Study to determine the educational preparation and teaching experience of Montana business education teachers in areas of bookkeeping and/or accounting and in data processing

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A STUDY TO DETERMINE THE EDUCATIONAL PREPARATION AND
TEACHING EXPERIENCE OF MONTANA BUSINESS EDUCATION TEACHERS
IN AREAS OF BOOKKEEPING AND/OR ACCOUNTING AND IN DATA PROCESSING

by

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CHAPTER I

INTRODUCTION

Wonderful are the devices that are being produced in the business world, and from present indications, the time is not far distant when all office work will be done automatically and where business will be merely a matter of pushing buttons, turning electric switches, and waiting for the result . . . typewriter girls, bookkeepers, and even office boys will lose their jobs.¹

The above quotation sounds as if it may have been written on September 8, 1957, instead it appeared in a newspaper on September 8, 1907. Since that time, the number of clerical workers in the business field have increased significantly.

When adding and calculating machines were introduced into the office, people said it would no longer be necessary to teach business mathematics. To the contrary, the need to teach this subject is greater now than in the past. Businessmen point out time and again that students are deficient in mathematics—fundamentals, decimals, percentages, and the like. A similar claim was made when the typewriter came into being. At that time, it was pointed out that one clerk could do the work of several. This was true, but the typewriter created a demand for a significantly greater number of typewritten documents. As a result, the number of typists is increasing continuously. With the use of electric typewriters and various

copying machines, this trend continues. When the typewriter came into its own, the office clerk needed a broader background than previously. In addition to needing a good background in English, she had to learn to operate the typewriter with a high degree of accuracy as well as with an acceptable amount of speed. Worries were expressed when bookkeeping machines were first used in the business office. However, as many business educators and businessmen suspected, the need for employees with a good background in bookkeeping and accounting has grown and will continue to grow in the foreseeable future.

Once again, history repeats itself. This time it is repeated in the "era of data processing." Not only do present office employees need the skills and knowledges required in the past, they need additional background for employment in the business office today. This is a case where progress does not adapt itself to people, instead people must adapt themselves to progress.

The impact of new techniques brought about by automation has forced business to convert rapidly to electronic data processing for improvement in fact accumulation and computation. Consequently, office procedures are changing; and when major changes are made in the business office, a revision of the business curriculum and educational preparation likewise becomes necessary for the student and the business education teacher alike.
STATEMENT OF THE PROBLEM

Bookkeeping and accounting are in an era of change. Should accounting records be taught only as a set of books? Should more emphasis be put on what is done with records rather than on how records are kept? Should the bookkeeping and accounting courses continue to consist of journalizing, posting, and preparing a trial balance; or should it include the area of electronic data processing? Do current bookkeeping courses recognize changes that are taking place?

With much of the paper work of bookkeeping being done by machines, many questions are being raised about the current and future status of bookkeeping and accounting in our secondary schools. It is becoming more and more apparent that bookkeeping and accounting, to justify their continued existence in the school curriculum, must be examined thoroughly to determine what changes will have to be made.

If nothing is as permanent as change, it must follow that no teacher contributes more to his students and his society than that teacher who prepares his students to cope with changes in that society. The desire and tendency on the part of many business teachers is to resist change and maintain the status quo.

Change produces challenges. Those challenges, although complex, offer opportunities which can lead to real advancement in business education. However, three specific areas must first be identified.
First, those opportunities having the greatest potential for
business education should be selected. Second, business education
teachers should be alert to opportunities for advancement that
stem from change. Third, there should be a readiness and a willingness
on the part of business teachers to break sufficiently with
traditional patterns of thought and practices to make innovations
possible and to foster the growth and development of new concepts
and improved practices. This threefold problem is today identified
in the areas of bookkeeping and accounting as well as in related
areas of data processing.

DEFINITIONS OF TERMS USED

Bookkeeping and Accounting

In many secondary schools, "bookkeeping" is gradually
disappearing and "accounting" is taking its place. As this practice
is not yet wholly accepted, the following simplified distinction will
be used throughout the study: the accumulation, classification,
summarization, and interpretation of data is referred to as
accounting; bookkeeping is the recording and computation phase of
the accounting process.

Data Processing

Data processing is the mass processing of data. However, as
used in this study, it is the mechanical or the electronic handling
of financial, statistical and related information for the production
of records and reports. It embodies both categories of integrated
data processing and electronic data processing as well as
information created from data and management information systems.

It should be noted that "automation" is used herein as a
term synonymous with "automatic business data processing." This
use is not wholly correct, but does communicate common meaning to
most business educators.

BOOKKEEPING AND ACCOUNTING IN RETROSPECT AND PROSPECT

The importance of developing and maintaining bookkeeping records
and of providing instruction in the bookkeeping and accounting subjects
has long been recognized.

From a historical standpoint, we are not sure when the business
of keeping records began, although we have in many of the great
museums of Europe and America specimens of Babylonian and Assyrian
business records in the form of clay tablets that are thousands of
years old. The Phenicians, the greatest commercial people of ancient
times, are given credit for inventing the alphabet. They were not a
literary people. As for Greece and Rome, literally hundreds of records
of sales made by the citizens of both countries have been discovered,
among the most interesting being wax tablets found in the uncovering of
Pompeii. The difficulties of the Roman bookkeeper, and in fact
bookkeepers in every century in Europe during the Middle Ages, can be
appreciated when it is remembered that all figures were expressed as
Roman numerals; it was not until the fourteenth century that Arabic
figures displaced Roman numerals in the commercial centers of Europe.
Throughout the early centuries, records of business transactions were kept in mere memoranda form. It was not until the fifteenth century that written records were printed. At this time, Pacioli's first printed work on arithmetic and algebra was published in Venice. A section of his textbook on mathematics was devoted to a new method of keeping books—double-entry bookkeeping. It was based on mathematical equations, "assets equal liabilities plus proprietorship" and "the sum of the debits equal the sum of the credits." As time passed, however, the relationship between bookkeeping and algebra was soon forgotten.

Pacioli's method of keeping books by double-entry spread from Italy, to Holland, France, and then to England. English colonists brought the double-entry method to America. Instruction in this method was offered early in our history. In 1635, for example, just a few years after the Pilgrims landed, we find that in Plymouth schools were teaching students to "read, write, and cast accounts." The expression of casting accounts is only one of several early designations used for bookkeeping.

From early colonial days until the first manufacture of the typewriter on a commercial basis, the program of private business schools was limited to instruction in bookkeeping. Early bookkeeping instruction consisted of the copy method, in which the student copied entries from the textbook being used onto blank bookkeeping forms.

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For decades after bookkeeping was introduced into the public schools around 1823, it was the only business subject taught in the high schools. Even after the first manufacture of typewriters, which resulted in the introduction of typewriting and shorthand into the private business schools and later into the public high schools, bookkeeping was still looked upon as being the backbone of the business curriculum.¹

As recently as 50 years ago, the bookkeeper in many business firms was the major-domo of the office. He carried the responsibility for all the business and financial records of the employer. He kept whatever books he felt his company needed. During the month, he made journal entries and posted. At the end of the month, he verified the accuracy of his work by taking a trial balance. At the end of the fiscal period, he formulated adjusting entries as well as made the closing entries. He balanced and ruled all accounts and made whatever financial statements or reports he felt his employer might need. He also interpreted the significance and meaning of these reports to his employer.

In addition to the regular routine duties, he advised other departments on extending credit, carried on negotiations with the bank on financial arrangements, and set up and kept records for special situations such as inventories of merchandise, supplies and equipment, interest income and interest expense, depreciation and allowances.

He was called a bookkeeper—but he was much more than just a keeper of records.

Today, it is only in a small business office that a bookkeeper may still be performing many of the same functions which his counterpart handled many years ago. Even in a small business, it is quite likely that a professional accountant is supervising the total financial record-keeping process, and perhaps is even doing some of the end-of-the-year work himself. The accountant probably prepares entries and tax reports for the various governmental agencies and perhaps does the financial statements. He probably interprets the financial reports for management and acts as a consultant and expert for them. The bookkeeper today handles the clerical or bookkeeping functions as distinguished from the accountant, who handles the professional accounting work.

In business organizations, where a large volume of transactions and many complicated reports are being handled and prepared, the total bookkeeping process has been divided among many employees. Each worker may be handling one phase of keeping records, such as accounts receivable, accounts payable, journalizing, posting, inventory control or payroll. These workers are specialists who carry distinguished job titles such as junior accountant or controller.

The future of bookkeeping occupations can be projected only in terms of past and present trends. Some factors, however, are very evident. The American economy will continue to expand; business, therefore, will continue to increase in volume. As a result, financial records will continue to expand as well. With the constant introduction
of new taxes and other governmental regulations, many additional man hours and machine hours of bookkeeping work will have to be done. The new uses of financial data create more work for the bookkeeping and accounting divisions, too. Much of what is taught about complex closing, opening, reversing, and adjusting entries is of little consequence in understanding the values for which bookkeeping is taught in the secondary school at the present time. It served its purpose when high school students could go out as assistant bookkeepers, but that very seldom happens today.

Bookkeeping found its way into business programs on every level, from the earliest beginnings of business education right down to the present time. Today, it is considered an essential phase of all business curriculums. The secondary school bookkeeping program, however, has not kept up with the occupational change. It still attempts to meet the problems of the old-time bookkeeper.

Today, bookkeeping and accounting must take into consideration the role of data processing. For bookkeeping to become meaningful to today's business student, the teacher must teach for transfer of learning. The skills and knowledges learned must be applied in the development of more complicated competencies involved in "real" bookkeeping, whether it be by hand, machine, or by data-processing equipment. Already many accounting and bookkeeping clerks have changed from manual bookkeeping operations to participation in some phase of integrated or electronic data processing. Just within the last ten years integrated data processing has become a major
phenomenon of business activity. This movement is destined to continue until large companies employ or train for their office only workers needed to operate the automated office equipment.

Technological changes are taking place at a bewildering pace. Change is occurring at an alarming rate. Old ideas in bookkeeping and accounting of obsolescence are themselves obsolete. Manpower needs have had to change educational emphases. Now, are we able and ready to change?

What then can we anticipate in the future in the teaching of bookkeeping and accounting? First, we can expect a continued trend minimizing double-entry as a method of keeping records. Double-entry bookkeeping is not characteristic of electronic data processing input. The idea is there, but not in the form in which it is presented in traditional bookkeeping. Second, we can expect further emphasis on the managerial use of bookkeeping records. Understanding this may be useful not only for business operations, but also for greater competency in the management of the home for general purposes. A third significant and related concept is that we can expect more emphasis placed upon systems. In order to use bookkeeping in the immediate and distant future, it is basic to learn to understand what happens to records when they are put into the computer. In the future, systems analysis and systems concepts could be developed at the very beginning of the bookkeeping course and used as a primary vehicle for learning.  

No one has a crystal ball to determine the exact future of bookkeeping and accounting in our secondary schools today. The trend toward automation in office positions will not decrease the employment opportunities in bookkeeping and accounting; nor will it decrease the need for an understanding of the basic principles of records. Considering (1) the millions of people employed in bookkeeping and accounting occupations along with clerical and sale positions all of which require a knowledge of bookkeeping, (2) the many executives, managers, and small business proprietors who need an understanding of bookkeeping in order to manage their businesses intelligently, and (3) others who may be able to profit from an understanding of bookkeeping, it seems highly probable that in the future more students than ever before will be enrolled in the secondary school bookkeeping and accounting programs.¹

DATA PROCESSING IN RETROSPECT AND PROSPECT

In going back through the corridors of history, one will find that the need to count has been necessary throughout time. The decimal system gives a clue that man's fingers were the first counting devices.

The earliest man-made counting device was invented in China around 5000 B.C. It was called the abacus and counting was accomplished with beads on strings of wire. The Chinese, Egyptians,

and the Romans all had their own forms of abacuses. It is
worthy to note that this efficient calculator is still being used
in some parts of the world. Another widely used calculator is
the slide rule, invented around the early part of the 1600's by
an Englishman.

Irrespective of the fact that adding machines and calculating
machines were used in the seventeenth century, it is generally
agreed that mechanical data processing, or at least a crude form
of it, is a product of the nineteenth century. Some claim that
electronic data processing came into being in 1822 when Charles
Babbage developed a "difference engine" for calculating mathematical
tables. Also, in 1833, he developed an "analytical engine" which
was the first internal-stored-program computer.¹ This engine was
based on the punched card pattern. Others feel that 1887 is a
more significant date as Dr. Herman Hollerith of the U. S. Census
Bureau developed a system of recording, compiling, and tabulating
census facts.

Mechanization was first stimulated by the needs of the U. S.
Census Bureau when the 1880 census was not completed until eight
years later. The statistics compiled were large and were handled
and sorted countless times. The growing population, relocation of
the population, and the increasing need for more statistics pushed
the demand for mechanical means. The Bureau, under the leadership

¹Commonwealth of Pennsylvania, Data Processing for Business
Education Departments in Pennsylvania's Public Schools, Bulletin
276, 1964, p. 18.
of Herman Hollerith and his assistant, James Powers, installed a set of mechanical equipment to process data from the 1890 census. As a result, this census was tabulated in less than three years.

Hollerith left the Census Bureau to form his own company. The Bureau organized its own laboratory and engaged Powers to develop a new concept in punching machines but continuing the use of the unit card principle. Powers later resigned to form his own company which eventually was acquired by Remington Rand. During the next few decades, many other machines were developed that aided the automated processes.

The history of computers dates back to 1939 when Howard Aiken began work on the first large-scale automatic computer. He was well along with his work when he read of other machines with remarkable similarities to his. Aiken conceived a mechanical, sequential computer capable of following a sequence of steps punched into a tape. This computer called 'Mark I,' officially named the "Automatic Sequence Controlled Computer" was completed in 1944 after seven years of effort.¹

In the 1940's, electronic computers were being developed and used to solve acute problems connected with World War II. At a most critical time, jobs outnumbered the civilian labor force.

Electronic data processing had come into being to meet an increasing need for information under most increasingly complex conditions.

The first-all-electric computer was developed by Mauchley and Eckert at the University of Pennsylvania between 1943 and 1945.¹ A significant feature of this machine over its forerunners was its ability to handle alphabetic and certain typewritten characters as well as numeric characters.

When computers were commercially offered in the early 1950's, the experts and computer manufacturer's predicted that, because of their size and cost, only a few dozen would be manufactured for use by large corporations. However, this prediction fortunately was incorrect. There are now more than 55,000 computers being used in and outside the United States. There are even more punched card data processing systems in use.²

A major development in computers was unveiled early in 1964 by a leading manufacturer of the industry. Early computers were operated by means of vacuum tubes that were bulky and demanded considerable power. The use of tiny transistors in place of the vacuum tubes was a step forward. These units required less power and occupied less space in the computer. After considerable research, a newer generation of computing equipment of less size and more power was soon developed.

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In looking into the future, it is believed that many changes in data processing will occur. The basic changes to be expected in the computer are that it will become smaller, more compact, more flexible, and easier to use.

The influence of electronic data processing is today being felt in hundreds of classrooms. The ability of data processing and computer technology to handle, organize, calculate, process and print the growing mass of educational data make its increased used inevitable. Teaching machines and computer-assisted instruction are already used extensively. The teaching of bookkeeping and accounting are amenable to both techniques.

The present and future of data processing will have a far-reaching effect upon the lives of American people. In conquering new frontiers, it has created problems that accord education one of its biggest challenges. A dramatic cleavage presently exists between practical accounting and accounting education. One reason for this divergence is the fact that education has not yet learned to utilize the computer with the same efficiency business has.1 Hopefully, in the next few years, one will see a dramatic new trend appearing in accounting education when the developments in business will be used to their maximum efficiency in the classroom.

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SIGNIFICANCE AND PURPOSE OF THE STUDY

Bookkeeping and accounting has become the second most popular business subject in our secondary schools today. Over one-half million students are enrolled in this subject each year.¹ This huge enrollment is one significant factor which points out the need for having bookkeeping and accounting instruction reflect the latest business practices.

Few people realize the tremendous progress that has been made in the past decade by American industry. Most Americans have been satisfied with enjoying the benefits from this progress without worrying about the economic changes and the effects of these changes. All business educators need to be concerned with equipping the unemployed, the under-employed, or displaced persons with the skills necessary to make them useful and productive. At the turn of the twentieth century, 1 out of every 25 wage earners worked in an office. By 1940, the ratio was 1 in 10. The ratio increased to 1 in 8 in the 1950's, and will continue to climb.²

There are two major reasons why this study is significant and should be beneficial:

1. The emphasis in accounting education and practice has shifted away from the mechanistic bookkeeping approach to a more conceptual, interpretive, decision-guiding approach over the last several years.

Most business teachers at the secondary level have not been exposed to this new approach.

2. Most reasonably large accounting systems and parts of many small systems utilize electronic and integrated data processing. Current teaching in this area at the secondary level largely ignores this fact.

The specific aspects of the problem to be studied and investigated were twofold:

1. Part I had its objective the identification and analysis of the educational preparation and teaching experience of Montana business education teachers to determine if they were adequately prepared in accounting and data processing skills, and to determine if their teaching practices showed knowledge of and exhibited the changing demands developed by data processing and the systems emphasis in accounting.

2. Part II involved seeking the cooperation of State Supervisory Personnel to: (1) estimate the percentage of accounting and/or bookkeeping teachers in their states who were inadequately prepared in their accounting and data processing skills, (2) determine if the teaching or use of the computer at the secondary level was being encouraged and practiced, and (3) determine
if an educational development program to upgrade accounting and bookkeeping skills in secondary business teachers would be desirable and beneficial.

DELIMITATIONS OF THE STUDY

Early in the planning stages of this research project, the investigator weighed the merits of various procedures for collecting data. The inquiry of this study started with the problem, and its nature was governed by the selection of the tools used.

Inasmuch as the basic data were secured by means of the questionnaire, in some instances it was not possible to obtain all the information desired from each business teacher and State Supervisor. Responses, occasionally, were limited by the extent of understanding of the questions asked. There was no assistance given the respondents in interpreting the questions which may have been possible under other data gathering techniques.

Conclusions cannot be accurately drawn concerning a population until the nature of the units that comprise it are clearly identified. Even with the aid of a preliminary list of Montana business education teacher personnel, some returns were submitted by unqualified business teachers.

Presenting respondents with carefully selected and ordered questions so as to elicit the required data also became a problem of this study. It remains unknown if replies were tailored to conform
with their biases, to protect their self-interests, to conform
with socially accepted patterns, to place themselves in a more
favorable light, or if replies were made to please the researcher.

This study was confined to only business education teachers,
and geographically, only to the State of Montana. The results
cannot be generalized to apply to all states and to all teachers—
now, in the past, or in the future. Therefore, this study
reveals only information relative to prevailing conditions in a
specified set of circumstances.
CHAPTER II

REVIEW OF RELATED LITERATURE

Business education, like the other subject fields, is feeling the shock waves of the school reform movement that has been gaining momentum since World War II. The showdown between curriculum obsolescence and reform grows closer by the hour.

Experimentation and research, combining electronic data processing and accounting, have already reached the stage in business education where programs on a meaningful scale are underway. What is the character of the reformation going on in the business curriculum? First, there is general agreement that schools need to take a hard look at what they are teaching. At the center of the reform movement is the attempt to update and unify accounting and bookkeeping subject matter around key ideas and concepts of data processing.

A search in the area of accounting and data processing and the growth of this automated technology failed to disclose any work done in the exact manner as this study. Very little literature was found concerning the educational preparation of business teachers in the areas of accounting and in data processing.
What was most encouraging is the fact that the many writers on bookkeeping and accounting in periodical literature have become realistic. They have recognized that automation is with us; that it is here to stay; and, that there is little need for fear of extinction of bookkeeping as a result of automation. But at the same time, there is a distinct need for overhauling our objectives and methods of implementation in terms of course content and instruction.

Literature Related to Bookkeeping and Accounting

Recent emphasis on accounting theory, the advent of computer technology and its rapid adoption by business and other enterprises along with increased application of mathematical techniques to the solution of management problems, are working substantial changes in the nature of accounting and is evident in much of the current literature. The following review substantiates some of these changes.

R. K. Mautz reported in the Business Education Forum that he felt hand-kept and hand-posted bookkeeping systems may soon become a matter of historical interest only, and "those high school teachers of bookkeeping who keep abreast of the field and can guide their students most effectively into high school educational programs that will prepare them for the future serve them doubly well."¹

Likewise, Caldwell points out that "the bookkeeping course that is presently taught today should be updated to reflect changes that are rapidly taking place. Many things which are currently being done in the bookkeeping class should continue to be done; some things should be modified; some new things added." He goes on to say that in the past, electronic data processing primarily affected offices with only large staffs. It was not economical to use this equipment in smaller offices. He also believes that electronic data processing can easily be correlated with each separate phase of bookkeeping because the concepts used in bookkeeping are the same concepts used in electronic data processing.

Johnston and Williams advocate electronic data processing as being essential in beginning bookkeeping. They feel that it is not really so complex that high school students cannot readily understand it. Johnston and Williams state, "It is the responsibility of teachers of bookkeeping to remove some of the mystery of modern methods of processing data. Students should be made fully aware of the need for instructions, or programs for equipment used in the automatic methods."

Joseph A. Lesak pointed out that because of the advent of data processing, unit record, and computer systems, he felt that all accounting and bookkeeping students should have sufficient exposure

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to a systems configuration.\(^1\) Realizing that his basic purpose was to teach accounting and not data processing skills, he nevertheless felt that his accounting students should understand the function of data processing equipment and how it could be used to process vast amounts of data quickly and accurately as well as reporting and projecting for management.

Many changes in the future in the teaching of data processing and accounting are anticipated by Herbert A. Tonne. "A significant change," Tonne says," is that we must expect in the teaching of bookkeeping is the emphasis upon systems. In order to use bookkeeping in the immediate or in the distant future, it is basic to learn to understand what happens to records when they are put into the computer.\(^2\)

Automation of bookkeeping instruction is primarily a matter of using existing materials in a new way according to Enoch J. Haga.\(^3\) He believes that teaching machines and computerized instruction are definitely on the way, and that bookkeeping and accounting are amenable to both techniques.

Joseph A. Lesak and William G. Carpenter reported concern over their accounting students. They stated that since the accountant


must be responsible for the processing of vast amounts of data quickly and accurately as well as reporting and projecting for top management, they were especially concerned that their accounting students acquired a knowledge of electronic data processing.\(^1\)

Automated data processing in bookkeeping is indispensable according to Marle W. Wood and Robert G. Espagren.\(^2\) They felt that every student training today in bookkeeping and accounting needed to develop an awareness and an understanding of electronic data processing procedures and equipment. The student would then soon discover that the same logic and theory used in "pen and paper" bookkeeping is employed in even the most complete automated data processing application.

Douglas T. Adamson stated that data processing knowledge and information should be an integral part of the bookkeeping and accounting course even though there is still some concern as to whether or not electronic data processing should be included in the high school bookkeeping course.\(^3\)

Boynton expresses the view that steps should be constantly taken toward the understanding, and where practical, the use of the newer tools


of bookkeeping. He stressed that the physical skill of bookkeeping operation should not replace the mental skill of bookkeeping understanding and indicated the urgent need for research to develop some form of machine instruction which would introduce students to the common elements of the highly diverse and costly machines that are in use in today's business offices.

LeRoy Brendel propounded in his article a series of questions bearing on the content, points of emphasis, and time distribution within the standard bookkeeping course in view of some of the things relating to the impact of electronic data processing on bookkeeping and accounting.

MacDonald and Will cautioned against complacency by pointing out that even though the principles in automated bookkeeping are similar to those in manual bookkeeping, we cannot and should not assume a carry over from manual to automated procedures takes place, but that the transition must be taught.

The bookkeeping and accounting course should definitely include the theory of data processing systems according to Elaine Utthe. She states that after a foundation had been laid in general business, the bookkeeping course should include the theory of electronic data processing systems.

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Cadugan, like the many others, also urged less emphasis on mechanics in the accounting classroom and more emphasis on the interpretation of the goals of accounting. He also suggested the introduction of elementary data processing equipment into the classroom, particularly punched-card equipment.¹

**Literature Related to Data Processing**

The vast changes introduced by electronic data processing have caused many concepts to emerge in the areas of accounting and bookkeeping. These concepts are beginning to receive serious consideration on the part of bookkeeping and accounting teachers. The following reviews substantiate this point.

Elsie Collins Ware, in a survey of literature concerning the impact of automation, concluded that business education was in a precarious state and that an effective working relationship between education and business for the purpose of developing a significant electronic data processing education program was imperative.²

In a series of three articles, Wood and Espegren provided an impressive summary of the evolution of data processing, the types of processing equipment in existence, how computers operate, and the uses to which they should be put in bookkeeping and merchandising.³

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In research done by John Hanke, conclusions were made that a good business background, especially in accounting and general business, was extremely necessary in the preparation of business programmers.1

MacDonald noted a growing tendency for business offices to look to secondary schools for the training in electronic data processing and related fields, since training programs of manufacturers and employers in this area have not produced many workers.2

Parsh found that most of the entry jobs in the electronic data processing area were open to high school graduates if only that had had the training in the high school. He strongly recommended that high schools should teach at least one unit on electronic data processing, or if at all possible, include such a unit in the bookkeeping and accounting course.3

The following reasons were given by Greiner as to why business pupils should have a background in electronic data processing:

High school graduates with a reasonable amount of technical training in data processing can qualify for many of the "apprentice" operator and programmer positions that data processing installations create . . .


Business education graduates with a knowledge of data processing will receive preferred consideration for clerical positions in the areas which prepare and edit data to be processed. Bryce W. Tourd also feels that the psychology of learning applied to accounting and data processing is very important. He states, "We feel that the punched card as a unit of business record is basic enough and common enough to a wide variety of systems and that it is very valuable as an instructional medium and serve well to related accounting systems." Courses and programs should take into account the effects of the electronic computer on business jobs and qualifications according to S. J. Wanous. The computer, introduced commercially just a little more than a decade ago, is making a marked impact on office and distributive jobs. The effect of these changes, in his opinion, must be assessed now.

Dr. Gilbert Kahn stresses the importance of electric data processing and states that no matter how small a high school business department may be, or how small its enrollment may be, or how inadequate its budget may be, data processing should be offered.


Carlton D. Stolle advocates the use of the computer in elementary accounting so as to update instruction in accounting and bookkeeping courses.\(^1\) He states that the student sees the world of automation moving onward around him, but does not readily link this movement to accounting merely because his education, although not inadequate, is nevertheless incomplete. He is of the opinion that many would-be accountants, some being highly qualified individuals, change their course of study after the first year because someone failed to relate to him the level of technological attainment the accounting profession has reached. He feels the accounting profession has become very dynamic because of electronic data processing.

The present and future of data processing will have a far-reaching effect upon the lives of all American people. To appreciate and understand the ramifications of electronic data processing, high school students will have to be informed of the effect it has on the business world, on present and future employment, on the presently employed as well as prospective office employees, and the effect it will have on their own future.

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CHAPTER III

METHOD OF PROCEDURE

To bring the techniques and their interrelationships used in this study into clear focus, the techniques employed will be divided according to the two parts of the study.

Business Education Teacher Personnel

A preliminary list of the 1967-1968 Montana Business Education Teacher Personnel, compiled from reports by the Department of Public Instruction, Helena, Montana, was obtained and became the official mailing list used in this study.

The data gathering technique used was a closed-form or structured questionnaire. It consisted of two parts—educational preparation and teaching experience—paralleling the nature and scope of the problem (Exhibit B). Part I of the questionnaire asked the business teacher to supply his educational preparation in any or all of the following accounting areas: elementary accounting, intermediate accounting, managerial accounting, income tax accounting, governmental accounting, cost accounting, and auditing. He was also asked to supply his educational preparation in any or all of the following data processing areas: unit record equipment operation, computer programming (Machine language, Fortran, Cobol, or others), and in system analysis or design, whether it was electronic data processing or unit record
systems. A choice of four possible alternatives was given for his responses to the amount of educational preparation received in these areas.

The second part of the questionnaire asked the business teacher to supply information relative to his teaching experience. The same areas were again given. He was to indicate if his teaching experience in these subjects was on a regular basis or if it was on an occasional basis. In both instances, he was asked if the subject was taught as a full course or as a unit course.

A one-page cover letter was devised explaining the nature and scope of the problem and asking for his assistance in answering the questions on the attached questionnaire (Exhibit A). A stamped and addressed envelope was enclosed for his return.

Three hundred fifty-four questionnaires were sent out to respondents via the mails. A second cover letter and questionnaire were sent out to respondents who did not reply after a two week period. A 77 per cent return was received from the Montana business education teachers. A 74 per cent return was utilized in this study. Three per cent of the questionnaires were returned unanswered.

State Supervisory Personnel

The U. S. Department of Health, Education, and Welfare, Office of Education, provided a directory of State Officials with Supervisory responsibility for Office Occupations Education which became the official mailing list for use in this study.
Rather than forcing respondents in this area to choose between rigidly limited responses, an open-form questionnaire was constructed for use (Exhibit D). This permitted State Supervisory personnel to answer freely and fully in their own words and in their own frame of reference. This also gave respondents an opportunity to reveal motives or attitudes or to specify the background and provisional conditions upon which their answers were based.

The questionnaire asked for assistance in answering four questions relating to Part II of the study. Each Supervisor was asked to estimate the percentage of accounting and/or bookkeeping teachers in his state who he felt were inadequately prepared in their accounting background and in data processing skills. He was asked if he felt an educational development program in this area would be advantageous. He was also asked to comment as to whether or not he encouraged the teaching of concepts and/or use of the electronic computer at the secondary level in his state; and if so, in what manner this was being accomplished. Any comments or recommendations he felt would be profitable or would contribute to this study in the area of bookkeeping and/or accounting and in data processing were welcomed.

A second questionnaire and letter were sent to ten State Supervisors after not receiving their original return in a period of two weeks. An additional mailing was sent to two respondents. The percentage of return in Part II of this study was 100 per cent.
CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

INTRODUCTION

This chapter is divided into two parts. Part I sets forth findings relative to the educational preparation and teaching experience of Montana business education teachers in the areas of bookkeeping and/or accounting and in data processing. Part II analyzes the results secured from the State Supervisors having supervisory responsibility for Office Occupations Education. A comparison is then made between the results obtained from the Montana business education teachers and the State Supervisors in order to relate this study to conditions prevailing within the United States.

This chapter answers the general question: Are Montana business education teachers adequately prepared in accounting and in data processing and is their teaching consistent with current thought and methodology in this area; or are Montana business education teachers in need of an educational personnel development program that will upgrade accounting skills, encourage the introduction of computers in accounting and bookkeeping curricula, and also develop data processing and administrative system skills?
A. Educational Preparation

The role of the secondary school bookkeeping and accounting course is changing. The primary reasons for studying bookkeeping and related accounting fields have shifted considerably in the last few decades. At one time, the vocational educational values of the bookkeeping course could be stressed as of prime importance. Today, the value of the bookkeeping and accounting courses for economic understanding and general education are clearly as significant as its vocational value. The goal of education today is to help the individual understand all aspects of life. Economics of curriculum construction seem to make necessary a secondary school bookkeeping course which provides general educational values, economic educational values, and vocational educational values.

The emphasis in accounting education and practice has shifted away from the mechanistic bookkeeping approach to a more conceptual, interpretative, decision-guiding approach. Training of youth must now be in "conceptual" skills rather than "perceptual" skills. The student must be cognizant of the similarity of what is being taught with what is in actual use; he must understand concepts basic to the operation of our economy. The student must be given opportunities to utilize his grasp of broad concepts and to develop flexibility in their application. Data obtained for this study clearly indicates that very few business teachers in the State of Montana have been exposed to this new approach.
We must assume, too, that one of the primary goals of the secondary school bookkeeping and accounting course is to build a foundation for advanced study for our students. High school bookkeeping and accounting courses can and do provide a foundation that does possess general and economic educational values. However, data obtained in this study reveal that many business teachers in Montana are unable to provide job-getting knowledges and skills for students because their own knowledge in this area is extremely limited. It is clearly illustrated that business teachers of Montana are unable to provide the more functional approach to the teaching of bookkeeping and accounting for vocational competencies.

Table I presents the percentage of educational preparation of Montana business education teachers in several courses of accounting. From the data obtained, many weaknesses are evident in their educational preparation. Only 12.9 per cent have received more than one year of elementary accounting. It was established that 33.4 per cent of the business teachers in Montana have had no intermediate accounting course. More than 80 per cent have had no educational preparation in the related areas of managerial and cost accounting and over 90 per cent of the business teachers in Montana have had no preparation in the areas of governmental accounting and auditing.
<table>
<thead>
<tr>
<th>ACCOUNTING</th>
<th>NONE</th>
<th>LESS THAN 1 YEAR</th>
<th>1 YEAR</th>
<th>MORE THAN 1 LESS THAN 2</th>
</tr>
</thead>
<tbody>
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<td>Elementary</td>
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<td>24.4</td>
<td>62.7</td>
<td>12.9</td>
</tr>
<tr>
<td>Intermediate</td>
<td>33.4</td>
<td>32.4</td>
<td>27.4</td>
<td>6.8</td>
</tr>
<tr>
<td>Managerial</td>
<td>81.0</td>
<td>16.3</td>
<td>2.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Income Tax</td>
<td>66.9</td>
<td>28.5</td>
<td>4.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Auditing</td>
<td>96.5</td>
<td>3.4</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Governmental</td>
<td>93.0</td>
<td>6.8</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Cost</td>
<td>85.9</td>
<td>11.4</td>
<td>2.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>
With rapid changes in employment opportunities, shifts in the demands of labor, and with the rise of new technology and methodology, business teachers in the State of Montana will have to be trained and continuously retrained; otherwise, they will transmit their obsolescence to the many young people they teach. Montana business education teachers must keep up-to-date with occupational change, with employment opportunities, and with the many manpower needs in this country.

Electronic data processing, as recognized and applied in this modern age, has evolved only in recent years. Man has made more technological advances since the beginning of World War II than in all previous years combined. Electronic data processing came into being to meet an increasing need for information under increasingly complex conditions. The impact of automation, data processing, and systems analysis have brought about many changes in business practices and procedures. Manual procedures have been supplemented or replaced by the use of office machines, punched-card and punched-tape equipment, and computers. The standard journal-ledger accounting systems have been supplemented or replaced by journalless and ledgerless systems.

These changes, however, have been changes in tools and procedures, not changes in basic accounting principles. Although the techniques for processing data have been up-dated, the basic accounting concepts
have been retained but applied in different perspectives. Thus in our basic accounting course, the emphasis must be shifted from mastering manual techniques to mastering concepts that apply to all techniques, whether data is processed by hand, by machines, or by a computer. Data indicate that the business teachers in the State of Montana have not been exposed to these new concepts because their educational preparation in the area of data processing has been limited.

To be effective as a vocational course, high school accounting must teach the student how to master accounting concepts, enabling him to cope successfully with the variety of data processing techniques that exist in the business world. To be effective as a nonvocational course, high school accounting must provide the student with an understanding of accounting concepts that will enable him to see the relationship between accounting and the many other aspects of business. None of these course objectives can be achieved if the emphasis still remains upon the mechanics of bookkeeping; the emphasis must be upon accounting concepts.

The changes in the duties, title, and environment of the "old bookkeeper" must be reflected in our educational programs. Our objectives must be shifted to objectives that prepare students adequately for jobs in today's labor market. The emphasis must be shifted from the mechanics of bookkeeping to the concepts of accounting—concepts that provide full comprehension of systems and the various techniques of data processing.
The present and future of data processing will have a far-reaching effect upon the lives of all American people. It is a mark of progress for at least two reasons. First, it has made the processing of data more efficient and more accurate. Second, it has made possible the use of data that formerly were not available because of the expense involved in processing this information. The need for training a substantial number of competent specialists and technicians in this field cannot be overlooked. A Kiplinger release once stated, "Computers are becoming commonplace and are becoming a competitive factor. Studies indicate that by 1975 approximately three million people will be employed by data processing operations in the United States."¹ This is more than triple the number that is now employed, and it appears that the number will be increased by that time.

The computer, along with programmed learning and simulation, may prove to be one of the most significant educational contributions of the twentieth century. Important advances and changes made with the use of this relatively new tool have already helped business and scientific fields. The real impact and challenge for education is only in its infancy. The ability of electronic data processing and computer technology to handle, organize, calculate, process and print the growing mass of educational data make its increased use inevitable.

Business education teachers in Montana will have to meet the challenge that data processing presents. They must take on the new responsibility of becoming adequately trained in this area so as to meet the demands data processing has created on business education. They must become adaptable to changing social, economic, and business needs. The implications of the explosion of knowledge in data processing must impregnate the thinking of every business teacher in the State of Montana. The challenge to business education is to help students acquire an educational background which is appropriate to change in a total environment. Equally significant is the need to imbue students with an insatiable thirst to learn these new concepts and new technologies. It is imperative—if they are to contribute to the expansion of knowledge and help to create change.

Table II is representative of the educational preparation experienced by business education teachers in the State of Montana in specified areas of electronic data processing. Again, the deficiency of skills is clearly exemplified.
| DATA PROCESSING                        | LESS THAN 1 YEAR | 1 YEAR | MORE THAN 1 YEAR | LESS THAN 2 YEAR |\hline
| Unit Record Equipment Operation       | 91.3             | 8.7    |                 |                  |\hline
| Computer Programming:                 |                  |        |                  |                  |\hline
| a. Machine Language                   | 91.6             | 9.4    |                 |                  |\hline
| b. Fortran                           | 94.3             | 5.7    |                 |                  |\hline
| c. Cobol                             | 96.2             | 3.8    |                 |                  |\hline
| d. Others                            | 97.3             | 2.7    |                 |                  |\hline
| Systems Analysis or Design:          |                  |        |                  |                  |\hline
| a. Electronic Data Processing         | 91.6             | 8.4    |                 |                  |\hline
| b. Unit Record Systems                | 88.6             | 11.4   |                 |                  |\hline
Business teachers in Montana are poorly prepared in specified areas of data processing. The influence of electronic data processing has moved very slowly in Montana. Very few business teachers in the State of Montana have been exposed to it. More than 91.3 per cent of the business teachers in Montana have had no training in the operation of unit record equipment. The following figures indicate the percentage of Montana's business teachers who have had no training whatsoever in computer programming: Machine Language, 91.6 per cent; Fortran, 94.3 per cent; Cobol, 96.2 per cent; and in other languages, 97.3 per cent. In the area of systems analysis or design, 91.6 per cent of the business teachers in Montana indicated they had no educational preparation in electronic data processing, and 88.6 per cent of the business teachers in the State of Montana indicated they had no training in unit record systems.

B. Teaching Experience

Any thoughtful person who scans in broad perspective and with deep discernment the total educational program in this country cannot escape seeing the relationship of the school to the life of people. By their very nature, the schools should be oriented to the future. For the most part, they serve young people—young people who look forward to rich, productive, satisfying lives. This is America's promise to its youth.

Each business education teacher in the State of Montana assumes a great responsibility. What the business educator teaches—or in
unfortunate circumstances, does not teach—affects the quality of personal and social life and in the long run determines in great measure the values by which our young people live, the things they cherish, and the ends they seek to achieve. Ignorance and low human aspiration not only lessen one's ability to earn and his chance to contribute something worthwhile, but also lessen his freedom. The individual, who was not taught the competencies required for employment, is not as free as one for whom a wide range of occupational opportunities is open.

Today, the need is pressing for better and more up-to-date teaching. It is imperative that each business teacher in the State of Montana teach to meet the demands of his times. It is up to each business educator to evaluate and appraise his own teaching experiences to see if he is providing the best educational opportunities available.

Table III and Table IV are representative of the teaching experiences found in the areas of accounting and in data processing. These tables are representative of the teaching experiences found in the secondary schools of Montana. The data indicate that it has not been the responsibility of Montana business teachers to see that their teaching has kept pace with ever-growing educational demands. The results obtained for Table III are not necessarily surprising as these courses are usually not taught at the secondary school level.
<table>
<thead>
<tr>
<th></th>
<th>REGULAR</th>
<th>OCCASIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCOUNTING</td>
<td>FULL UNIT COURSE</td>
<td>FULL UNIT COURSE</td>
</tr>
<tr>
<td>Elementary</td>
<td>4.4</td>
<td>1.1</td>
</tr>
<tr>
<td>Intermediate</td>
<td>2.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Managerial</td>
<td>1.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Income Tax</td>
<td>2.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Auditing</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Governmental</td>
<td>2.0</td>
<td>2.0</td>
</tr>
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</table>
TABLE IV. PERCENTAGE OF TEACHING EXPERIENCE OF MONTANA BUSINESS EDUCATION TEACHERS IN SPECIFIED AREAS OF DATA PROCESSING

<table>
<thead>
<tr>
<th>DATA PROCESSING</th>
<th>REGULAR</th>
<th></th>
<th>OCCASIONAL</th>
<th></th>
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</thead>
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<tr>
<td></td>
<td>FULL COURSE</td>
<td>UNIT COURSE</td>
<td>FULL COURSE</td>
<td>UNIT COURSE</td>
<td>NONE</td>
</tr>
<tr>
<td>Unit Record Equipment Operation</td>
<td>-</td>
<td>1.1</td>
<td>-</td>
<td>3.0</td>
<td>95.9</td>
</tr>
<tr>
<td>Computer Programming:</td>
<td></td>
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<td></td>
</tr>
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<td>a. Machine Language</td>
<td>-</td>
<td>1.1</td>
<td>-</td>
<td>1.9</td>
<td>97.0</td>
</tr>
<tr>
<td>b. Fortran</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100.0</td>
</tr>
<tr>
<td>c. Cobol</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100.0</td>
</tr>
<tr>
<td>d. Others</td>
<td>-</td>
<td>-</td>
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<td>Systems Analysis or Design:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Electronic Data Processing</td>
<td>-</td>
<td>1.1</td>
<td>-</td>
<td>3.0</td>
<td>95.9</td>
</tr>
<tr>
<td>b. Unit Record Systems</td>
<td>-</td>
<td>1.9</td>
<td>-</td>
<td>5.7</td>
<td>92.4</td>
</tr>
</tbody>
</table>
Teaching experience, other than elementary accounting in Montana's secondary schools, has practically been nil. Yet, there is a tremendous and growing demand in business for persons who have competency in all areas of accounting. It is also a known fact that data processing is becoming vital; yet, very few classrooms in Montana have felt its influence. Table IV indicates that 95.9 per cent of the business teachers in Montana have not taught unit record equipment operation and 92.4 per cent have not taught systems analysis or design in the area of unit record systems. One hundred per cent of the business teachers indicated they were not teaching computer programming in the language of Fortran or Cobol, or other languages aside from machine language. Data processing is taught only to a slight degree in the State of Montana.

The critical ingredient in automatic data processing is human ability. Since business education teachers are and must be concerned with the development of human ability as it is needed in office occupations, business education teachers in Montana are faced with the problem of developing people so that they may meet the demands of new and exciting occupations on the labor market.

STATE SUPERVISORY PERSONNEL

In Part I, it was indicated that opportunities emanating from challenge were present. However, there were three problems involved in taking full advantage of them: selecting opportunities having the greatest potential, becoming alert to opportunities for advance-
ment, and being able to readily and willingly break sufficiently with traditional patterns of thought and practices.

Returns received from the State Supervisors of Office Occupations Education unanimously indicated there was a willingness and a readiness to make innovations possible and to foster growth and development of new concepts and new techniques. When asked the following question,

Would you say an Educational Development Program to upgrade accounting skills of teachers presently teaching accounting and/or bookkeeping in secondary schools would be beneficial?

96 per cent of the State Supervisors replied "yes." They indicated a distinct need for upgrading accounting and bookkeeping skills. With the advent of data processing and the growth of electronic data processing, there seems to be a growing acceptance that an educational development program to meet these needs would be both beneficial and desirable.

The State Supervisors were also asked what percentage of accounting and/or bookkeeping teachers in their state were estimated to be inadequately prepared in their accounting and data processing skills. Data received on these two questions are presented geographically avoiding identification of any particular state. The order of the states is randomly presented.

Table V represents responses from the New England states, Middle Atlantic states, Mid-West states, Plain states, Pacific states, and the Mountain-West states. Montana is represented in the Mountain-West region.
## TABLE V. ESTIMATED PERCENTAGES OF ACCOUNTING AND/OR BOOKKEEPING TEACHERS INADEQUATELY PREPARED IN ACCOUNTING AND DATA PROCESSING SKILLS

<table>
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<tr>
<th>REGION</th>
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<th>DATA PROCESSING</th>
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</thead>
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<td>PER CENT OF INADEQUACY</td>
<td>PER CENT OF INADEQUACY</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>a.</td>
<td>2</td>
<td>98</td>
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<tr>
<td>b.</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>c.</td>
<td>25</td>
<td>90</td>
</tr>
<tr>
<td>d.</td>
<td>15</td>
<td>95</td>
</tr>
<tr>
<td>e.</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>f.</td>
<td>15</td>
<td>75</td>
</tr>
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<td>MIDDLE-ATLANTIC STATES</td>
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<td></td>
</tr>
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<td>a.</td>
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<td>50</td>
</tr>
<tr>
<td>b.</td>
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<td>100</td>
</tr>
<tr>
<td>c.</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>d.</td>
<td>5</td>
<td>95</td>
</tr>
<tr>
<td>e.</td>
<td>25</td>
<td>75</td>
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<tr>
<td>f.</td>
<td>10</td>
<td>95</td>
</tr>
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<td>MIDDLE-WEST STATES</td>
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</tr>
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<td>a.</td>
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<tr>
<td>e.</td>
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</tr>
<tr>
<td>f.</td>
<td>100</td>
<td>?</td>
</tr>
<tr>
<td>g.</td>
<td>40</td>
<td>90</td>
</tr>
<tr>
<td>h.</td>
<td>40</td>
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<tr>
<td>i.</td>
<td>8</td>
<td>95</td>
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<td>SOUTHERN STATES</td>
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<td>a.</td>
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<td>b.</td>
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<td>c.</td>
<td>?</td>
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<tr>
<td>d.</td>
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<tr>
<td>e.</td>
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<td>99</td>
</tr>
<tr>
<td>f.</td>
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<tr>
<td>g.</td>
<td>?</td>
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<td>100</td>
</tr>
<tr>
<td>i.</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>j.</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>k.</td>
<td>60</td>
<td>98</td>
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<table>
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<tr>
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<tr>
<td>c.</td>
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<td>d.</td>
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<td>80</td>
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<tr>
<td>e.</td>
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<td>99</td>
</tr>
<tr>
<td>f.</td>
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<td>90</td>
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<table>
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<tbody>
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<td>a.</td>
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<td>99</td>
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<td>d.</td>
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<td>e.</td>
<td>5 - 10</td>
<td>90 - 98</td>
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<td>f.</td>
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<td>g.</td>
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<td>h.</td>
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<tr>
<td>c.</td>
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<td>80</td>
</tr>
<tr>
<td>e.</td>
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</table>
The last question asked the State Supervisors brought many different responses as to the varied means of how the teaching and or the use of the electronic computer was being encouraged. The following question was asked the Supervisors:

Do you encourage the teaching of concepts and/or the use of the electronic computer at the secondary school level? If so, how is this being accomplished?

Table VI illustrates the extensiveness of encouragement to the teaching of concepts and/or use of the electronic computer at the secondary school level.

**TABLE VI. PERCENTAGE OF EXTENSIVENESS OF ENCOURAGEMENT TO THE TEACHING OF CONCEPTS AND/OR USE OF THE ELECTRONIC COMPUTER AT THE SECONDARY SCHOOL LEVEL**

<table>
<thead>
<tr>
<th>Extent of Encouragement</th>
<th>Per Cent of Response</th>
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<tr>
<td>The Teaching of Concepts and/or use of the Electronic Computer was Strongly Encouraged</td>
<td>53</td>
</tr>
<tr>
<td>The Teaching of Concepts and/or use of the Electronic Computer was Encouraged very little</td>
<td>14</td>
</tr>
<tr>
<td>The Teaching of Concepts and/or use of the Electronic Computer was not being Encouraged</td>
<td>33</td>
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</table>
Many reasons were given as to how the teaching of concepts and the use of the electronic computer were being encouraged. The following statements were received:

1. Vocational education courses
2. Unit in subject areas
3. Practice sets
4. Simulation
5. Bookkeeping and data processing curriculums
6. Workshops
7. Programs in punch card and automated recordkeeping
8. Orientation courses
9. Pilot programs through laboratory approach
10. Unit record equipment and computer installations
11. Teacher training

The following reasons were offered why the teaching of concepts and the use of the electronic computer was being encouraged very little if at all:

1. Inadequate funds
2. Little hardware
3. Individualized difficulty in teaching methods of presentation
4. No evaluation as yet
5. Remains in developmental stage
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

This study was made in an attempt to determine whether or not an interdisciplinary program of training for teachers of accounting and bookkeeping in Montana secondary schools would be beneficial. Such a program would be designed to:

1. Upgrade the accounting skills of teachers of bookkeeping and accounting in secondary schools,
2. Encourage the introduction of computers into accounting and bookkeeping curricula in the secondary schools, and
3. Develop data processing and administrative system skills.

This study involved two distinct phases. Phase I attempted to analyze and identify the educational preparation and teaching experience of Montana's business education teachers in the related areas of bookkeeping and accounting. It was also aimed at determining and identifying the educational preparation and teaching experience in related areas of data processing. Preparation and teaching experiences were then evaluated to determine if it was cognizant to the changing demands created and developed by automation. Phase II of the study
utilized the aid of State Supervisors. They related estimates illustrating nationally the percentages of deficiency of all secondary business education teachers in the areas of bookkeeping and/or accounting and in areas of data processing. Comparisons were then made between conditions prevailing in the State of Montana with those throughout the United States.

The basis of this investigation grew out of the apparent emphasis that has been placed on accounting education and practices—the trend away from the conventional methods to include electronic data processing and computer based systems.

Three hundred fifty-four business education teachers in the State of Montana and fifty-one State Supervisors were asked to participate in the study. A questionnaire was sent to business teachers asking them to supply information relating to their educational preparation and teaching experience in areas of bookkeeping and/or accounting and in data processing. The State Supervisors were asked to estimate percentages of inadequacy they felt their business teachers had in these areas and if a developmental program covering these areas would be beneficial. They were also asked if they encouraged the use and the teaching of concepts relating to the electronic computer at the secondary school level.

A 77 per cent return was received from the Montana business education teachers. A 100 per cent return was received from the State Supervisors.
A. Business Education Teacher Personnel

The impact of automation has definitely presented a challenge to teachers of accounting and/or bookkeeping in the State of Montana. Many weaknesses in educational preparation and in their teaching was clearly evident.

Montana business education teachers definitely substantiated the need for a program to foster and further develop their education in the areas of accounting and in data processing. The majority of business teachers in Montana have had no accounting education beyond the elementary accounting course. Only a very small percentage of the business education teachers in Montana have had any educational preparation in the areas of unit record equipment operation, computer programming, and systems analysis or design. The same pattern holds true in their teaching practices and methods. Elementary accounting is the only accounting instruction that is being offered in most of the secondary schools in Montana. Data processing is not being taught to any appreciable degree. Educational preparation and teaching experiences were found to be exceedingly confined in this area.

Educational researchers have made many significant findings in the areas of accounting and in data processing. It is distressing when one considers the tremendous time lag between the initial research findings and the implementation of these findings. In short, it seems that a massive and radical redesign of educational preparation
and teaching practices is imperative for business education teachers in the State of Montana. To bring this about, a coordinated planning and developmental effort, involving a variety of purposes and functions, is necessary in Montana.

B. State Supervisory Personnel

The responses received from the State Supervisors definitely indicated that teachers throughout the United States were inadequately prepared and trained in the areas of bookkeeping and/or accounting and in the areas of data processing. Not only the business education teachers in Montana, but the business teachers on a national scale, seemed to be deficient in terms of performance competencies which comprise these two subject areas. An expressed distress was very real in the responses received.

The extensiveness of encouragement of teaching and/or the use of the electronic computer at the secondary level varied depending upon conditions prevalent in the respective state. The teaching and use function, relative to its utilization, relied upon the theory and practice of learning, communication and systems analysis where behavioral objectives were defined, media options considered and selected, teaching strategies specified, and evaluative procedures established. Sixty-seven per cent of the responses favored, to some degree, the encouragement of teaching concepts and use of the computer at the secondary school level.
Ninety-six per cent of the responses favored an educational development program to help business teachers upgrade skills and competencies in the areas of accounting and in data processing. Many State Supervisors clarified their statements by saying in effect that an educational development program to upgrade accounting skills would not only be beneficial, but was necessary.

CONCLUSIONS

This study supports the generalization that Montana business education teachers, as well as business education teachers across the United States, are deficient and inadequately prepared in their accounting and data processing skills; and, their present teaching experience in the areas of accounting and in data processing are not commensurate in subject matter competence.

State Supervisors are very much aware of the existing need which teachers of accounting and/or bookkeeping face, and do recommend a program of development to upgrade skills and competencies in this area. Workshops, vocational education courses, pilot programs, simulation, and laboratory installations were only some of the methods that were being used to foster improvement in this area.

The present and future of data processing and its importance seems to have a wide effect throughout the United States. The use of the computer and the teaching of its concepts were found to be encouraged nationally.
RECOMMENDATIONS

Based on the findings for this study, the following recommendations are made:

1. That educational institutions engaged in the teaching of accounting and in the teaching of data processing be encouraged to foster similar research so that comparisons could be created to substantiate the findings in this study.

2. That educational institutions engaged in the preparation of business education teachers be encouraged to incorporate as much integrated data processing and electronic data processing as possible into their curricula.

3. That educational institutions engaged in business teacher training be encouraged to experiment in the area of accounting and data processing in order that further insight be provided for future research in this field. Thus far, relatively negligible work has been done in this area.

4. A better perspective and understanding of data processing, its role and its functions, must become a requisite of all business education teachers. This need applies to all who aspire to positions involving fields of business education.

5. Business educators must constantly attempt to look ahead in order to plan for the future. Therefore, an educational development program should be chartered to upgrade skills and competencies in the comparable and interrelated area of accounting and electronic data processing.
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A. BOOKS


B. PERIODICALS


MacDonald, Robert D. and William T. Will, "The Principles have not Changed, only the Methods." Business Education Forum, 19:19, April, 1965.


Dear Business Teacher:

The impact of automation has presented a challenge to teachers of accounting and bookkeeping in our secondary schools.

In order to meet this new challenge and new responsibility, the University of Montana is developing a program that will:

1. Upgrade the accounting skills of teachers of accounting and bookkeeping in our secondary schools,

2. Encourage the introduction of computers into their curricula, and

3. Further develop data processing and administrative systems skills for those who can serve as administrative advisers, vocational guidance counselors, or as EDP teachers.

Your assistance in answering the questions on the attached questionnaire would be appreciated so much. This is our second request. Your signature on the enclosure merely enables us to maintain a representative sample. All information will be reported in a group analysis. An addressed envelope is enclosed for your reply.

Sincerely,

JoAnne M. Breunhold
Business Education Department

enclosures
EDUCATIONAL PERSONNEL DEVELOPMENT PROGRAM QUESTIONNAIRE
FOR TEACHERS OF
ACCOUNTING AND/OR BOOKKEEPING IN SECONDARY SCHOOLS

Please answer the following in regard to your educational preparation and teaching experience in relation to accounting and data processing.

EDUCATIONAL PREPARATION

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<tr>
<td>Unit Record Equip. Operation</td>
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</tr>
<tr>
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<tr>
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TEACHING EXPERIENCE

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Name: ___________________________
School: _________________________
Address: _________________________
April 19, 1968

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Sincerely

[Signatures]

Dr. Donald B. Koeppen, Chairman
Business Education Department

JoAnne M. Breholt
Graduate Assistant

enclosures
EDUCATIONAL PERSONNEL DEVELOPMENT PROGRAM QUESTIONNAIRE

for teachers of

ACCOUNTING AND/OR BOOKKEEPING IN SECONDARY SCHOOLS

Please answer the following questions relating to teachers of accounting and/or bookkeeping in your state:

Would you say an Educational Development Program to upgrade accounting skills of teachers presently teaching accounting and/or bookkeeping in secondary schools would be beneficial?

In your estimation, what percentage of accounting and/or bookkeeping teachers in your state are inadequately prepared in their accounting background?

In your estimation, what percentage of accounting and/or bookkeeping teachers in your state are inadequately prepared in the data processing area?

Do you encourage the teaching of concepts and/or use of the electronic computer at the secondary school level? If so, how is this being accomplished?

COMMENTS OR RECOMMENDATIONS:

Name:

State: