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Study to Determine the Status of Data Processing Courses and or Units of Instruction in the Business Education Curricula of the Public High Schools of the Upper Peninsula of Michigan.

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A STUDY TO DETERMINE THE STATUS OF DATA PROCESSING COURSES AND/OR UNITS OF INSTRUCTION IN THE BUSINESS EDUCATION CURRICULA OF THE PUBLIC HIGH SCHOOLS OF THE UPPER PENINSULA OF MICHIGAN

by

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Submitted to

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This independent study submitted by Jerre G. Lewis in partial fulfillment of the requirements for the degree of Master of Arts in Education at Northern Michigan University, Marquette, Michigan, is hereby approved by the Advisor under whom the work has been done.

Robert N. Hanson
Advisor

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

A STUDY TO DETERMINE THE STATUS OF DATA PROCESSING COURSES AND/OR UNITS OF INSTRUCTION IN THE BUSINESS EDUCATION CURRICULA OF THE PUBLIC HIGH SCHOOLS OF THE UPPER PENINSULA OF MICHIGAN

Jerre Lewis, Master of Arts in Education

Northern Michigan University, 1971

Purpose

The purpose of this study was to determine the status of data processing courses and/or units of instruction in the Business Education curricula of the public high schools of the Upper Peninsula of Michigan. The major objectives of the study were to determine: (a) what data processing courses and/or units of instruction were being taught; (b) what equipment was available for student use; and (c) what instructional materials were being used.

Method and Sources

Based on a review of literature, a questionnaire was developed to determine the status of data processing. This questionnaire was sent to each of the public high schools of the Upper Peninsula of Michigan on March 22, 1971. A follow-up

mailing was sent after a two-week interval.

Summary of Findings

From the responses to these mailings, data were tabulated and analyzed. The significant findings concerning data processing courses were: (a) one school (2 per cent) offered such a course; (b) there were 69 students enrolled in the course; (c) the course was taught at the twelfth grade level; and (d) an IBM manual was used as the basic material for instruction. The significant findings concerning units of instruction in data processing were: (a) twenty of the schools (38 per cent) included at least one unit; (b) less than half of these schools had equipment, with the majority being calculators and IBM simulators; and (c) textbooks were listed as the basic instructional material for two-thirds of the units and practice sets for approximately one-fourth of the units.

The significant conclusions of the study were: (a) the public high schools in the Upper Peninsula of Michigan are just beginning to make plans to develop courses in data processing; (b) existing data processing courses reach only a few students in the public high schools of the Upper Peninsula of Michigan; (c) data processing units of instruction which are taught in the public high schools of the Upper Peninsula of Michigan are for the most part incorporated into Clerical Office Practice and Bookkeeping

courses; and (d) most of the units in data processing incorporated in business courses are for less than four weeks in duration in the public high schools of the Upper Peninsula of Michigan.

CHAPTER I

INTRODUCTION TO THE STUDY

Computer processing is playing a major role in many segments of our lives throughout the United States.

Because data processing affects the daily lives of all individuals and because it is an important aspect of business, a knowledge of data processing and its application is a topic which should be included in the business education curriculum of secondary schools. Gocker indicated the importance of including data processing in the high school business curriculum when he stated:

> As business educators, we must make our students aware of the increasing importance of data processing, especially the computer. They need to know the tremendous effect data processing has had and will have on business and industry, coupled with the strong emphasis being placed on it. Many authors feel that the greatest contribution secondary schools can make is to develop a general understanding and appreciation of the role the computers play in business. This must definitely be done, and if the computer is available, we must expose our people to a taste of the future. . . .[1]

The high school business curriculum has, in general, two

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[1] Phillip L. Gocker, "Programming Can Be Taught in the High School", Business Education Forum, Vol. XXV, p. 18, December, 1970.

stated purposes: (1) to provide personal use business education so that students may enrich their lives, and (2) to provide vocational business education which imparts marketable skills so that students may enter the labor market directly from high school.[2]

Business teachers must meet the challenge of teaching data processing as a part of the business education curriculum in the secondary schools.

Purpose

This study was designed to determine the status of data processing instruction in the business education curricula of the public high schools of the 15 counties of the Upper Peninsula of Michigan. Specifically, the purposes of this study were to determine:

1. If the schools investigated are offering a separate course in data processing.
2. If the schools investigated are offering a unit or units in data processing incorporated in another course.
3. If the schools investigated lease or own data processing equipment which is used for educational purposes.
4. If the schools investigated share data processing equipment with other schools or institutions.
5. Which data processing courses are being taught in the schools investigated.

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[2]Herbert A. Tonne, Principles of Business Education, (New York: McGraw-Hill Book Company, Inc., 1961), p. 14.

6. Which data processing units are being taught in the schools investigated.

7. On which levels data processing courses are being taught.

8. Whether data processing equipment is available for students on a full-time or part-time basis.

9. Future plans which are being considered for incorporating data processing courses and units in data processing into the curricula of the schools investigated.

10. The number of students receiving instruction in data processing.

Definitions of Terms

1. Data Processing - The recording, classifying, sorting, summarizing, calculating, transmitting, and storing of information through the use of electronic and electro-mechanical equipment, such as computers and unit record equipment.

2. Card Punch - A machine used to record data by punching holes in cards. The keyboard is similar to that of a typewriter.

3. Verifier - A machine similar to the keypunch used for pinpointing the errors on a punched card.

4. Sorter - A machine that classifies or groups cards automatically in numerical or alphabetical sequence according to punched data on the cards.

5. Collator - A device used to compare data from two decks of punched cards and merge, match, select, or sequence-check cards.

6. Accounting machine or tabulator - A device that reads (senses) holes in punched cards, calculates and prints information on report forms.

7. Reproducer - A device that reproduces data from one card by punching the information into another card in any sequence desired.

8. Interpreter - A machine that is designed to print data punched in the card on the card itself. Helps to detect errors.

9. Computer - A device making automation possible; the central processing unit in a data processing system. It is capable of making simple decisions and modifying instructions. It is the control center of the entire system.

10. Data Processing Unit of Instruction - A unit of instruction in data processing which is incorporated in another business education course.

11. Total School Enrollment - Kindergarten through Grade 12.

Deliminations

This study was delimited to 57 public high schools in 15 counties of the Upper Peninsula of Michigan.

The status of data processing was only considered as applied to the business education curricula. No attempt was made to survey other areas of the curriculum where data processing might be taught.

The effectiveness of the programs surveyed and the adequacy of the equipment are not to be evaluated. The questionnaire was designed to determine whether or not a school has a course or unit in data processing and if the school has data processing equipment available for student use.

Limitations

This study is limited to the researcher's ability to interpret and analyze the data gathered.

This study is further limited to the responses of the individuals who return a completed questionnaire.

The results of this study are only applicable to the population surveyed.

CHAPTER II

REVIEW OF RELATED LITERATURE

The literature in business education prior to 1960 has contributed little to the status of data processing in secondary schools; the majority of the materials cited in this chapter have been published during the 1960's.

An investigation of articles, books, and publications has revealed the importance of data processing in high schools. Professor Lewis D. Boynton of Central Connecticut State College, New Britian, Connecticut, has stated:

> Recognizing that automated data processing has become a part of everyday personal life and of vocational business life, one must conclude that formal instruction in this vital subject matter area must be a part of the high school curriculum.[3]

The importance of data processing in the high school curriculum was also indicated by Grippe and Maske who state that:

> It is our belief that data processing education should be included in the bookkeeping-accounting courses; in fact, such concepts can be a part of nearly all of the offerings of the business department.[4]

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[3]Lewis D. Boynton, Methods of Teaching Bookkeeping-Accounting, South-Western Publishing Co., 1970, p. 520.

[4]Patrick A. Grippe and Danna Maske, "Data Processing in Bookkeeping-Accounting," Business Education Forum, December 1970. Vol. XXV, p. 14 & 15.

Sister Mary Judith and Clarence M. Williams conducted a survey of 35 high school business education department chairmen in Rochester, New York, in 1964 to obtain information as to the extent of data processing courses in the curriculum and to consider future trends in data processing. Of the 33 respondents, only three stated that data processing had no place in the high school curriculum. Sister Mary Judith and Williams stated that the results of this study seemed to indicate that data processing does have a place in the secondary school curriculum.[5]

LaSalle found that both business educators and businessmen agree that one of the objectives of the business education programs in the secondary schools should be the preparation of the students for employment in business offices using data processing equipment. Thirty-three business educators, 69 secondary school business education department chairmen, 20 producers of data processing equipment, and 99 users of data processing equipment furnished data included in the study. The survey participants indicated that a separate, one-year course in data processing should be offered in the business education departments of the secondary school. They also indicated that the understanding of data processing should be integrated with other business education programs. In addition, they indicated that work experience

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[5]Sister Mary Judith, R.S.M. and Clarence M. Williams, "Data Processing in the Business Education Curriculum," The Journal of Business Education, XL (November, 1964), 52-54.

programs in business offices where data processing equipment could be used should be expanded.[6]

A study by James F. Wenner was undertaken to determine what types of jobs are open to high school graduates in the field of data processing and to develop a course outline for the teaching of an introductory, one-semester high school course in data processing. Wenner reported that his study, other related studies, and current research seemed to indicate that the teaching of data processing at the secondary school level was not only possible but desirable.

The following implications for administrators were stated by Wenner:

> 1. The administrators of public secondary schools, both large and small, should review the past and current research in data processing relative to the philosophy of secondary education. Although it is difficult to determine the number of high school students who will make use of specific skills in the area of data processing, it could be safely asserted that more will use the general background information in data processing regardless of the vocation they choose for their life's work.
>
> Consequently, even the small secondary schools should seriously consider the offering.
>
> 2. Secondary school administrators who feel that it is important for all high school pupils to become exposed in general business information should carefully study ways in which data processing information can become a separate

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[6]James F. LaSalle, "The Role of the Secondary School Business Education Department in Preparing Students for Employment in Business Offices Using Data Processing Equipment" (A published doctoral dissertation, Pennsylvania State University, State College, 1963), Abstract. P. 128-129.

> course in the curriculum. If the administrator, however, cannot or does not want to create a separate course for data processing, considerations should be given for the inclusion of information of this type into one of the existing courses in the curriculum. It is felt that this is necessary to provide this type of information for the student.
>
> 3. It is recommended that secondary school administrators in areas of large population concentration seriously consider the research completed and currently in progress relative to the teaching of data processing. It has been shown that the demand for trained data processing personnel presently exists, and all indications point to an increasing demand. It is important, therefore, that the opportunity for education and training in data processing be afforded to secondary school pupils.[7]

Carolyn Godby made a survey of the data processing occupations and the high school curricula of the Pekin-Peoria area. Twenty-one business firms in the area participated in the study. The findings of the study indicated the following to be true of the business employers.

> The business employers are in general agreement that there is a need for training automated data processing workers prior to the placement on the actual job. This is contrary to the common belief that the employee should be trained on the job. Employers think that the following agencies, in the order in which they are listed, should provide the training of data processing workers: high schools, equipment companies, business colleges, employers, colleges or universities, and adult education programs operated by the local public school system.[8]

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[7] James F. Wenner, A High School Orientation Course in Data Processing (Monograph 114. Cincinnati: South-Western Publishing Co. 1966). P. 105.

[8] Carolyn Godby, "Clerical Employees in Data Processing Occupations," The Balance Sheet, Vol. XLVI, (October, 1964), p. 60.

A comprehensive data processing program is taught at Poway High School in California. Janet Baulch who is responsible for initiating this program reports:

> Data Processing, as taught at Poway High School, covers the operation of the key punch, sorter, collator, reproducer, interpreter, and accounting machine or tabulator. In addition a general knowledge of computers and an introductory taste of Fortran Programming is given the students. For students who wish to pursue computer programming further, the high school also offers it as a follow up course, or concurrently in the case of seniors.[9]

MacDonald undertook a study to prepare teaching material for use in secondary school classes where data processing is being taught. The materials developed were designed for use as a unit of instruction in existing business classes where a minimal amount of data processing equipment was available. MacDonald felt that many schools would be unable to buy expensive data processing equipment.

> The teaching of data processing at a vocational competence level is and probably will be limited by the availability of equipment. Equipment is expensive and not available in many schools.[10]

Still he concludes that data processing should be offered to high school students. His conclusion concerning training of secondary school students was as follows:

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[9]Janet L. Baulch, "Data Processing in One Comprehensive High School," Journal of Business Education, Vol. XXI, (April, 1968), p. 283.

[10]Robert Davis MacDonald, "The Development of a Unit of Study in the Principles of Data Processing for Use in the Business Education Curriculum of Secondary Schools," (Ed.D. dissertation, Northern Illinois University, 1964), p. 199.

1) High school students who enter the labor market without training in data processing will be at a distinct disadvantage. Most jobs will, in some way, involve direct or indirect contact with data processing operations.

2) There is no single valid criterion for the identification of people who could profitably receive training in data processing. Many tests have been used to select trainees but none have proved entirely satisfactory.

3) At present very little is being done to provide the training in data processing that high school graduates will need. Few schools provide any training in the field.

4) This failure to offer the necessary training to high school students can be divided into four categories: confusion as to the training to be offered, shortage of qualified teachers, lack of data processing equipment for instructional purposes in most schools, and lack of suitable teaching materials.[11]

Jerre Gratz conducted a study to identify and analyze the major issues in selected business education subjects of the public secondary schools. His survey included 250 high school teachers and 48 leaders in the field of business education. One of the questions asked was: where will automation have its greatest effect in the business education curriculum? Sixty to sixty-nine percent of the leading business educators responded as follows:

> Automation will have its greatest effect on the teaching of bookkeeping by increasing the importance of teaching the fundamental skills, principles, and understandings in bookkeeping.
>
> Automation will have its greatest effect on the teaching of general business by making the content of these courses more difficult and challenging by discussing the problems caused by

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[11] Ibid., p. 10

> automation, such as the impact on the economy, technological unemployment, and product development.[12]

Adaline Jones, in a study conducted in Ohio, established that many jobs exist in data processing for people who have only a high school education.

> There is a level of employment in computer installations for which the clerical worker with only a high school education can qualify.
>
> This conclusion is based on the fact that 27 first level entry occupations occurred among the 69 participants in the study.
>
> A first level entry occupation has been defined as an occupation for which there is no work experience or education or training requirements other than high school graduation, although the education and training requirement was extended in the study to include as much as six months of education or training other than high school graduation, there were still participants who had no educational requirements beyond high school for each of the 27 occupations.[13]

The literature reviewed in this chapter was used by the researcher in the preparation of the questionnaire and in the organization of the study.

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[12]Jerre Eugene Gratz, "Identification and Analysis of the Major Trends in Selected Business Education Subjects of the Public Secondary Schools," (Ed. D. Dissertation, University of Houston, 1961), p. 275.

[13]Adaline Dorothy Seitz Jones, "A Survey to Determine the Knowledge and Skills Needed by Clerical Workers in First Level Entry Occupations in Digital Computer Installations," (Ph. D. dissertation, The Ohio State University, 1964), p. 352.

Summary

From the literature reviewed in this chapter, the business educators quoted are in agreement that data processing should be offered in the high school. However, there are some disagreements as to whether it should be offered as a course or as a unit incorporated in another business course. Furthermore, if data processing is to be offered as a unit incorporated in another business course, leading business educators are not in agreement as to what course would be the most appropriate. Although there are certain variations of the implementations of data processing into the business education curriculum, the implications for secondary teachers are clear. Data processing is a must for the business education curriculum.

CHAPTER III

METHOD OF PROCEDURE

The purpose of this study was to determine the status of data processing courses and/or units of instruction in the business education curricula of the public high schools of the Upper Peninsula of Michigan. To accomplish this objective, a survey of the business education departments of the Upper Peninsula was conducted.

Due to the number of high schools included in the study and the type of information to be gathered, a questionnaire survey was selected as the means for gathering the information. It was determined that personal interviews and visitations would not be practical.

A questionnaire was designed to obtain data concerning the status of data processing in the business curricula of the high schools of the Upper Peninsula of Michigan. Specific questions were asked in regard to whether the school was offering courses or units in data processing, the data processing equipment owned or leased, and the future plans of the school for offering data processing in their curricula.

A list of the 57 high schools was compiled, addresses were secured from Patterson's American Education Directories[14], and a

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[14]Patterson's American Education, ed. by Norman F. Elliott (Mount Prospect, Ill: Educational Directories Inc., 1970), LXVII, pp. 221-239.

questionnaire was mailed to the Business Education Department of each high school. The questionnaire (Appendix A, page 36), was submitted to Dr. Robert N. Hanson, Head of the Business Education Department of Northern Michigan University, for recommendations and revisions. Two revisions were made, one in regard to the total school enrollment category and the second revision was with respect to the approximate size of town and city category.

A cover letter was then submitted to Dr. Hanson for revision and approval (Appendix C, page 43). The questionnaire, cover letter, and a stamped, addressed envelope were mailed on March 9, 1971, to each of the 57 high school Business Education Departments.

Forty replies (a 70 per cent response) were received by March 22, 1971. A follow-up letter (Appendix C, page 43) was mailed with another questionnaire and a stamped, addressed envelope to the seventeen high schools who had not yet replied. Thirteen additional replies were received by the end of three weeks. Replies from a total of 53 schools (93 per cent) were received.

CHAPTER IV

FINDINGS

Of the 57 high schools surveyed, 53, or 93 per cent, responded to the questionnaire. Table 1, page 17, shows the number of schools in the various population categories.

Analysis and Presentation of Data Concerning Data Processing

Size of Schools

Twenty-three per cent of the 53 schools included in this study had total school enrollments (K-12) of less than 300. This group included 12 schools. The next category was schools with total enrollment of 301 to 549 students. There were 14 schools in this group, accounting for 27 per cent of the 53 schools surveyed.

If category one (schools with total enrollments of 1-300) and category two (schools with enrollments of 301-549) are taken as a summation, 26 schools (50 per cent) of the entire population of 53 schools show enrollments of less than 549 students.

Schools with student population of 550 to 1,199 students numbered fifteen (28 per cent). Nine schools (17 per cent) reported enrollments of 2,000 to 4,000. There were also three (6 per cent) high schools with student enrollments of 4,000 and over.

TABLE I

ENROLLMENT OF THE PUBLIC HIGH SCHOOLS OF THE UPPER PENINSULA OF MICHIGAN AND THE POPULATION OF THE TOWN OR CITY SERVED

Size of Town or City	School Enrollments					Totals	Per Cent
	Under 300	301-549	550-1199	2000-4000	Over 4000		
Under 2,000	11	6	0	1	0	18	33
2,000 - 4,000	1	8	6	0	0	15	27
4,000 - 6,000	0	0	4	1	0	5	10
6,000 - 8,000	0	0	2	1	0	3	6
8,000 - 10,000	0	0	3	2	0	5	10
10,000 - 12,000	0	0	0	1	0	1	2
Over 12,000	0	0	0	3	3	6	12
Totals	12	14	15	9	3	53	100

Towns and Cities

The size of the towns and cities served by the high schools in this study are also illustrated in Table 1 (Page 17). The first category of town and city areas (under 2,000 population) represented the largest single category of the survey. There were 18 towns and cities in this category. These areas included 33 per cent of the schools included in this study. The second largest category of metropolitan areas was the 2,000 to 4,000 grouping which included 15 (27 per cent) of the schools. These two categories (under 2,000 and 2,000 to 4,000) accounted for 33 (62 per cent) of the 53 town and city areas surveyed in this study. The remaining 20 (33 per cent) metropolitan areas fell into the other five categories which represented areas over 4,000 population.

Data Processing Equipment Available
for Instructional Purposes

The questionnaire for this study was used to ascertain the extent to which data processing equipment is available for either part-time or full-time student use in the 53 schools surveyed. Twenty-four (45 per cent) of the schools indicated that they did have some type of data processing equipment available.

Table 2 (Page 19) illustrates the data gathered regarding data processing equipment. Calculators were the largest category of equipment available in the schools covered in this study. They are used

TABLE 2

DATA PROCESSING EQUIPMENT AVAILABLE FOR USE IN DATA PROCESSING EDUCATION IN THE BUSINESS EDUCATION DEPARTMENTS OF THE HIGH SCHOOLS OF THE UPPER PENINSULA OF MICHIGAN

Equipment	Machines Available	Schools in Which Available	Per Cent of Schools
Calculator	16	8	15.0
IBM Simulator	12	6	12.0
Key Punch	5	2	4.0
Sorter	2	2	4.0
Tabulator Acctg. Machine	1	1	2.0
Interpreter	1	1	2.0
Collator	1	1	2.0
Verifier	1	1	2.0
Reproducer	1	1	2.0
Posting Machine	1	1	2.0
No Equipment		29	55.0
Totals	41	53	100.0

in 8 (15 per cent) of the high schools. The second largest category of equipment was IBM Simulators. This equipment is available in 6 (12 per cent) of the schools. Three (6 per cent) of the schools have both a sorter and a tabulator (accounting machine).

Interpreters are in use in two (4 per cent) of schools surveyed. One (2 per cent) school reported a collator, verifier, and reproducer for instructional purposes.

The data gathered regarding part-time or full-time use of data processing equipment (Table 3, page 21) revealed that only two categories of equipment are being used on a part-time basis. Four of the 8 schools which indicated that they had calculators reported that the equipment is available only on a part-time basis. IBM Simulators are shared in six of the 7 schools where they are used. Table 3 (Page 21) depicts the information concerning part-time and full-time student use of data processing equipment.

With Whom Data Processing Equipment Is Shared

Data processing equipment is being shared with the Office Machines class in two out of the 6 schools which reported the sharing of equipment. One school indicated that they are sharing data processing equipment with Adult Education classes.

TABLE 3

DATA PROCESSING EQUIPMENT AVAILABLE FOR FULL-TIME OR PART-TIME USE IN DATA PROCESSING COURSES IN THE BUSINESS EDUCATION DEPARTMENTS OF THE UPPER PENINSULA OF MICHIGAN

Equipment	Schools in Which Available for Full-time Student Use	Schools in Which Available for Part-time Student Use	Total Schools in Which Available
Calculator	4	4	8
IBM Simulator	6	6	12
Key Punch	2	0	2
Sorter	2	0	2
Tabulator (Acct. Mach.)	1	0	1
Interpreter	1	0	1
Collator	1	0	1
Verifier	1	0	1
Reproducer	1	0	1
Posting Machine	1	0	1

The majority of the schools did not share their equipment with anyone. Table 4 shows with whom data processing classes in the schools surveyed shared their equipment.

TABLE 4

WITH WHOM DATA PROCESSING CLASSES SHARED EQUIPMENT IN THE PUBLIC HIGH SCHOOLS OF THE UPPER PENINSULA OF MICHIGAN

With Whom Shared	Number of Schools	Per Cent
Office Machines Class	2	4.0
Adult Education Class	1	2.0
Not Shared	50	94.0
Totals	53	100.0

Summary

Of the 53 schools which responded to this study, nearly one third had student enrollments of less than 300 and were located in town or city areas of less than 2,000 population.

Some kind of data processing equipment was available in less than half (48 per cent) of the schools surveyed. Calculators and IBM Simulators made up the bulk of the data processing equipment which was being used for instructional purposes. There were not sufficient numbers of other types of data processing equipment to be of any significance.

Data Processing Courses Offered in the Schools Surveyed

Only one (2 per cent) of the high schools included in this study offered a course in data processing. This was a two-semester course.

Size of School Offering Data Processing Course

The school offering a data processing course had over 4,000 students and was located in city areas of over 12,000 population.

Basic Material Used in Data Processing Courses

The basic materials used in the data processing course offered in the Upper Peninsula high school is an IBM Manual.

Number of Students Enrolled in Data Processing per Semester

There were 69 students enrolled in the data processing course which was reported.

Grade Level in Which Course is Being Offered

The school surveyed offers its data processing course on the 12th grade level.

Summary

Actually only one two-semester course in data processing was being offered by one school in the Upper Peninsula when this survey was taken. School enrollments in this school were over 4,000.

The one school which had offered data processing as a course indicated a student enrollment of 69 students per semester. This course was being offered on the 12th grade level.

Units of Data Processing Incorporated in Other Business Courses in the Schools Surveyed

High schools included in this survey were also asked if they were incorporating units of data processing instruction in other business courses. Twenty (38 per cent) of the 53 responding schools indicated that they were teaching units in data processing. The remaining 33 (62 per cent) schools replied that they were not offering units of data processing in other business courses.

Sixteen high schools (30 per cent) were offering one business course which included a unit in data processing. An additional 4 schools were offering two business courses which included units in data processing. Table 5 (Page 25) shows the number of high schools offering courses in which units of data processing are incorporated.

The research data indicated that 25 separate units of data processing were being offered in business education courses. Thirteen (53 per cent) were being offered in Bookkeeping courses, and six (24 per cent) of these units were being offered in Clerical Office Practice courses. Secretarial Office Practice was the next largest category of courses which included data processing with 3 (11 per cent). Table 6 (Page 25) lists the business education courses in which units of instruction in data processing were taught.

TABLE 5

NUMBER OF BUSINESS EDUCATION COURSES IN WHICH UNITS OF INSTRUCTION IN DATA PROCESSING WERE INCLUDED

Number of Courses in Which Units of Data Processing were Incorporated	Number of Schools	Per Cent
0	33	62.0
1	16	30.0
2	4	8.0
Totals	53	100.0

TABLE 6

BUSINESS EDUCATION COURSES IN WHICH DATA PROCESSING UNITS OF INSTRUCTION WERE INCLUDED

Course	Number of Courses	Per Cent of Courses
Clerical Office Practice	6	24
Bookkeeping	13	53
Secretarial Office Practice	3	11
Record Keeping	1	4
Accounting	2	8
Totals	25	100

Length of Units

The length of the data processing units included in other business courses ranged from 1 to 9 weeks. Nineteen (76 per cent) of the units of instruction were from one to three weeks in duration. The remaining 6 (24 per cent) units in data processing were from 4 to 9 weeks in length. Table 7 exhibits the length of the units of data processing included in business education courses.

TABLE 7

LENGTH OF DATA PROCESSING UNITS OF INSTRUCTION OFFERED IN BUSINESS EDUCATION COURSES

Number of Weeks	Number of Units	Per Cent
1	5	20
2	8	32
3	6	24
4	2	8
5	0	0
6	2	8
7	0	0
8	0	0
9	2	8
Totals	25	100

Unit Description

Nearly half (48 per cent) of the units in data processing incorporated in business education courses were described as General Introduction. Thirteen schools (52 per cent) described their courses as General Introduction and Key Punching. Table 8 gives the names of the units of data processing which the high schools included in business education courses.

TABLE 8

DESCRIPTION OF DATA PROCESSING UNITS OF INSTRUCTION OFFERED IN THE BUSINESS EDUCATION DEPARTMENTS

Description	Number of Units	Per Cent
General Introduction	12	48
General Introduction and Key Punching	8	32
Key Punch	5	20
Totals	25	100

Materials Used in Data Processing Units

Table 9 (Page 28) illustrates the basic materials used in data processing units of instruction in the high schools surveyed. The basic materials for 16 (64 per cent) of the 25 units of data processing instruction reported were textbooks. Practice sets were reported as being used in 5 (20 per cent) of the units of instruction in data processing, while

TABLE 9

BASIC MATERIALS USED IN DATA PROCESSING UNITS OF INSTRUCTION IN BUSINESS EDUCATION COURSES

Material Used	Number of Units In Which Materials Are Being Used	Per Cent
Textbook	16	64
Practice Set	5	20
Practice Set & Textbook	4	16
Total	25	100

practice set and textbook materials were listed as being used as basic materials in 4 (16 per cent) of the data processing units.

Summary

Of the 53 responding schools, 20 (38 per cent) reported they were offering 25 separate units of instruction in other business courses. Approximately three-fourths of the units were either being offered in Clerical Office Practice or Bookkeeping and were from one to two weeks in length.

Nearly half (46 per cent) of the units in data processing were described as General Introduction. A majority (84 per cent) of the schools reported using either textbooks or practice sets as the basic

instructional materials.

Future Plans for Adding Data Processing Courses and/or Units of Instruction to Business Education Curricula

Data Processing Courses

Schools which did not offer a separate course in data processing were asked if they had plans to do so. Forty-one (77 per cent) of the 53 schools surveyed did not indicate future plans to offer a data processing course. Of the two schools which gave a positive answer to this question, one school was going to offer the course next year. The remaining school indicated it would be three to five years before the school would offer data processing as a course.

Future Plans for Units in Data Processing Incorporated in Business Education Courses

The respondents in this survey were asked if they had future plans to incorporate data processing units in business courses. Ten (19 per cent) of the 53 schools surveyed indicated plans to offer a unit of instruction in data processing. Five (50 per cent) of these units were to commence next year. An additional unit of instruction in data processing was planned by each of the other five (50 per cent) high schools within the next two to five years. These schools were uncertain when their units in data processing would begin.

All ten schools (100 per cent) indicated that they would offer

these data processing units in either Clerical Office Practice or Bookkeeping courses. Table 10 shows the courses in which data processing units will be offered in the future.

TABLE 10

BUSINESS EDUCATION COURSES IN WHICH DATA PROCESSING UNITS WILL BE INCLUDED IN THE NEAR FUTURE

Course	Number of Courses	Number of Schools	Per Cent
Clerical	5	5	50
Bookkeeping	5	5	50
Total	10	10	100

Reason for Not Offering Data Processing

Schools that did not offer either a course in data processing or a unit in data processing incorporated in another business education course were asked to give the reasons why. A combination of 70 different reasons, grouped into 5 categories, were given for not offering data processing. Lack of available equipment and lack of trained teachers were given as the two main reasons for not offering data processing. Table 11 (Page 31) lists the reasons why the schools surveyed did not offer either a course or a unit in data processing.

TABLE 11

REASONS GIVEN FOR NOT OFFERING DATA PROCESSING INSTRUCTION IN THE BUSINESS EDUCATION DEPARTMENTS

Reasons	Number	Per Cent
Lack of available equipment	36	52
Lack of trained teachers	15	21
Lack of community need	7	10
Lack of interest	8	11
Lack of concern by administration	4	6
Totals	70	100

Summary

Of the 53 schools surveyed, 10 (19 per cent) indicated plans to offer courses in data processing in the next one to five years. Forty-three (81 per cent) of the 53 schools had no plans to offer a course in data processing.

Ten of the 33 schools that did not have a unit of instruction in data processing stated that they had plans to offer a unit within the next five years. The majority of the units will be offered either in Clerical Office Practice or Bookkeeping.

Schools that did not have plans to offer data processing instruction gave lack of equipment and lack of trained teachers as the major contributing factors.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This study was designed to determine the status of data processing instruction in the business education curricula of the public high schools of the Upper Peninsula of Michigan.

Due to the number of high schools included in the study and the type of information to be gathered, a questionnaire survey was selected as the means for gathering the information needed.

One questionnaire was developed for this study. The questionnaire was designed to obtain data concerning the status of data processing in the high schools' business curriculum.

A letter of explanation and the questionnaire were mailed to 57 high schools in the 15 counties of the Upper Peninsula of Michigan. Fifty-three (93 per cent) of the 57 schools surveyed responded.

Summary of Findings

General Background Information

Of the 53 schools which responded to this study, nearly one-third had student enrollments of less than 300 and were in town and city areas of less than 2,000 population.

Some kind of data processing equipment was available in slightly less than half (48 per cent) of the schools surveyed. Cal-

culators and IBM Simulators made up the bulk of the data processing equipment which was being used for instructional purposes. There were not sufficient numbers of other types of data processing equipment to be of any significance.

Data Processing Courses

Actually only one two-semester course in data processing was being offered by one school in the Upper Peninsula of Michigan when this survey was taken. Enrollments of the school which was offering data processing as a course was over 4,000.

Data Processing Units Incorporated in Other Business Courses

Twenty (38 per cent) of the 53 responding schools reported offering 25 separate units of instruction in other business courses. Over two-thirds of the units were either being offered in Clerical Office Practice or Bookkeeping and were from one to two weeks in length.

Nearly one-half (48 per cent) of the units in data processing were described as General Introduction. A majority (75 per cent) of the schools reported using either textbooks or practice sets as the basic instructional materials.

Future Plans for Adding Data Processing Courses and/or Units of Instruction into Business Education Curricula

Of the 53 schools surveyed, 10 (20 per cent) indicated that they had plans to offer courses in data processing in the next one to five years. Forty-three (80 per cent) of the 53 high schools had no plans to offer a course in data processing.

Ten of the 33 schools that did not have units of instruction in data processing stated that they had plans to offer a unit within the next five years. The majority of the units will be offered either in Clerical Office Practice or Bookkeeping.

Schools that did not have plans to offer data processing instruction gave lack of equipment and lack of trained teachers as the major contributing factors.

Conclusions

The following conclusions were drawn as a result of the data presented in this study:

1. The public high schools in the Upper Peninsula of Michigan are just beginning to make plans to develop courses in data processing.

2. Existing data processing courses reach only a few students in the public high schools of the Upper Peninsula of Michigan.

3. Existing data processing courses in the public high schools of the Upper Peninsula of Michigan are being taught on the twelfth grade level.

4. Data processing equipment which is available for instructional purposes in the public high schools of the Upper Peninsula of Michigan is virtually non-existent.

5. Data processing units of instruction which are taught in the public high schools of the Upper Peninsula of Michigan are for the most part incorporated into Clerical Office Practice and Bookkeeping courses.

6. Most of the units in data processing incorporated in business courses were less than four weeks in duration in the public high schools of the Upper Peninsula of Michigan.

7. Textbooks and practice sets are the main sources of materials used in data processing instruction in the public high schools of the Upper Peninsula of Michigan.

Recommendations

1. Business educators in the public high schools of the Upper Peninsula of Michigan should investigate the feasibility of offering more units and courses in data processing.

2. High schools that do not have data processing equipment available for instructional purposes should investigate the possibility of sharing equipment with organizations such as local business, local government, and other school districts.

3. Local colleges and universities should make more courses in data processing available for prospective teachers and for in-service programs for practicing teachers.

4. Research should be conducted to determine the number of high school graduates in the public schools of the Upper Peninsula of Michigan who wish to seek employment in the field of data processing.

APPENDIX A

Please supply the information requested by circling, checking, or writing information in the blanks. Please answer all questions that apply to your school. All information is confidential; some will be reported individually.

GENERAL INFORMATION

School_____ Number of Business Teachers_____

Address_____
Street City Zip

Total School Enrollment:
Under 300 ( )
301 to 549 ( )
550 to 1,199 ( )
2,000 to 4,000 ( )
Over 4,000 ( )

Approximate Size of Town or City:
Under 2,000 ( )
2,000 to 4,000 ( )
4,000 to 6,000 ( )
6,000 to 8,000 ( )
8,000 to 10,000 ( )
10,000 to 12,000 ( )
Over 12,000 ( )

DATA PROCESSING COURSES OFFERED: If you have separate courses for data processing, please complete the following information. Do not complete this section if your data processing instruction is incorporated in another course. An example of the type of information desired is given on the first line.

Name of Course	Course Description	Basic Material Used	Length of Course (In Semesters)	Number of Students Enrolled
(Example) Data Processing	Gen. Intro	Textbook	1	85

Equipment Available	Number of Machines	Full-Time Student Use	Part-Time Student Use	With Whom Shared
Key Punch		( )	( )	
Verifier		( )	( )	
Sorter		( )	( )	
Interpreter		( )	( )	
Accounting Machine		( )	( )	
Reproducer		( )	( )	
Collator		( )	( )	
Computer		( )	( )	
Simulator (Typewriter Attachment)		( )	( )	
None		( )	( )	
Other (Specify)		( )	( )	
		( )	( )	

DATA PROCESSING UNITS INCORPORATED IN OTHER BUSINESS COURSES.
Please complete this section if data processing instruction is incorporated in other business courses. Please complete this section even though you may have separate data processing courses in addition to having data processing units incorporated in other business courses. An example of the type of information desired is given on the first line.

Name of Course	Unit Description	Basic Material Used	Length of Unit (In Weeks)	Number of Students Enrolled
(Example) Cler. Off. Pr.	Key Punch	Pr. Set	5	63

Equipment Available	Number of Machines	Full-Time Student Use	Part-Time Student Use	With Whom Shared
Key Punch		( )	( )	
Verifier		( )	( )	
Sorter		( )	( )	
Interpreter		( )	( )	
Accounting Machine		( )	( )	
Reproducer		( )	( )	
Collator		( )	( )	
Computer		( )	( )	
Simulator (Typewriter Attachment)		( )	( )	
None		( )	( )	
Other (Specify)				
		( )	( )	
		( )	( )	

FUTURE PLANS

If you do not already have a separate course in data processing, are you considering one? Yes ( ) No ( )

If the answer to the above question is Yes, when? Next year ( )
Two years ( )
3-5 years ( )
Indefinite ( )

If the answer to the above question is No, and if you are not currently teaching data processing as a unit in another business course, are you considering doing so? Yes ( ) No ( )

If Yes, in what courses? (Please list) When?

_____ _____

_____ _____

If you are not planning to teach data processing either as a separate course or as a unit in other business courses, is it because of:

Lack of concern by administration ( )
Lack of trained teachers ( )
Lack of available equipment ( )
Lack of community need ( )
Lack of student interest ( )
Other (Specify)_____

_____

I should like to see the results of this study. ( )

Please return to: Jerre G. Lewis
828 High Street
Marquette, Michigan 49855

JGL:nac

APPENDIX B

MAILING LIST

Sault Ste. Marie Area Schools
Sault Ste. Marie, Michigan 49873

Pickford Public Schools
Pickford, Michigan 49874

Brimley Public Schools
Brimley, Michigan 49715

Tahquamenon Area Schools
Newberry, Michigan 49868

Les Cheneaux Community Schools
Cedarville, Michigan 49719

Mackinac Island School District
Mackinac Island, Michigan 49747

Carney-Nadeau Public School
Carney, Michigan 49812

Ironwood Area Schools
Ironwood, Michigan 49938

Marenisco School District
Marenisco, Michigan 49947

Watersmeet Township School District
Watersmeet, Michigan 49969

Bergland Community School
Bergland, Michigan 49910

White Pine School District
White Pine, Michigan 49971

Public Schools of Calumet
Calumet, Michigan 49914

Lake Linden-Hubbell Public Schools
Lake Linden, Michigan 49945

DeTour Township Schools
DeTour, Michigan 49725

Rudyard Township School District
Rudyard, Michigan 49786

Whitefish School District
Paradise, Michigan 49780

St. Ignace Public Schools
St. Ignace, Michigan 49781

Engadine Consolidated Schools
Engadine, Michigan 49827

Rock River Township School District
Chatham, Michigan 49816

Stephenson Area Public Schools
Stephenson, Michigan 49887

Bessemer City Schools
Bessemer, Michigan 49911

Wakefield Township School District
Wakefield, Michigan 49968

Ewen-Trout Creek Consolidated School District
Ewen, Michigan 49925

Ontonagon Township Schools
Ontonagon, Michigan 49953

Public Schools of Hancock
Hancock, Michigan 49930

Chassell Township Schools
Chassell, Michigan 49916

Public Schools of Osceola Township
Dollar Bay, Michigan 49922

Portage Township Schools
Houghton, Michigan 49931

Adams Township School District
Painesdale, Michigan 49925

Dickinson County Intermediate School District
Iron Mountain, Michigan 49801

Iron Mountain City School District
Iron Mountain, Michigan 49801

Forest Park School District
Crystal Falls, Michigan 49920

Escanaba Area Public Schools
Administration Building
Escanaba, Michigan 49829

Gladstone City Schools
Gladstone, Michigan 49837

Baldwin Township School
Perkins, Michigan 49872

Rock Public School
Rock, Michigan 49880

Baraga Township School District
Baraga, Michigan 49908

Breitung Township Schools
Kingsford, Michigan 49801

North Dickinson County School District
Felch, Michigan 49831

Norway-Vulcan Area Schools
Norway, Michigan 49870

West Iron County School District
Stambaugh, Michigan 49964

Bark River-Harris Schools
Bark River-Harris Townships
Harris, Michigan 49845

Big Bay de Noc School District
Garden, Michigan 49835

Rapid River Public Schools
Rapid River, Michigan 49880

Manistique Public Schools
Manistique, Michigan 49854

APPENDIX C

COVER LETTER

828 High Street
Marquette, Mi. 49855
February 22, 1971

Dear Bookkeeping/Accounting Teacher:

As a part of my master's degree work at Northern Michigan University, I am undertaking a study to determine the status of data processing in the high schools of the Upper Peninsula of Michigan. My study concerns the data processing courses being offered and the data processing equipment available for student use.

I hope you can be a part of this study. The three-page questionnaire on the status of data processing in your school should be filled in by you, the bookkeeping/accounting teacher.

When you have completed the questionnaire, please return it in the enclosed addressed envelope. Your prompt reply will help to advance business education in Northern Michigan.

Thank you for your cooperation.

Sincerely yours,

Jerre Lewis

JL:nac
Enclosures

FOLLOW-UP LETTER

828 High Street
Marquette, MI 49855
March 16, 1971

Dear Bookkeeping/Accounting Teacher:

Two weeks ago a questionnaire concerning the status of data processing in Northern Michigan was sent to the 57 public high schools in the 15 counties of the Upper Peninsula of Michigan.

To date, the response to this questionnaire has been overwhelming. Over 70% of the department chairmen responded within the first three days. When you consider how busy teachers are, this kind of response is very gratifying.

To make this study representative of the schools surveyed, it is important that your school be included in the survey. Therefore I am appealing to you to complete the questionnaire and return it in the stamped, self-addressed envelope.

Thank you for your kind cooperation and assistance.

Best Regards,

Jerre Lewis

JL:nac

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LaSalle, James F. "The Role of the Secondary School Business Education Department in Preparing Students for Employment in Business Offices Using Data Processing Equipment" (published doctoral dissertation, Pennsylvania State University, 1963.)