

INTEGRATING OFFICE SYSTEMS TECHNOLOGY INTO THE
BUSINESS EDUCATION CURRICULUM AT THE
TWO-YEAR POSTSECONDARY LEVEL

by

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ABSTRACT

The purpose of this study was to examine and evaluate business curriculums in postsecondary institutions which have implemented or are planning to implement office systems technology.

The survey instrument was mailed to 240 community colleges throughout the United States, from which 82 usable returns were received.

These replies were tabulated and analyzed. Based on the findings of the study and the review of literature, a model curriculum in office systems technology was developed for the two-year postsecondary level. In addition, procedures were developed for integrating office systems technology into existing business curriculums at the postsecondary level.

The research findings led to the identification of the following trends in office systems technology curriculums at the postsecondary level: 1) the role of word processing is expanding to include teaching concepts of CAR, COM, micrographics, information processing, electronic mail, facsimile, office systems and telecommunications; 2) data processing continues to be an important component of an office systems technology curriculum; 3) information processing, computer graphics and office systems are of growing importance to an office systems technology curriculum; 4) education experiences in data processing, word processing and information processing should be both theoretical and hands-on; 5) the importance of oral and written communication skills in an office systems technology curriculum is evident; 6) a general education core in office systems technology curriculums is identified which includes the courses of English, mathematics, speech and psychology.

The writer recommended the following office systems core in office systems technology curriculums at the postsecondary level: Typewriting, accounting, business math, business communications, word processing concepts, office procedures, records management, machine transcription, computer systems/data processing, information processing, office machines, and office management.

CHAPTER I

INTRODUCTION

The order of the day is change and transition; transition from the traditional office to the automated office. Since most of the presently required elements of an automated office have been built, the challenge is to integrate them into an office system that will operate efficiently and effectively. Nardone (1982:297) states:

"The automated office promises to be quite a different place to live and work in than the one we have known. In the 1980s and 1990s, we will see increased integration of various technologies and systems in the office. Voice processing, micrographics, reprographics, telecommunications and word and data processing integration will be but a few areas where new developments for the office will be taking place."

Three current writers (Bear, Marwick and Mitchell) in office automation literature have stated that the majority of the senior executives surveyed are planning an automated office; 70 percent of the offices are already using word processing and/or facsimile transmission. (Chorafas, 1984:15) Primer (1983:22) states the success of automating office operations in many organizations will be determined by the level of employee acceptance of office automation, not by the technology that is used. A significant contribution can be made in acceptance of automated office systems by acquainting business students with the office automation concept--the more individuals know about the concept, the more willingly they will accept its use.

Milbergs (1982:4) concludes that there never has been such a demand for so many technical workers and so few qualified people. Business and office education programs have been traditionally designed to provide career preparation opportunities for students who plan to work in business and office occupations. As office technology advances to new levels, business educators must continually monitor these trends of changing office conditions in order to ensure that business curriculums incorporate the appropriate skill levels, attitudes and knowledge.

STATEMENT OF THE PROBLEM

The purpose of this study was to examine and evaluate business curriculums in postsecondary institutions which have implemented or are planning to implement office systems technology. Specifically, this study focused on the following:

1. Identification of existing trends in office systems technology curriculums at the postsecondary level.
2. Development of procedures for integrating office systems technology into existing business curriculums at the postsecondary level.
3. Development of a model office systems technology curriculum utilizing current state-of-the art information from existing office systems technology curriculums in community colleges and related literature dealing with office systems technology.

NEED FOR THE STUDY

A variety of business curriculums are available to students enrolled in two-year postsecondary programs. The main focus of these

curriculums has been to provide a program for students to become employable and/or to provide transfer education to four-year colleges or universities. In order to develop a curriculum to achieve occupational proficiency in today's business community, curriculums must provide students with the necessary skills not only for the conventional office but also for the more sophisticated automated office.

In 1980, information workers constituted approximately 50 percent of the U.S. workers, far outnumbering other service occupations. By 1990, it is estimated that 75 percent of the U.S. work force will be employed in jobs related to information processing.

During the 1980's, business office occupations will account for the most significant increase in jobs. The U.S. Bureau of Labor estimates that more than 685,000 office job openings will be available annually between 1980 and 1990.

In the past, training of personnel for business office occupations traditionally included technical training in typing, shorthand and duplication processes. Now and in the future, these jobs will require a different kind of education--education for an automated office.

As more and more offices introduce computer-based equipment into the office work environment, the demands on the office staff have grown beyond the technical skill level to include those higher-level skills such as decision-making, time management and priority setting. Yet some educators, as well as business people, feel that

insufficient curricular changes have been made to accommodate not only the operational demands of the new equipment, but also the changes that have occurred in office practices and procedures as a result of the increased use of automated equipment and systems. (Stouffer, 1982:13)

Chorafas (1982:ix) has succinctly pinpointed the effects of this resistance to change:

"To deny the need for a transition does not prevent change; it only postpones it. Apart from falling behind the competition and losing leadership in one's own markets, this assures that when change does come it will cause much greater pain, conflict upheaval and disruption."

The required elements of an automated office have already been built; the need is for business educators to develop a curriculum which incorporates the needed skills and technologies that develop the student's potential to function in such a setting.

LIMITATIONS OF THE STUDY

The population to which the questionnaire was sent was limited to a random sample of private and public community/junior colleges in the United States. Another limitation is that the technologies presented in the questionnaire were derived from current literature regarding office systems technology.

The model curriculum was developed from questionnaire information revealing current state-of-the-art office systems technology, respondent perceptions of which office systems technologies should be included in business curriculum and from current literature regarding office systems technology.

DEFINITION OF TERMS

To insure clarity for the reader, certain terms which will be used throughout the text are defined. According to Wagoner (1984:293) office automation terms can be defined in the following ways:

Office Automation Systems. Systems that offer word processing as part of a bundle of office functions including (but not limited to) electronic mail and message distribution; administrative functions such as calendaring, scheduling. These systems are perceived as being directed to a more general business audience than correspondence secretaries--administrative staff, professionals, managers and executives.

Integrated Systems. Systems that do not differentiate between word processing and other functions (such as data processing). Such systems permit multiple functions to occur simultaneously and permit the user to combine text and data in a single application.

Information Processing Systems. Office scenarios that assume a system in which all kinds of business information will be freely accessible to any level of worker within the necessary security restrictions.

Networking. A series of points interconnected by communications technology. The fully automated office environment will not deal with separate technologies but rather with networks of technologies. Information introduced into the network through any one device could be available to every other point on the network. The fully

automated office will consist of networks of separate yet interdependent technologies.

ORGANIZATION OF THE STUDY

This research project is organized into five chapters. Chapter one is the statement of the problem, the need for the study, the limitations of the study and the definition of terms.

Chapter two includes a review of literature and has been divided into 1) the examination of current technologies affecting the office environment and 2) the implications of these technologies on business curriculums.

Chapter three is a review of the procedures used in completing this project. This chapter covers the sources of data, design of the survey instrument, administration of the survey instrument and compilation and analysis of the data.

Chapter four contains the results of the study. Findings of the questionnaire are presented and analyzed.

Chapter five summarizes the study. It also includes the conclusions and recommendations of this research project.

CHAPTER II

REVIEW OF LITERATURE

The automated office is clearly widespread today and not the elusive dream "office of the future." Patricia Seybold, editor-in-chief of The Seybold Report on Word Processing refrains from using the term "office of the future" because, she explains, "The thing about the office of the future is that it will always remain in the future." (Rockhold, 1982:72)

Rockhold (1982:66-67) talks about the automated office and how its technological changes are going to affect personnel:

"We do not believe that the transformation in which we are all engaged consists of simply automating the annual and mechanical processing in the offices. We believe that the implementation and evolution in the use of office technology will dramatically change the way we work and interact. The office system to which we refer goes beyond hardware and software. It includes people and feelings and information exchange and new ways of working.

It is people who make up the office and people who will make or break any office automation system. The biggest fear among employees is that office automation will mean lost jobs. However, there seems to be a fundamental change taking place; more people are not only accepting computer technology; they

are insisting on it. The same people, who, a generation ago, clamored for an electric typewriter to replace a manual machine, are now begging for word processors or CRTs because the benefits have become obvious to them."

The technological revolution has enveloped the business office. This revolution is requiring a host of new qualifications in its work force and these qualifications must be addressed by those individuals responsible for meeting the training needs for office personnel--business educators.

Since the office technology curriculum is so closely intertwined with the office, the review of literature began with an examination of current technologies affecting the office environment. The implications of these technologies on business curriculums were discussed in part two of the review.

Office Automation Systems

1983 was a pivotal year in the evolution of office automation systems as several major transitional forces began to have an effect on office automation (OA) in the office. According to Jackson (1983:35), three major driving forces acted upon the OA market:

1. The growing acceptance by senior decision makers of the potential benefit of such systems.
2. The technology, which years ago was an impending force, is now a driven force.
3. U.S. industry's competitive pressure to enhance its organization productivity and improve its responsiveness.

The trend in office automation evolution is total integration--the ability to combine various OA functions into a single, powerful, yet easy to use system. (Pomerantz, 1982:24). This system integration will come from simple, multifunction devices through large, totally flexible OA networks.

The most rudimentary integration is Data Processing (DP) and Word Processing (WP). According to the report, "The Status of the Automated Office" written and published by Management Information Corporation, the distinction between word and data processors is becoming increasingly unclear. "Most word processors, today" states the report, "Possess some...features that could well be true data processing features...(and) virtually all the small computers have text processing features available." (Pomerantz, 1983:24). This integration will especially be used by small business because of its net support-cost reduction.

Beyond the basic WP/DP integration are a host of systems that combine any number of technologies and functions. Integration of facsimile systems, electronic mail and CAR systems with WP/DP work stations is the coming vogue. (Pomerantz, 1983:26)

Eisen and Carrell (1982:45) define integrated systems in four levels:

1. Level I - Simple multifunction systems which use similar hardware to perform a variety of tasks. Personal computers, for example, can be used to spreadsheet and to edit.

2. Level II - Limited data processing integration in which systems most commonly take the form of an integrated text-data system. Through the use of optional software, these systems permit sorting, records processing, forms entry and other advanced functions.

3. Level III - Integrated communicating systems that perform both local processing tasks and communicate with other systems. The first generation of systems are being announced that integrate such areas as facsimile devices capable of directly receiving and converting the output of word processors and computers.

4. Level IV - Integrated Networks - An integration still in its infancy, it allows means for dissimilar systems to easily and transparently communicate with each other through local area networks.

Although some radical new technologies will be part of the integrated systems of the future, Eisen contends (1982:45) the majority of integration opportunities will come from combining existing standalone technologies. An example of this is apparent in the area of information management.

In information management, two significant technologies are already making a significant impact of OA systems. Microfilm systems that can be directly linked to mainframe computers (computer output microfilm--COM) and computer-aided search and retrieval (CAR) of individual documents are already in wide-spread use. (Eisen, 1982:45)

Over 6,000 COM systems are installed world-wide with industry estimating that over 30 percent of print data output by mainframes is on microfilm. That's expected to increase to 36 percent by 1990. (Pomerantz, 1983:55)

Pomerantz (1983:47) views CAR as the synergism between the highly cost and space effective technology of micrographics and the fast, effective data base management capabilities of computers.

Eastman Kodak credits the recent advances in CAR to new developments of user-friendly software. New software offers users an unlimited number of data-entry and retrieval fields, along with the ability for users to determine their own application format and screen displays. Most can even be modified without reprogramming. (Pomerantz (1983:47)

Frost and Sullivan predict a 35 percent growth in CAR. As the role of the computer in offices continues to grow, so will the future status of CAR. (Sample, 1983:51)

A prototype technology in information management is optical disk. This technology uses laser or electronic technology to imbed data into the recording medium, just as microfilm or microfiche uses photography to imbed data on film.

Most experts agree that although a typical optical disk can hold more than 6,000 pages of images, along with 150 kilobytes of digital information, its high cost and uncertain predictions of life span means the disk will have little impact on OA systems for the next five to ten years. (Gerber, 1982:82)

With the profusion of desktop computers in businesses of all sizes, a highly touted, but largely undelivered OA technology is coming into its own--electronic mail. (Seymour, 1984:24)

Seymour (1984:25-26) describes four different EM systems:

1. At its simplest, EM may consist of a subscription to third-party EM mailbox services such as OnTyme, GTE's Telemain, The Source or CompuServe. With these services, the user can send EM messages to and receive them from other subscribers of the same service, using terminal, personal computer or communicating word processors.

2. Using an existing communicating word processor or microcomputer either for all or only part of the time to send and receive all the company's electronic messages. This system involves connecting the WP or Micro to a modem--and thus to a telephone line. Jones Engineering Assoc. was an early user of this kind of in-house EM system. Less than satisfied with existing available EM software, they developed and now sell E-Mail, one of the easiest to use micro-based EM packages.

3. Using microcomputers both as dumb terminals that simply access electronic mail systems and as unattended send-and-receiving host systems. This trend is gaining momentum as the processing speed and on-line-information capability of micros increases.

4. Large EM systems that reach beyond single-site, or even single-country connections. The Bank of America has run an increasingly sophisticated electronic mail system from its corporate

headquarters in San Francisco since the early 1970's. Today, that system uses satellites and other advanced, high-speed communications links to maintain a worldwide EM network for bank officers' use.

According to Seymour, (1984:30) all EM systems have shared one critical problem: what to do with those correspondents "outside the loop", i.e. those using in-house, closed EM systems can correspond only with other employees connected to that system. In October, 1983, MCI introduced what it believes is a universal link: MCI Mail. MCI offers four options: (Seymour 1984:30)

1. Instant terminal-to-terminal delivery via an MCI electronic mailbox. This service allows different types of systems to communicate with one another provided on a cost-per-message arrangement

2. Use of couriers to hand-deliver hard-copy messages to recipients who do not have EM systems.

3. Tie-ins with the U.S. Postal Service. A message is transmitted electronically to the MCI postal center nearest its destination. The post office then makes the local delivery.

4. The firm will soon introduce telex link for users of WPs who want to communicate via MCI with users of other brands of WPs.

Pomerantz, (1982:41) states that business executives include another technology when discussing EM systems--Facsimile. Estimated to represent at least 50 percent of the total electronic mail market today, most experts believe the facsimiles incompatibility with other computer-based office systems such as WP, has made fax growth reach a maturation point and predictions state their growth will drop off.

Telecommunications systems (Level III) is the area that is receiving much of the attention in OA systems. In simplified terms, telecommunications refers to the electronic transfer of data from one point in an information system to another. In today's office, however, telecommunications is viewed as the tool for linking computers and/or systems to expedite the exchange of business information. Its ultimate goal would be to create a totally interconnected world. (Wagoner, 1984:136)

Telecommunications is a highly technical field and requires in-depth study to understand. Wagoner states (1984:136) that certain basic understandings are useful and this review will focus on areas which many experts believe to be of major importance to OA systems.

Fiber optics are believed to be the cable of the future. (Wagoner, 1984:141) In fiber optics, strands of hair-thin glass fibers transmit light. Because fiber optics use light to transmit instead of electrical current, there is no current or voltage hazard especially in working environments where flammable and explosive material is present. Light is also a more efficient transmitter of signals than electricity. AT&T is currently using optical fibers in its telephone networks. In reprographics, manufacturers are starting to use fiber optics to replace the lenses and mirrors that transmit images in copiers. (Wolff, 1983:15)

According to Wagoner (1984:141), significant progress in communication satellite transmission technology has for the first time made feasible the widespread local use of the satellite's vast

communication potential. The major barrier to its use before was cost; however, technological advances is permitting a consistent downward cost trend which is predicted to significantly increase use of telecommunications.

Wagoner (1983) contends that the most dramatic advance in office automation technology has been the ongoing development of methods and devices to interconnect data processing, word processing, dictation systems, OCR, micrographics, phototypesetting, management workstations, records management--all of which have developed separately and with their own technology. Telecommunications is the medium whereby all of these separate technologies will become interconnected. Through it, information introduced into one device will become available to every other device on the network.

The introduction of networks is important to OA systems for many reasons. Networks provide the capabilities of an increasingly powerful array of office technologies to every office worker in every office location. Traditionally, offices have tended to be organized around separate technologies with data processing departments, word processing departments, telecommunications departments, etc. With the introduction of networking, each of these technologies becomes a subset to the overall network or system. Each technology continues to perform certain stand-alone operations, but the primary thrust will be toward the integration of all technologies. (Wagoner, 1984:148)

Replication and distribution technologies are also in the state of change in OA systems. According to Wolff, (1983:20) four major

technologies are changing reprographics: fiber optics (discussed earlier), intelligent copiers, laser printers and integrated phototypesetters.

Intelligent copiers are non-impact printers or copy machines that combine technologies from data processing, photocopying and typesetting. The system can function as a printing unit, a text processor or a device that can communicate with other office equipment and a convenience copier. (Wolff, 1983:20-21)

Laser printers can accept digital electronic input from computers and word processors; store or transmit it electronically and print paper copies. Although most observers emphasize that the print quality of laser printers is lower than that of intelligent copiers, it will continue to play an important typesetting role in integrated systems. Interleaf's Boucher contends that laser printers will be continued to be used for most business applications and integrated phototypesetting for more sophisticated printed needs. (Pomerantz, 1983:32)

Phototypesetting equipment has been used in large organizations for quite some time, however, the thrust is towards integrating this technology with computers, word processors and graphics. This integration permits electronically stored information to be transferred to a phototypesetter without rekeyboarding.

Another OA technology entering OA systems is graphics. According to Wagoner (1984:182), a graphic representation is the best way to discover, understand, and communicate the meaningful data often

hidden in output tabulations. Recent advances have put computer graphics within reach of even the smallest businesses. Of particular interest is the development of low-price, high quality pen plotters that are compatible with many microcomputers. (O'Rourke, 1983:47) According to research by International Data Corporation, the market for computer graphics will grow tremendously in the next few years. (Wagoner, 1984:185)

Office systems technology is becoming increasingly complex as new technology enters the market yearly. In order to work with this technology, office employees will have to work with multifunctioning computer-based systems in which word processing, data processing, information management, telecommunications, graphics, electronic mail, and reprographics are all integrated through similar electronic hardware and software. Office jobs will increasingly be those requiring high involvement with equipment with offices spending larger sums of money to obtain equipment which will improve productivity.

According to Chorafas (1982:3), finding more productive ways to do things is what the new office automation is all about. Computers, communications and business machines at large are effective productivity engines. As time passes, technical innovation makes them faster, more reliable, and easier to use--and the price keeps going down. The rising productivity that information "engines" make feasible translates into the benefit side of the balance sheet, i.e. decreased costs.

Traditionally, training of office personnel has been the charge of business educators. As office systems technology advances to new levels, it is imperative that business educators monitor these trends and look at their implications on office technology curriculums.

Implications for Business Education

Educators must be concerned about preparing students for a tight job market--one that is requiring new technology-related skills. Surveys (Guthrie, 1983:56) are showing that by 1990, an estimated 75 percent of all jobs will be related to information processing. "By exposing students to a technological environment now," explains Schmidt, (Guthrie, 1983:56) "we're not only helping them to feel basically comfortable with the equipment, we're also better preparing them for any business job."

Two-year postsecondary programs have traditionally operated in an atmosphere which welcomes and encourages change. Its curricular offerings have been in accordance with the education needs and requirements of its students and the business community. (Stouffer, 1982:21) Begeman (1982:120) further predicts that these institutions will enroll greater numbers of students who will be preparing for jobs or upgrading skills in the area of information processing.

With this rapid change of environment in OA offices, business educators must analyze not only how to prepare today's students for entry into the office system, but also how to prepare them for adaptation to constant change and the needs for continuing education. (Stouffer, 1982:11)

Business educators at the two-year postsecondary level must consider what curricular revisions and alignments are needed in order to provide programs which provide strong backgrounds for either further study or immediate entry success in the automated office. Business educators must realize that office technologies such as data processing, word processing, graphics, reprographics, micrographics, electronic mail, and telecommunications are not separate, discrete or independent developments. Offices are combining these technologies to achieve maximum office efficiency and office worker productivity at the lowest possible cost. (Boyd and Langemo, 1981:72)

Although business educators should not rush blindly into restructuring their courses and curricula simply because of changes in modern offices, they need to examine existing and future changes of the business community. The business world is clamoring for increased productivity and office automation is a means of reaching this goal. (Boyd and Langemo, 1981:72)

Owens (1982:14) states that everyone--students, teachers, and office personnel must adopt and maintain a positive attitude toward change. Continuous advances alter the technology which students are studying, teachers are teaching and office personnel are using in the automated office.

Wood (1983:303) defines three broad categories of workers in the high-tech office:

1. Workers who were already employed in offices during the technological revolution. To maintain their positions, these workers

trained on new equipment and developed new skills as the equipment was introduced into their businesses.

2. Workers who are entering office work as a second-choice career because of the lack of available positions in their chosen field.

3. People entering offices for their first work experience in the electronic office environment. Business firms rely on in-service education or business office training conducted by secondary and postsecondary schools or colleges for these people.

Wood goes on to further define an emerging new generation of middle managers who are trained in school in the use of the computer as a tool for managerial decision making that provides better information more efficiently. These managers command information processing systems from executive workstations. As these executives move to higher levels of responsibility, it is expected that their information processors will accompany them.

Wood (1983:303) further charges that business curriculums need to evaluate their programs to determine their relevance to the OA environment to insure these curriculums are providing well-trained personnel to meet these demands.

A doctoral study, by Bonita Stouffer, was completed in 1982 in an effort to determine what business educators at the postsecondary level perceived as the most important issues from the automated office and their recommendations regarding the resolutions to the issues. Two groups were involved in the study--business educators

currently teaching at the two-year postsecondary office technology level, and business education leaders located nationwide who were currently researching and/or publishing relative to the automated office.

According to Stouffer, the results were as follows: (1983:133)

1. Proficient language arts skills are of primary importance for future office employees.

2. The increased importance of both oral and written communication skills.

3. A decreased emphasis or growing uncertainty regarding shorthand as a requirement for all students.

4. The equal importance of technical and nontechnical skills for office workers both entry-level and career advancement.

5. An area "cluster" approach at the two-year level with students receiving a broader background preparing them for a variety of job positions.

6. In the technical areas of telecommunications, micrographics, and reprographics, an emphasis on the concepts, terminology, and systems, rather than hands-on training.

7. The "key role" of word processing in the program both as a core requirement and a specialty area of study.

Respondents in the study clearly indicated that regardless of the focus (entry-level or career advancement) the two-year program must provide equal emphasis on the development of technical and nontechnical skills in the business student. The findings of the

study enabled the writer to provide some guidelines that would assist in curriculum development in office technology programs. The study also concluded that students in the two-year postsecondary program must develop an awareness of the automated office and the "transitional" office which exists today. Likewise, business educators must realize the office technology curriculum will continue to be in a transitional state, and they, as faculty must be prepared to make adjustments and reassessments to curriculums as conditions warrant. (Stouffer, 1982:167)

Three major areas in office systems technology is becoming increasingly complex as new technology enters the market yearly--micrographics, reprographics and telecommunications. The equipment is too expensive for schools to purchase, but the question remains as to how familiar students need to be with the procedures, terminology and systems in order to be able to exercise good judgment and decision-making regarding the most cost-effective systems to use in varying circumstances. (Stouffer, 1982:64) Van Huss (1981:20) emphasizes that because of the telecommunications-based networks, the "systems approach" to office functions has been facilitated and students must develop an appreciation for the interdependency and interrelatedness within the office. The systems concept must be taught and can be incorporated into an already existing course as a learning module; developed into a course of its own (where the emphasis is on projects such as in-baskets and simulations and the focus is on the process as much as the content); or through on-the-job work experience as an intern. (Stouffer, 1982:64)

Some major decisions have to be made for integrating office systems technology into the business curriculum--the selection of content and the learning activities appropriate for the content. Educators charged with providing these programs at the postsecondary level, should be aware of the issues, changes and impact of the automated office. Changes are occurring--task analysis studies can provide educators with a base from which to formulate or evaluate office technology programs. Stouffer (1982:80) also contends that some "futuristic" thinking is also necessary. Students must be prepared to meet not only the demands of today's office but that of the next 5, 10, and 15 years.

The success of automating office operations in many organizations will be determined by the level of employees acceptance of office automation, not by the technology that is used. Teachers of business and office courses can make a significant contribution in the widespread acceptance of automated office systems by acquainting their students with the office automation concept. (Quible, 1983:22)

Summary

After reviewing the current literature about automated office systems, a key point should be made that careers available to students in the two-year business curriculum will range from the traditional office positions, to working in transitional office situations, to positions employing high-level technical skills in ultra-sophisticated automated office systems.

Projections for the automated office all seem to emphasize that a shift must be made from teaching the more traditional office skills to including the concepts of the automated office. To reflect this change, business education programs must shift from teaching skills and mechanics of the office to the concepts of systems. It must teach the students an understanding of concepts, terminology, attitudes and skills so he/she can more successfully adjust to changing office environments.

CHAPTER III

PROCEDURES

The purpose of this study was to examine and evaluate business curriculums in postsecondary institutions which have implemented or are planning to implement office systems technology. Specifically the study focused on the following:

1. Identification of existing trends in office systems technology curriculums in community colleges.
2. Development of procedures for integrating office systems technology into existing business curriculums at the postsecondary level.
3. Development of a model office systems technology curriculum utilizing current state-of-the-art information from existing office systems technology curriculums in community colleges and related literature dealing with office systems technology.

The procedures used in this study were divided into six phases: Review of literature; development of the survey instrument; selection of participants for the study; administration of the survey instrument; analysis of data and presentation of findings; drawing conclusions and making recommendations.

REVIEW OF RELATED LITERATURE

The study was begun in September, 1983, with the analysis of pertinent articles dealing with office systems technology and/or its implications for business education curriculums. Data for the review of literature was obtained from the Roland R. Renne Library, Montana State University and from the private libraries of Dr. Daniel Hertz and Ms. Virginia Hartman, School of Business, Department of Business Education and Office Systems, Montana State University.

One related study, "The Identification and Comparison of Business Educator's Perceptions of Critical Issues Arising from the Office of the Future" by Ms. Bonita Stouffer was ordered for reference from Dissertation Abstracts International, Ann Arbor, Michigan.

The review of literature helped the writer delineate issues and trends in office systems technology which was essential in the development of the survey instrument.

DEVELOPMENT OF THE SURVEY INSTRUMENT

As a result of the review of literature, the writer began to focus on trends in office systems technologies. The basis for selection of trends used for the questionnaire was the frequency of mention of a particular topic and the authority of the author in the literature.

The initial questionnaire was reviewed by the BUED 524 Research in Business Education class and by the Business Education and Office Systems Staff, Montana State University. Revisions were made to clarify the questions and the revised form was approved for use on May 1, 1984 by Dr. Norman Millikin, Head, Department of Business Education and Office Systems, Montana State University.

SELECTION OF PARTICIPANTS FOR THE STUDY

The writer's intention was to randomly survey community colleges throughout the United States. A current listing of all private and public community colleges was available from the 1983 Community, Technical and Junior College Directory.

Each school in this listing was assigned a number from 1 to 1,219. Using the random number generator on the IBM PC, the computer was asked to randomly select 20% of these schools to participate in the study. However, this selection process resulted in schools being randomly selected more than once. In addition, the number zero was randomly selected.

With the assistance of Mr. John Painter, Graduate Student in Business Education at Montana State University, a new program was written for the Apple IIe microcomputer, which randomly selected, sorted, eliminated the number zero and eliminated numbers being duplicated. The program used was:

```
100 DIM A(Y)
110 DIM B(Y)
120 FOR I = 1 to Y
130 LET X = INT (RND (1) * W + 1)
140 IF X = 0 then 130
150 FOR J = 1 to I
160 IF X = A(J) then 130
170 NEXT J
180 LET A (I) = X
190 NEXT I
200 FOR I = 1 to Y
210 FOR J = 1 to (Y-1)
220 IF A(J) = A (J+1) then 260
230 LET D = A(J)
240 LET A (J) = A (J+1)
```

```
250 LET A (J+1) = D
260 NEXT J
270 NEXT I
280 FOR I = 1 to Y
290 PRINT A(I)
300 NEXT I
310 END
```

A total of 240 community colleges were selected for this study.

On May 7, 1984, community colleges selected by the study were sent a questionnaire (Appendix C, page 68). A cover letter (Appendix A, page 66) accompanied the questionnaire. A stamped, self-addressed envelope was included for the convenience of the respondent in hopes of insuring a high percentage of return.

After four weeks, 65 of the 240 questionnaires had been returned. On June 11, 1984, 175 questionnaires were sent to the community colleges which had not responded. A stamped, self-addressed envelope was again enclosed with the survey instrument, and a new cover letter was also included (Appendix B, page 67). By July 1, 1984, additional forms were returned and a 35 percent (85 of 240) return had been achieved. The assumption was made that any questionnaires not received by this time would not be received. Eighty-two of the 85 returns were deemed usable.

ANALYSIS OF DATA AND PRESENTATION OF FINDINGS

Responses from the 82 usable returns were tabulated and compiled in order to summarize the data.

Tables were constructed from the data in order to present the findings in a readable and understandable form. The most frequent statistics given in these tables related to the number of responses to each category and how those responses compared as a percentage of the total responses for that table. The tables and explanations were presented in Chapter 4.

From the responses of the questionnaire, certain conclusions were drawn which enabled the writer to:

1. Identify existing trends in office systems technology curriculums in community colleges.
2. Develop procedures for integrating office systems technology into existing business curriculums at the postsecondary level.
3. Develop a model office system technology curriculum.

These conclusions are presented in Chapter 5 of this study.

CHAPTER IV

FINDINGS

Introduction

This chapter presents a tabulation and analysis of the data obtained from this survey of selected community colleges in the United States.

All responses relating to credit hours were converted to semester hours to provide a common factor for comparative purposes. All fractions of credit hours and all percentages were rounded to one decimal place. Because of this rounding process, some column totals will not add to exactly 100.0 percent.

The information contained in the completed questionnaires is presented and analyzed in the tables and explanatory paragraphs which follow.

Summary of Respondents

The primary objective of mailing the survey instrument to the business and office programs at the community colleges was to gather information on office systems technology curriculums which prepare students to pursue a career in an automated office.

Questionnaires were mailed to 240 randomly selected community colleges. As indicated in Table 1, 85, or 35 percent of the schools responded. Of the 85 schools responding, two respondents had written in the margin that they did not have office systems technology programs; one respondent reported their college was a liberal arts institution only. These responses were unusable.

TABLE 1
SUMMARY OF RESPONDENTS

EXPLANATION	NO.	%
Usable returns	82	34
Unusable returns	3	1
Schools responding	85	35
No reply	155	65
Totals	240	100

Therefore, 82, or 34 percent of the 85 responses were usable. One hundred fifty-six, or 65 percent, of the community colleges did not reply.

Technologies to be Considered in the Context of a Two-Year
Postsecondary Office Systems Technology Curriculum

Respondents were asked to identify whether specific subjects related to the automated office were being taught as separate subjects or as a unit of instruction. If the subject was taught as a unit of instruction, respondents were asked to indicate the course title. If the subject was not taught, respondents were asked to indicate if the subject should be taught.

This information is summarized in Tables 2 through 14.

Table 2. Technologies to be Considered in the Context of a Two-Year Postsecondary Office Systems Technology Curriculum

Subject	Number of Respondents	% of Respondents Identifying Subject as Separate Course	% of Respondents Identifying Subject as unit of instruction	% of Respondents Identifying Subject as not currently being taught	% of Respondents Identifying Subject should be taught
CAR	82	2.4	41.4	56.1	23.9
COM	82	1.2	32.9	65.8	22.2
Micrographics	82	4.9	41.4	53.7	22.7
Computer Graphics	82	11.0	24.4	64.6	32.1
Data Processing	82	93.9	0	6.1	20.0
Word Processing	82	97.6	1.2	1.2	100
Information Processing	82	31.7	28.0	40.2	42.4
Electronic Mail	82	0	61.0	39.0	30.8
Facsimile	81	1.2	50.6	48.1	8.3
Office Systems	82	24.4	50.0	25.6	28.6
Telecommunications	82	7.3	53.7	37.8	38.7
Reprographics	82	12.2	51.2	35.4	20.7
*Phototypesetting	82	8.5	26.8	64.6	7.5

* 3.6% of the respondents indicated this was a separate course in the printing department.

TABLE 3

Subject: Computer-Assisted Retrieval (CAR)

34 (41.4%) Respondents identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	15	44.1
Records Management	10	29.4
Data processing	3	8.8
Introduction to Data Base Management	1	2.9
Computer Programming	1	2.9
Computer & Society	1	2.9
Micro Business Systems	1	2.9
Office Technology	1	2.9
Office Procedures	1	2.9

Approximately 2 percent of the respondents indicated that Computer Assisted Retrieval (CAR) was taught as a separate course, and 41.4% of the respondents indicated that CAR was taught as a unit of instruction. Of these respondents, 15, or 44.1%, identified Word Processing as the course where CAR was most frequently taught. Ten, 29.4%, of the respondents indicated Records Management; 8.8% indicated Data Processing. Introduction to Data Base Management, Computer Programming, Computers and Society, Micro Business Systems, Office Technology and Office Procedures were also identified by the respondents as courses where concepts of CAR were taught as units of instruction.

Fifty-six percent of the respondents indicated that CAR was not currently being taught in their curriculums. Of this 56.1%, 23.9% of the respondents indicated that the subject should be taught.

TABLE 4

Subject: Computer Output Microform (COM)
27 (32.9%) Respondents Identifying Subject as Unit of Instruction.

Identified Course	Number of Respondents	%
Records Management	11	40.7
Word Processing Concepts	9	33.3
Data Processing	4	14.8
Computer and Society	1	3.7
Office Procedures	1	3.7
Introduction to Information Management	1	3.7

One respondent indicated that computer-output microform (COM) was taught as a separate course. Twenty-seven or 32.9% of the respondents indicated that COM was taught as a unit of instruction. Records Management was identified most frequently (40.7%) as the course where COM was taught as a unit of instruction. Thirty-three of the respondents indicated Word Processing; 14.8% indicated Data Processing. Computers and Society, Office Procedures and Introduction to Information Management were also listed.

Sixty-six percent of the respondents indicated that COM was not currently being taught in their curriculums. Of this 65.8%, 22.2% of the respondents indicated that the subject should be taught.

TABLE 5

Subject: Micrographics

34 (41.4%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Records Management	14	41.2
Word Processing Concepts	13	38.2
Data Processing	2	5.9
Office Procedures	2	2.9
Introduction to Information Management	1	2.9
Computers and Society	1	2.9
Office Technology	1	2.9

Approximately 5 percent of the respondents indicated that Micrographics was taught as a separate course.

Forty-one percent of the respondents indicated that Micrographics was taught as a unit of instruction. Of these respondents, 41.2% identified Records Management as the course where Micrographics was most frequently taught. Thirteen (38.2%) identified Word Processing; Data Processing, Office Procedures, Introduction to Information Management, Computers and Society and Office Technology, were other listed courses.

Fifty-four percent of the respondents indicated that Micrographics was not currently being taught in their curriculums. Of this 54 percent, 22.7% of the respondents indicated that the subject should be taught.

TABLE 6

Subject: Computer Graphics
20 (24.4%) Respondents Identified Subject As Unit of Instruction

Identified Course	Number of Respondents	%
Data Processing	5	25.0
Word Processing Concepts	5	25.0
Introduction to Micros	1	5.0
Computer Information Processing	1	5.0
Office Technology	1	5.0
Business Curriculum	1	5.0
Computers and Society	1	5.0
Electronic Data Processing	1	5.0
Drafting and Design	1	5.0
Computer Applications	1	5.0
Information Processing on Micros	1	5.0
Spreadsheet & Data Base	1	5.0

Eleven percent of the respondents indicated that Computer Graphics was taught as a separate course.

Twenty-two percent of the respondents indicated that Computer Graphics was taught as a unit of instruction. Data Processing and Word Processing Concepts were each identified by 25% of the respondents as the courses where Computer Graphics was most frequently taught.

Sixty-five percent of the respondents indicated that Computer Graphics was not currently being taught in their curriculums. Of

this 65%, 32.1% of the respondents indicated that the subject should be taught.

Subject: Data Processing

Approximately 94 percent of the respondents indicated that Data Processing was taught as a separate course.

Six percent of the respondents indicated that Data Processing is not currently being taught in their curriculums. Of this 6%, 20% of the respondents indicated that the subject should be taught.

None of the respondents indicated that Data Processing was taught as a unit of instruction.

TABLE 7

Subject: Word Processing

1 (1.2%) Respondent Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Micro Business Systems	1	100

Approximately 98 percent of the respondents indicated that Word Processing was taught as a separate course.

One respondent indicated that Word Processing was taught as a unit of instruction in the course, Micro Business System.

One respondent, indicated that Word Processing was not currently being taught in their curriculums. This respondent indicated that the course should be taught.

TABLE 8

Subject: Information Processing
23 (28%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	15	65.0
Systems Management	1	4.3
Advanced Office Procedures	1	4.3
Records Management	1	4.3
Microcomputer Application	1	4.3
Data Processing	1	4.3
Office Procedures	1	4.3
Unspecified	2	8.7

Information Processing (IP) was being taught as a separate course by 25% of the respondents.

Twenty-eight percent of the respondents indicated that IP was taught as a unit of instruction. Of these respondents, 65% identified Word Processing Concepts as the course where IP was most frequently taught. Systems Management, Advanced Office Procedures, Records Management, Microcomputer Applications, Data Processing, and Office Procedures were each identified as the course of instruction where concepts of IP were taught. Two respondents did not identify the specific course.

Approximately 40 percent responded that IP was not taught; 42.4% of these respondents indicated that the subject should be taught.

TABLE 9

Subject: Electronic Mail
51 (62.2%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	27	52.9
Office/Secretarial Procedures	11	21.6
Information Processing	2	3.9
Data Processing	1	3.9
Records Management	1	3.9
Computer and Society	1	2.0
Today's Secretary	1	2.0
Admin. Support Practices	1	2.0
Business Communications	1	2.0
Unspecified	5	9.8

None of the respondents indicated that Electronic Mail was taught as a separate course.

Approximately 62.2 percent responded that Electronic Mail is taught as a unit of instruction. Word Processing was identified most frequently (52.9%) as the course where EM was taught as a unit of instruction.

TABLE 10

Subject: Facsimile

41 (50.6%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	53.7	
Office Procedures	9	22.0
Business Machines	3	5.9
Data Processing	2	2.5
Admin. Support Systems	1	1.2
Today's Secretary	1	1.2
Unspecified	3	3.7

One respondent, indicated that facsimile was taught as a separate course.

Approximately 51 percent of the respondents indicated that facsimile was taught as a unit of instruction. Of these respondents, 53.7% identified Word Processing Concepts as the course where facsimile was taught as a unit of instruction, 22% indicated Office Procedures. Other course titles are listed on Table 10.

Approximately 26 percent of the respondents indicated that facsimile was not currently being taught. Of these respondents, 8.3% indicated that the subject should be taught. One respondent indicated he/she did not recognize this term.

TABLE 11

Subject: Office Systems

41 (50%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	18	43.9
Office/Sec. Procedures	11	26.8
Information Processing	3	7.3
Business Communications	1	2.4
Office Management	1	2.4
Sec. Skills	1	2.4
Fundamentals of Office Organization and Management	1	2.4
Administrative Support Systems	1	2.4
Records Management	1	2.4
Unspecified	3	7.3

Twenty-two percent of the respondents indicated that Office Systems was taught as a separate course.

Almost 98 percent of the respondents indicated that Office Systems was taught as a unit of instruction. Word Processing Concepts was identified most frequently (43.9%) as the course where Office Systems was taught as a unit of instruction. Twenty-seven percent of the respondents identified Office/Secretarial Procedures. Information Processing, Business Communications, Office Management, Secretarial Skills, Fundamentals of Office Organization and Management, Administrative Support Systems and Records Management were also listed. Three respondents did not identify the specific course.

Approximately 26 percent of the respondents indicated that Office Systems was not currently being taught in their curriculums; 28.6% of these respondents indicated that the course should be taught.

TABLE 12

Subject: Telecommunications
44 (53.7%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	23	52.3
Office Procedures	10	22.7
Intermixed through entire program	2	4.5
Information Systems Management	1	2.3
Emerging Technologies	1	2.3
Today's Secretary	1	2.3
Office Automation	1	2.3
Office Machines	1	2.3
Data Processing	1	2.3
Business Communications	1	2.3
Telephone & Reception Techniques	1	2.3

Approximately 7 percent of the respondents indicated that Telecommunications was taught as a separate course.

Almost 54 percent of the respondents indicated that Telecommunications was taught as a unit of instruction. Of these respondents, 52% identified the course, Word Processing Concepts. Office Procedures was indicated by 22% of the respondents. Table 12 lists other course titles specified by the respondents.

Approximately thirty-eight percent of the respondents indicated that telecommunications was not currently being taught. Of this 38%, 32 respondents indicated that the subject should be taught.

TABLE 13

Subject: Reprographics
42 (51.2%) Respondents Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	13	31.0
Office/Secretarial Procedures	13	31.0
Office Machines	5	11.9
Office Practice	3	7.1
Records Management	1	2.4
Office Technology	1	2.4
Office Systems	1	2.4
Office Administration	1	2.4
Office Automation	1	2.4
Today's Secretary	1	2.4
Administrative Support System	1	2.4
Undefined units	1	2.4

Twelve percent of the respondents indicated that Reprographics was taught as a separate course.

Approximately 51 percent of the respondents indicated that Reprographics was taught as a unit of instruction. Word Processing and Office/Secretarial Procedures were each identified by 31%

of the respondents. Office Machines, Office Practice, Records Management, Office Technology, Office Systems, Office Administration, Office Automation, Today's Secretary and Administrative Supports Systems were also identified causes. One respondent did not specify the course.

Approximately 35 percent of the respondents indicated that reprographics was not currently being taught. Of these respondents, 20.7% of the respondents indicated that the course should be taught.

TABLE 14

Subject: Phototypesetting
22 (26.8%) Identified Subject as Unit of Instruction

Identified Course	Number of Respondents	%
Word Processing Concepts	11	50.0
Information Systems Management	2	9.1
Office/Secretarial Procedures	2	9.1
Reprographics	1	4.5
Typography	1	4.5
Administrative Support Systems	1	4.5
Today's Secretary	1	4.5
Data Processing	1	4.5
Office Technology	1	4.5
Undefined Units	1	4.5

Seven respondents indicated that Phototypesetting was taught as a separate course. Of these respondents, three respondents stated that although phototypesetting is taught as a separate course, it is taught by a department other than business and office education.

Approximately 27 percent of the respondents indicated phototypesetting was taught as a unit of instruction. Of these respondents, 50% identified Word Processing Concepts as the course where phototypesetting was taught as a unit of instruction. Other courses are listed in Table 14.

Other subjects suggested by respondents that were not listed on the survey instrument included: Auto Speed Recognition (ASR), Word Processing Management, Automated Accounting, Optical Character Recognition and Networks--types and uses.

Table 15

Statement: Should Certain General Education Coursework be Required in the Two-Year Postsecondary Office Systems Technology Program.

Course	Should be Required				PROGRAM If yes, Recommended Semester Hours										
	Yes		No		1	2	3	4	5	6	7	8	8+		
	Number	%	Number	%											
English	80	97.5	2	2.4	2.5	28.8	15.0	10.0	8.8	31.3	0	0	0		
Speech	64	78.0	18	22.0	34.4	14.1	42.2	7.8	0	1.5	0	0	0		
Art	6	7.3	76	92.7	33.3	33.3	33.3	0	0	0	0	0	0		
Sociology	28	34.1	54	65.9	32.1	28.6	7.1	3.6	0	0	0	0	0		
Mathematics	68	82.9	14	17.1	25.0	7.4	32.3	10.2	5.9	16.2	0	2.9	0		
Sciences	24	29.3	58	70.1	25.0	29.2	29.2	8.3	4.2	4.2	0	0	0		
Psychology	59	72.0	23	28.0	25.4	23.8	37.3	10.2	1.7	1.7	0	0	0		
History	18	22.0	64	78.0	50	11.1	38.9	0	0	0	0	0	0		
Music	5	6.1	77	93.9	20	20	60	0	0	0	0	0	0		
Philosophy	9	11.0	73	89.0	55.6	11.1	33.3	0	0	0	0	0	0		
Language	5	6.1	77	93.9	0	50.0	20.0	0	20.0	0	0	0	0		

Respondents were asked to identify general education coursework that should be required in a two-year postsecondary office systems technology program. The individual courses to be included and the recommended number of semester hours are in Table 15. English was selected by approximately 98 percent of the respondents; Mathematics by 82.9%.

TABLE 16

Statement: Should an Internship Program Be a Requirement for Two-year Postsecondary Office Systems Technology Students Who Have Not Had Prior Work Experience.

Number of Respondents	Yes		No	
	Number	%	Number	%
82	52	63.4	30	36.6

Fifty-two, or 63.4%, of the respondents indicated that an internship program should be a requirement for two-year postsecondary office systems technology students who have not had prior work experience. The majority of the respondents (55.8%) indicated the time frame of one semester/one quarter, depending on the basis which the institution operated.

Thirty of the respondents, 36.6%, indicated the internship program should not be a requirement.

Table 17. Statement: Level of Expertise Necessary at the Two-Year Postsecondary Level in Office Systems Technology Subjects.

Subjects	Number of Respondents	Number of Respondents Indicating a Needed Level of Expertise		Theoretical		Practical		Both	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
CAR	82	71	86.6	27	38.0	10	14.1	34	47.9
COM	82	65	79.3	44	67.7	5	7.6	16	24.6
Micrographics	82	66	80.5	40	60.6	6	9.9	20	30.3
Computer Graphics	82	70	85.3	28	40.0	15	21.4	27	38.6
Data Processing	82	79	96.3	9	11.4	12	15.2	58	71.4
Word Processing	82	79	96.3	3	3.8	10	12.7	66	83.5
Information Processing	82	70	85.4	7	10.0	10	14.3	53	75.7
Electronic Mail	82	67	81.7	34	50.7	7	10.4	26	38.8
Facsimile	82	62	75.6	44	71.0	3	4.8	15	24.2
Office Systems	82	71	86.6	35	49.3	5	7.0	31	43.7
Telecommunications	82	65	79.2	38	58.5	5	7.7	22	33.8
Reprographics	82	65	79.2	13	20.0	21	32.3	31	47.7
Phototypesetting	82	54	65.9	37	68.5	8	14.8	9	16.7

Table 17 identifies the level of expertise necessary at the two-year postsecondary level in office systems technology subjects. Levels of expertise were identified as theoretical, practical (hands-on) or the level of both theoretical and practical hands on-experience.

TABLE 18

Statement: Should There Be a Stronger Emphasis than Your Program Now Stresses on Oral, Written or Both Oral and Written Communications.

Number of Respondents	More Stress on oral communication		More Stress on written communication		More Stress on both oral and written		Adequate stress on oral and written communication	
	No.	%	No.	%	No.	%	No.	%
82	7	8.5	7	8.5	50	61.0	18	22.0

Fifty, or 61%, of the respondents indicated that a stronger emphasis should be placed on both oral and written communications than their program now stresses. Eighteen, or 22%, of the respondents indicated that the stress their program now puts on oral and written communications is adequate.

Respondents were asked to identify common core coursework that should be required in the two-year postsecondary office systems technology program. The individual courses to be included and the recommended number of semester hours are in Table 19.

Table 19. Statement: Should Common Core Coursework be required for Two-Year Postsecondary Office Systems Technology Programs.

Course	Should Be Required		If Yes, Recommended Semester Hours (±)											
	Yes Number	No Percentage	1	2	3	4	5	6	7	8	8+	Unspecified		
Shorthand	35	42.7	47	57.3	0	25.7	22.9	11.4	8.6	20.0	0	8.6	0	2.9
Typewriting Keyboard	77	93.9	5	6.1	3.9	15.6	19.5	5.2	7.8	33.8	0	1.3	2.6	10.4
Office Machines	64	78.0	18	22.0	25.1	15.6	25.0	12.5	5.7	3.1	0	0	0	13.0
Word Processing	79	96.3	3	3.7	3.8	22.8	12.7	7.6	5.1	30.4	0	1.3	1.3	15.2
Reprographics	39	48.6	43	52.4	43.6	38.5	7.7	0	0	0	0	0	0	10.3
Computer Systems	58	70.7	24	29.3	22.4	24.1	20.7	8.6	0	10.3	0	0	0	13.8
Accounting	67	81.7	15	18.3	18.6	18.6	32.8	4.5	0	9.0	0	1.5		15.0
Office Systems	23	28.0	59	72.0	22.0	22.0	37.3	5.0	0	0	0	0	0	13.6
Office Procedures	5	6.0	77	93.9	24.7	14.3	33.8	9.0	2.6	1.3	0	1.3	0	13.0
Business Communications	4	4.9	78	95.1	19.2	12.8	30.7	10.3	2.6	6.4	0	0	2.6	15.4
Business Math	23	28.0	59	72.0	25.4	18.6	44.0	1.7	0	0	0	0	0	10.2
Office Management	21	26	61	74.4	29.5	14.8	32.8	8.2	0	3.3	0	0	0	11.5
Records Management	13	15.9	69	84.1	29.0	26.1	21.7	5.8	0	1.4	0	0	0	15.9
Machine Transcription	12	14.6	70	85.4	22.9	18.6	28.6	10.0	5.7	1.4	0	0	0	12.9

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Courses suggested by respondents not included on the survey instrument included Word Processing Management, Economics, Human Relations, Consumer Economics and Office Simulations.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to examine and evaluate business curriculums in postsecondary institutions which have implemented or are planning to implement office systems technology. Specifically, the study focused on the following:

1. Identification of existing trends in office systems technology curriculums at the postsecondary level.
2. Development of procedures for integrating office systems technology into existing business curriculums at the postsecondary level.
3. Development of a model office systems technology curriculum utilizing current state-of-the-art information from existing office systems technology curriculums in community colleges and related literature dealing with office systems technology.

To achieve this purpose, questionnaires were sent to 240 community colleges, from which 82 usable returns were received. These responses were tabulated and analyzed in Chapter 4. In Chapter 5, the findings have been summarized and general conclusions were drawn by the writer. The findings were then related to the review of literature, and recommendations were then made in the Recommendations section of Chapter 5.

SUMMARY

Office Systems Technology Subjects

Computer-Assisted Retrieval (CAR). The majority of the respondents currently teaching CAR in their curriculums, indicated AR was taught as a unit of instruction in either Word Processing Concepts or Records Management. Over half the schools did not teach this subject; approximately one-fourth of these schools indicated this subject should be taught.

Computer-Output Microform (COM). Almost two-thirds of the respondents indicated that COM was not taught in their curriculums. Of these schools, only 22 percent indicated that they felt this subject should be taught. Schools teaching this subject indicated the subject was taught as a unit of instruction in either Records Management or Word Processing Concepts.

Micrographics. Almost half of the respondents indicated that micrographics was taught as a unit of instruction. Records Management was the course identified most frequently where micrographics was taught.

Electronic Mail. Approximately 60 percent of the schools taught electronic mail as a unit of instruction. This subject was usually included in the course, word processing concepts.

Facsimile. Over half of the schools indicated that facsimile was taught as a unit of instruction. Word processing concepts was identified as the course where this subject was most frequently taught.

Office Systems. Approximately 22 percent of the schools taught office systems as a separate course; slightly over 50 percent of the schools indicated that office systems was taught as a unit of instruction. Again, word processing concepts was identified most frequently as the course where this subject was taught.

Telecommunications. Over half the respondents reported telecommunications was taught as a unit of instruction in word processing concepts. Only seven percent of the schools indicated telecommunications was taught as a separate course.

Computer Graphics. Nearly two-thirds of the schools indicated that computer graphics was not currently being taught; however, approximately one-third of these schools indicated that the subject should be taught. Computer graphics was taught as a separate course by 11 percent of the respondents and by approximately 25 percent of the schools as a unit of instruction in either data processing or word processing concepts.

Computer Systems/Data Processing. Nearly 94 percent of the schools responded that data processing was taught as a separate course.

Word Processing. Approximately 98 percent of the respondents indicated that word processing was taught as a separate course in their schools.

Information Processing. This course was taught as a unit of instruction by 28 percent of the respondents--usually in word processing concepts. Over 25 percent of the schools indicated that

information processing was taught as a separate course. Of the 33 respondents who indicated they did not teach information processing, 42.4% thought the subject should be taught.

Reprographics. Slightly over 50 percent of the schools reported that reprographics was taught as a unit of instruction. Word processing concepts and office/secretarial procedures were each identified as the course where reprographics was most frequently taught.

Phototypesetting. Over 64 percent of the schools indicated that this subject was not taught. Slightly over one-fourth of the respondents indicated phototypesetting was taught as a unit of instruction most frequently in word processing concepts.

Level of Expertise Indicated for Office Systems Technology Subjects

Theoretical Expertise. COM, CAR, micrographics, electronic mail, telecommunications, facsimile and phototypesetting were the subjects identified in this area.

Theoretical and Practical Hands-On Expertise. Information processing, word processing, data processing and reprographics were identified in this area.

Forty percent of the respondents indicated computer graphics and office systems should be a theoretical expertise; forty percent of the respondents indicated computer graphics and office systems should be both a theoretical and practical hands-on expertise.

Internships. Required internship programs for students who have not had prior work experience were suggested by over 60 percent of

the respondents. Most of the respondents indicated a one-semester or one-quarter time frame--dependent on which basis the institution operated.

Oral and Written Communications. Over 60 percent of the schools indicated there should be more stress than their curriculums now emphasize on both oral and written communications.

General Education Coursework. Over 97 percent of the schools indicated that English should be required in a two-year postsecondary office systems technology curriculum. Almost one-third of the respondents suggested 6 credits be required; almost one-third of the respondents suggested 2 credits. The other third of the respondents were in the 3, 4, and 5 semester credit range.

Almost 83 percent of the respondents suggested mathematics be a required course.

Over 70 percent of the schools indicated that psychology and speech should be required general courses in a two-year office systems technology curriculum.

Office Systems Technology Core Courses. The core courses recommended by at least 80 percent of the respondents were: typewriting/keyboarding, word processing, accounting, office procedures, business communications, records management and machine transcription.

Office machines, computer systems, office systems, business math and office management were recommended by over 70 percent of the respondents.

CONCLUSIONS

The research findings have led to the identification of the following trends in office systems technology curriculums at the postsecondary level:

1. The role of word processing is expanding to include teaching concepts of CAR, COM, micrographics, information processing, electronic mail, facsimile office systems and telecommunications.

2. Data processing continues to be an important component of an office systems technology curriculum.

3. Information processing, computer graphics and office systems are of growing importance to an office systems technology curriculum.

4. Educational experiences in data processing, word processing and information processing should be both theoretical and hands-on.

5. The importance of oral and written communication skills in an office systems technology curriculum is evident.

6. A general education core in office systems technology curriculums is identified which includes the courses of English, mathematics, speech and psychology.

RECOMMENDATIONS

Based on the findings of the study and the review of literature, the writer makes the following recommendations:

Recommendation 1

The writer recommends the following curriculum in office systems technology at the two-year postsecondary level:

TABLE 20

MODEL CURRICULUM
OFFICE SYSTEMS TECHNOLOGY

Course	Recommended Number of Semester Hours
Office Systems Core:	
Typewriting/Keyboarding	6
Accounting	3
Business Math	3
Business Communications	3
Word Processing Concepts	6
Office Procedures	3
Records Management	1-3
Machine Transcription	2
Computer Systems/Data Processing	1-3
Information Processing	3
Office Machines	1-3
Office Management	1-3
General Education Core:	
English	2-6
Mathematics	1-3
Speech	1-3
Psychology	1-3

Course electives should be determined by the individual schools based on the school's philosophy, community needs and equipment availability.

Recommendation 2

The following procedures should be used for integrating office systems technology into existing business curriculums at the postsecondary level:

1. Word processing courses should emphasize word processing terminology, procedures and systems. Since this knowledge should be both theoretical and "hands-on", it is essential to have up-to-date word processing equipment so that students may acquire employable skills. A variety of office system technology concepts should be included in WP courses--CAR, COM, computer graphics, information processing, electronic mail, facsimile, telecommunications and phototypesetting.

2. Office procedure courses should include some of the new procedures and systems being brought about by the automated office. A theoretical knowledge of electronic mail, facsimile, automated systems, telecommunications and reprographics would be appropriate topics to be included in this course.

3. Current literature suggests a move towards the term Information Management instead of Records Management. Concepts of CAR, COM and micrographics should be topics included in this course.

4. Information processing is a term used to define the entire scope of information handling and processing. It involves communication networks, telecommunications, micrographics, reprographics, data processing and voice communications, as well as processing words into typewritten documents. System capabilities are

limited only by the personnel and equipment available. The content and organization of this course should develop student awareness of the importance of viewing automated office technologies as a total entity rather than distinct and different technologies. Theoretical as well as practical hands-on experience should be incorporated into this course.

5. Integration of facsimile systems, electronic mail and CAR systems with WP/DP work stations is the coming vogue. (Pomerantz, 1983:26) This writer recommends that this be the approach in the office systems course.

6. With the automated office changing so rapidly, office personnel will have to adopt and maintain a positive attitude toward change. The Office Management course should include concepts of the changing office environment and strategies for coping with these changes.

Recommendation 3

The writer recommends that further studies be conducted to:

1. Determine appropriate course content, instructional strategies and instructional materials in the areas of word processing concepts, information processing and office systems.

2. Define competency-based objectives for word processing concepts, information processing and office systems.

3. Provide further data on the essential components of an office systems technology curriculum.

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APPENDICES

APPENDIX A
Letter of Transmittal

May 7, 1984

Dear Business Educator

With the advent of the information age, we are sure you are aware of the changes occurring in the automated office. Many business educators are calling for an assessment of office programs to determine if students are being adequately prepared to work in these offices.

A review of the current literature identifies many technologies for the automated office. These technologies have formed the basis for the various questions on the enclosed questionnaire. As a result of this study, technologies will be identified which will help in developing a model office systems technology curriculum at the two-year postsecondary level.

We would appreciate your taking a few minutes of your time to complete the enclosed questionnaire and return it to us by May 25 in the enclosed, stamped, self-addressed envelope. All returns will, of course, be kept confidential.

We look forward to your response.

Sincerely,

Cheri Jimeno
Graduate Student
Department of Business Education
and Office Systems

Dr. Norm Millikin, Head
Department of Business Education
and Office Systems

APPENDIX B
Follow-up Letter

June 11, 1984

Dear Business Educator

With the advent of the information age, we are sure you are aware of the changes occurring in the automated office. Many business educators are calling for an assessment of office programs to determine if students are being adequately prepared to work in these offices.

Perhaps the questionnaire we sent you earlier arrived at an inconvenient time. This questionnaire identified many technologies for the automated office. When the study is completed, a business education curriculum which will incorporate office systems technology will be developed for the postsecondary level.

Would you please take a few minutes and answer the enclosed questionnaire. A self-addressed, stamped envelope is again enclosed for your convenience. Your input is vital to this project. Please return the questionnaire before June 27. All returns will, of course, be kept confidential.

We look forward to hearing from you.

Cheri Jimeno
Graduate Student
Department of Business Education
and Office Systems

Dr. Norm Millikin, Head
Department of Business Education
and Office Systems

Appendix C - Survey Instrument

PLEASE CONSIDER THE FOLLOWING TECHNOLOGIES IN THE CONTEXT OF A TWO-YEAR POSTSECONDARY OFFICE SYSTEMS TECHNOLOGY CURRICULUM PREPARING STUDENTS TO PURSUE A CAREER IN AN AUTOMATED OFFICE. THE CURRICULUM IS DESIGNED FOR BOTH TRANSFER AND NON-TRANSFER EDUCATION.

IS TAUGHT AS A SEPARATE SUBJECT	IS TAUGHT AS A UNIT OF INSTRUCTION PLEASE LIST THE SUBJECT'S NAME	IS NOT TAUGHT	SHOULD BE TAUGHT	SUBJECT/UNIT	
1 ☐	☐	☐	☐	CAR (COMPUTER-ASSISTED RETRIEVAL)	1
	(NAME OF SUBJECT)				
2 ☐	☐	☐	☐	COM (COMPUTER OUTPUT MICROFORM)	2
3 ☐	☐	☐	☐	MICROGRAPHICS	3
4 ☐	☐	☐	☐	COMPUTER GRAPHICS	4
5 ☐	☐	☐	☐	DATA PROCESSING	5
6 ☐	☐	☐	☐	WORD PROCESSING	6
7 ☐	☐	☐	☐	INFORMATION PROCESSING (INTEGRATING DP AND WP)	7
8 ☐	☐	☐	☐	ELECTRONIC MAIL	8
9 ☐	☐	☐	☐	FACSIMILE	9
10 ☐	☐	☐	☐	OFFICE SYSTEMS	10
11 ☐	☐	☐	☐	TELECOMMUNICATIONS	11
12 ☐	☐	☐	☐	REPROGRAPHICS (COPY PROCESSING)	12
13 ☐	☐	☐	☐	PHOTOTYPESETTING	13
14 ☐	☐	☐	☐	OTHER (PLEASE SPECIFY)	14
☐	☐	☐	☐		
☐	☐	☐	☐		
☐	☐	☐	☐		

15 PLEASE INDICATE WHETHER YOUR INSTITUTION OPERATES ON A QUARTER OR A SEMESTER BASIS.

☐ QUARTER

☐ SEMESTER

16. SHOULD CERTAIN GENERAL EDUCATION COURSEWORK BE REQUIRED IN THE TWO-YEAR POSTSECONDARY OFFICE SYSTEMS TECHNOLOGY PROGRAM?

☐ YES ☐ NO

IF YES, INDICATE WITH A CHECK THE CONTENT AREAS YOU WOULD RECOMMEND AND CIRCLE THE NUMBER OF QUARTER/SEMESTER HOURS YOU WOULD RECOMMEND

_____ 1 2 3 4 5 6 7 8 ENGLISH	_____ 1 2 3 4 5 6 7 8 PSYCHOLOGY
_____ 1 2 3 4 5 6 7 8 SPEECH	_____ 1 2 3 4 5 6 7 8 HISTORY
_____ 1 2 3 4 5 6 7 8 ART	_____ 1 2 3 4 5 6 7 8 MUSIC
_____ 1 2 3 4 5 6 7 8 SOCIOLOGY	_____ 1 2 3 4 5 6 7 8 PHILOSOPHY
_____ 1 2 3 4 5 6 7 8 MATHEMATICS	_____ 1 2 3 4 5 6 7 8 LANGUAGE
_____ 1 2 3 4 5 6 7 8 SCIENCES	_____ 1 2 3 4 5 6 7 8 OTHER _____

17. SHOULD AN INTERNSHIP PROGRAM BE A REQUIREMENT FOR POSTSECONDARY TWO-YEAR OFFICE TECHNOLOGY STUDENTS WHO HAVE NOT HAD PRIOR RELATED WORK EXPERIENCE?

☐ YES ☐ NO IF YES, LENGTH OF INTERNSHIP _____

18. WHAT LEVEL OF EXPERTISE IS NECESSARY AT THE TWO-YEAR POSTSECONDARY LEVEL IN THE AREAS OF (PLEASE CHECK)

	THEORETICAL (OVERVIEW OF CONCEPTS)	PRACTICAL HANDS-ON TRAINING	BOTH ARE NECESSARY
COMPUTER-ASSISTED RETRIEVAL	_____	_____	_____
COMPUTER OUTPUT MICROFORM	_____	_____	_____
MICROGRAPHICS	_____	_____	_____
COMPUTER GRAPHICS	_____	_____	_____
DATA PROCESSING	_____	_____	_____
WORD PROCESSING	_____	_____	_____
INFORMATION PROCESSING	_____	_____	_____
ELECTRONIC MAIL	_____	_____	_____
FACSIMILE	_____	_____	_____
OFFICE SYSTEMS	_____	_____	_____
TELECOMMUNICATIONS	_____	_____	_____
REPROGRAPHICS (COPY PROCESSING)	_____	_____	_____
PHOTOTYPESETTING	_____	_____	_____
OTHER _____	_____	_____	_____

19. SHOULD THERE BE A STRONGER EMPHASIS THAN YOUR PROGRAM NOW STRESSES ON A) ORAL, B) WRITTEN, C) BOTH ORAL AND WRITTEN BUSINESS COMMUNICATION SKILLS IN AN OFFICE SYSTEMS TECHNOLOGY CURRICULUM? (PLEASE CHECK A, B, OR C)

☐ A ☐ B ☐ C

20. SHOULD COMMON CORE COURSEWORK BE REQUIRED FOR THE TWO-YEAR POSTSECONDARY OFFICE SYSTEMS TECHNOLOGY CURRICULUM?

☐ YES ☐ NO

IF YES, CHECK AND CIRCLE	WITHIN CORE		NUMBER QUARTER/SEMESTER HOURS
	YES	NO	
SHORTHAND	_____	_____	1 2 3 4 5 6 7 8
TYPEWRITING/KEYBOARDING	_____	_____	1 2 3 4 5 6 7 8
OFFICE MACHINES	_____	_____	1 2 3 4 5 6 7 8
WORD PROCESSING	_____	_____	1 2 3 4 5 6 7 8
REPROGRAPHICS	_____	_____	1 2 3 4 5 6 7 8
COMPUTER SYSTEMS	_____	_____	1 2 3 4 5 6 7 8
ACCOUNTING	_____	_____	1 2 3 4 5 6 7 8
OFFICE SYSTEMS	_____	_____	1 2 3 4 5 6 7 8
OFFICE PROCEDURES	_____	_____	1 2 3 4 5 6 7 8
BUSINESS COMMUNICATIONS	_____	_____	1 2 3 4 5 6 7 8
BUSINESS MATH	_____	_____	1 2 3 4 5 6 7 8
OFFICE MANAGEMENT	_____	_____	1 2 3 4 5 6 7 8
RECORDS MANAGEMENT	_____	_____	1 2 3 4 5 6 7 8
MACHINE TRANSCRIPTION	_____	_____	1 2 3 4 5 6 7 8
OTHER _____	_____	_____	1 2 3 4 5 6 7 8

21. GENERAL COMMENTS _____

