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## The Need And Means For Establishing A Program Of Data Processing Instruction In The Secondary School

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THE NEED AND MEANS FOR ESTABLISHING A PROGRAM  
OF DATA PROCESSING INSTRUCTION IN  
THE SECONDARY SCHOOL



PRAIRIE VIEW AGRICULTURAL AND MECHANICAL COLLEGE  
GRADUATE SCHOOL

WORKSHOP SHEET III & IV  
THESIS (OR ESSAY) REPORT

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OR ESSAY

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Prairie View, Texas DATE SUBMITTED August, 1969  
TITLE OF THESIS OR ESSAY: PREVIOUS DEGREES:  
The Need and Means For Estab- B. S. Prairie View A & M  
lishing A Program of Data (DEGREES) (COLLEGE)  
Processing Instruction in the August, 1962  
Secondary School (DATE)  
(DEGREE) (COLLEGE)  
(DATE)  
RECORD:  
NUMBER OF PAGES: 43 UNDERGRADUATE MAJOR Bus. Ed.  
NUMBER OF TABLES OR CHARTS 9 UNDERGRADUATE MINOR Math  
NAME OF TYPIST: Nellie S. GRADUATE MAJOR Bus. Ed.  
Charleston GRADUATE MINOR Math  
APPROVAL: *N. H. Smith*  
(Signature of Supervising Professor)

BRIEF SUMMARY OF THESIS (OR ESSAY)  
(Not to exceed 100 words)

(This summary is a permanent bibliographical record. It should be written carefully).

This thesis is intended to show the importance of establishing a program of data processing instruction in the secondary school. It includes factors to be considered in establishing the program, planning the course curriculum, and suggested ways of teaching the course or courses. Also a study of the status of data processing instruction in the secondary schools is presented.

The point is made that educators and business men feel that the high schools can play an important role in helping to prepare high school graduates to meet some of the employment demands created by automation.

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THE NEED AND MEANS FOR ESTABLISHING A PROGRAM  
OF DATA PROCESSING INSTRUCTION IN THE  
SECONDARY SCHOOL

A Thesis  
Presented to  
the Faculty of the Department of Business  
Prairie View A. and M. College

HF1106  
C32

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science

by  
Nellie S. Charleston  
August, 1969

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## ACKNOWLEDGEMENT

The writer acknowledges with deep appreciation the assistance received from Dr. K. Briggs, Head of the Business Administration Department and Mr. Sam Peters, Sr. of the W. R. Banks Library Staff for his special assistance in locating information needed in developing this paper.

N.S.C.

## DEDICATION

This paper is dedicated to my six children, David, Phyllis, Kathleen, Carlen, DeWayne, and Craig; my husband, Cube Charleston; and to my parents, Mr. and Mrs. Leslie Thomas, because of their encouragement and assistance during my pursuance of this degree.

N.S.C.

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business is still concerned with the same kinds of data. However, larger amounts of these data are being handled, and additional records have been added. New ways are constantly being sought to speed up the processing of information.

In an effort to cope with changing situations, business has turned to the use of the most advanced form of office automation--Electronic Data Processing or Automated Data Processing, including the computer.

Machines and their application to office work have brought about many changes in the methods of handling paper work and in the flow of information. The machines sort checks, record transactions, and prepare monthly statements. The entire payroll procedure of an organization, which formerly involved many clerical workers, may now be done by machines in less time and possibly less errors and confusion. This involves the computer with several units attached to process data. Before the computer can process the data, however, it must be put in a form acceptable to the computer. This media will be in the form of punched cards, perforated paper tape, or magnetic tape. With this new development in business we have witnessed a revolution in office



procedures. Today almost half of the nation's bookkeeping tasks have been taken over by electronic data processing.<sup>2</sup>

Since the number of offices using data processing equipment has increased at such a fantastic rate in the past few years, people knowledgeable in the data processing area are in constant demand. Because of the rapid change, however, no one can say exactly how long there will be a continued demand for a specific skill, but there is no question that any person going into the business occupations today will encounter some form of automated data processing.

The question arises, "How can we prepare for the changes taking place?" A basic search for sanity, reality, and practicality in data processing education is underway. Thoughtful teachers and administrators are now coupling their respective talents and newly defined needs with the technical knowledge of businessmen and machines manufacturers to plan together.

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<sup>2</sup>Clair R. Parsh, "Data Processing Education-- Whose Responsibility?" The Journal of Business Education, XLII (December, 1967), 111.

## DEFINITIONS OF TERMS

Automated data processing: A process in which information is handled with a minimum of human effort and intervention. The process depends upon original data that have been recorded in such a way that further use can be made of them without subsequent manual rerecording.

Automation: A process in which work is done with a minimum of human effort, in which the process is largely self-regulating. The investigation, design, development, and application of methods of rendering processes automatic, self-moving, or self-controlling.

Card-punch or Key-punch machine: A keyboard-actuated device that punches holes in a card, in order to represent data.

Card verifier: A machine used to check the accuracy of holes punched into a card. It is similar in appearance to a card-punch machine.

Collator: A machine that will merge two decks of cards in sequence. A device to collate sets of punched cards or other documents into a sequence.



Data processing: A term that encompasses the recording, classifying, summarizing, computing, transmitting, and storing of information. The term applies whether the work is done by hand or by machine.

EDP: Electronic data processing.

Electronic-computer system: A system in which both numeric and alphabetic data are processed in the form of electrical pulses.

IDP: Integrated data processing.

Interpreter: A machine that prints on a punched card the data already punched in the card.

Programmer: An operator or technician who plans the steps and the order of the operations necessary to produce the desired report or document.

Reproducer: A unit that punches a new set or file of cards, from an original set of cards. The new cards can be exact reproductions or can be modified according to requirements.

Sorter: A machine capable of sorting or classifying numerical or alphabetic data by sequencing, grouping, or selecting.



Unit record: A record in which all the data concerning each item in a transaction are punched into one card.

Unit record system or Tabulating system: In this system, data are punched into cards or paper tape in such a way that they can later be treated automatically by machines that sort, perform calculations, and print the resulting reports in any form desired.

## CHAPTER II

### THE ROLE OF THE SECONDARY SCHOOL IN PROVIDING A PROGRAM OF DATA PROCESSING INSTRUCTION

The impact of office automation is causing high school teachers today to reevaluate concepts and skills in every course. The teacher asks, "What part should the high school play in educating the student for this new field? What are the needs of the students with the chances of having some contact with office automation?" He probably needs an introduction to automation which may be accomplished by the following.<sup>1</sup>

1. Acquisition of a vocabulary of new terms used in office automation;
2. Introduction to concept of automation as it applies to systems and procedures;
3. Experience in actual procedures;
4. Experience by audio-visual procedures how machines use common language as input and output;
5. Development of concepts of office work in which automation will play an increasingly more significant role.

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<sup>1</sup>"The Impact of Office Automation," Business Education in the Secondary School, Illinois Curriculum Program, Subject Field Series Bulletin, D-Three, p. 7-8.

### Planning the Data Processing Program

Initiating a course in data processing calls for a great deal of personal and material development. William K. Toomey wrote, "Anyone who is considering the establishment of classes in data processing would be wise to make a thorough investigation. Probably the greatest weakness in this field is the lack of well-planned and well-written materials..."<sup>2</sup>

### Limitation of Data Processing Instruction

Many schools and business teachers are debating whether to offer data processing; and if so, in what form and to what degree. The answer will depend on each individual school and its needs in a particular area. Instruction might also be limited based on the materials and equipment available in the school system. Still another limitation of the instruction may be influenced by the availability of a qualified teacher.

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<sup>2</sup>Paul Factor, "Data Processing Instruction in the High School? Yes!" The Journal of Business Education, XXXX (February, 1965), 186.



One author points out, and several others agree, that the high school's responsibility should be on an orientation level.<sup>3</sup> He believes that the primary objective should be to acquaint the student with the many aspects of data processing.

### Employment Opportunities

Before data processing equipment is acquired or courses are developed, the business department should make extensive surveys to determine opportunities for data processing jobs. The teacher should be thoroughly familiar with the job titles and complete job descriptions and should stress this information in each class.

One such survey was made of data processing employers in a city of approximately 50,000 people located in the central Illinois corn belt. This survey revealed several important facts.<sup>4</sup>

1. The demand for trained data processing personnel in this locality is great.

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<sup>3</sup>Parsh, loc. cit.

<sup>4</sup>Stephen F. Hallam, "Businessmen Talk About Data Processing Education," The Balance Sheet, XLIX (September, 1967), 15.

2. The employers generally agreed that the high schools could render a valuable service by teaching the basic terms and concepts fostered by this electronic age.
3. Some of the employers thought that some of the data processing clerical skills such as key punching should be taught at the high school level.

The survey concluded that there is a need for a well-developed program of education in data processing at the high school, junior college and university levels. The businessmen interviewed favor a high school program which provides for a basic understanding of computer terminology, application, and operation.

A survey made by the Charlotte-Mecklenburg school system in cooperation with the Charlotte Chamber of Commerce, Charlotte, North Carolina, also presents some interesting findings.<sup>5</sup>

It was significant to find that of the 800 businesses surveyed a large number of them already have data processing equipment installed, or, are planning to acquire it in the near future.

Ninety-five percent of the business firms believe that public schools should train keypunch

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<sup>5</sup>John M. Bunch, "Survey Shows Need for Data Processing Instruction," Business Education Forum, XXIII (March, 1969), 27.

operators, and 75 percent also indicated that the schools should train computer operators. Ninety-one percent want public schools to train students in the basic concepts of programming for vocational purposes.

A shortage in the availability of data processing workers was noted by 76 percent of the firms. The greatest shortage appears to be for programmers, keypunch operators, and machine operators--in that order.

Of the responding firms, 82 percent indicated that they would be willing to interview a well-informed graduate in the field of data processing for possible employment, and 64 percent would be interested in interviewing a selected twelfth-grade high school student who is enrolled in data processing for part-time, on-the-job training.

The findings of this survey indicate the need to expand the high school program to provide further training in the field of data processing.<sup>6</sup>

Figures from surveys show that clerical employment is steadily rising. In 1910 only one in 20 employed workers was in a clerical occupation; by

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<sup>6</sup>Ibid.



1940 the proportion had risen to one in 10; in 1950 it was one in 8; and today clerical workers represent about one out of every 7 workers.<sup>7</sup>

Because of the technological improvements and the great increase in clerical employment, business education teachers must include instruction in data processing to prepare students for the office jobs of today and the future. Some of the jobs open to high school graduates are:

1. Key-Punch and Verifier
2. Tabulating Equipment Operator
3. Auxiliary Equipment Operator
4. Console Operator
5. Punched-card Methods Analyst
6. Data Typist

#### Utilizing Available Resources

In planning the instruction in data processing it is wise to consider the resources available for instructional use. Some of the possible resources to be investigated are:

1. local business offices,
2. business personnel,
3. representatives of data processing equipment and supplies,
4. data processing literature,
5. subject related audio visual aids.

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<sup>7</sup>Carolyn Kuntzman Godby, "Preparing for Data Processing Occupations," Business Education Forum, XXII (February, 1968), 7-8.

Utilization of all the possible resources can add "zest" to the classroom instruction as well as bring the student face to face with the effect automation has had on office procedures.

#### Cost and Methods of Financing the Program

Naturally the question is raised as to the cost of a program in data processing instruction. It is true the cost is rather expensive dependent upon the program offered. The question of cost, as it relates to the specific area of instruction, might best be answered by another. Do we always apply a monetary yardstick to measure the dollar value return on each of our educational courses? Before injecting the question of relative costs, we must not lose sight of the real subject under discussion--the needs of all of our pupils in a fast changing society.

A survey made of business men relative to the need for data processing instruction in the secondary schools reveals a suggestion offered by one employer on reducing the expense. He suggests in addition to the orientation course or key punch course, that data processing jobs be further emphasized in the office occupations program. This program of cooperation between business firms and the high schools should

include a separate branch or division for data processing. A program of this type would enable a student to obtain some data processing skills as part of his work experience, and the schools would be spared the cost of the expensive equipment.<sup>8</sup>

The type and amount of equipment available for teaching data processing vary considerably between schools. Selden makes the following statement with reference to equipment.

...the key punch, verifier, and sorter are three machines most commonly used in an office practice class or any other class. When a larger installation is provided the following additional machines are included: accounting machine, collator, and interpreter. In discussing these machines with administrators and teachers at the schools in which they were located it was found that this equipment in almost every instance was rented.<sup>9</sup>

Since styles change so rapidly, renting equipment offers the advantage of exposing students to new equipment more readily than if the school purchased its own equipment.

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<sup>8</sup>Hallam, op. cit., p. 17

<sup>9</sup>C. A. Nolan, Carlos K. Hayden, and Dean R. Malsbary, Principles and Problems of Business Education (Cincinnati: South-Western Publishing Company, 1967), p. 316, citing William Selden, "Planning the Facilities for Business Education," Monograph 112 (Cincinnati: South-Western Publishing Company, 1964), p. 20.



Schools, then, may adopt various plans for obtaining use of machines including (1) school district office equipment; (2) local companies; (3) city or county government equipment; (4) rent or purchase own equipment.

## CHAPTER III

### THE TEACHING OF DATA PROCESSING

Probably the first question asked following a decision to offer data processing instruction is, "What will be included in the program?" Every school will have different needs, so perhaps no two curricula will be the same.

#### Influential Factors

The program of instruction will be influenced by several factors--the needs of the local school environment, textbooks and other materials, the data processing teacher, individuals who will be studying data processing, and standards in data processing.

#### Local Needs

In establishing a program in data processing, a survey made to determine the local needs of such instruction, the type of equipment being used in offices, and employment possibilities.

#### Textbook and Supplementary Materials

In choosing a textbook, one should look for thoroughness and simplicity of textbook content, and

available materials to supplement the text. Supplementary materials may include study guides, projects, problems, working papers, examinations, and other helpful materials. The manufacturers of data processing equipment can usually give information as to available textbooks for instruction or selected books in developing a library. Sources in addition to book publishers should be utilized to develop an up-to-date data processing library.

### The Teacher of Data Processing

While we hear a lot of discussion about the demands for employment in data processing, high schools still seem slow to include such instruction in their curricula to meet the demands. Perhaps one reason for this lag could be lack of qualified teachers. Teachers seem to shy away from the field because they feel insecure in introducing new courses. Those teachers who do learn about data processing are usually persuaded to leave their school jobs to go into the business field, where they can make more money.<sup>1</sup>

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<sup>1</sup>W. G. Carpenter and R. L. Nickels, "Setting Up a Successful High School Data Processing Program," Business Education World, XLVIII (May, 1968), 9.



The Evanston program, which began with one qualified instructor now has three faculty members who are involved full-time in teaching data processing. These teachers became qualified, technically through taking courses at nearby colleges and universities and through on-the-job experience provided by local businesses during evenings, weekends and summers.<sup>2</sup>

Realizing that changes in this new field will be endless, business education teachers must prepare to accept the change. This can be done by learning as much as possible about EDP machines--what they can and what they cannot do and how they will affect work flow in offices; by taking courses in programming; and through work experience.

#### Data Processing Students

In developing courses, all pupils should be considered since all must prepare for a useful and fruitful life ahead, not merely the college bound but the non-college minded as well or maybe more so. Consideration must be given to the various levels

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<sup>2</sup>Ibid.

and positions of employment which all pupils with their varying degrees of ability can fulfill in this new and fast-developing field of data processing.

Studies show that although women dominate the key-punch jobs, there is usually only one female programmer to every five males; and the higher the level in data processing, the fewer women are employed.<sup>3</sup>

### Standards in Data Processing

Business men are interested in establishing standards of education and experience. These standards could be of considerable value to business teachers when they are trying to determine content for a course or courses in data processing.

Business men feel that students should be familiar with machines to the extent they do not fear the computer and automation. A development of data processing skills through work experience in addition to a basic background in electrical data processing is desirable. There should be evidence

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<sup>3</sup>Caroline Beckner, "Who Should Study Data Processing?" Business Education World, XLVIII (April, 1968), 11.

of aptitude and the education necessary for work in the field of electronic data processing.<sup>4</sup>

### Curriculum Content

The business education curriculum has undergone necessary changes from time to time to keep abreast of current changes and practices. We are now faced with revolutionary changes in practices of recordkeeping and data processing.

Although some controversey has been noted as to what should be offered on the secondary level, many high schools are offering instruction in some form. Some of the types of programs in existence in the secondary schools are: (1) Introduction to Data Processing, (2) Key-Punch Operation, (3) Tabulating Equipment Operation, (4) Computer Programming, (5) Integrated or Fused Data Processing.<sup>5</sup>

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<sup>4</sup>Hallam, op. cit., p. 17.

<sup>5</sup>"Changing Emphases In Business Teacher Education," NABTE Bulletin 82, A Division of the National Business Education Association, (1965), p. 23-24.



### Introduction to Data Processing

An introductory one-semester course (usually 11th or 12th grade) in data processing at the high school level should include:

1. a history of data processing,
2. the punched card--fields and coding,
3. tabulating equipment uses and applications,
4. electronic computer data processing,
5. simple computer programming including flow charting and block diagramming,
6. social implications of data processing and automation,
7. the future of electronic data processing.

Electronic data processing equipment is not needed for this type of class. All that would be necessary would be textbooks, overhead projector and/or opaque projector, transparencies, 16mm projector and some resource material. Field trips could be arranged to expose the students to some of the data processing equipment.<sup>6</sup>

### Key-Punch Operation

In addition to an orientation course in data processing, some schools may offer an elective course in data processing training on card punch equipment. Courses are being offered to students in secondary

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<sup>6</sup>Parsh, loc. cit.

schools to develop high quality key punch operators. The course may be offered on a key punch and also on key punch simulators.

#### Tabulating Equipment Operation

In some areas of the country, where post-high school training is not available or where there is an unusually high demand, the high school may be justified in teaching tabulating machine operations and wiring. Like keypunch, this course aims at development of a high degree of skill in the operation of various units of tabulating equipment. These include the sorter, collator, reproducing punch, interpreter, and accounting machine. This course is usually two to three semesters in length.<sup>7</sup>

#### Computer Programming

Employers agree that the programmer should have special training above the high school level. However, with competent instructors and heavy staffing in data processing, a course may be offered in the secondary school. This course would include

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<sup>7</sup>NABTE, loc. cit.

such phases as business management, accounting, systems procedures, computer programming, machine operation, communication skills, and human relations. The course usually requires three years of study. Students in this area must have above average scholastic ability.<sup>8</sup>

### Fused Data Processing

If it is not possible to schedule a separate course as mentioned, another suggested procedure would be to integrate data processing in business and related areas. In almost every subject matter area in high schools, data processing can be taught successfully. Essential, of course, are teachers who have sufficient mastery of both the subject matter and of applications of data processing to the subject to adapt it well to the needs of the student. Of all the courses in the business curriculum, probably office practice is the course in which the unit is offered most frequently.<sup>9</sup>

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<sup>8</sup>Ibid.

<sup>9</sup>Norman F. Kallus, "Integrating Data Processing Concepts in Business Classes," Business Education Forum, XXII (March, 1968), 22-23.



According to one high school, the office practice course was chosen as the class in which to teach data processing for the following reasons.<sup>10</sup>

1. It permitted building on previous skills.
2. Similar problems are encountered and solved in office practice and data processing.
3. A very good textbook was available with sufficient supplementary materials.
4. Less expense was involved.

The separate course in data processing tends to be most common where unit-record or electronic equipment is available for instruction. The integrated or fused course, on the other hand, stresses basics such as vocabulary, machines functions, and social and economic effects with little or no machine time. In the final analysis it is the teacher who must determine how the new subject matter of data processing should be handled in his school. For that large segment of the business teacher population in the smaller high schools, experience has shown that the "integrated or fused route" is a useful starting point.<sup>11</sup>

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<sup>10</sup>Charles D. Nadler, "Introduce Data Processing in Your Office Practice Class," The Balance Sheet, XLVII (November, 1965), 116.

<sup>11</sup>Kallaus, loc. cit.

Data Processing Curriculum Patterns  
in Secondary Schools

The following curriculum patterns give an idea as to how the demand for data processing instruction is being met in some high schools.

Des Moines High School Data Processing, Iowa<sup>12</sup>

This business department has five staff members and three types of curricula in data processing. These types are: (1) Key Punch, (2) Tabulating Equipment Operator, and (3) Programmer.

The courses for the Key Punch sequence include (1) Key Punch, which is a complete course in key-punch operation, drills and practice problems;; and (2) Introduction to Unit Record Equipment, a survey course of how key-punch function fits into the entire unit record process.

The courses for Tabulating Equipment Operator include (1) Tabulating Equipment I, instruction on all phases of unit record equipment from key punch through printing machines and board wiring fundamentals;

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<sup>12</sup>James F. Wenner, "A High School Orientation Course in Data Processing," Monograph 114, (Cincinnati: South-Western Publishing Company, 1966), p. 32-35.

(2) Tabulating Equipment II, a continuation of Tabulating Equipment I; and (3) Introduction to Computers, a survey course of the relationship between unit record equipment and the computer.

The largest of the three in vocational data processing is that of programmer. Since it is highly unlikely if not impossible, for a high school graduate to secure a job upon completing his study, these courses will not be discussed. Courses are offered, however, in Programming I through VI.

Business Education Service, State of Virginia<sup>13</sup>  
Suggested Curriculum Pattern for Grades 9-12

The department has several different sequence of business courses. In the data processing-bookkeeping sequence, for the first two grades, the basic high school program is followed including general business, and Typewriting. Programs in data processing usually begin specialization training in grade 11. For the 11th grade the student enrolls in the basic education courses plus Bookkeeping I and office practice. In grade 12 in addition

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<sup>13</sup>"Vocational Business Education--A Progress Report," National Business Education Quarterly, XXXIV (1966), 65.



to basic education courses the student enrolls in Accounting I and Data Processing Principles and Problems. Any of several subjects in business may be chosen as electives. These include Bookkeeping I and II, Business Organization and Management, Business Law, Economics, and Data Processing Machine Operation.

Charlotte-Mecklenburg Schools<sup>14</sup>

The Charlotte-Mecklenburg school system, Charlotte, North Carolina, has 11 comprehensive high schools, and instructional data processing is offered in 8 of them. There is one full-time teacher in each of these 8 high schools in the field of data processing. Two different courses are presently being offered in each school: a one-semester course in key-punch training and a one-year course in computer technology. During the four previous years, the course offered in these same schools was unit-record technology.

Surveys indicate the need for further expansion of the high school program in data processing.

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<sup>14</sup>Bunch, loc. cit.

## CHAPTER IV

### STATUS OF DATA PROCESSING IN AMERICAN SECONDARY SCHOOLS<sup>1</sup>

C. B. S. Grant, contributing editor of the Data Processing Magazine, predicted in 1966 that within five years most schools will be offering their students instruction in data processing.<sup>2</sup> He also reported as of April, 1966 that about 10 percent of the high schools currently offer this training.

In 1964-65, the Research Committee of Delta Pi Epsilon was concerned with several facets of data processing. Three studies evolved from the work of the committee relating to the needs and status of data processing in the secondary schools. One of the three studies was conducted cooperatively with the South-Western Publishing Company through a postal card insert in the May, 1965 issue of the Balance Sheet mailed to all business teachers.

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<sup>1</sup>Fred S. Cook, "Status of Data Processing In American Secondary Schools," The Balance Sheet, XLVII (April, 1966), 347.

<sup>2</sup>S. J. Wanous, "Revolutionary Changes Under-Way in Our Schools--Influence of the Electronic Computer," Business Education Forum, XXII (January, 1968), 23.

The purpose of this study was focused on the status of data processing on the secondary school level. It was intended to determine (1) the extent to which school districts possess data processing installations; (2) how this equipment is being used; (3) the type of equipment being used for instructional purposes; (4) the extent of community surveys prior to the acquisition of instructional data processing equipment; and (5) the extent to which any data processing instruction is being offered.<sup>3</sup>

Returns were received from every state in the union. A total of 2,228 separate high schools responded to the survey which represented approximately 10 percent of the secondary schools in the United States. Results of the responses are outlined in Tables I through IX which follow.<sup>4</sup>

Table I shows the distribution of responses by the size of school.

TABLE I

<u>Size of School</u>	<u>Responses</u>
A (1100+ )	822
B ( 450-1099)	676
C ( 250- 499)	341
D (less than 250)	389

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<sup>3</sup>Cook, loc. cit.

<sup>4</sup>Cook, op. cit., p. 348-350.



Table II shows the distribution of school districts having data processing installations.

TABLE II

Does the central office of your school district or board of education have a data processing installation?

<u>Size</u>	<u>Yes Answers</u>	<u>Percent</u>
A	392	47.8
B	92	13.6
C	18	5.3
D	15	3.9
Total	517	23.2

It should be noted that while 23 percent of all districts have some type of data processing equipment, close to 50 percent of the equipment will be found in the larger school systems. The smaller the school district the less likely they are to have such equipment.

Most of the schools that had data processing equipment used it for school record keeping, although a small percentage used it exclusively for payroll and inventory purposes.

Table III shows the distribution of schools that have access to their school district office equipment for teaching purposes.

TABLE III

Individual schools that have access to equipment for teaching purposes.

<u>Size</u>	<u>Yes Answers</u>	<u>Percent</u>
A	115	14.0
B	35	5.2
C	9	2.6
D	2	0.5
Total	161	7.2

Table III indicates for schools in Size A, only 115 are able to use school district equipment for teaching purposes.

Types of data processing equipment found most frequently available for teaching purposes were:

1. Key Punch,
2. Sorter,
3. Reproducer.

Table IV gives us a clue to the number of schools that are adding data processing equipment for instructional purposes.

TABLE IV

Are there active plans to introduce data processing equipment for instructional purposes into your school system within 1-2 years; 3-5 years?

<u>Size</u>	<u>YES (1-2)</u>		<u>YES (3-5)</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
A	230	28.0	92	11.2
B	96	14.2	80	11.8
C	33	9.7	28	8.2
D	14	3.6	29	7.5
<u>Total</u>	<u>373</u>	<u>16.7</u>	<u>229</u>	<u>10.3</u>



Table V indicates the number of schools conducting a survey to determine the need for data processing instruction.

TABLE V

Has there been a community survey made in your area to determine the need for a data processing program?

Size	YES		NO		UNAWARE		TOTAL	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
A	173	21.0	404	49.2	245	29.8	822	100.0
B	100	14.8	386	57.1	190	28.1	676	100.0
C	39	11.4	201	58.9	101	29.6	341	100.0
D	17	4.4	255	65.5	117	30.1	389	100.0
Total	329	14.8	1,246	55.9	653	29.3	2,228	100.0

In theory, curriculum changes should be based upon the needs of the students and the needs of the community. Table V shows that relatively few business departments at the time of the report had determined, through surveys, the need for adding data processing to their curriculum. It is indicated by Table V that only 14.8 percent of the schools had actually conducted a community survey.

Table VI shows the number of schools that have data processing equipment in their building.

TABLE VI

Has your high school any data processing equipment on the premises?

<u>Size</u>	<u>Yes Answers</u>	<u>Percent</u>
A	243	29.6
B	70	10.4
C	21	6.2
D	10	2.6
<u>Total</u>	<u>344</u>	<u>15.4</u>

Most of the schools that had any type of data processing equipment had a key punch. Approximately 60 percent had a sorter and about 25 percent had a collator and a reproducer. Thirty-six schools or approximately 10 percent had a computer. Of these, 26 were size A schools.

Table VII shows the extent to which equipment is available for teaching purposes.

TABLE VII

Is this equipment used for teaching purposes?

Size	YES		NO		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
A	174	21.2	648	78.8	822	100.0
B	55	8.1	621	91.9	676	100.0
C	19	5.6	322	94.4	341	100.0
D	9	2.3	380	97.7	389	100.0
Total	257	11.5	1,971	88.5	2,228	100.0

Table VII indicates that not all equipment in the district or even in the high school building is available for instructional use.



Table VIII shows the number of schools actively planning on securing equipment in their building within the next two years presumably for use by their students.

TABLE VIII

Are there active plans to introduce data processing equipment into your school within the next two years?

Size	YES		NO		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
A	188	22.9	634	77.1	822	100.0
B	99	14.6	577	85.4	676	100.0
C	25	7.3	316	92.7	341	100.0
D	10	2.6	379	97.4	389	100.0
Total	322	14.5	1,906	85.5	2,228	100.0

If all these schools actually acquire the equipment as indicated in Table VIII, this will mean almost a 100 percent increase within a two-year period.

One of the most interesting findings is shown in Table IX concerning data processing instruction offered in the high school.

TABLE IX

Does your high school offer any data processing instruction?

Size	YES		NO		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
A	375	45.7	447	54.3	822	100.0
B	201	29.7	475	70.3	676	100.0
C	90	26.4	251	73.6	341	100.0
D	53	13.6	336	86.4	389	100.0
Total	719	32.3	1,509	67.7	2,228	100.0

In response to the question, "Does your high school offer any data processing instruction?" we found that 719 or 32.3 percent gave some instruction in, or about data processing.

Based on the survey, it was determined that apparently 590 schools gave less than one semester of key punch instruction, while 97 had one semester, and 28 schools reported two semesters.

One hundred twenty-eight schools had one semester in the Principles of Data Processing and 25 schools had two semesters. Nine schools actually reported three or more semesters for this course. If instruction in data processing is part of another course, it was predominantly in a course of one semester or less.

From this survey, several points can be noted. The total number of individual schools having access to data processing equipment for teaching purposes appears to be very small. The larger the school, the more likely it is to have, or anticipate having, equipment. There is an interest on the part of a number of schools to incorporate instruction in or about data processing, within the next five years. If anticipations are realized, the number of schools having access to equipment will double within the next two years.



## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### Summary

The tremendous changes taking place in business activity have caused widespread discussion of the teaching of integrated and electronic data processing in the secondary schools. The field once considered by many as beyond the ability of the high school student is now becoming somewhat of a status symbol in the secondary schools, and at the same time, meeting necessary needs and demands.

Business educators and business men agree that there should be a certain amount of data processing instruction in the secondary school. The amount and type of instruction will depend upon the needs and opportunities in the community, the employment opportunities in American business, and the funds available in the school district for such instruction.

Although the immediate objectives of teaching data processing can be quite numerous, the ultimate goals seem to fall into two major categories, that of

1. the development of vocational skills, and

2. the development of an educational background in relationship to data processing and automation.

Data processing instruction requires that there be sufficiently prepared teachers for the subjects, a well-written textbook plus supplementary materials. These are necessary in order to achieve the objectives of data processing and meet the needs of the students.

Just how the course will be taught is the decision for the teacher to make. Data processing may be offered as a one-semester introductory course, a course in key-punch operation, tabulating equipment operation, computer programming, or data processing may be integrated or fused with some other course.

### Conclusions

The need for teaching concepts of electronic data processing is evident.

Because data processing is growing and technological improvements are causing a revolution in American offices today, instruction in data processing must be included in the curriculum on the high school level.

Special studies and surveys seem to indicate that educators and business men recognize the need for data processing instruction in the high school and are working together in preparing to meet these needs.



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