275		68.36		.350
None	2,014.85	83,685.49	1,483		56.43		.289

Rank order of Group A Schools by cost per unit credit per contract day: Agriculture Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,541	$10,556.25	$372.94	$630.32	$116.28	$245.00	$343.20
2,228	None					
1,872	None					
1,601	None					

Rank order by Group B Schools by cost per unit credit per contract day: Agriculture Program.

470	$ 9,637.00	$4,916.71	$892.13	None	$ 245.00	$ 343.20
737	5,857.00	222.65	100.00	None	205.00	257.71
975	8,121.00	650.16	815.82	None	245.00	343.20
918	10,710.65	1,097.31	850.62	None	245.00	343.20
823	6,000.00	512.25	532.79	None	210.00	264.00

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
$ 103.30	$ 323.00	$ 12,690.29	47	1	$270.01	255	$1.058
None	$ 656.00	$ 16,690.04	56	1	$298.04	255	$1.168
310.00	1,320.00	8,272.36	38	1	217.69	215	1.012
1,506.00	193.00	11,874.18	62	1	191.52	260	.736
490.00	1,288.00	15,024.78	107	1	140.42	250	.561
212.30	329.14	8,060.48	60	1	134.34	240	.559

Rank order by Group A Schools by cost per unit credit per contract day: Distributive Education Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,872	$16,794.00	$ 223.62	$298.00	None	$490.00	$686.40
1,541	10,102.00	353.35	213.00	116.28	245.00	343.20
1,601	9,655.00	321.00	540.00	98.40	245.00	343.20
2,228	6,105.00	None	304.00	None	213.67	268.62

Rank order of Group B Schools by cost per unit credit per contract day: Distributive Education Program.

823	$ 5,418.00	$ 93.65	$165.00	None	$189.63	$238.39
737	7,096.00	158.86	387.00	None	245.00	312.22
975	None					
918	None					
470	None					

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	None	$ 18,492.02	44	1	$420.27	211	$1.991
None	3,591.00	14,963.83	(102) 51	2	146.70	215	.682
None	None	11,202.60	(102) 34	3	109.83	208	.528
None	1,356.00	8,247.29	(26) 13	2	317.20	209	1.510
None	None	$ 5,872.57	28	1	$209.73	190	$1.107
None	426.00	6,530.67	(30) 15	2	217.69	215	1.012
587.00	None	8,786.08	(60) 20	3	146.43	220	.665

Rank order of Group A Schools by cost per unit credit per contract day: Home Economics Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,541	$18,721.20	$628.87	$128.40	$232.56	$490.00	$ 686.20
1,872	33,261.00	509.26	45.90	None	918.19	1,258.71
1,601	13,679.00	789.13	25.00	196.80	393.37	529.72
2,228	22,075.79	73.00	26.90	None	490.00	343.20

Rank order of Group B Schools by cost per unit credit per contract day: Home Economics Program.

823	$16,253.00	$523.27	$126.55	None	$490.00	$686.40
737	7,883.00	484.72	29.75	None	245.00	343.20
470	8,608.00	895.67	25.55	None	245.00	343.20
975	15,706.00	423.60	116.27	None	490.00	686.40
918	14,108.75	909.40	None	None	490.00	616.00

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	$ 78.00	$20,965.23	117	1	$179.19	215	$.833
307.00	756.00	37,056.06	230	1	161.11	202	.797
1,204.72	200.00	17,017.74	204	1	83.42	203	.410
None	996.00	24,004.89	367	1	65.40	209	.312
$ 456.85	$303.20	$18,839.27	116	1	$162.40	210	$.773
65.00	467.00	9,517.67	67	1	142.05	220	.645
None	783.00	10,900.42	83	1	131.33	215	.610
788.00	430.00	18,640.27	152	1	122.63	210	.583
111.00	None	16,235.15	142	1	114.33	211	.541

Rank order of Group A Schools by cost per unit credit per contract day: Office Education Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,872	$ 9,017.00	None	$244.00	None	$245.00	$343.20
1,601	8,104.00	76.20	250.00	98.40	245.00	343.20
1,541	12,350.00	200.00	None	116.28	245.00	343.20
2,228	7,440.00	None	None	None	245.00	343.20

Rank order of Group B Schools by cost per unit credit per contract day: Office Education Program.

918	$ 9,310.00	$ 52.23	$337.00	None	$245.00	$343.20
823	5,519.00	56.00	145.00	None	193.17	242.84
470	2,952.00	15.13	247.00	None	103.32	129.89
975	6,813.00	None	125.00	None	238.46	299.77
737	3,534.00	93.71	64.00	None	123.69	155.50

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	$ 151.00	$ 10,000.20	21	1	$476.20	211	$2.256
None	1,890.00	11,006.80	(45) 15	3	244.60	208	1.175
None	None	13,254.48	(102) 51	2	129.95	210	.618
None	341.50	8,369.73	(28) 14	2	298.91	209	1.430
None	$3,944.00	$ 14,231.43	24	1	$592.98	200	$2.964
None	2,336.54	8,492.55	(30) 15	2	283.09	210	1.348
None	None	3,447.34	(16) 8	2	215.46	215	1.002
513.00	2,130.00	10,119.23	12	1	84.33	190	.447
275.00	263.00	4,508.90	(66) 22	3	68.32	200	.341

Rank order of Group A Schools by cost per unit credit per contract day: Trades and Industries Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
1,872	$11,749.00	None	$244.65	None	$245.00	$343.20
1,541	5,910.98	210.00	18.56	58.14	206.85	260.00
1,601	10,393.00	30.10	356.48	98.40	245.00	343.20
2,228	17,740.00	141.89	180.10	None	490.00	686.40

Rank order of Group B Schools by cost per unit credit per contract day: Trades and Industries Program.

470	$ 6,850.00	$586.78	$104.70	None	$239.75	$301.40
918	20,530.00	None	719.51	None	490.00	686.40
823	9,394.00	129.00	None	None	245.00	343.20
975	4,805.00	None	88.00	None	168.18	211.42
737	None					

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$863.00	$5,263.00	$ 18,707.85	(70) 35	2	$267.25	211	$1.266
None	431.10	7,095.67	(28) 14	2	253.42	210	1.206
None	None	11,466.18	(48) 16	3	238.88	208	1.148
None	3,574.12	22,812.51	(93) 31	3	245.29	209	1.173
None	$ 279.00	$ 8,361.63	(22) 11	2	$380.07	215	$1.767
None	None	22,425.91	74	1	303.05	211	1.436
None	None	10,111.20	(42) 21	2	240.74	215	1.119
64.00	556.00	5,892.60	13	1	45.33	190	.231

Rank order of Group A Schools by size of enrollment:
Vocational Program.

Enrollment	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
2,228	$53,360.79	$ 214.89	$ 511.00	None	$1,438.67	$1,641.42
1,872	70,821.00	732.88	832.55	None	1,898.19	2,631.51
1,601	41,831.00	1,216.43	1,171.48	492.00	1,128.37	1,559.32
1,541	57,640.43	1,765.16	990.28	639.54	1,431.85	1,975.84

Rank order of Group B Schools by size of enrollment:
Vocational Program.

975	$40,756.00	$1,073.76	$1,287.09	None	$1,327.53	$1,774.47
918	54,659.40	2,058.94	1,907.13	None	1,470.00	1,988.80
823	42,584.00	1,314.17	969.34	None	1,327.80	1,774.83
737	24,370.00	959.94	580.75	None	818.69	1,068.63
470	28,047.00	6,414.29	1,269.38	None	833.07	1,117.69

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
None	$6,267.62	$ 63,434.39	514		$123.41		$ .590
1,170.00	6,170.00	84,256.13	365		230.84		1.110
1,204.72	2,090.00	50,693.32	399		127.05		.617
103.30	4,423.10	68,969.50	396		174.17		.788
$2,871.00	$3,309.00	$ 52,398.85	267		$196.25		$ .947
601.00	5,232.00	67,917.27	347		195.73		.897
669.15	3,394.88	52,034.17	278		187.17		.858
1,237.00	2,050.00	31,085.01	231		134.57		.631
None	1,718.00	39,399.43	177		222.59		.989

Composite of academic programs of Group A Schools.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$416,275.00	$1,282.15	$438.50	$3,005.52	$12,879.14	$17,589.31
Math	300,366.00	220.83	278.76	2,074.88	9,202.69	12,223.38
Science	230,759.00	6,306.17	532.10	1,337.28	7,904.72	10,635.81
Soc. St.	385,338.00	946.14	270.05	1,932.12	9,802.73	13,104.79
TOTAL	$1,332,738.00	$8,755.29	$1,519.41	$8,349.80	$39,789.28	$53,553.29

Composite of vocational programs of Group A Schools.

VOCATIONAL						
D E	$42,656.00	$ 897.97	$1,355.00	$ 214.68	$1,193.67	$1,641.42
H. E.	87,736.99	2,000.26	226.20	429.36	2,291.56	2,817.83
Ag.	10,556.25	372.94	630.32	116.28	245.00	343.20
O. E.	36,911.00	276.20	494.00	214.68	980.00	1,372.80
T & I	45,792.98	381.99	799.79	156.54	1,186.85	1,632.84
TOTAL	$223,653.22	$3,929.36	$3,505.31	$1,131.54	$5,897.08	$7,808.09

Replace Equip.	Capital Outlay	TOTAL	Student Equivalent Enrollment	Unit Cred.	Cost/ Unit Credit	Contract Days	Cost/ Unit Cred/ Contract days
$ 123.00	$ 789.00	$452,381.62	7,656	1	$59.09	194	$ .304
None	895.39	325,261.93	4,868	1	66.82	194	.344
1,103.48	24,844.59	283,423.15	4,054	1	69.91	194	.360
87.42	2,391.12	413,872.37	6,752	1	61.30	194	.315
$1,313.90	$28,920.10	$1,474,939.07	23,330		$63.22(avg.)		$ .325(avg.)
None	$4,947.00	$ 52,905.74	274	1	$193.09	210	$ .919
1,511.72	2,030.00	99,043.92	918	1	107.90	207	.521
103.20	323.00	12,690.29	47	1	270.01	255	1.058
None	2,382.50	42,631.18	196	1	217.51	209	1.040
863.00	9,268.22	60,082.21	239	1	251.40	209	1.202
$2,478.02	$18,950.72	$267,353.34	1,674		$159.71(avg.)		$ .746(avg.)

Composite of academic programs of Group A Schools.

ACADEMIC	Salaries	Supplies	Mileage	Hosp.	IPERS	F.I.C.A.
C. Skills	$311,192.00	$1,199.28	$540.10	$748.80	$10,003.99	$13,220.06
Math	156,500.00	802.31	338.00	468.00	5,013.79	6,648.71
Science	181,833.00	7,175.31	702.40	280.80	5,375.51	7,512.82
Soc. St.	218,191.00	1,537.41	342.41	561.60	6,759.20	9,139.81
TOTAL	$867,716.00	$10,714.31	$1,922.91	$2,059.20	$27,152.49	$36,521.40

Composite of vocational programs of Group B Schools.

VOCATIONAL						
D E	$17,825.00	$ 252.51	$694.00	None	$620.52	$784.29
H. E.	62,558.75	3,236.66	298.12	None	2,360.00	2,675.20
Ag.	40,325.65	7,399.08	3,191.36	None	1,150.00	1,551.31
O. E.	28,128.00	217.07	918.00	None	903.64	1,171.20
T & I	46,534.00	715.78	912.21	None	1,142.93	1,542.42
TOTAL	$194,371.30	$11,721.10	$6,033.69	None	$5,276.09	$7,724.42

Replace Equip.	Capital Outlay	TOTAL	Student Equiv-alent Enroll-ment	Unit Cred.	Cost/ Unit Credit	Con-tract Days	Cost/ Unit Cred/ Con-tract days
$3,558.46	$1,095.13	$341,557.82	4,580	1	$74.58	192	$ .388
1,426.00	1,445.29	172,642.10	2,694	1	64.08	192	.333
5,144.16	6,838.00	214,862.00	2,778	1	77.34	192	.402
319.00	3,492.73	240,343.16	5,048	1	47.61	192	.247
$10,447.62	$12,871.15	$969,405.08	15,100		$64.20(avg.)		$ .334(avg.)
$ 587.00	$ 426.00	$ 21,189.32	118	1	$179.57	205	$ .875
1,420.85	1,973.20	74,132.78	560	1	132.38	212	.624
2,518.30	3,786.14	59,921.84	323	1	185.51	246	.754
788.00	8,673.54	40,799.45	148	1	275.67	201	1.37
64.00	835.00	46,791.34	215	1	217.63	202	1.07
$5,378.15	$15,693.78	$212,834.72	1,364		$156.04(avg.)		$ .732(avg.)