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## Computers in post-secondary vocational business education

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## Computers in post-secondary vocational business education

### Abstract

According to Naisbitt (1982) in Megatrends, contemporary life is an everyday encounter with computer technology. When a person wakes in the morning, it is often to the sound of an alarm programmed the previous night. A person answering the phone receives a call relayed through a computer system. Programs produced for television are often combined with visual effects produced through computer enhancement. As people review their mail, many of the bills and letters have been produced with the aid of computers. Merchandise purchased at many stores is checked out using a computer to read and register the price of the items being purchased. Many students attending our schools wear watches that act as miniature computer calculators. Doctors, lawyers, engineers, politicians, accountants, bankers, farmers, and the entire scope of the business world have come to rely on computers.

COMPUTERS  
IN  
POST-SECONDARY  
VOCATIONAL BUSINESS EDUCATION

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A Graduate Paper  
Submitted to the  
Department of Curriculum and Instruction  
In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts in Education  
UNIVERSITY OF NORTHERN IOWA

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by  
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has been approved as meeting the research paper requirement for the  
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## CHAPTER I

### Introduction

According to Naisbitt (1982) in Megatrends, contemporary life is an everyday encounter with computer technology. When a person wakes in the morning, it is often to the sound of an alarm programmed the previous night. A person answering the phone receives a call relayed through a computer system. Programs produced for television are often combined with visual effects produced through computer enhancement. As people review their mail, many of the bills and letters have been produced with the aid of computers. Merchandise purchased at many stores is checked out using a computer to read and register the price of the items being purchased. Many students attending our schools wear watches that act as miniature computer calculators. Doctors, lawyers, engineers, politicians, accountants, bankers, farmers, and the entire scope of the business world have come to rely on computers.

In the books Future Shock and The Third Wave by Toffler (1970 and 1980), the societal shift to computers and related technology is brought into focus. Toffler painted a scenario in which society is rapidly moving out of the industrial age into the information age of high technology. In the age of high technology, labor will center more on service oriented occupations which require the effective use of communication skills which will include data processing, data retrieval, data manipulation, and data interpretation.

National education leaders including Sizer (1984), Boyer (1983), and Parnell (1985) have called for an educational focus on computers. These individuals and others call for the emergence of computer education as a core part of the educational curriculum along side the traditional core of English, math, science, and social studies. Computer education should focus on developing literacy skills which include an ability to access, organize and utilize information, along with understanding the social implications of computers. Parnell (1985) in particular provides advocacy for computer education at the post-secondary level.

Computer education is so frequently mentioned in state and national studies regarding education that attention needs to be given to this relatively new and rapidly emerging area. Education is easily locked into existing paradigms regarding curriculum and instruction. This paper will focus on discovering to what extent computers fit into a particular aspect of education at the post-secondary level.

### The Problem

Because so much attention has been given to the rise of computers as an integral part of society, and in particular the world of work, the use of computers in education is a general concern which includes elementary, secondary, and post-secondary education. The purpose of the study is to

provide an integrative review of the literature relative to the current status of computers in vocational business education at the post-secondary level.

As this review of the literature unfolds, the answers to four questions related to the current status of computers in Vocational Business Education at the post-secondary level will emerge. 1) What considerations are important to the use of computers? 2) What is the focus of computer use? 3) What types of computers are used? 4) What types of software are used?

#### Significance of the Study

The pronouncements of national educational leaders that computer education is imperative, brings the role of the computer in education to the forefront at every level of education. With computers rapidly becoming a common sight in almost any large or small business it would seem that computers would equally command the attention of post-secondary vocational business education programs. The forecasts of many futurists indicating the rise of the informational age in which easy access to information and communications will have a dramatic impact on the nature of the work place, should cause post-secondary vocational business education programs to closely examine the nature of their curriculum and instructional delivery.

This research offers an opportunity to integrate existing literature regarding computers in vocational



business education at the post-secondary level for the purpose of examining past trends and determining future direction. This information could be helpful to post-secondary vocational business teachers and administrators in establishing or updating a vision, plan, and agenda for computer acquisition and use.

First, this paper will synthesize considerations important in determining the use of computers in vocational business education at the post-secondary level. This compilation of considerations will provide a frame work for current and future computer use.

Simply having computers is one thing, but the focus of computers as educational tools is of real significance. Second, this review of the literature will reveal what focus is placed on computer use in regards to vocational business education at the post-secondary level.

At the present, there are a host of computers on the educational market. Third, this research will present factors important in determining which computers to use, and the research will examine which computers are being used in business and vocational business education at the post-secondary level. By revealing this information, post-secondary business educators and administrators can make a more knowledgeable decision regarding what computers to purchase.

Combined with the focus of computers is the selection of software to serve various purposes. Finally, this paper will identify what software is utilized in post-secondary business education programs.

This particular review of the literature will help post-secondary business teachers and administrators determine if they are effectively addressing the computer needs of their students as they prepare them for careers in the business world.

## CHAPTER II

### Review of Literature

#### Considerations Important to Computer Use

The acquisition of computers is not enough. Attention must be given to how computers will be utilized to provide post-secondary vocational business students with meaningful educational experiences. This chapter seeks to identify basic considerations which are important in determining the focus of computer use in post-secondary vocational business education. In a book by Wacker (1987), John F. Beeten is quoted as sizing up the future of computer use in this manner.

There will be profound changes in the way work is performed over the next twenty years, triggered by the low cost of personal computers. Workers who now only use computers become computer programmers, partly due to the coming widespread creation and use of specialized programming languages. Tedious jobs will be automated, often by workers doing these jobs, who will then proceed to more interesting work. Education will have an important challenge in preparing students for a changing world and improving the skills of existing workers (p. 290).

The scenario presented by Beeten addresses the eventual wide spread availability and use of computers. Beeten

envision computers transforming the work place and the manner in which work is performed. Beeten acknowledges the important role of education in helping business and workers make the transition to a more automated and computerized work environment. Beeten's scenario speaks loudly to the need for post-secondary vocational business education to take the lead in developing workers with the computer skills needed for the business place of the future.

According to Clarke (1988), what is needed in determining the direction of computer use in post-secondary vocational business education is a working definition which focuses on four areas: first, the essential knowledge students need to possess regarding how computers function; second, the ability of students to use computers; third, the knowledge students need to possess regarding the capabilities of computers; fourth, student understanding regarding the effects of computers on society.

While traditional data processing (programming) jobs are diminishing, a new set of unique individualized jobs (word processing, data management, electronic filing, desktop publishing, telecommunications, etc.) are emerging. Many positions are being built around data, its delivery, and the network that must consistently, accurately, and expediently transmit data to the user's desk (Wacker, 1987).

Clarke (1988) indicated that business teachers have an obligation to make the curriculum relevant to the business

world. The simple availability of computers does not transmit into necessary skills or experiences for students. Vital attention must be given to the learning experiences essential to computer use. Students need to learn how to enter, retrieve, manipulate, interpret, organize, and transmit data using a number of different computer functions. Focus must be placed on the types of hardware, software, and functions needed to offer meaningful learning experiences in computer use.

The curriculum, inclusive of content and process, must be the foundation for computer use. Lantz (1984) stated that the computer curriculum of post-secondary vocational business education must be driven by the needs of students to obtain the computer skills required by the business world. Through the formation and use of a local advisory committee composed of business and industrial leaders, post secondary business education can gain a better understanding of the type of computer use which will meet student needs.

Post-secondary vocational business education best serves students when the expectations of business for incoming employees is considered. According to Wacker (1987) modern businesses want employees that know how to acquire, synthesize, and communicate information. Post-secondary vocational business education needs to teach the practical use of new computer technology and specialized

application programs in a manner that prepares students to enter the business world.

Wacker (1987) identified the emerging business occupations which require computer experiences as Data Specialists, Data Operation Manager, Corporation Librarian, Data Base Designers, Software Consultants, Electronic Mail Persons, and Multi-Media Specialists.

In reviewing Editor (1985) and Clarke (1988), five important considerations emerge regarding computer use:

- 1) The hardware and software should be widely used in business.
- 2) There needs to exist a flexibility for upgrading.
- 3) There needs to be a network capability and the ability to interface.
- 4) There needs to exist an environment which promotes a variety of applications.
- 5) A modern business like environment should be created.

When considering computer use, it is important to remain aware of existing emerging technologies. Pelletier (1983) and Heath and Camp (1984) identified the emerging computer related technologies which impact post-secondary vocational business education as telecommunications (satellite, fiber optics, interactive, and bulletin boards), multi-media, lasers, and robotics.

The considerations that are important to computer use are numerous. However, if effective computer use in post-secondary vocational business education is to be achieved, educators must carefully examine future trends in business, student career needs, emerging technologies, and societal impact. These considerations can not be examined in isolation, but must be combined to provide a holistic examination which will reveal the salient factors crucial to the successful use of computers in post-secondary vocational business education.

#### The Focus of Computer Use

Within the business community there is emerging a breed of personal computer software experts, both skilled at creating their own software and at using available prepackaged software. Also emerging are the skilled consultants and technology procurers for end users. Computer experts in local area networking and moving spread sheets, documents, text, and graphics from one user to the next are becoming increasingly important in the business world (Wacker, 1987).

In a report issued by Editor (1985), the need for stand alone as well as on-line capability with a mainframe was emphasized. Clarke (1988) concurred with this idea by promoting the establishment of well supervised labs which provide students with an opportunity to do individual as well as on-line work. The lab must replicate a business

setting that offers students a simulated business environment. The lab setting must be flexible to facilitate diverse experiences for students (Groneman and Owen, 1984). The lab should accommodate the needs for individual, didactic, and small group work.

In the curriculum realm, computer literacy must preclude all other computer instruction (Clarke, 1988; Allbright and Holcup, 1988). While computer literacy includes basic understandings regarding the computer and it's sociological implications, the heart of a literacy course is word processing, data bases, and spreadsheets. Nearly every article reviewed gave mention to the development of basic skills in word processing, data base, and spreadsheets. Keyboarding was mentioned but the general feeling was that this should be a basic skill geared for secondary education. Lloyd (1983) took a little different view of computer literacy in business education by defining it as experiences in BASIC programming, business applications, and office applications.

Seltz (1983) and Gibbons (1985) pointed out implications of computer automation for post-secondary vocational business education. Students need experiences on computers which will develop their abilities at problem solving, group decision making, and personal initiative. Such experiences would involve working with MS-DOS.



graphics, shared logic systems, program systems, information retrieval, and computations.

Jonninga (1982) promoted using the computer in post-secondary vocational business education as a tool to teach programming. Groneman and Owen (1984) specifically indicated that the programming languages of Fortran, Pascal, and BASIC were important to students. This emphasis on programming needs to be carefully weighed against the fact that a diverse array of pre-programmed software currently exists for just about every business application. However, as business needs change, so will the need for creative programming. In this sense, there will always exist a need for individuals with programming skills.

A primary consideration for computer use in post-secondary vocational business education has to be training for specific occupations. Six business occupations surfaced in the literature as areas of high computer use.

First, Data Processing was identified by Huber (1984), Heath and Camp (1984), Groneman and Owen (1984), Hertz (1985), and Lambrecht (1986). Second, Accounting was mentioned by NIACC (Editor, 1985), Huber (1984), and Lambrecht (1986). Third, Marketing was suggested by Allbright and Holcup (1988) and NIACC (Editor, 1985). Fourth, Management was noted for NIACC (Editor, 1985), Groneman and Owen (1984), and Hertz (1985). Fifth, Secretarial was included in the plan for NIACC (Editor,

1985) and Groneman and Owen (1984). Sixth, Merchandising was among those listed for NIACC's plan (Editor, 1985).

In the more recent literature, the focus has been futuristic for computer use in post-secondary vocational business education. Wacker (1987) and Clarke (1988) addressed computer use in the areas of satellite technology, fiber optics, interactive video, electronic bulletin boards, telecommunications, computer conferencing, multi-media, and artificial intelligence. The modern business office is envisioned to be a center for technological retrieval and transmission of information. Thus, the computer focus of post-secondary vocational business education must keep pace.

#### Types of Computers and Systems Used

Once consideration has been given to computer use and the focus of computer use has been determined, post-secondary vocational business education must determine the types of computers and systems that will be used.

According to Groneman and Owen (1984) there are four prerequisites to determining the types of computers and systems to use. First, the hardware must be capable of providing the desired function. Second, the hardware must facilitate the type of storage media desired. Third, the purchased hardware should have distinct advantages over other available hardware. Fourth, the purchased hardware should have the capacity for future expansion.

Different brands of computers have different features, functions, and capabilities. Different computers have different memory capabilities, and some have the capability to be upgraded in memory while others do not. Some computers have color and/or sound capabilities. Not all computers have the same DOS (Disk Operating System). The function keys vary with the brand of computer, as does the number of columns on the monitor. All of these are important in purchasing the correct hardware for a post-secondary vocational business education program (Groneman and Owen, 1984).

The literature generated by Editor (1985) stressed the importance of the internal memory capabilities of computers to run various software. The more sophisticated the software, the more memory that may be required to run the program.

Chandler (1982) indicated the importance of using equipment for training which is commonly found in the business world. Give consideration to mainframing, networking, and micros, and then move ahead in putting together the facilities.

When examining the literature, many various brands of computers are identified as part of existing post-secondary vocational business education programs. The most extensive list of computers being used was provided by Clarke (1988). Clark included the IBM PC, MacIntosh, Zenith, IBM XT, IBM

Clones, Lanier, Apple IIe, Tandy 1200, Tandy 2000, Digital, DED, Leading Edge, Decmate.

Three brands of computers surface as prominent in the business world and post-secondary vocational business education programs. IBM computers are the most commonly used computers in the business world. IBMs were originally produced for the work place and naturally took the lead in market share. As post-secondary vocational business education programs placed increased focus on computers, IBMs commanded the most attention because they were the most prominent computer in the work place. When considering computer needs and business applications of computers, IBMs have proven to be highly versatile (Clarke, 1988; Editor, 1985; Groneman and Owen, 1984; Huber, 1984; and Lambrecht, 1986).

Tandy computers, originally produced by Radio Shack were quick to appeal to the business world. Many smaller businesses bought into Tandy because it provided similar functions as the IBM and was more economical. Thus, as post-secondary vocational business education programs considered computer use, Tandy controlled a significant amount of attention based on the desire of educators to match what was being used in the business world (Clarke, 1988; Groneman and Owen, 1984; and Huber, 1984).

In the past couple of years, Apple Computers has made some gains on IBM in competing for a share of the business

world market for computers. Apple Computers and particularly it's Macintosh line of computers have added features and capabilities which more closely meet the needs of the modern work place than the older Apples. According to Editor (1985), Groneman and Owen (1984), and Lambrecht (1986), the Apple II series was being used in post-secondary vocational business education programs to a limited degree. This particular fact does not make a lot of sense when the Apple II series commanded such a small share of the business market. However, Clarke (1988) indicated that the Apple Macintosh is second only to the IBM PC in terms of commanding the market share in the business world. This factor would suggest that Apple Macintosh should become more common to post-secondary vocational business education programs.

#### Type of Software Used

The type of software used depends upon the desired application and the hardware available. Software is not necessarily compatible from computer to computer. The quality of educational computing is dependent upon the quality of the software used.

When looking for post-secondary vocational business education computer software, Groneman and Owen (1984) suggested four considerations. First, is there a good training manual for the software? Second, have exercises been developed for specific classroom use or will the manual

need to be rewritten? Third, is there a good index? Fourth, has the software been on the market long enough to be "debugged"? Clarke (1988) agreed with the above suggestions, but added that consideration must be given to the strengths and weaknesses of the software. A software evaluation form and procedure need to be developed. The NIACC literature points out the need for software that can provide multiple applications (Editor, 1985).

Groneman and Owen (1984) stated that there exists a need for Cobol, Fortran, and Pascal Programming software in post-secondary vocational business education. However, Wacker (1987) claimed that programming as part of post-secondary vocational business education is on its way out.

Software should be menu driven so that the need for documentation is lessened (Clarke, 1988). The most frequently used software will focus on simulation, tutorial, and drill and practice. There are many application software packages available on the market. Among these are Wordperfect, dBase III, Displaywrite, Wordstar, Lotus 1-2-3, Pagemaker, First Choice, and PFS Write. The most common software applications are word processing, database, and spreadsheet.

Word processing software used in post-secondary vocational business education programs focus primarily on IBM and Apple compatible programs. For the IBM; Multimate,

Wordperfect, and Displaywrite 1 & 2 are commonly used. For the Apple, Appleworks, Super Script II, Word Handler, Apple Writer II, and Magic Window are frequently used (Groneman and Owen, 1984).

Database software used in post-secondary vocational business education programs focus primarily on IBM compatible programs. For the IBM; dBase II & III, PFS File, Data Base Manager II, and Metafile are identified. For the Apple, Appleworks is the only program mentioned (Groneman and Owen, 1984).

Spreadsheet software is similar to database in that the primary focus is IBM. For the IBM; VisiCalc, Multiplan, Peach Calc, and Lotus 1-2-3 are listed. Again, the only Apple program noted is Appleworks (Groneman and Owen, 1984).

Unfortunately, the software identified for specific occupational areas are not classified by computer compatibility. What this literature basically revealed was that there exists software for the application of specific business occupational skills. When these software packages are applied to various instructional settings, they can facilitate the development of computer skills valuable in the work place.

In the area of accounting, there are numerous software programs being used. Accounts Payable, Accounts Receivable, General Ledger, and Payroll were all identified (Editor, 1985; and Groneman and Owen, 1984). Peachtree and VisiCalc

were noted as the most frequently used (Groneman and Owen, 1984) and Tax Preparation, Financial Statement, and Automated Accounting were mentioned. Sales orders, Billing, Cash Flow, and Inventory Control were noted (Editor, 1985). Mills (1989) stated that Lotus 1-2-3 was an effective program for accounting.

In the area of secretarial, Master Type, Type Attack, Timed Writings, and Type Master were identified as software that would help develop valuable secretarial skills (Editor 1985, and Groneman and Owen, 1984). In a more expanded listing, Editor (1985) included Office Procedures, Inventory Control, word processing programs, and data base programs.

In the area of marketing, The Real Estate Market Simulation, The Stock Market, and Conglomerates Collide were noted as beneficial software packages (Groneman and Owen, 1984). Editor (1985) listed Sales Orders and Sales Analysis as effective marketing software.

In the area of management, Management Skills and Office Procedures were identified (Groneman and Owen, 1984). Inventory Control was noted by Editor (1985).

As indicated in this chapter, software consideration and selection is every bit as important to a successful post-secondary vocational business education program as is the selection of hardware. The important thing is making sure there exists compatibility between hardware, software, and the intended application. While most software is not



developed as instructional software, the packages and accompanying materials facilitate the learning of computer skills important to successful employment in the business world. Once the proper hardware and software are available, the quality of the instruction offered to students at the post-secondary vocational business education level is largely dependent upon the pedagogical skills of the instructor.

## CHAPTER III

### Summary and Discussion

#### Summary Analysis

Computer technology is changing the way people function in the business world. The rising trend of business in our service economy is the effective and efficient reception and transmission of information. Post-secondary vocational business education must look to the business world for the sign of the times if their programs are going to effectively meet student needs. One vital means by which post-secondary vocational business education can maintain an ongoing assessment regarding developments in the business world is through the use of a local advisory committee composed of business leaders and computer consultants. The goal of post-secondary vocational business education must be more than merely staying abreast developments in the business world. Through a local advisory committee, post-secondary vocational business education can strive to meet the contemporary needs of business students while seeking to offer training in emerging and developing technologies.

The best arrangement of computers in the post-secondary vocational business education setting are in labs which are able to replicate an office and individual environment. The purpose of a lab setting is to help students develop individual initiative at computer use, and to facilitate group work which fosters teamwork and problem solving.

The needs of students to possess skills valued in the business world must be the focus of computer use in post-secondary vocational business education. Business students need to possess a general knowledge of how computers function and the implications they have for society. Students need to develop practical application skills in the basic computer literacy areas of word processing, data base, spreadsheet, and utility software use. Once specialization in a particular business area occurs, the students need to experience software that is specifically designed to develop the appropriate skills.

There are several specific areas of business impacted by computers. Students involved in data processing accounting, secretarial, marketing, management, and merchandising programs need to develop competency in the use of computers.

There are a variety of computers currently being used by the business world. IBM, Apple, and Tandy are the most frequently used computers by business. Most post-secondary vocational business education programs offer computer experience on IBM with limited use of Apples and Tandy. With the emergence of the Apple Macintosh in business, however, post-secondary vocational business education programs are giving serious consideration to the inclusion of Macintosh in their programs.

While there is a prevailing emphasis on a few brands of computers in post-secondary vocational business education, the software being used represents a diverse array of programs and functions. There were at least nineteen different programs listed for word processing, database, and spreadsheet. In the specific areas of business, the software listed ran from twelve programs for accounting to three programs for management.

While post-secondary vocational business education is committed to the use of computers, the emerging nature of computer technology necessitates continued growth. The areas of telecommunications, multi-media, fiber optics, interactive video, and artificial intelligence require careful consideration if the instruction offered students is to be beneficial in the business world.

#### Synthesis of Research

Rapid movement in the business world toward the utilization of technology is providing the impetus for change in post-secondary vocational business education. The importance of the local advisory committee is irrefutable. Through the effective use of a local advisory committee, post-secondary vocational business education can maintain an accurate and ongoing assessment of the needs within the business community for employees with computer related skills. Furthermore, the advisory committee could help post-secondary vocational business education shake the cart

before the horse syndrome. In the past, post-secondary vocational business education has been responding to the needs of the business world. However, by keeping a finger on the pulse of the business world and technological development, post-secondary vocational business education could provide students with computer skills that not only serve the business world, but help shape the business world.

It seems that post-secondary vocational business education should maintain its commitment to IBMs, but need to carefully consider the inclusion of the Apple Macintosh as an important component of the program. The lab concept which seems to prevail needs to be continued as long as it is organized to resemble the modern business office environment. The lab must also be organized in a manner which recognizes that emerging businesses in the future may be run out of the home using a single computer and a phone modem hooked up to a fiber optics network. The current commitment to educating students in utility programs and specialized software for specific areas needs to be continued. However; as software improves, post-secondary vocational business education needs to abandon antiquated programs for the enhanced programs in an effort to be better prepared to serve the business world.

Post-secondary vocational business education needs to be prepared for dynamic change in the areas of business and technology if student needs are going to be met.

Flexibility and versatility are the key words to hardware and software. The wave of the future holds exciting developments in the computer related areas of telecommunications, multi-media, interactive video, fiber optics, laser technology, and artificial intelligence. Each one of these areas could play an important role in the emerging world of business.

While post-secondary vocational business education and the business world needs to maintain a partnership for advisement, the same type of partnership may be required for financial support. Computer technology is changing so rapidly that a financial strain on post-secondary vocational business education could occur. Business needs to be prepared to reach out to education and offer financial assistance so that post-secondary vocational business education students can receive the training which will make them valuable business employees.

### Implications for Practice

This review of the literature offers three implications for practice. First, this review provides insight to what currently exists in regards to computer use in post-secondary vocational business education. This review amalgamates many articles into a quick reference regarding the current status of computer use. Second, this review offers a basis from which computer use in post-secondary vocational business education at any institution can be assessed to determine a comparative status. From this assessment, post-secondary vocational business education programs can decide whether their services are appropriate or whether changes need to occur. Third, this review offers insight regarding emerging computer related technology. This insight can serve as a focal point for the contemplation of future program development.

### Recommendations for Further Research

This review of the literature was hampered by the relative unavailability of literature published between the dates of 1987 and 1989. While the literature published before 1987 served this review, computer technology is moving so rapidly that more recent literature would have been extremely beneficial. It seems that the extreme growth in computer education which occurred between 1980 and 1985, gave rise to the large amount of literature available during this time span.

Future research into the area of emerging computer technologies would be beneficial in helping place focus on the current status of computers in post-secondary vocational business education. The current status of computer use can only take on meaning when considered in relationship to the prospect of future development. The emergence of fiber optics and laser technology have huge implications for computer application in the business world. As these technologies are adopted as part of post-secondary vocational business education programs, an increase in literature pertaining to computers in post-secondary business education should occur.

Because the current literature available places so much emphasis on the need for local advisory committees in developing computer use in post-secondary vocational business education, it would be highly beneficial to research the current status of computers in the business world. This research would provide valuable information for assessing the appropriateness of current computer use in post-secondary vocational business education.



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