CHAPTER 2

LITERATURE REVIEW

This study proposed to identify the tasks and related IT competencies of administrative support staff employed in networked environments and, at the same time, determine priority areas for training in IT. This chapter reviews literature on main issues of information technology in the office:

1. Definition of information technology;
2. Information technology competencies;
3. Development of competency standards;
4. Competencies of administrative support staff;
5. Skills required by employers in the workplace;
6. Impact of information technology on the secretarial profile,
7. Developmental training for career progression;
8. Emerging trends in learning technologies, and
9. Related methodological studies.

In Malaysia, little interest is shown in the research of IT usage among office workers, especially secretaries (Norlida M. N., 1998; Raja Munirah R. Mustapha, 1995). A large amount of research is concentrated on the use of ICT for effective teaching and perceptions of educators in effective implementation of ICT in schools (Abd. Rahman Daud, 2000; Arfah Salleh,. McLaren & McLaren, 2000; Muhamad Hasan Abdul Rahman, 2000; Rosnani Jusoh, 2000; Rosnaini Mahmud, Mohd. Arif Hj. Ismail & Abdullah Mohd.

Sarif, 2000; Suhaida Abdul Kadir & Soaib Asimiran, 2000). On the contrary, studies on office professions, which include clerical and secretarial professions in the United States and Europe, are numerous. Research on programs such as school to work curriculum, workforce readiness, employability skills, workplace-based retraining, and career development often include office occupations as a unit of analysis. As a result, the review of literature on administrative support staff is mainly obtained from sources in the United States and Europe.

Definition of Information Technology

Information technology has been defined as IT, office technology and office automation interchangeably. According to Long (1987) information technology is the result of the convergence of three previously separate technologies namely computers, telecommunications and office machines through the development of the microprocessor chip. The evolution of this convergence can be traced by observing the development of the three traditional technologies.

Computing technology—from military use to business use

Following the Second World War, the United States military found that it was important to continue expanding programs for wartime readiness. This situation led to the growth of technological devices that would be flexible enough for various purposes. The first ever general-purpose computer was revealed in 1946. The Electronic Numerical Integrator and Calculator, or more popularly known as (ENIAC) performed at speeds of 100 to 1000 times faster than the other computers at that time. Computers were primarily used for academic research and military purposes and designed solely for the process of numbers (Craiger, 1997; Pliskin, 1997). Mainframe computers were expensive and most

companies could not afford the cost of owning computers. Thus, companies resorted to a link to time-sharing companies for data processing services.

Through developments and innovations in computer technology, manufacturers were able to make minicomputer systems that were faster, cheaper, and smaller but comparable in power with mainframe computers. In 1975 IBM introduced the minicomputer system, which is comparable in power with a mainframe, at one-tenth the price (Fuori & Aufiero, 1989). The low cost of minicomputers and ease of operation gained rapid acceptance among small businesses.

The computer systems at the time, according to Tapscott and Caston (1993), were highly complicated that access to the technology became limited to members of the Management Information Systems (MIS) team who were equipped with the special technical skills and knowledge. This problem combined with the fact that computer systems were isolated from the day-to-day functions of the business caused senior executives and management to view computers as relatively unimportant. However, this scenario had to change due to the increased demand for office productivity.

The introduction of the first standalone personal computer in 1981 by IBM, allowed businesses to use data processing and it proved to be an efficient way of processing routine tasks. Further developments were made to include word processing and by 1983, IBM personal computers became the industry standard, and personal computers began to infiltrate organizations. All levels of employees from clerical, secretarial to senior management and executives were able to utilize the technology. Computers were used not only for data processing applications such as accounting, inventory control and payroll but also for database management and office tasks such as typing. However, work on the personal computers was still done in an isolated manner, that is, individual computers were not connected with other computers (Pliskin, 1997).

Telecommunications technology and computing power creates the networked organization

A major shift in technology occurred in the early 1980s when businesses began to reassess business and work processes. Computers were already used on a daily basis throughout the organization, but organizations wanted to utilize computer technology fully so that information and technology resources could be shared, thus avoiding redundancy. The organization's wish was made possible by the connection of personal computers.

The United States Department of Defense was the first organization to experiment with inter-organizational e-mail and file transfer through the WAN (Wide Area Networks). Pliskin (1997) reported that ARPANET connected computers used by research communities. The convergence of computing power and telecommunications technology resulted in local area networks (LANs) and client-server networks. A LAN is a computer system environment that enables integration in the office through interconnecting terminals, computers and other devices for the exchange and sharing of information. This sharing capability allows joint creation and use of databases, e-mail exchanges, file transfer to and from other computers, and system administration such as file backup and software maintenance (Pliskin, 1997).

The LAN environment supports common business applications such as word processing, spreadsheet, presentation and graphics, with the added connectivity that allows communications and online research (Baber, 1996). Therefore, organizations that adopt these technologies become known as open-networked organizations (Tapscott & Caston, 1993). This new technology makes it possible for computers to transmit data, voice, and video messages electronically to almost anywhere in the world. Advancements in communications technology led to the networking of office environments and ability to access information from the Internet (Ray, Palmer & Wohl, 1995; Stern & Stern, 1996).

Office technologies and computing power

Automation of office work began with the invention of the typewriter but of more significance is the use of magnetic media for creation and storage of documents. The creation of magnetic media opened the door for the entry of computer power in the office (Ray et al., 1995). Offices in the early twentieth century had already used mechanical devices for information processing ranging from the use of typewriters for document preparation, tabulating machines for data input, punched card accounting machines, adding machines for calculations, and the telegraph and telephone for communications. But, separate office technologies were less efficient to manage information rapidly and accurately and technological innovations for improving office productivity were necessary. Hence, came the concept of office automation.

The concept of office automation is continuously changing. Office automation allows sophisticated computers and other electronic equipment carry out many of the office's routine tasks as much as possible. Weizer and Little (1991) define office automation as a number of systems and technologies that assist workers in carrying out their functions in a business environment. Ray et al. (1995, p. 3) defined office automation as "the concept involving the interaction of people in offices using systems and technologies to meet their organization's goals." All definitions include the elements of people, environment, equipment and procedures. However, the levels of automation implemented depended on the structure and work process, which resulted in different levels of automation—non-electronic, semi-automated and fully automated. The non-electronic office obviously uses almost exclusively traditional equipment and methods of carrying out office functions (Fruehling, Weaver & Lyons, 1992). In semi-automated offices, computers are used mainly for carrying out word processing functions. The processing, storing and

retrieving capabilities of the computer are not fully utilized. Documents are in paper form and filed in the traditional manner. A fully automated office utilizes technology fully to process information. Technology is used not only to automate repetitive tasks but also help the company plan, schedule, communicate and negotiate functions. Software applications, intra and inter-organizational electronic communications, shared databases, on-line information, project management is commonly applied in fully automated offices (Fruehling et al., 1992; Ray et al., 1995). The management and administration of any public or private sector acknowledge that the three most commonly used applications are word processing, creating databases, and creating spreadsheets (Elliot & Tevavichulada, 1999).

The networked office evolved through the power of the microprocessor chip Previously separate devices were integrated into one office system and enabled people to communicate with other resources and other people. This system combines a number of tools focusing on categories of people who work in the office and changed the nature of work (Tapscott, Henderson & Greenberg, 1980). The connection of the integrated workstation with other computers on a LAN allowed the distribution of resources across a network and subsequently restructured work from individual to work-group computing. This new technology called GroupWare or computer-supported collaborative work supports group decision support systems, video and teleconferencing, faxes and e-mail.

Figure 2.5 illustrates the shift from standalone to work-group computing:

Standalone Personal Computer	Work-Group Systems
NIL	Information Exchange E-mail document distribution Computer conferencing Teleconferencing
Standalone word processing and presentation graphics	Shared Document Creation Co-authoring (hypermedia thinking tools) Shared work space Multi-user idea processing
Desktop database	Shared Information Handling Access to information resource (data, text, voice, image) Application sharing
Spreadsheet	Multi-user decision support Modeling environments Flags, threshold indicators Knowledge bases
Diaries	Time and Resource Management Scheduling Meeting management Procedure automation Process management Group project management
Tutorials	Electronic Performance Systems Electronic job aids Computer-based training

Figure 2.5 Shift from Standalone PC to Work-group Computing

Note. From "Technology, Organizations, and Work in the 20th Century", by J. P. Craiger, 1997, The Second Paradigm Shift: The Open Networked Organization section. Reprinted with permission of the author.

It is obvious that the traditional technologies of computer, office and telecommunications have converged to the point that it is difficult to identify them as distinct technologies (Blum, 1996; Tapscott & Caston, 1993). The convergence of these three technologies, now called Information Technology (IT) has brought about a dramatic impact on the world of work, home life, government and education. Societies of the world are planning towards becoming technologically literate by deploying the technologies and providing accessibility to proper training and support. In short, IT is a basic skill needed by all ("Future Public Servants", 1997). The George Washington University Forecast of Emerging Technologies (Halal, Kull & Leffmann, 1997) launched at the start of 1990s through 1996 concludes that technological revolution is destined to transform our lives.

There has been tremendous effort on the part of organizations to provide opportunities for employees to upgrade computer competencies. The Dalhousie University has a vision for use of IT among its academia, staff and students. The university believes that IT can enhance the teaching and learning processes making it attractive and competitive in the educational and research market. The report defines IT as "the converging technologies of communications, computing, video, audio and image, together make the basis for a new technology: Information Technology" (Dalhousie University, 1998, What is Information Technology section).

ChainWave Systems Inc., a systems consulting group that provides advice, design, and implementation of software systems shares Dalhousie University's definition of IT. ChainWave Systems Inc reports that IT concerns the development of applications and systems for the entire business enterprise. Therefore, IT is not only limited to usage of applications in the business but concerns networks, operating systems, shared databases within the company for customer service improvement and overall business efficiency (ChainWave Systems Inc., 1996).

According to ChainWave Systems Inc., "Information Technology concerns the development and deployment of applications and systems for business that cover the entire business enterprise. IT is more than a spreadsheet or a word processor, although IT is concerned with how spreadsheets and word processor programs are used within your company" (ChainWave Systems Inc., 1996, para. 1).

Information Technology Competency

The term competence raises confusion among employers, educators and trainers What is meant by competence seems to be determined in many technical papers, government reports and general documents as occupational competence and personal competence. This confusion is compounded even further by the latest additions of the term "general" competence, "workplace" competence and "core" competence (Fletcher, 1997).

Definition of information technology competency

Competence as defined by The American Heritage Dictionary of English Language (Davies et al. 1981, p. 147) is: "The state or quality of being properly qualified, capable and adequate for a purpose". One who is equipped with the knowledge, skills and ability to use the tools of technology to improve productivity and efficiency demonstrates technology competency. Since IT is defined as a convergence of computer, communication and office technologies, this study defines Information Technology Competency as the ability to operate technology-based tools, use technology to locate, select and manage information, and use technology to express ideas and exchange information (Fairbanks North Star Borough School District, 2001).

Information technology has infiltrated all disciplines that the requirement for IT competencies occurs across all occupations. From teacher training to certified public

accountants as well as professional military education, the call for competency in IT is increasing ("A Worldwide Call", 1996; Agarwal & Prasad, 1999; Chilcoat, 1998; Ginsburg & Elmore, 1998; Imel, 1999; Parkinson, 1998; Petropulos, 1997; Tanyel, Mitchell & McAlum, 1999; Ward, 1996). New teachers are expected to demonstrate computer competency, with mastery in business applications that include word processing, databases, spreadsheets, presentation programs, online service access, e-mail, troubleshooting and use and evaluation of software (Dougherty, 2000). Paralegal entry-level positions require two levels of computer competency. Level one requires basic competency in word processing, databases, spreadsheets, and legal research assistance while level two requires competency in legal applications such as document assembly in word processing, completion of standard legal forms with a database, case management software, and a time and billing program (Petropulos, 1997).

A research to assess current and future needs for technology training among financial service employees found a high need for training in all software programs (Ward, 1996). As a result, a large number of organizations and educational institutions have developed IT competency standards for students and employees (Ayersman, Ackermann & Zisman, 1996; "Basic IT Competencies", n.d.; "Computing Competencies Bibliography", 1999; United States Department of Education, 1999).

A survey of 250 institutions belonging to the American Association of State Colleges and Universities (AASCU) (as cited in Ayersman et al., 1996) found that although few colleges have computer experience entrance requirements, most have computer competency requirements to be achieved by graduates. For Mary Washington College students, a two-phase approach was used to achieve computer competency requirements. Phase One provided students basic technology skills training and Phase Two integrated

technology into courses extensively. At the end of the program students would have acquired the ability to:

1. create a word-processed document
2. create a spreadsheet that involves calculations
3. access on-line information from the world wide web
4. use the campus computer network to send and receive information
5. electronically locate topically relevant information within the campus library

The Western Illinois University has initiated an integrated program to develop computer competencies for students in its goal towards a computer-intensive campus by 2005 ("Report of the Computer Competency", 2000). The Computer Competency Committee that was established to oversee implementation of Computer Competency Plan believed that the goal of the curriculum is to ensure that all students attain the highest appropriate levels of computer competency rather than computer literacy. Thus, computer competency encompasses basic college level competencies and professional level competencies to ensure success for students in specific disciplines.

Figure 2.6 lists the draft definitions that were given to all departments of the university for identification of basic and professional computer competencies:

Computer Competency	Definition
Basic vocabulary of computer terms and concepts	• Familiar with basic terms such as operating systems, networks, platform, elements of computer structure (RAM, ROM, drives)
Ability to use the Internet	• Use search engines to search reliable material on a given subject • Evaluate reliability and usefulness of material • Store and retrieve materials using file transfer protocol • Send and receive e-mail • Understand ethics and etiquette of e-mail • Understand basic concepts of networked computers, Intranets and the Internet • Write effective Web pages
Ability to use word processing	• Create effective letters, memos, outlines, tables, reports and similar documents • Retrieve, edit and print documents • Create, edit and print text in ASCII format as well as word processor specific format • Use word processing or desktop publishing program to create appropriate document layout
Ability to use library databases, catalogs and search engines to locate print materials	• Effectively search for useful materials
Ability to use a spreadsheet	• Design and create a spreadsheet • Present information from a spreadsheet both numerically and graphically • Use formulas for spreadsheet computations

Figure 2.6 Computer Competencies required for graduation at Western Illinois University

(figure continues)

Computer Competency	Definition
Ability to use presentation software	• Construct and present visual text and graphic supporting materials for an oral presentation
Ability to use graphics program	• Design and create or manipulate graphics for use in print documents, presentation or Web sites.
Appreciation of ethical issues in computing	• Understand the ethical obligations of individual Internet users as well as users of any networked system. • Know that software and hardware is protected as intellectual property • Know differences between freeware, shareware and proprietary material. • Appreciate larger issues of intrusion on individual privacy and capture of privileged information using the computer • Recognize the ways computers are redefining traditional understandings of relationships and organizations • Understand other ethical issues such as access, censorship, computer crime, etc.
Ability to adapt knowledge and skills to new applications	• able to learn new programs, program updates, changes in platforms, based on previous experiences

Figure 2.6 Computer Competencies required for graduation at Western Illinois University

Note. From "Computer Competency: Draft Definition" by Computer Competency Committee at the Western Illinois University, 2000, Appendix 4. Reprinted with permission of author.

Traditionally, fluency in IT requires a minimal competency level in the use of technological tools like word processors, e-mail, and Web browsers. However, fluency in IT according to a report from the National Research Council ("Being Fluent", 1999, chapter 2, para. 1), ". . [R]equires a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving

than does as traditionally defined." The report stated that IT fluency, or increasingly termed as IT literacy, requires a person to:

1. understand and apply information technology productively at work and in their everyday lives,
2. recognize how information technology could assist or impede the achievement of a goal, and
3. continually adapt to changes and advancements in information technology. (*chapter 2, para. 1*)

IT fluency or IT literacy as defined by the above report is the ultimate goal of any student or employee. However, IT literacy hinges on basic technological competencies in using IT tools. That is, IT literacy is only achieved when one becomes competent in the use of IT tools.

Development of competency standards

Educators need to provide graduates that meet industry standards but changing technology widens the skill gap between technology and the end-user. As a result, educational institutions face a constant challenge to keep abreast with new technologies. In order to meet the needs of the changing workplace, educators and employers have collaborated to develop standards of work performance. The development of competency standards is necessary for it defines a minimum standard for performance in any occupation. So how do these standards come about? All jobs have a number of main duties or functions and each of these are broken down into tasks. A competency standard is then used to describe the skills and knowledge needed to effectively perform these functions and tasks. Competency standards are beneficial to employers and educators because benchmarks can be developed for training delivery and assessment, identification

of career paths, development of skills-based position descriptions, staff recruitment and promotion (Chen, Shoh & Jin, 2001). Standards of competency are also a measure for recognizing and assessing skills of employees as well as identifying current and future training needs.

The University of Saskatchewan, for example, believes that a comprehensive IT plan must be developed in order to define the role of IT in the university and address academic as well as administrative functions. A survey of faculty, staff and students was carried out to determine access to computers and type of support needed to utilize technology for education and work-related activities. With input from faculty, students and staff at the university the survey recommended, among others, that new responsibilities in a networked environment require significant training and provision of technical support, without which, the stakeholders will be unable to function effectively. ("Summary of Faculty, Staff", 1999).

The Department of Natural Resources in Cornell University is another example of an organization that assists administrative support staff deal with the impact of technological changes on the work process and expectations of administrative staff. The report recommended that administrative positions be redesigned based on skills and competencies needed in the technological era. A list of skills and competencies was developed which included the ability to work effectively with others, ability to use technology effectively and adapt to change (Cornell University, 1999).

Competency standards for administrative workers are necessary because administrative workers are employed throughout the public and private sector ("Secretaries, Recorders, and Transcriptionists", 2002). Administrative staff is employed in the repair shop, local department store, school office and virtually all businesses. Therefore,

competency standards for administrative workers need to be general to meet the needs of a wide spectrum of businesses.

In the United States, skill standards for administrative support occupations have been developed by the Center for Occupational Research and Development, the Southern Regional Education Board, the Vocational Technical Education Consortium of States (V-TECS), and American College Testing. The skill standards, based on current administrative support practices, are organized into broad occupation-specific knowledge to include communication, mathematics and science; technical skills that include core and occupation-specific skills and workplace behaviors that include work ethics, interpersonal relationships, teamwork and solving problems and critical thinking (Linn, 1998).

National Occupational Skill Standard (NOSS)

The National Vocational Training Council (NVTC) established in 1989 develops a system of national occupational skill standards and certification in Malaysia. Through the DACUM approach of job and task analysis, the agency put forward the National Occupational Skill Standards (NOSS) for 34 occupational areas and placed these standards within a five-level framework.

The standards within the levels of NOSS are outlined in Figure 2.7:

Level	Occupational Skill Standards
1	Competent in performing a range of varied work activities, most of which are routine and predictable.
2	Competent in performing a significant range of varied work activities, performed in a variety of contexts. Some of the activities are non-routine and require individual responsibility and autonomy.
3	Competent in performing a broad range of varied work activities, performed in a variety of contexts, most of which are complex and non-routine. There is considerable responsibility and autonomy and control or guidance of others is often required.
4	Competent in performing a broad range of complex, technical or professional work activities performed in a wide variety of contexts and with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and allocation of resources is often present.
5	Competent in applying a significant range of fundamental principles and complex techniques across wide and often unpredictable variety of contexts. Very substantial personal autonomy and often significant responsibility for the work of others and for the allocation of substantial resources feature strongly, as do personal accountabilities for analysis and diagnosis, design, planning, execution and evaluation.

Figure 2.7 National Occupational Skill Standards (NOSS)

Source: From "National Occupational Skill Standard. National Vocational Training Council", n.d., at http://www.trainingmalaysia.com/mlvk/NOSS(english).shtml. Reprinted with permission of author.

NOSS specifies the levels of competencies expected of a skilled worker employed in an occupational area in Malaysia. The levels of competencies are broad-based and generic rather than job-specific; therefore, require fine-tuning to suit specific organizations and industries.

NOSS has been used as references for staff recruitment, training need analysis, job appraisals and competency benchmarking. The availability of such standards allows

NOSS to be used as a benchmark to gauge the level of competence acquired by a trainee for the purpose of certification.

Other organizations are accredited by NVTC to provide training and assessment for certification. Therefore, NOSS becomes widely used by accredited training providers as a basis for developing syllabuses, learning guides or learning modules that lead to the award of Malaysian Skill Certificates (National Vocational Training Council, n.d.).

Secretary's Commission on Achieving Necessary Standards (SCANS)

In 1990, Elizabeth Dole then secretary of the United States Department of Labor established the Secretary's Commission on Achieving Necessary Skills (SCANS)—a set of workplace skills that high school graduates must master for entry-level employment in the modern workplace (Whetzel, 1992). SCANS call these workplace essentials as "foundation skills" that are required for most jobs. Foundation skills comprise basic skills, like basic reading, writing and arithmetic, thinking skills and personal qualities like responsibility and self-esteem. On the other hand, "competencies" are more closely related to what people actually do on the job. The SCANS report (United States Department of Labor, 1991) has identified the competencies that fall into five broad categories:

1. ability to locate and use resources—identifying, organizing, planning, and allocating time, money, materials, and workers;
2. interpersonal skills needed for work—negotiating, exercising leadership, working with diversity, teaching others new skills, serving clients and customers, and participating as a team member;
3. ability to use and communicate information—using computers to process information and acquiring and evaluating, organizing and maintaining, and interpreting and communicating information;

4. ability to understand and work within systems—understanding systems, monitoring and correcting system performance, and improving and designing systems; and
5. ability to use technology—selecting technology, applying technology to a task, and maintaining and troubleshooting technology.

The five categories of competencies challenge students to develop competencies that can lead to successful transformation from school to work. As the SCANS report recommends that the competencies must be learned in context and applied to the environment, there is a need for school and industry collaboration (Lankard, 1995).

The introduction of this new skill framework led to the development of industry skill standards for entry-level workers. This move is currently taken by the United States federal government in its support for the development of skill standards in 22 industries (Giddens & Stastz, 1999). Figure 2.8 illustrates the foundation skills and categories of competencies that would lead to successful transition from school to work:

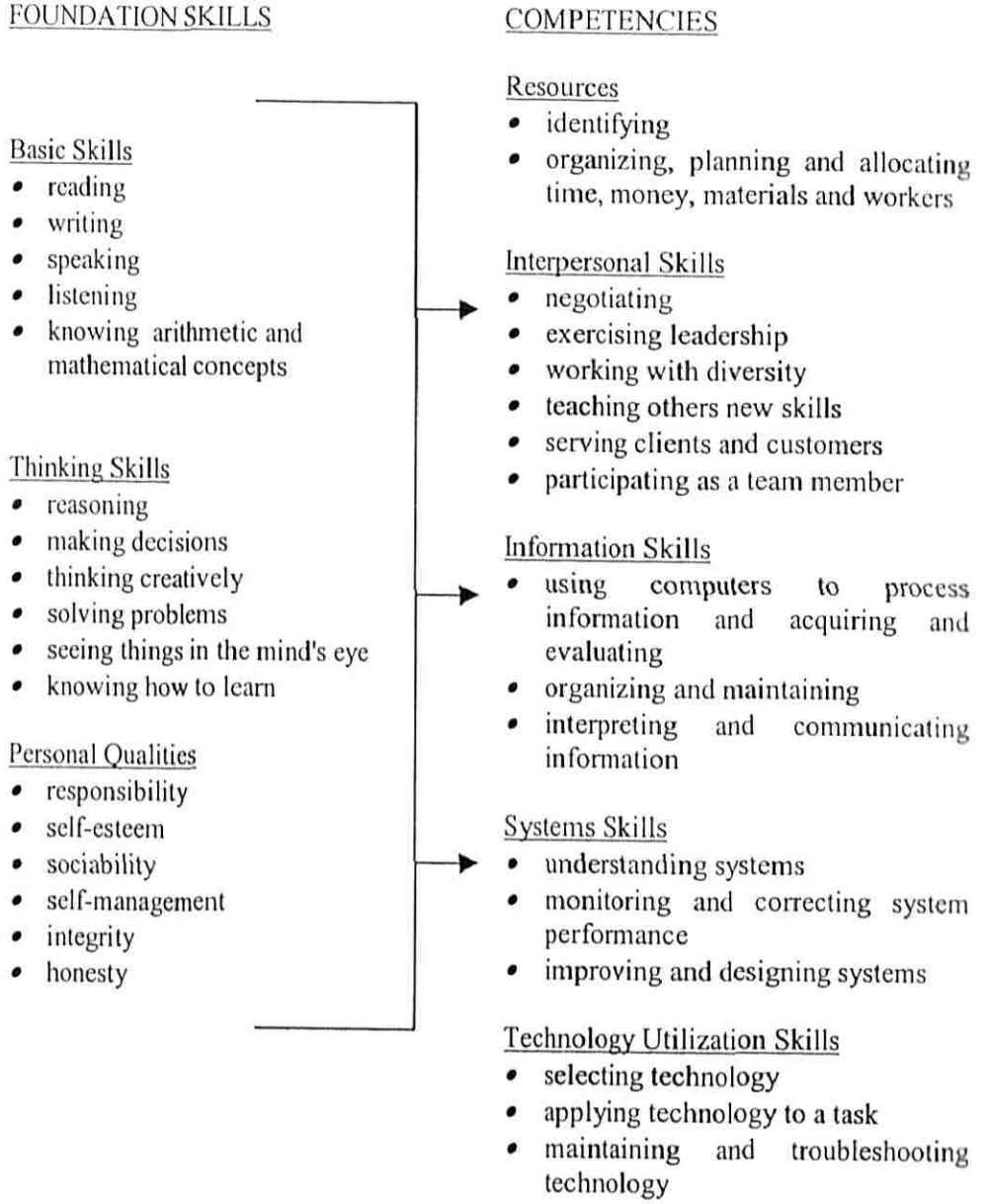

Figure 2.8 Secretary's Commission on Achieving Necessary Skills (SCANS)

Competencies of Administrative Support Staff

In the early 1980s, the general consensus was that automation of the office would reduce the number of office support jobs. But this has not been the case. Arzy (1992) found that there was an enormous increase in the sales of computers and a subsequent increase in office occupations. Two out of every three administrative support staff use a computer in their jobs ("Computer use", 1992). Even though there were reports that the secretarial career was perceived as a dead-end career track and that organizations see little reason to develop employees in the field, changes in technology have forced companies to restructure and redefine the role of administrative support staff (Carr-Ruffino, 1993; Farnham, 1997; Lancaster, 1998). Office support staff are shown to maintain traditional office functions and tasks with the addition of computer skills to enhance office tasks.

Office competencies and related IT competencies

Many studies have examined job competencies of office support staff. According to Goodrich (as cited in McEwen, 1996) office support staff will be doing more creative work together with more traditional routine tasks. Her study found that only the methods of completing tasks have changed. The content of office work, however, is fairly consistent. Davis and Gonzenbach (1996) support Goodrich's conclusion that office support staff will still perform traditional tasks. The research concluded that basic office competency such as records management, telephone techniques, handling mail and visitors are still relevant with the added competencies in word processing, spreadsheets and databases. Arzy (1992) in her study on necessary computer skills for entry-level office workers found that office tasks would benefit from computer technology. Since office tasks center on data production, processing and dissemination, the use of automated

equipment and software efficiency when dealing with office tasks is increased. Arzy concluded that office communication functions are accomplished through the use of word processing, maintenance of records through calculations in spreadsheet applications, management of individual records through database applications and production of publications through desktop publishing that incorporates text, pictures and drawings.

McEwen (1996) supports the findings of the previous researches. Her study found that most functions and tasks done in a traditional office are still relevant in the technological office environment even though there is evidence to support the trend that office support staff is taking bigger roles and responsibilities. However, her study found that end-user-computing competencies seem to be at the basic level and limited to text-editing technologies.

While McEwen (1996) identified job competencies required for office support roles, other organizations have developed skill standards for entry-level jobs traditionally included in local vocational education programs at the secondary and post-secondary levels. The Center for Occupational Research and Development, in collaboration with the Southern Regional Education Board, the Vocational Technical Education Consortium of States (V-TECS), and American College Testing, has developed career pathways that link occupations requiring similar skills and knowledge (Linn, 1998). V-TECS has developed skill standards or a set of performance expectations based on current administrative support practices. The skill standards are grouped into broad technical functions that include organizing and planning, maintaining equipment and supplies, performing financial functions, managing records and files, communications, document production, information distribution, producing desktop-publishing documents and using operating systems.

Occupation specific technical skills include supervising personnel, preparing legal documents and providing medical services while work behaviors include work ethics, interpersonal relationships, teamwork, solving problems and critical thinking (Linn, 1998).

Figure 2.9 combines the main functions taken from the National Skills Standards of Administrative Support Occupations ("National skills standards", 1996) and related IT competencies frequently needed in office support roles (McEwen, 1996):

Job Function	Related IT Competencies
Document Production	Use word processing software • Revise stored documents • Prepare extensive reports • Print Final Documents • Proofread for spelling, grammar, and punctuation errors • Key routine office correspondence (letters, memos, etc.) • Use personal computer to key a variety of materials • Keyboarding
Communications	Use local area network • Use e-mail • Review and log incoming mail • Sort/distribute incoming mail • Maintain and update mailing lists • Utilize personal computer to obtain information • Perform liaison work with other administrative and management personnel in the organization and other organizations through the company network • Make travel arrangements through the Internet • Use a fax machine
Organizing and Planning Functions	Use calendaring and scheduling tool to: • Prioritize/assign work • Schedule meetings and coordinate meeting agenda • Schedule appointments • Maintain manager's calendar • Maintain computerized calendars

Figure 2.9 Job Functions and Related IT Competencies Frequently Needed in Office Support Roles

(figure continues)

Job Function	Related IT Competencies
Maintaining Equipment and Supplies	Maintain office supplies • Prepare requisitions and vouchers for purchasing equipment and supplies
Producing Desktop Publishing Document	Produce newsletters, brochures, cover designs, etc.
Managing Records and Files	Maintain electronic filing system • Do data entry • Maintain up-to-date archive library, copying, deleting, and retrieving documents as necessary • Maintain diskettes and index files • Establish and maintain confidential files • Prepare and maintain database files • Maintain payroll and/or personnel records
Information Distribution	Develop Web sites and Web pages • Coordinate and maintain department's procedures manuals • Develop and revise department's or organization's policies • Update and maintain job description index and file • Update files via personal computer directly into the mainframe computer • Compile reports and distribute information
Performing Financial Functions	Prepare and maintain spreadsheets • Complete expense reports • Create Graphs

Figure 2.9 Job Functions and Related IT Competencies Frequently Needed in Office Support Roles

Note. From "The Impact of Selected Variables on Office Roles and Responsibilities", by McEwen B. C., 1996, p. 136-138 and "National Skills Standards: Administrative Support Occupations", 1996, para. 1. Adapted with permission of authors.

Skills Required by Employers in the Workplace

Rapid technological change in the workplace requires employee to possess new job skills and competencies. Inability on the part of employees to adapt to change or embark on continuous learning can have far reaching implications on employee and organization productivity (Barley, 1992; Connolly, 1996; Marino, 1993). Organizations that realize the importance of assisting employees deal with technological changes have initiated programs for continuous retraining. On the part of education and training institutions, research needs to be continuously carried out to identify skills and competencies needed by employers as well as reduce gaps or mismatches between education and industry needs.

A review of literature shows that skills required of employees in the workplace are categorized as either workplace or generic competencies or job-specific competencies that include computer and IT skills.

Workplace or general competencies

It is becoming common to hear that employees are less prepared for the workplace and need new kinds of skills to perform successfully in the workplace (Barley, 1992; Cruz, 1996; Messmer, 1999; Smith, 1996). The perceived skills gap or mismatch between the existing workforce skills and skill demands in the workplace is forcing employers to redefine skill needs to reflect the concerns of employers. This redefinition of skill seems to shift the focus from job-specific skills to general skills. Technological proficiency may exert a strong influence in the workplace but it will not likely displace the human element. A major research study conducted by OfficeTeam (Domeyer, 2000) found that technical abilities are highly valued in a networked environment where hundreds

of people are linked together and communication is frequent and rapid. However, such an environment demands not only technological proficiencies but also interpersonal abilities such as communication abilities. As stated by Domeyer (2000, para. 10): "Being linked together so conveniently and frequently means that people who are lacking in diplomacy and negotiation abilities, for example, will reveal such shortcomings to wider audiences".

When making decisions on hiring, employers most often cited the importance of employee attitudes, followed by an emphasis on "generic" skills such as problem solving, teamwork and communications over job-specific skills (Kretovics & McCambridge, 1998; Messmer, 1999; National Center on the Educational Quality of the Workforce, 1995; Natriello 1989). The emphasis on generic skills, however, does not imply less importance of work-related or job-specific skills among employees. Generic skills and work-related dispositions continue to be a part of most occupations and crucial for effective performance. In a study carried out to explore skills and work-related dispositions in technical work (Stasz, Ramsey, Eden, Melamid & Kaganoff, 1996) the researchers found that generic skills and work-related dispositions are a part of most occupations and essential for performance. However, the importance of generic skills such as communications, problem solving, working as part of a team, and positive dispositions toward work are dependent on the work context (Anonymous, 1998a; Kretovics & McCambridge, 1998). Carnevale et al. (1990) in the book, *Workplace Basics: The Essential Skills Employers Want,* identified the skill of learning to learn as a foundation for 16 other skills. The basic 3 R's that include reading, writing and computation form the basis for building technical competence. The 3 R's only form a small part of the list, but the more prominent are the broad areas of creativity, motivation, communication and teamwork as these incorporate a wide variety of skills and competencies. Communication skills, which include communication and listening, enable people to communicate effectively on the job.

Problem solving and creativity are essentially adaptability skills that enable workers to be flexible in the workplace while self-esteem, motivation and goal setting, employability and career development, are developmental skills that enable people to keep and hold jobs as well as move up the career ladder. The broad area of teamwork skills examines interpersonal skills, teamwork, and negotiation, organizational effectiveness and leadership These are group effectiveness skills that enable people to work together productively in the completion of tasks (Alonzo, 1998; Carnevale et al., 1990).

Researches on non-technical or general skills seem to place a lesser emphasis on computer skills among graduates. Studies have reported that possession of knowledge and skills in computers alone cannot guarantee that graduates can fit easily into a business organization and succeed in such an environment. According to Elliot (1997) computer science graduates may have the computer skills in hardware and operating systems, file processing and database organization, data communication and networking, and programming. But, in order to succeed in the field, they require general skills such as the ability to apply knowledge to the workplace, communicate ideas effectively, work with a variety of people, and adapt their knowledge and skills to new situations.

In order to be successful in a networked organization, employees need both technological and personal skills. The integration of IT into work processes makes the boundaries surrounding IT work to be unclear. As a result, IT workers must learn more business skills and non-IT workers need to become proficient computer users. Gerhard (as cited in Raths, 1999, New learning technology section, para. 3) said: "The IT workers will need to transfer their knowledge of not only how applications work, but what the data means. People not only need a report, but they need to know how to prepare the report themselves".

Computer competencies

Available studies show that valuable skills for the new millennium are "people skills" such as interpersonal communication and "soft" skills such as negotiation. However, an important asset for employees to have is technical or technological skill (Dench, 1997). The importance of technological skill among workers is seen in the fact that retirees can successfully return to work because they are computer literate and familiar with current software applications (Dutton, 1998). Employers frequently report that administrative support staff must be equipped with advanced computer skills that include proficiency in Internet use (Allerton, 1997; Grayson, 1997; Morgan, 1998).

Therefore, the discussion on computer competencies required of administrative support will center on keyboarding competency and technological competencies in using major business softwares and network applications.

Competency in using major software and network applications

The available literature on computer skills required of graduates emphasize that graduates must be literate or, at least, possess basic proficiency in hardware, operating systems and software applications—word processing, spreadsheet, database, desktop publishing and presentation (Anonymous, 1998a; Kennedy, 1998; Kretovics & McCambridge, 1998; Kryder, 1999; Perry, 1998; Wiedmaier & Owens, 1998; Zhao, Ray, Dye & Davis, 1998).

Recruiters are reported to hire only computer-competent candidates. According to Kennedy (1998) recruiters have reported that their Fortune 500 clients demand that all candidates must be tested for computer competence and that they will only interview candidates with mastery of specific software. The need for technology literate employees is

reflected in Kennedy (p. 52) ". . . . they are determined not to let another computer illiterate in the door. Every computer illiterate means an up-front investment in support staff".

Davis (1997) who conducted a survey on computer skills required of recent Cornell University graduates, found that employers have high expectations of computer literacy in creating documents, manipulating numeric data, managing databases and working with computers. An overwhelming number of employers responded favorably to skills in computer network where a significant percentage of employers expected e-mail experience and competency with online and Internet searching. A surprising conclusion is the fact that creating documents on the Internet or also known as creating Web pages was ranked last. However, the survey was conducted in 1997; it does not forecast expectations of employers in four years time and the possibility that creating documents online would become as important as word processing. Two years before Davis (1997) carried out his study, the College of Agriculture and Life Sciences (CALS) at Cornell University (Monk et al., 1996) had set up an Ad Hoc Committee to determine computing capabilities employers seek in graduates. The report indicates that students should:

1. obtain a basic knowledge of major applications, particularly word processing and spreadsheet analysis,
2. have experience with presentation and database management software.
3. use the Internet for effectively gathering and evaluating data.

Heavy investments in technology have caused United States companies to raise the standards for computer literacy in the workplace and demand advanced PC skills among employees. According to Diane Domeyer, executive director of OfficeTeam (Holyoke, 1997) executives want staff to learn advanced PC skills. Advanced PC skills includes not only keeping current of the latest version of word processing but also becoming proficient

in all the applications of an office suite package. Employees must be proficient enough to use the timesaving features of all applications and possess an in-depth knowledge of their company's hardware and software.

The Total Quality Management team from the University of Wisconsin-Stout (Furst-Bowe & Boger, 1996) wished to identify the usefulness of computer competencies grouped under the following areas: basic computer skills, word processing skills, spreadsheet skills, database skills, graphics/multimedia skills and information retrieval/telecommunications skills. The university students, administrators, alumni and employers responded that the competencies were important and detailed the competencies required for each of the above-mentioned areas. The survey concluded that all graduates at University of Wisconsin-Stout should be able to:

1. use MS-DOS commands and the "Windows" interface;
2. manage files on a hard disk;
3. learn to use a program with the documentation provided;
4. generate business letters and research reports;
5. create a spreadsheet that includes formulas;
6. create, sort, and query a database;
7. create charts, graphs, and flow charts; and
8. send and retrieve electronic mail (Furst-Bowe & Boger, 1996).

For administrative support staff, there is a great demand for them to be competent in the applications of a whole office suite package. Administrative support staff who have mastered multiple software packages and Internet savvy are most sought after by employers in both the public and private sectors (Brent, 2000). According to Eurich (as cited in Ginsburg & Elmore, 1998) secretaries employed in government offices must be able to communicate with coworkers and clients electronically, retrieve and transmit data

electronically, and be proficient in the use of databases, word processing, spreadsheet and accounting. Administrative support staff employed in the education sector need proficiencies in advanced computer skills as well. A survey of education and training needs for 149 secretaries employed at Temple University and Temple University Hospital found that secretaries need proficiencies in database, the Internet, Lotus, Excel, Word, Desktop publishing and Windows. The study recommended that courses and professional development services be programmed sequentially and allow for articulation in the curriculum (Agabiti, 1997).

The range of technological competencies in multiple softwares and the increased use of the Internet reflect the diverse tasks that are expected of administrative support staff ("New Name Reflects", n.d.). An OfficeTeam study reported that the role of administrative support is being redefined—Internet proficiency is more than e-mail or familiarity with search engines. Administrative assistants are reported to be the key source for online searches that provide value-added industry news to their departments ("Internet Redefining", 1998).

Competency in keyboarding

Keyboarding skills is cited as an important skill for today and tomorrow and employers expect office support staff to be proficient in it (Howard & King, 1998). The importance of successful mastery in keyboarding, according to Toppe (as cited in Arzy, 1992), generally motivates an individual to pursue more comprehensive computer skills. Adult learning centers offering keyboarding classes are popular as middle-aged men and women who reenter the workforce realize the importance of acquiring keyboarding skill in order to use computers (Benavides, 1999). Keyboarding is increasingly considered as a

basic skill that must be acquired through education in addition to literacy, numeracy and computer skills (Bynner, 1997).

Keyboarding is an important basic competency because managers of small, medium and large businesses involved in a research project carried out by Nellermoe (1992) found too many personnel across departments productively handicapped by the use of two fingers on each hand to operate a computer. In another study that identified Internet/Intranet competencies expected by employers, Batcha and Kunar (1998) found that employers ranked keyboarding or typing competency highest.

Competency in understanding computers and information systems is increasingly used as a criterion in staff recruitment. This is necessitated by the fact that computer literacy requirements for all job levels have increased dramatically in the early part of this decade (Davis, 1997), making computers a required resource for business, government, education and personal life (Chen & Bankston, 1998). As a result, employers believe that computer skill is a valuable asset in addition to "people skills", communication skills and a 3.00 or better grade point average (Scheetz, 1994). Being computer proficient proves to be an asset for graduates. Some communication graduates reported that they have indirectly experienced situations when computer literate people get better jobs. When competing for new jobs, individuals with computer skills also have an advantage (Bishop, 1995; Chen & Bankston, 1998; Dutton, 1998). In addition, workers who are technologically proficient get the opportunity to express themselves, promote their views and gain influence (Ginsburg & Elmore, 1998).

Therefore, the plight for job security requires workers to be proficient in technology because the demand for technology-proficient workers is not limited to critical areas in IT but the need for ALL workers to become proficient in the use of technology

(Agarwal & Prasad, 1999; Elliot & Tevavichulada, 1999; Furst-Bowe & Boger, 1996; Ginsburg & Elmore, 1998; Imel, 1999; Lambrecht, 1999; May, 1995; Orr, et al., 2001).

The literature on generic and technological competencies lead to the conclusion that employees of the future need to enhance both technical and personal competencies. This statement is reflected in Howard and King (1998, p. 2):

> . . . . vital competencies needed by workers include such skills as (1) communicating orally and in writing, (2) using the computer effectively, (3) working collaboratively, (4) thinking critically/making judgments, (5) organizing, scheduling and coordinating work activities, and (6) listening and responding appropriately to what has been said . . . .

Impact of Information Technology on the Secretarial Career Profile

The impact of IT is felt not only in the use of new tools to complete office tasks but also in changes on work and organization structures. What used to be a rigid, inflexible work organization is now non-hierarchical, organic, and decentralized with a team approach to office work (Robbins, 1996). As staff gain accessibility to common databases and implement full utilization of IT, several predictions are made on the secretarial and administrative support staff careers. The review of literature predicts four effects of new technologies on secretaries—skill twist or obsolescence, deskilling, upskilling and opportunities for advancement to operative levels of management. Skill twist refers to the displacement of old skills with new ones. In deskilling, new technology reduces the level of skills required, while upskilling has the opposite effect or also called skill enhancing (Ginsburg & Elmore, 1998; Kearsley, 1989).

As technology changes the composition of jobs and tasks carried out so has the need for education and training among workers changed. In the overview of Ontario's employment patterns to the year 2000 (1997) it was found that in 1971 only 10 percent of

workers employed in full-time jobs had post-secondary certificates, diplomas or degrees. In 1991 the number increased nearly 50 percent across all major occupational groups that includes administration and clerical. The need for higher levels of education and skill-improvement is reflected in the occupation itself. Experts from "Workforce 2000" (Ward, 1996) as well as Verespej (1998) reiterated that in the new millennium a majority of jobs will require education beyond high school and be linked to the use of information technology. Employees must upgrade their own skills to avoid obsolescence and pursue lifelong learning throughout their careers. According to the National Center for Education Statistics ("Who's Getting Trained?", 1998) almost 30 percent of administrative support staff are involved in ongoing training in their current job.

At the same time employers are urged not to replace obsolete but experienced workers with new technology-savvy workers. Experienced support staff have the awareness and understanding required for a given work setting. By eliminating support staff or relying on temporary support staff means that an organization may lose out on skills crucial to its very existence (Lambrecht, 2000). According to Ginsburg and Elmore (1998) experienced secretarial personnel have accumulated knowledge and experience that cannot be easily attained, developed or trained in new workers. Therefore, in order to help office support workers keep up with changing technology, it is beneficial for organizations to develop accessible retraining programs to help experienced workers acquire new skills that are built on previously acquired skills.

Skill Twist—Displacement of old skills with new ones

Changes in the marketplace, technology and work processes have tremendously affected the office environment. The impact of IT on the overall makeup of employment will force companies to reduce overhead costs and increase efficiency. As a result, low-skill repetitive jobs and clerical workers will be displaced (Anonymous, 1999a; Baber, 1996). Howell and Wieler (1998) observed that computerization trends in service industries from 1984 through the early 1990s caused a decline in the employment of administrative support who were predominantly female. The decline in employment of administrative support staff is also observed in the civil service. Reforms in the civil service have shown a decline in employees from the junior civil grades. A research on recent trends in clerical work shows that from 1984-1986 increases in employment were recorded for senior and middle ranking higher executive officer grades but a dramatic 35 percent drop was recorded in the most junior administrative assistant grade (Marshall, Lewis, Belt, Richardson & Parkinson, 2001). According to data provided by the Office of Personnel Management (Hagstrom, 1999) the United States federal government eliminated 30% of employees in the job classification of secretary between 1993 and 1997. A spokesperson from the office says that the cuts were appropriate, as office technologies have reduced the need for secretaries. Therefore, this calls for better education and training in order to produce better quality employees.

Torracco (1999) reported that in order for employees to maintain adequate skills they need to continuously add, replace, and enhance their expertise, because changes eliminate the need for old skills and necessitate the development of new ones. Torraco as well as Stephens (1999) both reported that the pace of skills turnover is evidently quick due to the impact of the Internet and the World Wide Web on all aspects of the office. Rapid

global communications combined with conducting business through e-commerce have changed the marketing operations of organizations. Intra-organizational communication is also growing with the advent of internal networks called Intranets. Steinberg (1997, p. 4) stated that: "Intranets link members of an organization together to ease communication, share information, and project coordination. Intranets make information available to members of the organization but keep it away from outsiders".

For secretaries, technological change has displaced old skills with new ones. Technological change that has infiltrated most occupations is causing job restructuring and redesign of the secretarial function. The consequences of organizational and technological restructuring on employment of secretaries are ambiguous—for some new opportunities become available while others suffer job losses and reductions. Secretaries to high-profile leaders of Silicon Valley high-tech companies, for example, report empowerment in carrying out nontraditional roles (Mendoza, 1999). These high-earning secretaries with stock options make crucial business decisions daily and carry out tasks such as drafting letters, researching companies, briefing executives and organizing deals. Nelsen's (as cited in Barley, 1992) pilot study of secretaries in universities suggests that the wide usage of personal computers among faculty members has shifted the role of secretary to research assistant. Farnham (1997) found that organizational and technological changes have provided new opportunities for secretaries. Even though secretaries still make up about 17% of support staff, the numbers have declined by about one-fifth over the decade. Those who survive no longer function in the traditional role; instead, they are the first ones to take over the tasks of displaced middle managers ("Computer use", 1992; Jackson, 1999; Lancaster, 1998; Lloyd, 1999; Marino, 1993; McEwen, 1996; Mittelhauser, 1998; Rosselli, 1997).

Organizational restructuring, on the other hand, has forced organizations to thin the ranks of the traditional and subservient helpers. An asset management firm with 600 employees in the United States does not employ a secretary. Instead, the Chairman said, "Managers once served by corporate assistants now handle all their correspondence, field phone calls, make their own travel arrangements, schedule their own meetings, even photocopy their own documents" (Farnham, 1997, p. 152). According to Gates (2000), Microsoft Corporation's ratio of professional staff to administrative assistants is about 15 to 1. This change in ratio is due to the fact that computer software lets the executives do the work of secretaries. Gates answers all e-mail himself, types his own memos and letters even more than his own administrative assistant. His administrative assistant, on the other hand, assumes the role of coordinator—handles arrangements and attends to details when he is out of the office.

With Internet trading already in place in the year 2000, employees find that they need to be flexible, or be replaced by technology (Massaro, 1999). The evolution of online discount brokerages not only displaced brokers and sales people but also middle office and back office support staff. According to Massaro (1999) financial firms are deploying office support staff to the front office—office support jobs are now in call centers and the support staff act as client service representatives. There are instances where technology and changing workforce demographics are causing secretaries to be redeployed. Secretaries who are used to deal with a variety of people become ideal candidates for public relations jobs (Carroll, 1993).

Changes in technology, society, markets or regulations have created emerging occupations—a new occupation or an existing occupation that has been substantially modified by the same changes and are increasing in employment. Computer skills open doors to lateral and other moves. According to the International Association of

Administrative Professionals (IAAP) ("Administrative Trends", n.d.) new jobs are coming about because of new computer applications.

Even though the United States Census Bureau reported that the number of secretaries dropped to 3 million in 1997 from 3.9 million in 1983, much of the decrease is due to a name change (Benavides, 1999). Technological innovations, however, have reported an increase in the number of administrative assistants. According to a survey of 40,000 members from the International Association of Administrative Professionals ("The 21st Century", n.d.) only 18% carried the title secretary, 23% carried the title administrative assistant and 21% assumed the title coordinator, associate or specialist. Some secretaries who have been upgraded to administrative assistants find that their position goes beyond clerical or general secretarial duties. Innovations in office technology are expected to allow administrative professionals carry out higher-level tasks. Less time is spent on routine duties and in addition to general administrative duties, administrative assistants carry out office management functions, working with payroll, budget, or personnel records. They may also work independently on projects involving research, outlines or presentation material and supervise or assign tasks to clerks and secretaries ("Computer use", 1992; Mendoza, 1999; United States Department of Labor, 2001; Watters, 2000).

A survey of 150 executives ("The Office of the Future", 1999) found that the office of the future would comprise a mobile workforce, staggered work schedules and the need for instant communication. Such a need will transform the administrative assistant into an information coordinator by the year 2005. The surveyed executives observed that entry-level administrative assistants are likely to assume greater responsibility in areas such as Internet research, desktop publishing, help desk or computer training and Web page design and updating ("Administrative Trends", n.d.; Anonymous, 1999b; McDougall, 1999; "The Office of the Future", 1999). Currid (1997) stated that authoring skill for

creating Intranet content is becoming common and easy that some corporations are giving Web-page responsibility to employees who are non-information systems professionals.

Deskilling—Technology reduces level of skills required

Technology not only raised concerns of skill obsolescence but the added worry that IT has changed demand for labor resulting in a reduced demand for some secretarial jobs. Cappelli (as cited in Howell & Wieler, 1998) used data from a large compensation consultancy and found that new office technologies caused some clerical jobs to experience significant deskilling. The year 2000 and beyond require employees to possess technical skills and training that goes beyond the traditional school education. Employees must be committed to the process of lifelong learning and must strive to upgrade their own job skills to avoid being obsolete (Anonymous, 1999a; Connolly, 1996). The content of jobs has changed resulting in a deskilling effect. For example, word processing has placed secretaries in typing pools. Secretaries no longer support one principal. In reverse, secretaries work for a group of professionals and managers and this has created a sense of job loss (Administrative Development Institute, 1994; Goldstein & Fraser, 1985; Haff, 1993; Herman, 1998). It is true that "old-fashioned" secretaries performing traditional clerical and administrative duties for a single boss are becoming extinct, but the new secretary or the name change to administrative assistant or even coordinator holds a challenging future (Anonymous, 1999a; Epstein, 2001; Farnham, 1997; Hamm, 1997; Kurtz, 1999; Love, 1998; Mendoza, 1999; Napier & House, 1988; Stone, 1995; Watters, 2000).

Upskilling—Increases the level of skills required

Although there are reports of job displacements and deskilling effects on the secretarial profession, other reports and studies show that technological changes can increase the opportunities for secretaries to acquire broader skills. The implications of upskilling are that job descriptions of secretaries can include areas that were non-existent or under other job descriptions (Ginsburg & Elmore, 1998; Lloyd, 1999). Results of the research conducted by the European Secretarial Development Network and the Industrial Society found a most significant finding—the environment of change in today's business has improved the job of the secretary (Jones, 1997). Technological gadgets may allow the executives to produce their own work, but the help of a support person is still required in either research or refining the end product (Gatlin, Rogers & Kordsmeier, 1995; Ginsburg & Elmore, 1998; Hamm, 1997). The National Partners for Reinventing Governments (Hagstrom, 1999) believes that cuts in clerical jobs may have improved citizen's ability to deal with the government, however government executives seethe over the time they need to handle their own travel arrangements, solve computer problems and prepare letters in final form. They also refuse to answer telephone calls.

The role of the secretary, now known as office professional, has changed and improved dramatically in the last two decades. The office professionals in the nineties handle many duties previously restricted to managers (Administrative Development Institute, 1994; Jones, 1997; Lancaster, 1998; Love, 1998; Moore & Johnson, 1999; Stone, 1995). Stone wrote that a significant increase in the average office professional's workload occurred because of restructuring. Five hundred secretaries in the United States and Canada reported that they have been assigned duties previously handled by management. These duties included office supplies and equipment purchases, preparation of periodic

reports, personnel training and supervision, implementation and supervision of personnel and implementation and supervision of quality management programs. In small companies, secretaries even double as managers (Mullaney, Burrows & Rocks, 1999). They are fully proficient in a wide range of computer applications and they have increased interaction with customers as well as management through participation in cross-functional teams. According to Fruehling et al. (1992, p. 19): "Secretaries can carry out more administrative support activities and become more involved in research, analysis, and decision making". In a survey of 500 office professionals (Administrative Development Institute, 1994), 42% of respondents reported that they still hold the job title "Secretary" but a majority of them reported new management duties and acquired training to assist them with the new responsibilities.

Due to the ability of administrative professionals in the use of software applications, they take on the role of trainer every time an organization upgrades software (Frazee, 1996; Lloyd, 1999; Salmons, 1996). A survey of 150 human resources professionals and other executives from 1,000 of the largest companies in the United States found that more than half of managers learned technical skills from their assistants (Frazee, 1996). According to a group director of a staffing firm in Atlanta, Georgia ("New Name Reflects", n.d.) administrative support staff who have strong technical skills also find themselves transferred to the IT help desk. The ability of administrative support staff to work with various programs gives them the capability to communicate with non-technical users in layman terms.

IT is seen as providing an avenue for new forms of work—new modes of work and work relationships are made possible with technology of telecommuting or teleworking. Networking with the use of GroupWare among office employees is increasing. This conclusion was made in the research project, "Teleworking and

Development in Malaysia", conducted by United Nations University/Institute for New Technologies (UNU/INTECH) in collaboration with MIMOS Berhad (Economic Planning Unit, 1999). Even though the study found that the use of home-based telework in Malaysia is negligible in all sectors, networking among office employees is increasing. The report continued to state that:

> . . as a mode of work, it (teleworking) requires the development of new skills, indeed of multi-skills, of new orientations to work and career, of a different management culture, and of a societal context conducive to lifelong education. (Economic Planning Unit, 1999, Recommendations section, para. 1)

Office support workers may find the prospect of working at home appealing, but available literature shows that telecommuting is still confined to a small segment of employees. Some jobs still require face-to-face contact with clients, coworkers or management and depend on facilities or equipment located in the office (Deeprose, 1999; "Managing Today's Automated", 1996; Reeder, 1998). Office jobs suitable for telecommuting are those done by individuals who can work on their own such as database administrators, instructional designers and technical support jobs. Therefore, the office support staff will have to hold the fort and remain at the office (Reeder, 1998).

Opportunities for promotion from administrative to operative levels of management

The new millennium is the best time to utilize the untapped skills of secretaries and turn them into Identified National Treasures (Illingsworth, 1998). Organizations that realize the importance of retaining support staff have embarked on programs of professional development and mentoring to assist support staff achieve their career aspirations. The National Aeronautic and Space Aviation (NASA) headquarters through a study of secretarial positions has established a model for the career development of

NASA's secretarial and support staff (Professional Development Guide, 1996). As stated in the development guide (Professional Development Guide, 1996, para. 1):

> The information collected in this study was used to determine the sequence of positions, experiences, responsibilities, education and training that may be desirable or required at each point in a secretary's/clerk's career progression. In addition, individuals who left the secretarial field were also interviewed to identify the bridges they used to other career paths.

The implementation of integrated office systems is seen as an opportunity for employees in the administrative support function to change roles or career paths. Tapscott et al. (1980) found that employees with knowledge gained from word processing environments are a source of expertise for the overall office automation and can move up the organizational ladder.

Technology may open the door for promotions but there are still cases where employers are not providing the avenue for secretaries to move into management. Employers seem to lack faith in the ability of their senior secretaries whose potential skills are left undiscovered. Even if secretaries move into executive positions, there is a ceiling on upward movement—secretaries' upward mobility depends on the managers' movement. A study to compare the promotion prospects of secretaries in three European countries comprising England, France, and Germany (Truss, Goffee & Jones, 1992) found that the prospects of secretaries to be promoted either within or outside secretarial work were very limited. Promotion depends on the boss's movement rather than secretarial merit, achievement or qualification. Another survey carried out by the Industrial Society ("Secretaries Aspirations", 1994) shows that even though employers demand higher qualifications of secretaries, spending on training is less than 10 percent and secretaries are not encouraged to further develop themselves. They are, instead, placed firmly in the secretarial bracket.

Developmental Training for Career Progression

Administrative professionals who assume the titles administrative assistants, secretaries or receptionists function strictly in a support capacity that tends to be viewed as less value-added with little impact on company outcomes. However, organizations must begin to view administrative support staff as strategic business partners if they want to achieve high-performance results. Scott (1998, para. 9) said: "It is critical that you select administrative staff who can contribute to client satisfaction as well as your profitability, productivity and goal achievement". Administrative support staff have been trained in basic office, computer and personal skills that are required in any office. These skills form the foundation for acquiring the necessary skills to access information and communications sources and the opportunity to become a part of management. Therefore, there is a need for organizations to utilize the talents and skills that administrative support staff have in office management. Scott (1998, para. 22) stated that: "There is a rule of human nature that goes like this: Your staff's commitment to excellence will rise in proportion to the opportunities they have to work on things of interest to them".

The idea of empowering support staff is also discussed in the article by Napier and House (1988). Top executives are reluctant to become expert microcomputer operators even though they need to get critical information on new business opportunities. More than half of senior and middle managers are technologically incompetent and justify their avoidance to utilize technology by saying that their secretaries or assistants can perform that part of the job (Kennedy, 1998; Maciag, 1996). Company-sponsored technology training programs get support from younger workers but receive many reasons from managers who cannot attend (Maciag, 1996). Therefore a practical and easy solution

was found—teach the necessary skills to an executive secretary who could deliver the required information.

When organizations need to fill IT positions they should not only recruit IT professionals but also look into the business ranks or their non-IT employees such as secretarial personnel. Computer science graduates may have the technical skills but lack the ability to relate those skills to business. On the other hand, administrative support staff would have an advantage due to the fact that they have been trained to be organized and tend to possess qualities and related ability to move into IT careers (Brandel, 1999; Holyoke, 1997; "New Name Reflects", n.d.; Sliwa, 1998). By recruiting within the organization and providing the appropriate technical training the organization will gain a group of loyal technical specialists with business skills. Wreden (1999) stated that internal recruitment for IT staff from non-IT staff has an impact on employee morale. Wreden reported that after appropriate training, an administrative assistant who previously relayed messages from customers to project managers and other executives now works with the same customers from whom she used to take messages. The idea here is that greater investments must be made in administrative support staff professional development for the fact that these are the very individuals who serve as the backbone of the overall organization operation. However, administrative assistants, secretaries and other office professionals often need to convince management of the need for additional training or staff development opportunities (Scott, 1998; Stone, 1995). Scott (1998, para. 15) said that: "a tremendous amount of attention is given to technical skills courses for financial planners, while there is little support given to those administrative professionals who are critical to success".

The United States economy projected that 1.13 million college-level job openings would be created from 1996 to 2006 (Mittelhauser, 1998). The overall economic

growth subsequently affects employment growth, educational upgrading, and replacement needs. When organizations restructure, workers in certain occupations are relied upon to assume new responsibilities. The reduction of middle managers has resulted in a shift of some managerial responsibilities to secretaries. Mittelhauser (1998) said that secretaries now carry out tasks requiring college-level skills such as training new employees, performing research or working with spreadsheets. As a result, secretarial jobs that previously did not require a college degree for entry has created a new job opening for college graduates.

Emerging Trends in Learning Technologies

Learning is most effective when it fulfills the need at the very moment that it is needed (Just, 1998). The need for continuous learning is important among employees who constantly face changes in workplace technologies and procedures. Even if there are no major shifts in computers, softwares frequently update and versions change from time to time. Advances in technology and global competition are forcing organizations to look at the two issues of human resource training and development and the use of rapidly growing technology for training.

Organizations in the United States are concerned about maintaining and increasing performance effectiveness within changing business and technological needs. Technology affects daily tasks of employees and effective methods to keep staff up to date with technology are needed (May, 1995). Goldstein (as cited in Christoph, Schoenfeld & Tansky, 1998) said that managers and organizations are turning to training to solve the two issues and estimated that United States organizations spend more than US$50 billion annually in the development and delivery of training programs. Goldstein continued to

state that in order for training to be successful, there is a need for well-designed training content and instructional strategies. The effect of technology has made an impact on the way business is done and the subsequent need for staff training. The American Society of Training and Development (ASTD) (Anonymous, 1998b) revealed that formal training by United States organizations with 100 or more employees topped $60 billion in 1998. The astounding fact is that one third of all courses were devoted to computer training (Garger, 1999; Harp, Taylor & Satzinger, 1998). Corporate spending for training rises annually with a large portion spent on computer software training (Harp et al., 1998). The 2000 ASTD State of the Industry Report found that training expenditures continue to grow and this time employers rely more on in-house training staff to conduct training sessions ("The 2000 ASTD", n.d.). With such a big allocation provided for staff training it is imperative that workforce development programs are effective because ineffective training programs work out to a waste of over US$9.5 billion a year (Alonzo, 1998). Alonzo's statement is supported by a study conducted by Development Dimensions International that found five out of 10 organizations needed to improve their workforce development systems. In addition to a shift in training content, employers are also finding that it is not adequate just sending their workers to occasional classes. Instead, employees need to undergo ongoing or just-in-time training to help them update technical skills and knowledge (Bassi, Cheney & Van Buren, 1997; Black, 1998). Therefore, employees need to have access to information that is just in time and relevant for their needs.

Experts say that more information has been produced in the last 30 years than was produced in the previous 5,000. The amount of available information doubles every five to seven years and the added advances in technology means that the life of an employee in terms of knowledge is short. Changing workplace needs make half of the skills acquired today outdated within three to five years (Howard & King, 1998). In

organizations where financial outlay on technology account for higher capital spending, skills become outdated in months (Klor de Alva, 2000). For an engineer at Hewlett Packard (Caudron, 1996) a new set of skills is needed every one and a half years to develop products. According to Caudron (1996), product life cycles have become short that time spent for learning away from the workplace means time taken up for a whole cycle of new products. A Stanford Research Institute survey discovered that the time required for half of the knowledge of a graduate to become obsolete is continually decreasing.

Organizations that are faced with the challenge of training employees within time and cost constraints need to review the training process. Training must provide employees with the information they need, when and where they need it most and that is in their workplace. Obviously the answer to this is through the use of just-in-time technology for training (Allen, 1997; Caudron, 1996; Harp et al., 1998; Just, 1998; Ouellette, 1999).

Use of Intranet for training

Just-in-time training simply coincided with the availability of computers, computer networks and corporate Intranets in the workplace. According to Just (1998) several factors have made just-in-time training feasible. Among them are the availability of a telecommunication infrastructure that supports interactivity and the increase in the amount of information that employees need to retain and understand. The increases in the costs of instructor-led training also led employers to look for other training methods.

The existence of corporate Intranets, which function just like the Internet except that access is solely for employees, allows employee access to information required anytime and anywhere making training through Intranet beneficial and cost-effective to an organization (Allen, 1997; Croft, 1996; Just, 1998).

In 1997 Allen wrote that technology training has advantages over traditional classroom-based training. Allen stated that many formal studies on the effectiveness and efficiency of technology training have for the most part shown a relative success in technology training when compared to traditional classroom training. According to Allen (1997, p. 2):

> Technology training can help people learn better, faster and cheaper and can provide a real return on investment when used appropriately and developed effectively. In general, it seems to work well to increase learners' ability to retain and use information, to save money and time and to have an impact on an organization's effectiveness.

The Intranet is also becoming a valuable training vehicle for corporations in the United States. Banta Corporation, one of the largest printing companies in the United States launched its Intranet in 1997 and has reaped the benefit of boosting employee productivity (Sharples, 1998). Sharples (1998) stated in the article that Banta Corporation provides a training site that allows employees to initially access qualified internal training specialists and materials on any subject. The company is proud of the fact that it is able to maximize training costs internally.

Intranets not only change ways of work but also provide alternative methods for staff continuing education or retraining. Employees need not be away from the workplace because learning can take place in-house through interactive CDs, videoconferencing or courses offered through the Intranet (Caudron, 1996; Croft, 1996; Greengard, 1998; Ouellette, 1999; Steinberg, 1997). Greengard (1998) stated that Intranets are now moving from a publishing content model used for information sharing to an interactive process model. Intranets are designed not only for the purpose of loading static content such as online manuals or directories but a medium to exchange data eliminating tasks that require layers of approval and paperwork. Workplace learning is becoming an important strategy for organizations to obtain a competitive advantage. Organizations need to ensure that

employees are equipped with new skills in response to rapid technological change (Bassi et al., 1997).

Related Methodological Studies

The workplace has undergone tremendous changes due to economic, technological and demographic changes. The impact of new technology is evident in changing skill requirements leading to an increased need for employee reeducation and graduates entering the workplace. Malaysia's vision to develop an area similar to the Silicon Valley and launching flagship applications such as electronic government and smart schools requires effective approaches aimed at producing skilled labor. The nation needs to focus on the skills and education of Malaysian workers. Therefore, it is extremely important to acknowledge that the success of the Malaysian vision is linked to the effectiveness of the nation's education system. Auerbach (1997) voiced the same concern that the United States education systems must adequately prepare students for the workplace and one of the highest priorities is to eliminate the skills gap between the school and the workplace.

The field of computing and IT is constantly evolving and graduates need basic skills to get the first job. Today's technological environment requires graduates to have exposure on current hardware and software (Pollack, 1997). However, due to the rapid changes in IT, curricula must be constantly reviewed. Therefore, the role of curriculum planners, trainers and educators is to maintain awareness of developments in the field and react with appropriate curricular modifications on an annual basis.

Similar studies on IT competencies of administrative support staff employed in networked organizations or using networked computers were not available. The reason for

this is the fact that technology changes rapidly and studies on computer or IT competencies becomes quickly dated. However, studies that employed the proposed methodology were available for review. Several researches (Echternacht, 1996; Erickson, 1996; Ewing, 1991; Gatlin et al., 1995; Norlida M. N., 1998; Raja Munirah R. Mustapha, 2002; Reynolds, 1993; Wiedmaier, 1997) identifying competencies for entry-level and advancement positions with implications for curriculum and training were reviewed. Other studies were reviewed for relationships between frequency of performing tasks with perceived importance placed on performing the tasks (Bryant, 1997).

A study that examined the relationship between skill levels and job characteristics of administrative support staff who use information technologies was carried out on 1,100 administrative support staff in Malaysian service organizations with a response rate of 46% (Raja Munirah R. Mustapha, 2002). Respondents were required to rate the level of use in both technical and non-technical skills for the information technology categories of text, data, communication, administrative support, and graphics. A majority of respondents reported proficiency in technical skills related to text handling and paper-based technologies (printers and facsimiles). With the exception of spreadsheets, approximately 40% rated themselves as non-users of database technology. Over half of respondents reported non-use of electronic calendars, teleconference and desktop publishing. Use of technologies was limited to technologies related to the traditional responsibilities of administrative support staff. Use of information technologies related to higher level tasks associated with management are not used or the respondents do not have the abilities to use the technologies for management-related tasks. The research therefore challenges the current literature that IT changes the roles and responsibilities of administrative support jobs.

Erickson's (1996) study analyzed office automation competencies needed by practicing office managers. Erickson developed a survey instrument for all Certified Administrative Managers in the United States. The study attempted to determine office automation competencies perceived to be important for office managers, the perceived performance level of office automation competencies, the assessment of office automation competencies and the method of gaining office automation competency. The study found that office managers generally view office automation competencies as important and perceived their level of competency as acceptable.

In 1993, Haff conducted a study to identify computer competencies needed by entry-level secretaries and administrative assistants. At the same time, the study determined if the same computer competencies were taught in two-year, post-secondary institutions that offered business education programs. Personnel directors of business organizations and department chairs of two-year, post-secondary institutions that offered business education programs participated in a three-round Delphi process for obtaining consensus on computer competencies. Computer competencies rated above 85 percent should be emphasized in business education programs that prepare entry-level secretaries and administrative assistants. Out of the 168 computer competencies listed in the questionnaire the following competencies were found to be necessary and desirable in business education programs: 19 general maintenance competencies, 29 word processing competencies, 19 spreadsheet competencies, 36 database competencies, 23 graphics competencies, and 5 integration and communication competencies.

Ewing (1991) utilized the Delphi technique to identify and determine the importance of future secretarial competencies in the next five to ten years. The four-round Delphi process involved a focus group and panel of experts that included educators and employers in the state of Illinois. Future secretarial competencies were defined as basic

knowledge and skills, communication skills and personal characteristics. Ewing emphasized that the business education curriculum must not only meet vocational needs but also prepare students to be lifelong learners, mentally flexible and able to cope with challenges in the electronic world. The study recommended that the competencies to be included in the secretarial curriculum are basic knowledge and skills such as arithmetic, coordinating and performing activities for employer, keyboarding accuracy, keyboarding speed, microcomputer usage, organizing and planning, performing clerical activities, proofreading skills, report preparation, software, time management skills and word processing skills. Personal characteristics are also found to be important in secretarial programs. These are the ability to look ahead, analytical ability, assertiveness, confidentiality, creativity, dependability, diplomacy, flexibility, good judgment, imagination, initiative, integrity and ethics, job commitment, keeping cool under pressure, professional imaging and sense of responsibility.

While Ewing's definition of competencies included personal and technical, Wiedmaier (1997) identified database competencies needed for entry-level employment and advancement. The modified Delphi technique was selected for use in the study. A national panel of 30 individuals comprising Association of Records Management Administrators (ARMA) and National Business Educator Association (NBEA) professionals, responded to 64 competencies via e-mail or fax transmission. The panel rated the importance of each competency on 2 six-point Likert-type scales, one for entry-level and one for employment advancement.

Reynolds (1993), on the other hand, carried out a study not only to identify professional competencies required of Extension Agents but also the time acquisition of each competency. The extension agents rated the importance of each competency and the perceived acquisition time of each competency. The responses to the perceived acquisition

time of each competency were before entering the job, during formal education, Cooperative Extension Service In-Service and on the job. A majority of the competency items were rated as having importance and the primary choice of time acquisition of competencies was on-the-job.

While the above studies identified competencies of various software applications, Gatlin et al. (1995) conducted a study to determine word processing competencies required by selected businesses located in Mid-South states. All businesses surveyed reported using word processing software packages to produce letters, memos, reports, envelopes, labels, tables, newsletters, columnar text and e-mail. In response to word processing competencies needed by employees a majority of the respondents reported basic formatting as the most needed skill, followed by editing, filing and disk maintenance.

Echternacht (1996) was concerned about the role of effective communications in assisting users create high-impact business presentations in the workplace. Desktop computer presentation software offers features that help a presenter deliver efficiently and effectively. However, designing a training program for desktop computer competencies is challenging. As Echternacht said (1996, p. 10) " . . . there is not a clearly defined role for computer presentations in the workplace environment". Therefore, a modified Delphi technique using a panel of secondary vocational business teachers and business professionals was used to determine the importance of desktop computer presentation competencies for business workers. The desktop computer presentation competencies were divided into six domains comprising planning computerized presentations, selecting the presentation looks, creating text slides, creating graphs and charts, enhancing presentation with graphics and media and viewing the presentation. Programs need to address the teaching of desktop computer competencies for workers entering the workplace and employee retraining.

Determining the perception of job incumbents on the importance of performing a task and the perceived level of competency is one approach that can be used to determine discrepancies between what one should be able to do and what one can do. A study on the perceived needs of beginning agriculture teachers found that the difference between the importance placed on performing a task and the perceived competency level identified the gap between needed and possessed competency. The weighted discrepancy was used to identify the perceived gap. Kawasaki's (1994) study was designed to determine information-related competencies and training needed by Montana Extension Service Professionals for the purpose of acquiring and disseminating information to clients electronically. The survey on Extension Service professionals identified the weighted discrepancy score as a measure of determining priority for additional training. The responses on perception of importance and level of knowledge required for information related competencies were analyzed to determine discrepancy scores that were translated into discrepancies between needed and required competencies.

Bryant (1997) asserted that there is a need to continually evaluate and update curriculum content for emergency management training programs due to an increase in emergencies. Sixty-three (63) directors of state, federal and volunteer emergency agencies from every area of the United States participated in a survey to identify duties with tasks/competencies that were necessary for successful emergency management personnel. The respondents indicated the importance and frequency levels of duties and tasks/competencies. The research approach adopted by Bryant (1997) allowed the identification of important competencies as well as level of performance. The positive relationships between importance and frequency of each duty indicated that the listed tasks/competencies be used as a basis for developing curriculum for emergency management and administration.