THE EFFECT OF TRAINING IN AUTOMATED OFFICE EQUIPMENT ON SECRETARIES' JOB PERFORMANCE

BY

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DECLARATION

I hereby declare that this thesis has been written by me and that it is a record of my own research work. It has not been presented in any previous application for a higher degree. All quotations are indicated by quotation marks or indentation and the sources of information are specifically acknowledged by means of references.

EMMANUEL ADEKUNLE AROMOLARAN

CERTIFICATION

This Thesis entitled "THE EFFECT OF TRAINING IN AUTOMATED OFFICE EQUIPMENT ON SECRETARIES' JOB PERFORMANCE " by Emmanuel Adekunle Aromolaran meets the regulations governing the award of the degree of Doctor of Philosophy (Business Education) of Ahmadu Bello University Zaria and is approved for its contribution to knowledge and literary presentation.

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D E D I C A T I O N

This Thesis is Dedicated

to

1. The MEMORY of my BELOVED parents -

   Chief James A. Aromolaran and
   Lady Leader Comfort O. Aromolaran

2. Princess (Mrs.) V. Adenike Akinshunmi
   (Nee Aromolaran)

3. My Sweetie - Rosaline Oluwakemi and
   My "God's Gifts" - Isaac Ayobami Adebare
   Emmanuel Ayodeji Adewale
   Comfort Ayomikun Temilade
   Abraham Ayokunle Adeboyejo

For their UNFADED LOVE and WORDS OF ENCOURAGEMENT TO 'DEKUNLE always; and for their ASSURANCE OF HOPE, PERSEVERANCE, UNDERSTANDING, FAITH AND STEADFASTNESS IN GOD

that

ALL WILL BE WELL

and that

"WITH GOD, ALL THINGS ARE POSSIBLE"

Their patience, endurance and prayers

have made this study come to

F R U I T I O N!

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ABSTRACT

This study was designed to provide information that might be useful for secretaries-in-training and secretaries already working in either the private or public sector or in the parastatals in appreciating the need for the acquisition of automated skill training in performing office tasks.

The population of this study consisted of 200 secretaries who have been using manual typewriters in their respective offices. The sample of the study consisted of 40 secretaries, randomly selected, adopting the simple random sampling technique from the above population.

The study determined the effect of training in automated office* equipment on secretaries' job performance. The treatment was the introduction of the experimental group to Information Processing on IBM Wheelwriter 50 Series II Electronic Typewriters.

The results of the study indicated that secretaries who acquired automated skill training were able to produce mailable correspondence faster and more accurately on electronic typewriters than secretaries who did not acquire automated skill training. Moreover, being a male or a female secretary is not a barrier in acquiring automated skill

training. It was also established that a secretary who has been making use of manual typewriter for a long time can still acquire automated skill training. Age was not an impediment for the acquisition of automated skill training.

It was recommended that:

1. **Emphasis should be placed upon hands-on-experience in automated office equipment by secretaries-in-training, while on-the-job training facilities should be provided for secretaries trained with manual typewriters to enable them fit into their new work environment - automated office.**

2. **Maintenance workshop should also be established in every school where automated office equipment is mounted for their proper care and maintenance.**

3. **Secretarial studies teachers should also be current about the development and improvement in the area of automated office equipment.**

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DEFINITION OF TERMS

The following terms are defined to provide a common understanding of the terms frequently used in this study.

(a) Automation

The process of replacing human work with work done by a machine or system designed to perform a specific combination of actions automatically or repeatedly (Spencer, 1981). For the purpose of this study, automation refers to the use of electronic typewriters in producing mailable correspondence.

(b) Automated Skill

Skill involving the use of electronic typewriter, word processor and computer to perform office operations such as the production of mailable correspondence, storage and retrieval of information, editing with the aid of electronic equipment.

(c) Experimental Training

Skill imparted to a group of secretaries who have no knowledge of the use of electronic office equipment such as word processor or electronic typewriter.

(d) Office Tasks

Tasks involving the use of electronic typewriter such as typing certain words in bold letters or in italics to emphasise their importance within the text or correspondence.

(e) Model Office Programme

A programme in the Secretarial Studies curriculum in which secretaries-in-training are exposed to the real office situation. Modern office equipment and devices are available and their applications are demonstrated in the model office programme.

(f) Technology

A technical method of achieving practical purpose. The totality of the means employed to provide objects necessary for human sustenance and comfort (Webster, 1981).

(g) Mailable Correspondence

Correspondence which is error-free. Its layout is properly set, devoid of grammar or syntax error. The margins (top, bottom, left and right) are properly set.

(h) Job Performance

Ability of a secretary to make use of electronic typewriter in producing mailable

correspondence within one hour, faster and more accurately. The minimum pass grade was fixed at 50 percent (the standard set by the National Secretarial Examinations Board).

(i) Experimental Group

This refers to a group of 20 secretaries who received automated skill training in the use of electronic typewriters. They included four male and sixteen female secretaries who were previously making use of manual typewriters before receiving automated skill training.

(j) Control Group

This refers to a group of 20 secretaries who neither receive automated skill training, nor had any previous knowledge of making use of electronic typewriters. They were four male and sixteen female secretaries.

(k) Achievement

The performance of a group of secretaries on production typewriting ability after the experimental treatment on automated skill training. The minimum pass mark was 50 percent.

(l) Age Group

This refers to the age distribution of secretaries into the range of 15 and 20 years, 21 and 25 years and above 25 years.

(m) Years of Experience

Dividing secretaries into three categories based on the number of years of experience which they possess as secretaries using manual typewriters in their respective offices. Such years of experience range from 1 to 5 years, 6 to 10 years, and above 10 years.

Chapter 1

INTRODUCTION

1.1 Background of the Study

The need for automation in the modern business world, whether in the private or public sector of Nigerian economy cannot be over-emphasised. There is currently a growing need to computerise information by managers, administrators and even businessmen at all levels of management where information is processed. Secretaries and their users should be able to locate records within the shortest possible time. There are many problems associated with the manual method of processing information. These include the loss of information and inability to locate records when needed.

Automation is an innovation and a consequence of the industrial revolution. It is therefore necessary to understand and appreciate its origin, capabilities, power and limitations. Automation is a collection of methods for controlling machinery and production processes by mechanical means, usually with electronic equipment. It requires a device capable of a two-way communication. Such control devices must be able to encode messages to the machine by instructing it to perform certain operations. The machine also decodes the message and subsequently produces a feedback in the form of output (Spencer, 1981).

There is a sort of interaction between the machine and the component of its environment; that is, a human being. The term, "automation" encompasses not only the familiar mechanisation of energy but also that of information by electronic typewriters, computers and word processors. It also connotes that some mental or physical tasks have been assigned to a machine. The machine is able to store, retrieve and even edit information with the assistance of a human being.

Prior to Nigeria's independence in 1960, there were old manual equipment such as typewriters, filing cabinet, duplicating machines, huge telephone switch-board, in Nigerian offices. Secretaries worked under pressure, and hardship. Consequently, they wasted office time. The development prevailing in the office technology from 1960 to date and the foreign influences on the Nigerian economy have made it impossible for secretaries and their users to cope with the challenges of automation. The roles of secretaries are being transformed from the traditional role of taking notes in shorthand and transcribing notes on manual typewriters to storing, retrieving and text-editing information computers, word processors, electronic typewriters, dictaphones and computer storage devices such as diskettes and magnetic tapes/discs (Okoye, 1992).

Secretaries who still rely on the old manual method of processing information must update their skills and acquire

automated skill training. This is necessary for them to keep their jobs and face the challenges of the automated office tasks. With automated skill, Silver and Silver (1981) stated that secretaries would be able to assist their users in:

(a) providing a means for the information of the establishment to be integrated and dynamically updated so that it can be used for planning, decision making and control purposes;

(b) eliminating inefficient policies and procedures;

(c) achieving better resource acquisition, allocation and use.

(d) having immediate access to the organisation's information resources;

(e) keeping accurate records, retrieving management information when required.

In the study conducted by Okoye (1992), it was observed that secretaries should be able to face the challenges of automation in the world of work. She revealed further that the assessment of secretaries by their employers indicated that much improvements are still needed in the training programmes for their secretaries to be able to operate the electronic gadgets such as word processors, electronic typewriters, computers and other office equipment. The concept of automation, according to Thompson (1964) embraces not only the familiar mechanisation of energy but also the mechanisation of information by electronics and computers. Trickett (1979) stated that the nature and

structure of office work is changing. The presence of sophisticated equipment such as computer, word processor and magnetic keyboard typewriter in today's office has been the cause of change. Consequently, automation has been a significant factor in restructuring office occupations. He stated other factors as:

1. The need for employers to make use of non-productive secretarial/office time.
2. The attempt of employers to apply such professional managerial concepts as the division of work, specialisation, and professional supervision of secretarial work.
3. The demand for a change in the work role on the part of secretarial staff in an automated office.

With the innovation in automation and the introduction of sophisticated office equipment in the modern office, it is imperative for secretaries using the old method of producing correspondence to understand and appreciate the innovation in office automation. The progress recorded by most businesses--medical research, product development, etc. would have been almost at a standstill without automation. The revolution in the clerical and secretarial processes has been progressively permeating the business lives of secretaries and their users after the Nigerian independence in 1960. This revolution has changed the scope, the usages, the methods and the outcomes of many of the recording functions with which the business environments have been familiar. There has been a tremendous

increase in the amount of paper work and paper processing needed for the conduct of business. The impact of this change can be termed, "The Information Processing Revolution"!

Moreover, secretaries need a broad, general understanding of the principles involved in the processing of data; a knowledge of modern techniques and methods of handling data; a basic competence in the application of systems of electro-mechanical and electronic data processing equipment and a thorough knowledge of the possible uses of available machines such as word processors, electronic typewriters and computers. Secretaries must also understand the entire process of an office. There is an increased need for accuracy on the part of secretaries because, if an error is committed in automation, it will be carried through an entire process. It is also important for secretaries who are to operate automated office equipment to learn how to follow instructions, especially, in the manuals accompanying automated office equipment and to understand why certain operations are necessary.

For a secretary to be employable in an automated office, Meroney (1983) believed that such a secretary must be well-versed in the following specific automated office equipment training:

(a) The concept and theory of specific automated office equipment.

(b) Terminology of such equipment.

(c) Proof-reader's marks and their proper usage.

(d) Knowledge of the categories of equipment and their intended uses and differences.

(e) The skill to use resource or reference materials properly.

(f) Hands-on equipment training.

However, a mere possession of the above-mentioned skills is inadequate. Quible (1983) asserted that a secretary who hopes to cope with the challenges of an automated office still has to meet the following conditions:

1. A desire to work with machine.
2. Good keyboarding and excellent grammar skills.
3. Proof-reading ability and excellent reading comprehension.
4. Ability to use reference and resource materials.

Owojori (1990) defined a secretary as an executive assistant who possesses the mastery of office skills and ability to assume responsibility with minimum direction or supervision from her superior officer, displays initiative, exercises judgement and makes decisions within the scope of her assigned authority. She is also an officer who combines the major skills of shorthand and typewriting with other competences in filing, reprography and telephone techniques in performing her duties. The secretary described above excludes other types of secretaries such as company

secretary, local government secretary and other parastatals' secretaries who are higher than the secretaries for the purpose of this study.

1.2 Statement of the Problem

The challenges and competitiveness of the automated office make it mandatory for secretaries to be current with automated office equipment. Okoye (1992) opined that secretaries still have the problem of information management in the areas of processing, storing, retrieving and distributing information with modern office equipment such as word processors. For instance, Aromolaran (1993) observed that secretaries in some offices in Lagos allowed their electronic typewriters to lie idle. Such secretaries resorted to manual typewriters because they could not manipulate electronic typewriters! This meant that their employers have to either retrain them or employ new secretaries who could manipulate electronic typweriters.

The researcher's experience as a secretarial lecturer and consultant coupled with his interaction with secretaries in workshop and seminars revealed that some secretaries still rely on manual equipment in performing office tasks.

The public sector is not exonerated from the blame of making use of obsolete equipment in offices. Some states, even some federal ministries still find it difficult procuring automated office equipment. Such parastatals have

to contend with manual typewriters; and have appreciated the need for abandoning them--they were not adequate. Anyawu (1993) stated that some businessmen prefer "cheap" labour in producing documents to modern office equipment. Such businessmen erroneously believed that "one does not need electricity to generate power supply for manual typewriters!"

A series of literature review by some authors who wrote on automation such as Gibson (1963), Haga (1965), Spencer (1981), Muscat and Lorton (1982), Greenland and Bartholome (1987) and Shyllon (1992) confirmed that most secretarial office routines have long been mechanised in developed countries such as Britain and United States of America. However, Owojori (1990) and Adeakin (1994) believed that automation is still new in some developing countries such as Nigeria.

It was against this background that this study was aimed at determining the effect of training in automated office equipment on secretaries' job performance.

1.3 Objectives of the Study

The objectives of this study were:

1. to determine the difference in the mean score performance on production typewriting ability of the experimental and control groups before automated skill training;

2. to determine the difference in the mean score performance on production typewriting ability of the experimental and control groups after automated skill training;
3. to find out the difference between the mean score performance on production typewriting ability of male and female secretaries before the experimental treatment on automated skill training;
4. to determine the difference between the mean score performance on production typewriting ability of male and female secretaries after the experimental treatment on automated skill training;
5. to find out the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20 21 and 25 and above 25 years before the experimental treatment on automated skill training;
6. to determine the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20 21 and 25 and above 25 years after the

experimental treatment on automated skill training;

7. to determine the difference in the mean score performance on production typewriting ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years before the experimental treatment on automated skill training; and
8. to determine the difference in the mean score performance on production typewriting ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after the experimental treatment on automated skill training.

1.4 Research Questions

The purpose of this study was to evaluate the effect of training in automated office equipment on secretaries' job performance. Specifically, answers were sought to the following research questions:

1. What is the difference between the mean score performance on production typewriting ability of the experimental and control groups before experimental treatment on automated skill training?
2. What is the difference between the mean score performance on production typewriting

ability of the experimental and control groups after the experimental treatment on automated skill training?

3. What is the difference in the mean score performance on production typewriting ability of male and female secretaries before the experimental treatment on automated skill training?
4. What is the difference in the mean score performance on production typewriting ability of male and female secretaries after the experimental treatment on automated skill training?
5. What is the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20, 21 and 25 and above 25 years before the experimental treatment on automated skill training?
6. What is the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20, 21 and 25, and above 25 years after the experimental treatment on automated skill training?

7. What is the difference in the mean score performance on production typewriting ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years before the experimental treatment on automated skill training?

8. What is the difference in the mean score performance on production typewriting ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after the experimental treatment on automated skill training?

1.5 Null Hypotheses

The following Null Hypotheses were tested at .05 level of significance with a view to determining the effect of training in automated office equipment on secretary's job performance:

Ho_1: There is no significant difference between the mean score performance on production typewriting ability of the experimental and control groups before automated skill training.

Ho_2: There is no significant difference between the mean score performance

on production typewriting ability of the experimental and control groups after automated skill training.

Ho_3: There is no significant difference between the mean score performance on production typewriting ability of male and female secretaries within the experimental group before and after experimental treatment on automated skill training.

Ho_4: There is no significant difference between the mean score performance on production typewriting ability of male and female secretaries within the control group before and after experimental treatment on automated skill training.

Ho_5: There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) in the age range 15 and 20, 21 and 25 and above 25 years before the experimental treatment on automated skill training.

Ho_6: There is no significant difference in the mean score performance on production

typewriting ability among secretaries (experimental and control) in the age range 15 and 20, 21 and 25 and above 25 years after the experimental treatment on automated skill training.

Ho_7: There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years before the experimental treatment on automated skill training.

Ho_8: There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after the experimental treatment on automated skill training.

1.6 Significance of the Study

The study aimed at determining the effect of training in automated office equipment particularly electronic typewriter on secretaries' job performance. The

findings of this study would be useful to secretaries-in-training and professionally trained secretaries already working in offices. Such secretaries would appreciate the benefits which could be derived from using electronic typewriters. Moreover, more efficient ways and means could be devised in processing, retrieving and distributing information through automated office equipment.

The findings of this study would also assist the trainers of secretaries in preparing secretaries-in-training adequately for the automated office tasks to enable them meet up with the challenges of the automated office and the competitiveness of their profession in the labour market. Automation, as an instrument of change, is not easy to accept by people who are already used to paper documents, manual typewriters, and power failures in companies which are unable to afford electric generators. It is expected that the benefits inherent in the use of automated office equipment such as cost, time and labour saving devices would encourage professional secretaries and their employers in taking advantage of the innovation in office technology - automation. The results of the study would help educationists and policy makers in emphasising the need for the inclusion of information processing courses in the curricula and course specifications of secretarial studies programmes at the secondary and tertiary levels. The

findings would, furthermore, be of great interest to other students in other disciplines, in areas of automation.

1.7 Basic Assumptions for the Study

The basic assumptions that guided the study were that the secretaries who were subjected to the experimental training and those who were not subjected to the experimental training would be able to perform office tasks satisfactorily by making use of either electronic or manual typewriters respectively.

The basic assumptions were made on the premise that:

1. the objectives stated in the study adequately covered the elementary application of the necessary skill needed for operating electronic typewriters;
2. both the experimental and control groups have similar perceptions of the automated office equipment.

The researcher also assumed that secretaries for the purpose of this study, should possess the minimum entry qualifications of School Certificate and National Diploma in Secretarial Administration with 50/100 words per minute in Typewriting and Shorthand respectively from a government recognised tertiary institution. He also assumed that such secretaries were trained with manual typewriters.

1.8 Delimitations

The study is delimited to:

1. one skilled-subject area in secretarial studies - Typewriting;
2. production typewriting for one hour during the pre-test and post-test periods;
3. the ability of participants to produce mailable correspondence in the automated office within a specified period of time;
4. only secretaries with the required speed of 50 words per minute in typewriting (National Diploma in Secretarial Studies equivalent).

1.9 Limitations

1. The types of equipment previously used by the experimental and control groups posed a serious limitation on their post-test mean score performance on production typewriting ability.
2. The attitudes and dispositions of the experimental and control groups also constituted a serious limitation because they have been used to the manual equipment. Hence they tend to fake responses during the period of the study.

3. The fact that participants were secretaries with tight schedules in their respective offices was another serious limitation. Their companies could only afford six weeks for the study and this prevented the study from extending beyond six weeks.

4. It was also not possible to control human beings effectively like animals. However, the researcher was able to conduct the pre-test and post-test without giving the participants the impression that an experiment was being carried out on them.

Computer was used in analysing the data which also did not indicate the problems emanating from the variables tested.

Chapter 2

REVIEW OF RELATED LITERATURE

2.1 Introduction

The purpose of this study was to evaluate the effect of training in automated office equipment on secretaries' job performance. Consequently, a review of related literature in automation was appropriately surveyed.

The review of related literature has been organised into the following eight sections:

2.2 Historical Perspectives of Secretaryship in Nigeria.

2.3 Historical Overview of Automation.

2.4 Traditional and Modern Roles of Secretaries in the Office.

2.5 Effects of Automation on Secretaries.

2.6 Relevance of Automation in Business.

2.7 Merits and Demerits of Automation.

2.8 Research on Automated Office Equipment.

2.9 Summary of Related Literature.

2.2 Historical Perspectives of Secretaryship in Nigeria

Secretaryship, as a profession in Nigeria, has not had a bright beginning. There were very few well-organised institutes for training secretaries. They existed in the Colleges of Arts, Science and Technology. There were also

Staff Training Centres which included secretarial training in their curricula (Amaefule, 1986). There were very few privately-owned commercial secondary modern schools and many "road-side" commercial institutes which offered secretarial courses to prospective secretaries in English, Typewriting, Shorthand and Office Practice. The graduates sat for professional examinations such as the Royal Society of Arts; Pitman; London Chamber of Commerce in typewriting, Shorthand, Commerce, Office Practice, etc. after their training (Osuala, 1989).

In his contribution to the development of automation, Spencer (1981) stressed that most of the information needed in an automated office are stored in computer mass storage devices, on microfilm and microfiche, electronic typewriters and word processors. Wood and Espegren (1964) asserted that automation has already had a great deal of effect on office jobs. They stressed further that it has brought about changes as new equipment and new systems of record handling make their appearance. Consequent upon population explosion, many people require more office services which require speedy information handling equipment such as electronic typewriters, computers, word processors, telex and teleprinters, etc.

Amaefule (1986) commented further that the problem of secretaryship in Nigeria was a consequence of most of the available institutions in the past not exposing prospective

secretaries to the world of automation. Hence, they were bound to face stiff competition with their counterparts who were exposed to the modern office equipment used in the automated offices while in training.

However, Ehiametalor (1990) believed that self-effort was required for a prospective competent secretary and those who rose through the ranks of secretaryship in the past. He stated further that some Nigerians were privileged to travel to Britain either as government-sponsored or private students for proper training in the art of secretaryship. According to him, one interesting aspect of secretaryship in the past was that those who trained abroad took up fresh appointments in the public and private sectors on their arrival to Nigeria in order to assist in the improvement of secretarial profession. Some of them were either deployed to Staff Training School or employed to teach secretarial subjects such as Typewriting and Shorthand.

Ehiametalor (1990) also stated that the development of secretaryship in Nigeria could be discussed under two headings -unstructured and structured. The unstructured secretaryship, according to Ehiametalor, can be traced to the 1930's with the establishment of a clerical training centre at Osogbo in order to train clerical/secretarial staff who were needed in government offices. The problem militating against the establishment of the training centre was the appointment of unqualified teachers. Another difficulty encountered was

that the curricula of other few government training centres and privately-owned centres established were not structured to adequately meet the needs of the (then) offices. The emphasis of the government and privately-owned training centres, according to Evans (1972), was on the acquisition of special skills in Typewriting, Shorthand, Office Practice and Secretarial Duties.

Structured programme in business studies was traced to the late 1950's and early 1960's when new technical colleges were established in various parts of the country as a result of Ashby Commission's recommendations which highlighted on the inadequate supply of technicians and supporting staff (secretaries inclusive) to meet the needs of the industrial sector. Ehiametalor stressed further that the Comprehensive High School at Aiyetoro and several technical colleges represent the highly structured technical and vocational curricula designed to meet vocational and academic needs of students. Ozoro (1975) submitted that the Curriculum Conference of 1969 provided the recognition of vocational business studies (secretarial) as an indispensable field of study in a developing industrial economy; hence the emphasis on pre-vocational business studies in the junior and senior secondary schools curricula in the 6-3-3-4 system of education in Nigeria.

At the tertiary level, business education was emphasised at the Curriculum Conference of 1969. However, it should be

noted that Yaba Institute was already in existence and engaged in the training of vocational personnel before 1960. In 1975, Osuala (1987) asserted that there were 84 post-primary institutions of vocational and technical education in all states of the federation, where secretarial studies were offered. According to him, there were also additional five technical colleges; the Yaba College of Technology, Yaba; Institute of Management and Technology, Enugu; National Technical Teachers College (now Federal College of Education-Technical), Akoka - Yaba (already in existence as far back as 1967), and the three Polytechnics in Ibadan, Kaduna and Auchi - all offering secretaryship courses. Many other States and Federal Polytechnics/Colleges of Education (Technical) now offer courses in Secretarial Administration. At the University level as at 1984, the University of Nigeria, Nsukka and the Ahmadu Bello University, Zaria were the pioneers in Business Education programmes with Office Education option. However, successive governments in Nigeria have emphasised the need for Vocational Business Education (Office Education or Secretarial Option) from 1979 to date by establishing several polytechnics, technical universities, technical colleges and colleges of education throughout the country.

A series of literature review on the historical perspectives of secretaryship in Nigeria potrays secretarial profession as a profession that is not static. It is,

therefore, imperative that secretaries should learn to live with their new work environment and should constantly adjust and adapt to the challenges of the automated office in terms of skills required by their employers. Secretaries should possess a sound knowledge of modern office equipment. Proficiency in English Language and office routines cannot be over-emphasised.

Anyaduba (1991) asserted that the efficiency and success of any business executive is determined, to a large extent, by the level of efficiency of his secretary. To butress this assertion, he identified the following secretarial competences which a good secretary should be associated with:

1. Familiar with the full range of her executive's responsibilities and activities; his personal ambitions and the correlation between his performance goals and the company's objectives.

2. Capable of handling her executive's business and personal affairs responsibly and expeditiously in his absence.

3. Able to coordinate her executive's appointments and schedules, help him to keep track of vital dates and meet deadlines.

4. Alert in initiating, handling and going through projects without having to be reminded.

5. Qualified in the basic secretarial skills and procedures.

6. Able to obtain corporate facts that would be difficult, awkward or impossible for her executive to obtain.

7. Able to summarise information both orally and in writing, and should be clear and precise in giving instructions.

8. Willing to learn about the business and customers, attend classes and seminars, and participate in management-oriented programmes in order to enhance her efficiency at work.

Wallace's (1974) statement agreed with Anyaduba's because there is a great challenge posed by the demand for a high standard of secretarial performance as a result of technological changes. According to Wallace technological change and the need for the country's survival of its present economic plight call for a better education of secretaries in automation and more effective use of secretarial services. It was observed in the study conducted by Okoye (1992), that office skills such as the ability to operate word processors, computers, radio equipment, electronic typewriters, telex, fax, etc. were rated so low by the employers of secretaries. Consequent upon her findings, she recommended that the trainers of secretaries should improve secretarial training programmes to accommodate the challenges of the automated office tasks.

2.3 Historical Overview of Automation

Automation is a collection of methods for controlling machinery and production processes by mechanical means, usually, with electronic equipment. It requires a device capable of a two-way communication. Such control devices must be able to encode messages to the machine by instructing it to perform certain operations. The machine also decodes

the message and subsequently, produces a feedback in form of output. There is a sort of interaction between the machine and the component of its environment - man.

Shyllon (1992) submitted that the introduction of automation was brought about by the growth in the volume of paper work in the modern offices and the need to find the most convenient and cheap means of storing and retrieving information when needed. Okoye (1992) asserted that the use of office machines is an innovation which poses great challenges to secretaries due to the increasing demands of office automation. A secretary is expected to have attained so high a level of training in order for her to be competent for her perceived role and, therefore, become an invaluable resource person to the business that makes optimum use of her training. In addition, the inclusion of some office automation courses such as Information Processing and Word Processing in the 'Curriculum and Course Specifications' of the National and Higher National Diploma in Secretarial Studies programmes at the polytechnic level by the National Board for Technical Education (NBTE) (1989) confirmed the significance of the acquisition of automated skill on secretary's performance of office tasks whether in training or those already available for work in the labour market.

There is a wide disparity in the various definitions of automation. Gibson (1963) described automation as those processes that require some types of machines or devices

which capture data at their source through less of human efforts. Spencer (1981) defined automation as the process of replacing human work with work done by a machine or system designed to perform a specific combination of actions automatically or repeatedly. Example of automated office equipment abound in the computer, word processor, electronic telephone, facsimile (fax) and electronic typewriter. Poynter (1982) described automation as a typing system which allows instantaneous editing and has an electronic memory capable of storing information. Odiagbe (1988) defined electronic typewriter as a modern computer-like electronic office machine which has typewriter-kind of keyboard capable of storing, proportional spacing and right/left margins justification features. It also has memory for self-correction of a few characters or lines.

Okafor (1992) asserted that terminology and definitions become somewhat muddled whenever a new concept or system such as automation is introduced into the market. However, the issue at stake is not the definition, but the problem is that the business world is no longer satisfied with a secretary who can only take dictation and transcribed her notes but currently demands one who has acquired automated skill in operating automated office equipment. Research studies in the area of automation could therefore, be worth-while in keeping abreast of the latest improvement in office technology. A historical overview of automation shall be

discussed under three sub-headings as follows origin of manual typewriters; invention of electric typewriter; automated equipment (with reference to electronic typewriter and word processor).

2.3.1 Origin of Manual Typewriters

Before the advent of the "writing machine", Roberts (1973) asserted that all writing was done by the tedious method of "quill penmanship". However, the mounting volumes of paper work forced men to work for a faster process; therefore, the writing machine was invented out of necessity. According to him, America's first typewriter patent was granted to William Austin Burt on July 13, 1829 by President Andrew Jackson. Burt called his machine, "Typeographer". It was a box-like structure made mostly of wood. Roberts stressed further that many machines were patented after Burt's machine. The first practical typewriter came in the early 1868 with Shole's machine developed by Christopher Lathem Sholes, assisted by two associates - Samuel W. Soule and Carols Glidden.

However, the two associates lost interest but Sholes kept working on the machine for several years. He finally sold his patent to James Densmore and George Washington Yost for 12,000 American Dollars. Densmore and Yost set out in search of a company to manufacture their machine. Their search ended with E. Remington and Sons of Illion, New York. Hossfield (1958) confirmed that:

> There were probably fifteen or sixteen attempts to make a workable writing maching prior to the year 1870. Sholes and two friend - Samuel W. Soule and Carlos Gliddon spent several years building model after model, until by 1873, the machine had reached such a stage of development that they enlisted the aid of a manufacturer familiar with the problem of making a product build up from many small intricate parts and put their machine into production. Thus was "born" in 1873, the world's first practical typewriter; a machine which was destined to revolutionise business, and incidentally, play a prominent part in the economic emancipation of women.

He asserted further that the first completed manual typewriters were placed on the market early in 1874. Its main defficiency, however, was that it did not have a shift key mechanism--it wrote capital letters. There was a great improved feature of manual typewriters by the late 1890's (Hossfield, 1972). There existed 286 different models of typewriters. Many of them were, however, never commercially manufactured. Others had only a short life, and the increasingly exacting demands of industry gradually eliminated many others. It is interesting to note that several devices, according to Mill (1914) were developed to assist the operator of a typewriter after 1900 to produce work more easily of more effectively. These included the ten-key tabulator, the palm tabulator, the quick-feed handle, front-feed device, an adding mechanism that added up figures as invoices were typed, card-holding attachments, continuous stationery devices and inter-changeable platens.

Ten-Key Tabulator

It was a device of ten keys set in a row, either above or below the normal typewriter keyboard. By pressing the appropriate button, the carriage carrying the paper would automatically move to a pre-determined point in such a way that would facilitate the typing of figures in any amount without using the space key; the tabular key taking the carriage direct to any of the ten pre-determined point.

Palm Tabulator

It was lever located by the space bar which the operator could press with the palm of the hand in order to move the carriage immediately to any pre-determined paragraph setting.

Quick-Feed Handle

It is a device usually located in the region of the right-hand platen knob which enables a letter to be turned around the platen cylinder by putting a handle instead of turning the platen knob.

Front-Feed Device

It is a development in the design of the mechanism at the front while the daybook sheet is held in the machine. It was a development used for writing receipts, cheques, and other documents of which summary may be required.

Adding Mechanism

It automatically added invoices and other accounts as they were typed. It was eventually developed for

book-keeping purposes, even though, it was originally incorporated on a typewriter.

Card-Holding Attachments

They consisted basically, of a detatchable metal strips which could be fitted or removed at will.

Continuous Stationery Attchments

Strips of carbon papers fitted to appropriate levers were interleaved between sheets of papers made in continuous form. The papers were fed in from the rear of the machine and could be turned off in sets as completed. The carbon paper reminaing interleaved in the next sets of forms which had automatically followed on and remained in the machine at the appropriate position for typing.

Inter-changeable Platen

This was the introduction of the removable platen on certain makes of typewriters. On some typewriters today, it is possible to take as many as 20 legible carbon copies, given the right combination of paper, carbon paper and machine.

Hall (1977) and Okoye (1992) observed that in spite of the technical improvement in the area of manual typewriters by manufacturers, such as the invention of standard typewriters, there was still the need for a better way of gathering and processing information. Hence, the invention of electric typewriter.

2.3.2 Invention of Electric Typewriters

The invention of electric typewriter was becoming increasingly popular with employers and secretaries because of its resultant increase in secretarial work and less effort needed in typing documents. In the study conducted by Thompson (1964), it was discovered that the continuous striking of typewriter keyboard required the expenditure of a lot of energy by the secretary using manual typewriter. A lot of serious thoughts, experimentations and inventions therefore, resulted in the developmentof electric typewriter. Consequently, it was possible for secretaries to produce more mailable corres- pondence more easily and more quickly with less fatigue. Thompson asserted further that the electric typewriter was good on speed and legibility; with proportional spacing providing further improvement in the appearance of copy.

In Odiagbe's (1988) submission, electric typewriter was described as a modern equipment which performs a number of functions that are outside the scope of the manually-operated typewriters. Thus, it reduces the physical effort involved in typing to a minimum. In it, all features normally operated by the secretary such as keyboard, carriage return, line spacing, tabulator, etc. are electrically-controlled. In addition, there is an absolute uniformity of type impression, even, with variability in the secretary's touch.

The first electric typewriter, according to Roberts (1973), came into being in 1908 when the Blicknes-derfer Typewriter Company introduced an electronically-powered model machine.

In his research work, Roberts submitted further that the Woodstock introduced its Electric Model and North-east Electric Company introduced its electromatic typewriter in the early 1920's. However, as of early 1930's the IBM, which became the leader in the electric typewriters purchased the patent from the North-east Electric Company. Consequent upon man's insatiable wants and quest for knowledge, Oladebo (1991) stated that man still realised that there was the need to store, retrieve and process information faster than in the era of manual or electric typewriter--he now believed that emphasis must shift to the new technology from the more traditional typewriter. Hence, the invention of electronic typewriter, word processor and computer.

2.3.3 **Automated Equipment**

Schneider (1966) confirmed that a revolution in the secretarial and clerical processes has been under way for some decades. This, according to him, has changed the scope, the usages, the methods and the outcomes of many of the recording functions with which office workers have been familiar. Quible (1983) stressed the importance of the "Office of the Future" in terms of automation as follows:

> In many respects, the office of the future is arriving today in the form of office automation. The automated systems will

> also enable many types of employees to perform their jobs more easily and with greater efficiency than ever before. They (automated systems) will also enable employees to attain levels of productivity that are unattainable with many of the procedures and operations found in the majority today's offices.

Silver and Silver (1981) traced the history of office automation to the invention of typewriter in 1800 as a step forward in automating the office. They stated further that the first automatic typewriter, designed to type repetitive letters was introduced about the same time of World War 1. Furthermore, no substantial progress was made in the area of automatic word processing until the 1960's. The introduction of the computerised word processing system took place in the 1970's. Many of the word processing systems were complete typesetting devices, capable of generating a wide variety of page sizes, type-faces, and graphic displays.

A historical background of office automation would be incomplete without mentioning the great contri- butors to the field of automation and the generations of computers - the "bedrock" of office automation. The computer originated from the invention of Abacus to the sophisticated electric typewriters, electronic typewriters, word processors and computers, according to Michael (1987). He also stressed further that an increased demand for information necessitated automation preparation and dissemination of information. With the inceased demand for information, it was impossible

to meet such a demand with the aid of manual typewriter. To McCabe, et al (1977), the first aid however, was the Abacus which had its origin from China about 2600 B.C. John Napier also invented logarithmic tables on which the slide rule was based about seventeenth century.

Haga (1965) submitted that the first computer, capable of performing basic arithmetical funtions came into being in 1840 by Charles Babbage which he called, "Analytical Engine". This could solve variety of problems. It also had memory unit. The unit stored data in the form of hole punched in cards and combined arithmetic processes with decisions based on its own computations. McCabe (1977) cited in Michael (1987) stated that Howard Aiken started on the work of Babbage and came out with the "Automatic Sequence Controlled Calculator" in 1939. It was also between 1950's and 1960's that computers were introduced to offices. The table below illustrates the evolution of computers:

PERIOD	EVENT	REMARK
B. C.	The First Mathematical Device	Abacus
SEVENTEENTH CENTURY	The first four-function Calculator	Machine Arithmetic
1885	First Computer Cards	Hollerith Cards
1930-1950	First Computer by Charles Babbage	Analytical Engine
1930	Card Reader Sorter and Accounting Machine	Unit Recording Machine
1940-1959	First Generation Computer	Vacuum Tubes
1959-1964	Second Generation Computer	Transistors
1964-early 1970's	Third Generation Computer	Integrated Circuits
Early 1970's to date	Fourth Generation Computer	Large-Scale Integrated Semi-Conductor Circuits

EVOLUTION AND GENERATIONS OF COMPUTER
(Adapted from Introduction to Information Processing by D. D. Spencer)

Spencer (1981) identified four computer generations as follows:

The First Generation Computer

The first generation computer used vacuum tubes for control, calculation and memory. The demerit of this generation was detected in its bulkiness. It was also found to be unreliable and it generated heat.

The Second Generation Computer

Most of the machines made in the late 1950's and early 1960's belonged to the second generation. They were much smaller, required less power and produced much less heat. They were noted for the use of Transistors.

The Third Generation Computer

The third generation computers were smaller, more reliable and faster than earlier machines. They made use of integrated circuits. They were faster equipment for storage and handling input and output.

The Fourth Generation Computer

The 1970's witnessed the era of fourth generation computers with many of the functions already provided in the third generation computers. These functions were with several improvements such as faster internal performance; added reliability; enhanced functional capabilities; more efficient input/output processing; and integrated emulation of other systems.

In a nutshell, the fourth generation computer featured many changes in all areas of computer fields such as the introduction of micro-processors, micro-computers and computers-on-a-chip.

Silver and Silver (1981) also traced the historical background of computers as follows:

> It was not until 1642 that the first practical calculating machine was built by Pascal. Leibnitz also developed a similar machine which could multiply and divide. Charles Babbage also developed the analytical engine in 1833. In 1844, the first commercially practical adding machine was invented by William Burroughs. In 1877, Herman Hollerith used punched card equipment to process the USA Census of 1890, and in 1907, James Powers invented the punched cards system. Between 1937 and 1944, Howard Aiken led a group to design the Automatic Sequence Controlled Calculator. IBM manufactured machines for business users by the late 1950's and early 1960's.

Spencer's historical background of automation corroborates that of Silver and Silver because of the significant contributions of the great inventors which led to the "Information Processing Revolution" of the twenty-first centuries. According to McCabe (1977) cited in Michael (1987), electronic typewriters and word processors are communicator computers used by secretaries with a high speed of transmitting documents. The success of automated office tasks would be determined by the level of awareness and secretary's acceptance of office automation. The more the secretaries know about automation, the better for the new office innovation.

Quible (1983) listed the characteristics of office automation as follow:

1. Users-Friendly - this emphasises the ease at which the various equipment and components can be used.

2. Electronically-Integrated - that is; many of the equipment are electronically inter-connected; which will result in powerful automated office systems. This will make the equipment more functional than the manual equipment found in many offices in the past.

3. Custom-Designed - to meet users' requirements rather than requiring users to adapt to system's capabilities.

In his own submission, Ober (1983) believed that the conventional method of using manual and electric typewriters by secretaries should be discouraged in the automated office. He believed that developing typing competences such as straight-copying and production typing skills, using electronic typewriters or word processors, are most essential in the electronic or automated office.

Thompson (1964) also believed that the concept of automation embraces not only the familiar mechanisation of energy by electronics and computers. To him, cybernated systems could perform with precisions and a rapidity unmatched in humans. He stated further that the basic skill used in manual or electronic typewriter can be adapted to automated equipment. Based on the positive dispositions of various authors and the benefits of automation such as cost, time and labour saving devices, the researcher believes that automation, with reference to electronic typewriters, is an area in which secretaries should be adequately prepared for in order to face the challenges of the automated office. Secretaries should not believe that automation could displace

them. Rather, they should perceive the new innovation as the only "saviour" in improving their performance and enhancing their efficiency in the automated office tasks. In support of this admonition, Muscat and Lorton (1982), Hedley (1983), Oswalt (184), Meal (1987), Shelly and Cashman (1990) and Spencer (1981) asserted that the age of the computer is here with its increasing frequency. It is recognised that an understanding of the computer, how it works and how it influences the daily lives of the general education for all students and users who live and work in this technological society would have a tremendous impact on the business world.

2.4 The Traditional and Modern Roles of Secretaries in the Office

The traditional role of a secretary is significant in this type of research work in order to justify the need for the secretary to prepare herself for the automated office tasks. These involve her ability to manipulate the automated office equipment such as computers and electronic typewriters. In addition, text-editing, information retrieval and production of mailable documents are all parts of the automated office tasks that she should be familiar with. Her role transcends taking dictation and transcribing on the manual typewriter. She is expected to assist her boss and should be able to work with less supervision. Okezie (1991) discussed the role of pre-computer secretary as follows:

1. Organising the office physically.
2. Taking notes from the boss.
3. Keeping a diary of events to enable her remind her boss.
4. Ensuring that mails are received and dispatched.

The National Board for Technical Education (NBTE) Curriculum and Course Specifications for Secretarial Studies Programme (1989) listed the traditional roles of a secretary as follows:

1. Typing of correspondence.
2. Taking dictation and transcribing dictated materials into mailable documents.
3. Arranging files and various information into appropriate headings.
4. Answering phone calls and attending to visitors.
5. Making travel travel arrangements (itineraries) for her boss.
6. Arranging meetings and booking hotel accommodation.
7. Acting on behalf of the boss.

The traditional roles of the secretary listed above are not exhaustive. There are other traditional roles which she could perform, depending in the office and situations in which she finds herself. Among other traditional roles which she could play are: keeping petty cash on behalf of her department; creative role of cutting articles that are relevant to her department from newspapers, dailies,

magazines, etc. However, the "office of today" (automated office) expects secretarial roles to transcend those itemised above. What then are the roles of secretary in the automated office?

According to Aromolaran (1991), a secretary who intends to keep her job should prepare herself for the challenging tasks of the automated office. He stated further that her (secretary) role in automated office would be quite different from what it used to be in the traditional or orthodox office. She should be familiar with the uses of computers, word processors, electronic typewriters, telex, etc. In support of Aromolaran's assertion, Okezie (1991) affirmed that a computer-assisted secretary does not need to bother too much about file jackets and filing cabinets as a large part of the documents she wants to store are kept and stored in magnetic disks and tapes. He stressed further that diaries are now being kept in the computer which can be programmed to remind the boss everyday. A dynamic secretary, therefore, must be aware of the uses and the extent to which the computer can be put in aiding managerial decision making.

Spencer (1981) like Okezie, believed that fewer paper documents would be retained in the storage in the automated office. Instead, information would be stored in the computer mass storage devices on micro-film and micro-fiche; and in word processing systems. Morris and Kilpatrick (1985) asserted that the need for automation in secretarial

profession has been motivated by the increase in technological advancement in business and industry. As the traditional office moves towards automation, according to Griffith (1989), the need for secretaries with word processing or electronic typewriter skills cannot be over-emphasised. More employers now expect their secretaries to acquire automated skills to enable them (secretaries) perform automated office tasks as efficently and effectively as possible.

Nanassy et al (1979) stressed the need for the automisation of many clerical and secretarial processes in order to achieve greater efficiency of office and scretarial routines. They also advised secretaries not to perceive automation as an instrument which could displace them for the following reasons:

1. The data to be collected and processed still require human effort in being collected with a high degree of accuracy in feeding.
2. Output usually cannot be used in the form in which it is presented but needs considerable interpretation to enable the management use them (data).

Okoye (1992) listed, among other things, the following automated office skills desired by the employers of secretaries:

1. Good human relations.
2. Ability to type.
3. Good office routines competency.

4. Ability to operate word processor, computer and electronic typewriter.

5. Ability to operate telex and fax machines.

6. Proficiency in audio typing.

7. Ability to operate reprographic equipment such as photo-copier.

In addition, Merony (1983) also itemised some of the pre-requisites that should be met by secretaries who enroll in an Information Processing course as follows:

1. A desire to work with machines.

2. Good keyboarding skills.

3. Excellent English Language skills.

4. Good mathematical background.

5. Proof-reading ability.

6. Excellent reading comprehension ability.

7. Ability to use reference and resource materials.

Aromolaran (1992) stated that there are several other non-typing skills that must be acquired by a secretary in addition to the competency in typing skills listed above to enable a secretary experience success and job satisfaction in the automated office. These are:

1. assisting her executive in taking decision on some issues affecting the establishment;

2. making and answering telephone call;

3. supervising her subordinates;

4. handling incoming and out-going mails;

5. ability to work under pressure and manage her time and that of her boss effectively;

6. ability to work for more than one boss in a depressed economy;

7. ability to manage herself and her boss.

2.5 Effects of Automation on Secretaries

Vogel (1975) asserted that generalisations about the effects of automation on secretaries are difficult to make. His assertion was based on the premise that, while the extension of computer usage spurred increases in some clerical and secretarial occupations between 1960's and 1970's, the demand for experienced secretaries in automation was relatively unaffected. His conclusion was that, information processors in our society, whether they are typist-clerks or professional secretaries will continue to grow in number and importance. Spencer (1981) also supported Vogel when he asserted that the introduction of automation in the office would result in enriching secretary's everyday life, and not encroaching on her freedom. He (Spencer), however, opined that automation, if misused, can possibly "dehumanise" the society, and can just have the oppsite effect. With the increasing number of automated applications to information management, consideration should be given to the effects of automation on the secretary, either positively or negatively.

Keeling, et at (1978) maintained a positive stance that automation is bound to succeed and would work most

effectively if we take care of the human implications and the human concern which it createes. No wonder why Wu (1979) commented on automation that:

> We are caught up in a revolution that is beyond our once wildest dream; a revolution that affects all of us in our daily lives - a revolution that has changed and will continue to change the way in which we perceive our world and process information. The breadth and depth of the impact of automation on our lives make it imperative for everyone to be educated in both the fundamentals of automated office equipment and their myriad uses.

Among the more significant developments during the period of industrial revolution, according to Tremblay and Bunt (1979) is automation - a replacement of human effort with self-directing mechanism. Keeling, et al (1978) opined that automation would enable the employers of secretaries to regroup all the elements of control under a single roof. In addition, the centralisation of information processing, the establishment of total systems and procedures, and the ability to project more accurately, the company's goals, costs, and budgets all serve to justify the need for a full understanding of the managerial functions of planning, organising, leading, and controlling. Furthermore, they stressed that secretaries will be relieved of the repetitive monotonous functions of recording and transcribing messages from the executives. Johnston (1972) stated that, with automated office equipment, there will be a rising demand for

workers with a high level of secretarial education and training, while there will be a lessening of opportunities for the less skilled and less educated secretarial staff. Aromolaran (1993) supported the idea that, as a new technology eliminates jobs, it also creates new jobs. According to him, a secretary who is able to rise to the challenges of the automated office cannot be displaced because such a secretary would be needed to operate any of the automated office equipment such as word processor, computer, electronic typewriter to perform automated office tasks. Aromolaran suggested further that there should be a continuous examination of office education subject matter (secretarial), and that, retraining programmes should be made available for the traditional secretaries; that is, those who were trained with old equipment such as manual typewriters, while provision should be made for modern secretaries (those trained with automated office equipment) to update their skills in the newly-introduced office equipment.

Furthermore, Drucker (1974) predicted that the job of middle management would become obsolete and that the number of middle management would be severely reduced with the introduction of automation. Spencer (1981) opined that automation can free secretary from drudgery and allow them to devote much of their time to other office activities such as answering telephone calls, filing, etc. However, the effects of automation can be viewed from two perspectives--the

optimist believes that it can solve many modern office problems which might look hopeless. The optimist also recognises the technological feasibility of a computerised business world and views its expansion favourably. But the pessimist is only concerned about its adverse effect on secretary's liberty and the pursuit of happiness at work.

In conclusion, office automation will not eliminate the seasoned and experienced secretary. It is only the inexperienced and less educated secretary who refuse to update her knowledge and keep abreast of the new innovation - automation, that will be relieved of her repetitive and monotonous functions of typing and transcribing dictated passages manually. Experienced secretaries would still be required to operate automated office equipment in performing automated office tasks. There is no doubt that there would be the need for experienced secretaries who have expanded responsibilities for managing information, and who could supply information to various executives in the automated office without wasting time.

2.6 Relevance of Automation in Business

The introduction of automation into secretarial profession in this "jet" age of office technology is very relevant. Specifically, the introduction of computer, electronic typewriter and word processor no doubt, ensures that secretarial staff are not left behind in the concerted effort to revolutionise and modernise business office

equipment. An automated office, undoubtedly, offers new roles and responsibilities to the secretary. Such new roles presuppose that additional training and qualifications are required from the "modern day" secretaries. Their ability to manipulate automated office equipment must remain unquestionable. Their knowledge of English Language must be good since their new role will require them to compose letters and reply customers' enquiries. Automation, therefore, is relevant in this regard.

The secretary's ability to work with little or no supervision will be appreciated in the automated office. Her ability to work alone becomes necessary because, in the process of feeding information into a computer system or word processor, she will be working alone most of the time. The relevance of automation in business as identified by Bergerud and Gonzalez (1978) to the secretary are as follows:

1. Creating a distinct career path for the secretary.
2. The secretary depends on her skill, ability and performance on the job for her promotion.
3. Automation creates a prominent place for the secretary on the organisation chart.
4. It creates routine, assigned and creative roles for the secretary.
5. It makes the secretary to be loyal to her employer rather than the boss.
6. It enables the secretary to work in a separate compactment instead of being stationed at the boss's door.

7. Automation relieves the secretary of repetitive task of typing form letters.

8. With automation, the secretary now spends less time in correcting, revising, proof-reading and reproducing documents.

9. It frees the secretary from sitting with typewriter to do other jobs while the printer prints documents.

10. It enables the secretary to specialise in either typing or non-typing duties with a view to reaching her optimum at work.

Silver and Silver (1981) asserted that automation is equally relevant to the manager who demands the best from his secretary as follows:

1. With the re-organisation of the office and the introduction of the automated office equipment, the manager's work is producedfaster with professional touch.

2. The manager is provided with administrative secretary, to whom he delegates part of his official duties.

3. The manager's time is now expended on more important duties.

4. He is more productive than before the installation of the automated office equipment because he is being assisted by an experienced secretary who can process information required with dispatch.

5. He can also dictate on a dictaphone for the secretary to reproduce in a mailable format.

6. Hiring of temporary emplyees is reduced since the secretary can stand in for an absent clerical employee in the Information Processing Section.

7. The manager is able to concentrate on a more creative task with the presence of an experienced secretary assisting him.

According to Spencer (1981), automation is relevant to the employer of a secretary as follow:

1. It helps to lower the cost of producing office documents that could have risen if manual method of processing information has been adopted.

2. It creates for the employer an ample opportunity to employ specialists who are able to work at a high level of productivity.

3. The employer is able to produce more because of the services performed by experienced clerical and secretarial supporting staff.

4. Efficient utilisation of equipment and procedure enables the employer to respond promptly to customer's needs.

5. Workloads are equitably distributed among the clerical and secretarial personnel.

6. The introduction of automated office equipment enhances the prestige of the company and "boost" the morale of staff.

7. It ensures that work is done speedily and with a high degree of accuracy.

8. It reduces cases of redundant workers.

9. Automation makes it possible to measure workers' productivity.

Michael (1987) also stated the relevance of automation of include:

1. Rush correspondence can be taken faster.

2. Employers enjoy the personal contact of their secretaries.

3. In some places, the volume of correspondence would determine the nature of automated office equipment to be installed.

However, Moore (1987) advised that the relevane of automation must not be abused by the secretary, the manager and the employer. He asserted further that the usage of the automated office equipment must be controlled in terms of stationeries and other useful accessories and peripherals. In order to get the best result from the automated office equipment, he suggested that they should be constantly maintained.

2.7 Merits and Demerits of Automation

Inspite of the skepticisms and misconceptions about automation, Spencer (1981) opined that it still remains a prominent factor that has contributed immensely, and positively to the complete information processing revolution. He stressed further that the traditional secretarial routines involving repetitive clerical work are disappearing as a result of the office information technology. According to him, it is now easy for secretaries to perform automated office tasks consequent upon the advent of automation. He also asserted further that a secretary can rise to managerial position, and, more importantly, information processing personnel.

Silver and Silver (1981) listed the merits of automation to include:

1 Improved general and secretarial education; thus, enabling secretaries to become better prepared for the automated office tasks.

2. Increased specialisation of secretarial staff. There are varied opportunities for specialisation such as legal secretaries, medical secretaries, etc.

3. New job opportunities. Automation has introduced many job categories and produced thousands of new businesses, all of which emply experienced secretaries.

4. Improved communications. Direct dial telephone services would have been possible without the rapid switching capabilities of computers. Communication satelites, which provide offices with inter-continental telephone communi-cations, are built, launched, controlled, and maintained with the aid of computers".

Schramm (1991) stated that several researchers have reported the relationship between automation and secretaries. Although, such studies, according to him, present valuable information concerning the merits of automation; but the overall conclusions about the merit of automation centred around its importance in the office. In the studies conducted by Collier (1983), Balkena (1984), Greenland (1986), and Pollock (1986); they concluded that automated office equipment greatly affect the performance of automated office tasks by secretaries. Similarly, Butter-Nalin (1986), Duling (1986), Gredja (1989), Miller (1985) and Piper (1984) significant differences in secretaries' mean score achievement on production typewriting ability with manual method versus modern method of the automated office equipment.

Daiute and Taylor (1981), Feldman (1984), Koening (1985), Moore (1987), Pernia (1988), Pivarnick (1985) and Shimanoff (1988) reported that secretaries using automated office equipment produced a significantly better written products than secretaries using the manual method. The merits of automation as supported by various researchers cited above indicate that research studies in automation would keep the secretary, the manager and the employer abreast of the benefits inherent in the applications of the automated office equipment in performing automated office tasks. Glass (1976) opined that research studies in automation would provide varluable information for the effective utilisation of secretarial services in the labour market.

2.7.1 Demerits of Automation

Automation, according to Trickette (1979), has touched our daily lives and has given us an idea of what the automated office equipment can do for us, and what such equipment can do for the new work environment. He, however, lamented that automation also reduces the quantity of workforce. Spencer (1981) identified the following problems of automation:

1 Dependence on the computer may cause the people, particularly, secretaries to lose their self-reliance and their ability to cope with emergencies, unexpected pressure and difficult office situations.

2. Proliferation of data banks. This may create many problems that affect individual's right to privacy.

3. Many people object to being assigned a univeral identifier, even though, it is necessary for information processing.

4. It is assumed that people may become dis-oriented and alienated if changes occur too rapidly through the computerisation of information.

5. Computer crime. People seldomly use computers ot help them steal money, print unautorised cheques and swindle stocks and money.

6. It has also be been complained that computers force us into rigid molds. For instance, computer-processed forms force businessmen to put their companies' names, addresses, and other related data within a specific number of spaces or to answer questions in a pre-determined manner.

Greenland and Bartholome (1987) also identified the following problems of automation:

1. Problem of power supply. Automated office equipment such as electronic typewriter require constant electricity supply.

2. "Robotic" nature of equipment. Automated office equipment such as computer and electronic typewriter can only do what human beings direct them to do. Such equipment can only accept information and process them into output but cannot perform any physical function.

3. Lack of technical know-how of automated office equipment. Lack of adequate qualified manpower to operate and maintain equipment has been a major constraint of automation".

Uwa (1994) also identified the "Nigerian" factor as a problem of automation - an erratic power supply! According to him, this reduces the efficiency and life-span of machines and may even necessitate the use of manual typewriters. Adeakin (1994) corroborated Uwa's assertion when he stated that the improvisation of electricity generating engines may be rendered useless due to the recent fuel price hike (from ₦ 3.25 to ₦11 per litre) by the government! This, according to Adeakin would affect the overheads of companies using automated office equipment. Another problem identified by Adeakin is the lack of maintenance culture of equipment users.

However, there is a high hope for improvement on the use of automated office equipment with the rate of technological education awareness in Nigeria. The 6-3-3-4 system of education, as it emphasises on functional education might be the "right step in the right direction" in solving our computer literacy problem.

2.8 Research on Automated Office Equipment

The study conducted by Owojori (1990) indicated no significant difference in the mean score achievement on production typewriting ability of the experimental and control groups before experimental training. The objectives of Owojori's studies were to evaluate the level of skill development on production typewriting ability and keyboarding

inputting ability of subjects at different times during his study.

Furthermore, it was discovered by Okoye (1992) that secretaries using word processors produced a significantly better written product than secretaries using manual typewriters. Also, the findings of Daiute (1985) corroborated the findngs of Feldman (1984) that electronically integrated office equipment will not only produce better written results but will be more functional than much of the manual equipment presently found in many offices.

To further butress the importance of automated office equipment, Koenig (1985) stressed three key words on the uses of computer and word processors as confidence, security and dignity of work. Koenig substantiated further that by confidence, a secretary knows that she is equipped to meet all situations normally encountered in the office and business world. Such a secretary is also sure of job security and will command respect in the business world as a useful office companion. Moore (1987) stressed that the potential secretaries who can benefit from instructions in word processing will consist of all secretarial students who will be entering an office occupation upon graduation, having acquired automated skill training. Pernia (1988) supported Moore's assertion by recommending that automated office skill

training should include the teaching of hardware and software overview, user, conceptual and programming competencies.

The findings of Pivarnik (1985) indicated a large significant and positive effect on the attitude of secretarial students towards writing, using word processing equipment when compared to those secretarial students using traditional writing methods.

Glass (1976) was interested in determining whether or not sex (male of female) could significantly affect the performance of automated office tasks, using word processors or computer. It was found that there was no significant difference in the mean score achievement of either male or female secretaries in performing automated office tasks, using word processors or computers. Shimanoff (1988) also reported that no significant difference existed between male and female secretaries using word processing equipment on writing quality. The only significant difference noticed by Gredja (1989), however, was within the experimental group exposed to experimental training. Gredja reported that subjects within experimental group were able to type faster and more accurately than their counterparts within control group.

With reference to the correlation between age and performance automated office tasks by secretaries within experimental and control groups, it was discovered that age is no barrier in acquiring automated skill training. The

findings of Collier (1983) and Balkena (1984) supported this assertion. Subjects were divided into experimental and control groups. The experimental group was exposed to experimental training in specific skilled areas of automation such as keyboarding, inputting ability on computer and word processors, etc. It was concluded that age does not affect secretaries in acquiring automated skill training.

Furthermore, Pollock (1986) observed no significant difference between the experimental and control groups with reference to the acquisition of automated skill training. However, Pollock suggested the provision of up-to-date automated office equipment which are used in modern offices for prosperctive secretaries-in-training. Greenland (1987) opined that word processing equipment is bound to contribute immensely to the performance of automated office tasks and enhance the efficiency of male or female secretaries in processing information.

The findings of researchers in the area of automation have proved that years of 'experience, using manual typewriters could not constitute a barrier in acquiring automated skill training. Duling (1986) and Butler-Nalin (1986) supported this assertion when they reported that using manual equipment did not have any significant effect on subjects in acquiring automated skill training. Ober (1983) also observed that, although, the number and use of micro-computers in the office setting are rapidly increasing for

developing writing skills, there is no form of empirical basis to confirm that, making use of manual equipment in writing instruction will prevent secretaries for acquiring automated skill training. Miller (1985), however, opined that the acquisition of automated skill training would assist secretaries significantly in performing automated office tasks better than secretaries making use of manual equipment. Piper (1984) also reported that the experimental group which received automated skill treatment was able to make use of word processors better than the control group, even though, no significant difference existed between the mean score performance of the two groups.

Okoye (1992) and Okafor (1992), however, opined that secretaries are still deficient in the application of modern office equipment such as fax, telex, etc. They suggested that secretaries should acquire information processing skills for self-reliance. In Owojori (1990), the problem of acquiring automated skill training arises from inadequate supply of qualified personnel, lack of automated office equipment and other supporting equipment and peripherals for practical training.

However, the introduction of the 6-3-3-4 system of education and computer literacy awareness indicate that the future is brighter in Nigeria and other developing countries. Secretaries should, therefore, take the advantage of this new innovation of modern office technology since there would be the need for modern secretaries who have expanded

responsibilities for managing information; and who can supply such information to various executives in their respective establishements.

2.9 Summary of the Related Literature

The aim of this study was to determine the effect of automated skill on the performance of automated office tasks by secretaries. Moreover, the review of related literature on automation indicated that adequate opinions have been expressed, coupled with related research findings published to justify that a study in the area of automated office equipment was necessary in developing countris such as Nigeria.

The National Board for Technical Education (1989) and other organs of government responsible for making policy statements on technical education, having identified the deficiency of secretarial personnel in the application of automated office equipment in performing automated office tasks are making concerted efforts in improving the curricula of secretarial studies at the secondary and tertiary levels.

Most of the authors emphasised the need for the automisation of secretarial processes in order to achieve greater efficiency of secretarial processes in order to achieve greater efficiency of secretarial office routnes. Inspite of the skepticisms and misconceptions about automation, it still remains a prominent factor that has

contributed to the complete information processing revolution. Research studies in automation would, no doubt, provide valuable information for the effective utilisation of secretaries in the labour market. The onus rests on secretaries, whether trained with manual or automated office equipment, to keep abreast of the innovation and development in office technology.

Chapter 3

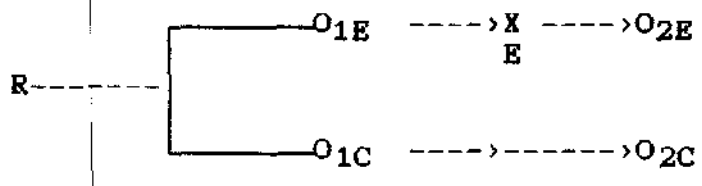
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the research design, population, sample and sampling procedure, research instrument, method of data collection, data analysis and pilot study.

3.2 Research Design

The study was designed to determine the effect of training in automated office equipment on secretaries' job performance. The experimental Pre-test-Post-test Control Group design with randomisation (Campbell and Stanley, 1963) and Leedy (1980) was used. Thus, the design used is as follows:



In the above design, 'R' indicates that the secretaries were randomly assigned to Group E and C. The 'E' represents the experimental group; while 'C' represents the control group. The 'R' indicates that, before separation, the two samples (E and C) were kept isolated from the influence of the experimental variable 'X' 'O_{1E}" and "O_{2E}" are the two evaluations of the experimental group before and after its

exposure to the experimental variable 'X' 'O_{1O}' and 'O_{2C}' are the evaluations of the control group.

A pre-test (O_1) of one hour production typewriting was given to both the experimental and control groups on the first day of the commencement of the study. This pre-test was scored to assess the performance of the two groups (O_{1E} and O_{1C}) using manual typewriters. The treatment (X_E) was introduced for six weeks. During the six weeks' period, the researcher taught the experimental group personally, the use of electronic typewriters in performing automated office tasks on the IBM "Wheelwriter 50" Electronic typewriters. The first lesson was devoted to the objective of the study, introducing the participants to the electronic typewriter and its parts. See Appendix I for the Teaching Materials used during the period of the study.

A post-test (O_2) was given to both the experimental and the control group after the treatment (X_E) on the IBM "Wheelwriter 50" Electronic typewriters for one hour. The researcher believes that a six-week duration was sufficient for the study, based on the degree of maturity and various years of experience of the secretaries in office routines while making use of manual typewriters. In Owojori (1990), subjects were exposed to experimental training in keyboarding for six weeks. He substantiated further that there was a great improvement on the performance of subjects within the duration of the six-week experimental training.

In justifying the six-week duration of the study, Owojori cited Lawal, et al (1987) that keyboard is normally covered in ten lessons of one hour each; which is, approximately, two weeks, and that 20 periods of one hour each were enough for consolidation, drill, and speed and accuracy practice-an equivalent of the period needed for introducing word processing or office information systems in the polytechnic at the National Diploma and Higher National Diploma levels respectively (NBTE, 1989).

3.3 Population

The subjects of this study consisted of 200 secretaries--55 from the Union Bank of Nigeria (UBN) Plc, Lagos; 20 from BAGCO Nigeria Limited, Lagos; 30 from the Federal Ministry of Communications, Lafiaji, Lagos; 40 from the Nigerian Postal Services (Headquarters); 10 from the EMS Speedpost, Somolu, Lagos; and 45 from the Establishment and Services Matters Division of the Lagos State Military Administrator's Office, Alausa-Ikeja. All the secretaries who participated in the study work with manual typewriters in their respective offices.

3.4 Sample and Sampling Procedure

The sample for this study consisted of forty (40) secretaries, randomly selected from the population mentioned above. Each of the six establishments which participated in the study (See Appendix A) was assigned a number (1,2,3,4, etc.). The number of each of the six establishments was

written on separate pieces of paper. The papers were folded properly and put in a container. After a thorough reshuffling, the researcher requested a drawer, with closed eyes, to pick one slip each successively for 40 times, representing the number of subjects needed for the study. They were subsequently released by their employers for the study based on the letters of introduction from the Head of Business Section and Head of Department of Vocational and Technical Education of the Ahmadu Bello Univeristy, Zaria to the prospective participating establishments (See Appendix D for letters of introduction). Subjects were later divided into two groups - 20 for the experimental group and 20 for the control group.

Simple random sampling technique was used in this study, based on the recommendations of Downie and Heath (1965) and Nworgu (1991) that samples resulting from this technique are said to be unbiased and are, therefore, representative of the population. They asserted further that, in each of the selected organisation, participants could be chosen randomly since the sampling method provides a wide coverage of participants; yet, it is economical and efficient in terms of the number of participants tested.

3.5 Research Instrument

Tests used for the pre-test and post-test were adapted from the past questions of the National Secretarial Examinations Board (1992, 1993) for the advanced secretarial

studies (typewriting) students. The tests were administered by the researcher to subjects on manual typewriters (pre-test), and electronic typewriters (post-test). The teaching materials for the experimental training were also adapted from the "IBM Wheelwriter 50 Series' Operator's Guide (First Edition). Both the tests and teaching materials used were validated by a Business Education expert and a statistician in terms of their face and content validity (See Appendices E, F, and G for the research instrument).

3.6 Method of Data Collection

The study was conducted for six weeks between September 5 and October 14, 1994 at the Laboratory of Providence Royal Institute of Computer and Management Studies, Lagos. The researcher personally collected the data regarding the participants' sex, age groups, and years of experience as secretaries using manual typewriters on the first day of the commencement of the experiment. The information processing classes for the experimental group were scheduled for three hours per week of one-hour duration on Monday, Wednesday, and Friday. Individualised instruction method was adopted in teaching the experimental group based on the ability of each participant in coping with instructions. A post-test of one hour production Typewriting was administered on the last day of the experiment in the same Laboratory.

3.7 Procedure for the Analysis of Data

The pre-test and post-test were marked and recorded by the researcher for the computer analysis in order to evaluate the mean score performance on production typewriting ability of the experimental and the control groups. A participant is regarded as having passed, if he or she scored the minimum of 50 percent and above.

A two-tailed T-test was used to analyse the data resulting from the Null Hypotheses 1,2,3, and 4 at both the pre-test and post-test levels. A One-way Analysis of Variance (ANOVA) was used to analyse the data resulting from the Null Hypotheses 5,6,7, and 8. The level of significance for the eight Null Hypotheses was fixed at .05 level of sginificant.

A two-tailed T-test and the One-way ANOVA were used in this study because they provide a means of determining whether or not a significant difference exists in the mean score performance on production typewriting ability of the experimental and control groups (Oyeyiola, 1992). He substantiated further that a One-way ANOVA, like the two-tailed T-test, is useful in testing the differences between means. Specifically, Oyeyiola opined that One-way ANOVA is a model concerned with testing differences in k sample means when the subjects are assigned randomly.

3.8 Pilot Study

The pre-test and post-test were pilot-tested to avoid ambiguity, using secretaries from private and public sectors, who attended the Workshop organised by Providence Royal Konsult Limited, Lagos in March 1994. Nworgu (1991) suggested that a pilot study is necessary in order to eliminate bias which might arise from the absence of pilot-testing. Nworgu further suggested that validation of research instrument is necessary to ensure its face and content validity. The reseacher, therefore, conducted the pilot study to test the reliability of research instrument (validated by a Business Education expert and a statistician). Cronbach's (1977) Alpha (α) reliability coefficient was computed (α = 0.71). This was found to be significant at .05 level of significance.

Chapter 4

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This Chapter presented and analysed the data collected throughout the duration of this study. The eight research questions were first itemised and the eight hypotheses were subsequently analysed.

4.2 Research Questions

Specifically, answers were sought to the following eight research questions:

1. What is the difference between the mean score performance of the experimental and control groups before experimental treatment on automated skill training?
2. What is the difference between the mean score performance on production typewriting ability of the experimental and control groups after the experimental treatment on automated skill training?
3. What is the difference in the mean score performance on production typewriting ability of male and female secretaries before the experimental treatment on automated skill training?

4. What is the difference in the mean score performance on production typewriting ability of male and female secretaries after the experimental treatment on automated skill training?
5. What is the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20, 21 and 25 and above 25 years before the experimental treatment on automated skill training?
6. What is the difference in the mean score performance on production typewriting ability among secretaries in the age range 15 and 20, 21 and 25, and above 25 years after the experimental treatment on automated skill training?
7. What is the difference in the mean score performance on production typewriting ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years before the eperimental treatment on automated skill training?
8. What is the difference in the mean score performance on production typewriting

ability among secretaries whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after the experimental treatment on automated skill training?

4.3 Hypotheses Testing

This section is devoted to the testing of the hypotheses.

Hypothesis No. 1

There is no significant difference between the mean score performance on production typewriting ability of the experimental and control groups before automated skill training.

TABLE 4.01 RESULT OF PRE-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF EXPERIMENTAL AND CONTROL GROUPS

Group	M.S.*	S.D.*	df	T-Cal	T-Crit. α = 0.05	Remark
Experimental (N = 20)	61.1500	6.627	38	0.20	<1.96	Not Significant
Control (N = 20)	60.8500	7.066				

*M.S. = Mean Score
S.D. = Standard Deviation
df = Degrees of freedom
T-Cal = Calculated Value of T-Test
T-Crit. = Critical Value of T-Test

The data above indicate that the pre-test scores have the mean of 61.1500 for the experimental group, while the mean score of 60.8500 was recorded for the control group. The difference between these mean scores is not significant at .05 level of significance. The calculated value for t-test statistic is 0.20 with 38 degrees of freedom. This shows that the experimental and the control groups are the same in terms of production typewriting ability, using manual typewriters at the commencement of the experimental training. It also connotes that any significant difference which might arise at a later stage between the experimental and the control groups could be attributable to the effect of automated skill training received by the experimental group. This speculation corroborates the findings of Owojori (1990) when subjects were introduced to touch keyboarding training.

Since there is no significant difference between the mean score performance on production typewriting ability of the experimental and control groups, it is logical to retain the null hypothesis.

Hypothesis No. 2

There is no significant difference between the mean score performance on production typewriting ability of the experimental and control groups after automated skill training.

TABLE 4.02 RESULT OF POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF EXPERIMENTAL AND CONTROL GROUPS

Group	M.S.	S.D.	df	T-Cal	T-Crit. $\alpha = 0.05$	Remark
Experimental (N = 20)	71.5000	5.166				
			38	9.65	>1.96	Signi-ficant
Control (N = 20)	58.8500	6.595				

The data above indicate that there is a significant difference between the mean score performance on production typewriting ability of the experimental and control groups after automated skill training. The mean score for the experimental group was 71.5000; while the mean score for the control group was 58.8500. The calculated value for t-test statistic was 9.65 with 38 degrees of freedom.

TABLE 4.03 SUMMARY OF PRE-TEST AND POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF EXPERIMENTAL AND CONTROL GROUPS

Group	Pre-Test	Post-Test	Variance
Experimental (N = 20)	61.1500	71.5000	+10.3500
Control (N = 20)	60.8500	58.8500	-2.0000
Pre-post test Group Variance			8.3500

For further explanation of the significant difference existing between the experimental and control groups, the pre-post-test group variance for the two groups depicts 8.3500 as shown in the Table above. The experimental group had a pre-post-test mean score of +10.3500 as against the pre-post-test mean score of -2.0000 for the control group.

This clearly indicates that the experimental group performed better than the control group in the automated office tasks, consequent upon the automated skill training received by the experimental group. The findings of Daiute (1985), Ober (1983), Koenig (1985) and Pivarnick (1985) butress this assertion when they

reported that secretaries using word processing equipment produced a significantly better written product than secretaries using manual equipment.

The null hypothesis is not retained because of the significant difference which exists between the mean score performance on production typewriting ability of secretaries who received automated skill training, and secretaries who did not receive automated skill training.

Hypothesis No. 3

There is no significant difference between the mean score performance on production typewriting ability of male and female secretaries within the experimental group before and after experimental treatment on automated skill training.

TABLE 4.04 RESULT OF MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY BETWEEN PRE-TEST (MALE AND FEMALE) AND POST-TEST (MALE AND FEMALE) SECRETARIES WITHIN EXPERIMENTAL GROUP

Variable	No. of Cases	M. S.	df	T-Cal	T-Crit. α = 0.05	Remark
Pre-test Scores	20	61.1500	19	-8.42	>1.96	Signi-ficant
Post-test Scores		71.5000				

The Table above shows that there is a significant difference between the mean score performance on production typweriting ability of male and female secretaries within the experimental group before and after experimental treatment on automated skill training. Their pre-test mean score was 61.1500; while their post-test mean score was 71.5000. This significant difference justified that the acquisition of automated office tasks competency by the experimental group is very relevant to their performing automated office tasks. Furthermore, the male and female secretaries within experimental group had the calculated value of t-test statistic of -8.42 with

19 degrees of freedom. The calculated value of t-test statistic is, obviously, greater than the critical value of t-test (1.96). Pernia's (1988) findings also supported the existence of a significant difference when the experimental group was able to type faster and more accurately after experimental training. Therefore, the hypothesis is rejected since there is a significant difference in the mean score performance on production typewriting for secretaries within experimental group.

Hypothesis No. 4

There is no significant difference between the mean score performance on production typewriting ability of male and female secretaries within the control group before and after experimental treatment on automated skill training.

TABLE 4.05 RESULT OF MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY BETWEEN PRE-TEST (MALE AND FEMALE) AND POST-TEST (MALE AND FEMALE) SECRETARIES WITHIN CONTROL GROUP

Variable	No. of Cases	M. S.	df	T-Cal	T-Crit. α = 0.05	Remark
Pre-test Scores	20	60.8500	19	1.62	‹1.96	Not Signi-ficant
Post-test Scores		58.8500				

The data above indicate that there is no significant difference between the pre-test and post-test mean score performance of male and female secretaries within the control group. Their pre-test mean score of 60.8500 reduced to 58.8500 during the post-test period! The calculated value for t-test statistic of 1.62 with 19 degrees of freedom supports the claim that there is no significant difference between the pre-test and post-test mean performance of male and female secretaries within control group.

However, there might have, probably, been a significant difference if they had been exposed to automated skill training like their counterparts in the experimental group. There is a decrease in the post-

test mean score performance on production typewriting ability of the control group (58.8500) from their pre-test mean score performance of 60.8500. It therefore, means that the acquisition of automated office tasks competency is imperative for the control group to enable them perform automated office tasks like their colleagues in the experimental group.

Consequent upon the non-existence of a significant difference between the pre-test and post-test mean score performance of male and female secretaries within control group, the findings of Glass (1976) and Shimanoff (1988) that the control group who were not exposed to experimental training did not perform better, even, after experimental training support the decision to retain the null hypothesis.

Hypothesis No. 5

There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) in the age range 15 and 20, 21 and 25, and above 25 years before the experimental treatment on automated skill training.

TABLE 4.06 RESULT OF PRE-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN EXPERIMENTAL GROUP IN THE AGE RANGE 15 AND 20, 21 AND 25 AND ABOVE 25 YEARS

Source	Sum of Square	df	M.S.S.*	F-Cal	F-Crit $\alpha = 0.05$	Remark
Between	84.3942	2	42.1971			
Within	750.1558	17	44.1268	0.9563	‹1.96	Not Signi-ficant
Total	834.55	19				

*M.S.S. = Mean Sum of Squares

The data above indicate that no significant difference exists in the mean score performance on production typewriting ability among secretaries (within experimental group) in the age range 15 and 20, 21 and 25, and above 25 years before experimental treatment on automated skill training. The calculated F-test statistic of 0.9563 was recorded at 19 degrees of freedom. It is pertinent to analyse the data for the pre-test of secretaries within control group in the age range of 15 and 20, 21 and 25, and above 25 years to determine whether or not any significant difference exists, too.

TABLE 4.07 RESULT OF PRE-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN CONTROL GROUP IN THE AGE RANGE 15 AND 20, 21 AND 25 AND ABOVE 25 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit $\alpha = 0.05$	Remark
Between	75.7903	2				
Within	872.7597	17	51.3388	0.7381	‹1.96	Not Signi-ficant
Total	948.5500	19				

The Table above indicates that there is no significant difference in the mean score performance on production typewriting ability among secretaries (within control group) in the age range 15 and 20, 21 and 25, and above 25 years before experimental treatment on automated skill training like their counterparts in the experimental group. The calculated value of F-test statistic stood at 0.7381 at 19 degrees of freedom. This also confirms that age has no influence on secretaries production. It also supports the assertion that the experimental and control groups were the same before experimental treatment on automated skill training. Consequently, the null hypothesis is retained.

Hypothesis No. 6

There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) in the age range 15 and 20, 21 and 25, and above 25 years after the experimental treatment on automated skill training.

TABLE 4.08 RESULT OF POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN EXPERIMENTAL GROUP IN THE AGE RANGE 15 AND 20, 21 AND 25 AND ABOVE 25 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit $\alpha = 0.05$	Remark
Between	53.3333	2	26.6667			
Within	453.6667	17	26.6863	0.9993	<1.96	Not Signi-ficant
Total	507.0000	19				

The data above show no significant difference in the post-test mean score performance on production typewriting ability of secretaries within experimental group in the age range 15 and 20, 21 and 25, and above 25 years. The calculated value for F-test statistic of 0.9993 at 19 degrees of freedom supports this assertion. It also depicts that age is no barrier in acquiring automated skill competency by secretaries who have been using manual equipment for a very long time.

The secretaries within control group shall be discussed to determine whether or not age has any influence on their performing automated office tasks. The Table below shall be used to illustrate the post-test mean score performance on production typewriing ability of secretaries within control group in the age range 15 and 20, 21 and 25, and above 25 years.

TABLE 4.09 RESULT OF POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN CONTROL GROUP IN THE AGE RANGE 15 AND 20, 21 AND 25 AND ABOVE 25 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit α = 0.05	Remark
Between	43.5000	2	21.7500			
Within	774.2500	17	45.5441	0.4776	<1.96	Not Signi-ficant
Total	817.7500	19				

The data presented above indicate no significant difference in the post-test mean score performance on production typewriting ability of secretaries within control group in the age range 15 and 20, 21 and 25, and above 25 years. The calculated value for F-test statistic of 0.4776 at 19 degrees of freedom supports this assertion. It then implies that age has no effect on the performance of automated office tasks, either

for secretaries within experimental or control group.

However, there was a marked improvement on the part of secretaries within experimental group when the researcher compared their pre-test mean score performance (0.9563) with their post-test mean score performance (0.9993). The mean score performance comparison for the control group stood at 0.7381 (pre-test) and a drastic fall of 0.4775 (post-test)! The difference in the mean score performance of the experimental and control groups indicates that automated skill training is still relevant in performing automated office tasks, even though, no significant difference exists in the mean score performance on production typewriting of the experimental and control groups.

Furthermore, the findings of Collier (1983) proved that age does not affect the mean score performance of automated office tasks by secretaries. It is, therefore, justifiable to retain the null hypothesis.

Hypothesis No 7

There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years before the experimental treatment on automated skill training.

10 years, and above 10 years before experimental treatment on automated skill training. The data below support this assertion.

TABLE 4.11 RESULT OF PRE-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN CONTROL GROUP WHOSE EXPERIENCES RANGE FROM 1 TO 5 YEARS, 6 TO 10 YEARS, AND ABOVE 10 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit α = 0.05	Remark
Between	112.2214	2 3				
Within	836.3286	17	49.1958	1.1406	‹1.96	Not Signi-ficant
Total	948.5500	19				

The calculated value of F-test statistic of 1.1406 at 19 degrees of freedom also butresses the claim. This implies that years of experience as secretaries making use of manual equipment have no effect on both the experimental and control groups. Consequently, the null hypothesis is retained.

Hypothesis No. 8

There is no significant difference in the mean score performance on production typewriting ability among secretaries (experimental and control) whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after the experimental treatment on automated skill training.

The data on page 112 below shall be used to illustrate whether or not any significant difference exist after experimental treatment on automated skill training.

TABLE 4.12 RESULT OF POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN EXPERIMENTAL GROUP WHOSE EXPERIENCES RANGE FROM 1 TO 5 YEARS, 6 TO 10 YEARS, AND ABOVE 10 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit $\alpha = 0.05$	Remark
Between	91.4000	2	45.7000			
Within	415.6000	17	24.4471	1.8693	<1.96	Not Signi-ficant
Total	507.000	19				

The data above show no significant difference in the mean score performance on production typewriting ability of secretaries within experimental group whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years after experimental treatment on automated skill training. The calculated value for F-test statistic of 1.8693 at 19 degrees of freedom confirms this statement. Likewise, the data below indicate no significant difference in the mean score performance no production typewriting ability of secretaries within control group whose experiences

range from 1 to 5 years, 6 to 10 years, and above 10 years after experimental treatment on automated skill training.

TABLE 4.13 RESULT OF POST-TEST MEAN SCORE PERFORMANCE ON PRODUCTION TYPEWRITING ABILITY OF SECRETARIES WITHIN CONTROL GROUP WHOSE EXPERIENCES RANGE FROM 1 TO 5 YEARS, 6 TO 10 YEARS, AND ABOVE 10 YEARS

Source	Sum of Square	df	M.S.S.	F-Cal	F-Crit $\alpha = 0.05$	Remark
Between	27.8262	2	13.9131			
Within	789.9238	17	46.4661	0.2994	<1.96	Not Signi-ficant
Total	817.7500	19				

The calculated value for F-test Statistic of 0.2994 at 19 degrees of freedom from the data above indicates that years of experience as secretaries using manual equipment did not help the control group better in performing automated office tasks. It may be argued that there is also no significant difference in the mean score performance on production typewriting ability of secretaries within experimental group whose experiences range from 1 to 5 years, 6 to 10 years, and above 10 years like their counterparts within control group.

However, with the calculated value F-test statistic of secretaries who received automated skill training of 1.8693 (post-test) over that of secretaries who did not receive automated skill training of 0.2994 (post-test); it could still be deduced that automated skill training assisted the experimental group to perform automated office tasks better than the control group when the two groups were requested to use electronic typewriters for production typewriting for one hour. It also butresses the point that, "Experience is the best teacher". The control group could have improved on their performance if they had been exposed to automated skill training since they were at par with the experimental group before automated skill training.

Furthermore, the findings of Miller (1985) and Butler-Nalin (1986) indicated no significant difference in the mean score performance of secretaries using manual method versus modern method of word processing equipment. In a nutshell, the two groups' pre-post-test mean score performance indicates no significant difference when their years of experience in making use of manual equipment were considered. It is, therefore logical to retain the null hypothesis.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions drawn from the findings, recommendations, and suggestions for further research.

5.2 Summary

The purpose of this study was to evaluate the effect of training in automated office equipment on secretaries' job performance. The problem of this study was to investigate whether or not training in automated office equipment has any significant effect on the production typewriting ability of the experimental and control groups.

5.3 Summary of Findings

It was found that the experimental group had higher calculated values of F-test statistic of 0.9563 (pre-test) and 0.9993 (post-test) as against secretaries within control group who had lower calculated values of F-test statistic of 0.7381 (pre-test) which later decreased to 0.4776 during the post-test period when the first variable (age) was tested.

Initially, the control group justified the adage which says, "Experience is the best teacher" through their pre-test performance while testing the second variable (years of experience). The calculated value of F-test statistic of

1.0589 was recorded for the experimental group while 1.1406 was recorded for the control group. Subsequently, the experimental group also justified that "Knowledge is power" during the post-test period. The F-test statistic of 1.8693 was recorded for the experimental group as against the 0.2994 for the control group!

It could therefore, be deduced that the automated skill training acquired by the experimental group assisted them in performing better than the control group who did not acquire any automated skill training.

The study showed that there was a significant difference in the mean score performance on production typewriting ability of the experimental and control groups, consequent on automated skill training acquired by the experimental group. The study, however, showed that sex (male or female); age; and years of experience as secretaries making use of manual equipment are no barriers in acquiring automated skill training.

Furthermore, when age was tested, there was an increase of 0.0390 when the pre-post-test scores of the experimental group were compared. The pre-post-test scores comparison of the control group showed a decrease of 0.2605. This could also be attributed to the automated skill training received by the experimental group.

Moreover, years of experience mean score performance comparison of the two groups showed an increase of 0.8104 in

favour of the experimental group as against the decrease of 0.8412 for the control group. This also indicates that the acquisition of automated skill training is important for secretaries regardless of their years of experience.

5.4 Conclusions

Based on the findings obtained from this study, it was concluded that secretaries who possessed automated skill were able to produce mailable correspondence faster, with a high degree of accuracy than secretaries who did not possess automated skill. Furthermore, secretaries who received automated skill training were able to type faster and more accurately on the electronic typewriters than secretaries who did not possess automated skill training. The researcher also concludes that secretaries who possessed automated skill training were able to produce mailable correspondence faster, with a high degree of accuracy on electronic typewriters than secretaries who did not possess automated skill training.

It is also concluded that being a male or a female secretary is not an impediment to acquiring automated skill training for secretaries "who are willing and able". Age is also not a barrier to secretaries who intend to acquire automated skill training. That a secretary has been using manual typewriter is not an excuse for not being conversant with modern office equipment such as electronic typewriters since she could easily acquire the necessary skill for

manipulating modern office equipment with a high degree of accuracy.

5.5 Recommendations

The following recommendations are made, based on the conclusions drawn from the outcome of the study:

5.5.1 Recommendations to Education Policy Makers

1. The results of this study should be utilised in improving the present secretarial studies curricula in terms of course contents and vocational preparation of potential graduates.
2. Courses leading to the acquisition of automated skill such as word processing, management information systems, etc. should be incorporated into the present secretarial studies curricula at the colleges of education, polytechnic, and university levels.
3. Funds should be provided for the purchase, maintenance and replacement of obsolete equipment in schools.

5.5.2 Recommendations to Schools

1. Maintenance workshop should be established in schools for taking care of automated office equipment.

2. Emphasis should be placed upon hands-on-experience in automated office equipment by secretaries-in-training.
3. Secretarial students should be prepared and encouraged to sit for professional examinations such as RSA, Pitman, etc. while in the school.
4. Automated office equipment such as word processors and electronic typewriters should not be kept in the drawers or allowed to lie fallow when not used by secretaries-in- training.
5. It is also pertinent to state that the teachers themselves should be current about the development or improvement in the area of automated office equipment.
6. Model office programme should form part of the secretarial studies curricula.
7. Emphasis should be placed upon competencies in specific secretarial skill areas such as typewriting and office routines.

8. Secretarial students should be allowed to participate in the Supervised Industrial Works Experience (SIWES) right from the end of second semester of their first year in the school.

5.5.3 **Recommendations to Employers**

1. The employers should provide on-the-job facilities in automated office equipment for secretaries trained with manual equipment such as manual typewriters.
2. Workshops and seminars in management information systems should be organised for secretaries to keep them abreast of the new innovations in automated office equipment.
3. They should expose secretaries to automated office equipment to enable them meet the challenges of automated office tasks.

5.5.4 **Recommendations to Secretaries**

1. Secretaries should not wait until they secure study leave (with pay) before they could acquire automated skill

training. Self-development is the answer in meeting the challenges of the automated office tasks.

2. Secretaries should belong to professional association such the Nigerian Institute of Management; Institute of Chartered Secretaries and Reporters, etc.

3. Annual subscription to professional journals is a "condition-sine-quanon" for secretaries who want to be current with recent developments in secretaryship.

5.5 **Suggestions for Further Research**

1. A follow-up study of this type should be conducted at a regular interval of five years in order to keep abreast of other innovations in secretaryship in terms of equipment.

2. Research students in business and office education should carry out another experimental study in other automated skill areas not covered in this research, especially, for those who receive training for longer period of time in other automated office equipment different from electronic typewriters.

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APPENDIX A

LIST OF PARTICIPATED ESTABLISHMENTS

1. BAGCO Nigeria Limited, Lagos
2. EMS Speedpost (Headquarters), Somolu, Lagos
3. Establishment and Service Matters Division, Lagos State Military Administrator's Office, Alausa-Ikeja, Lagos
4. Federal Ministry of Communications
5. Nigerian Postal Services (Headquarters), Lagos
6. Union Bank of Nigeria Plc, Victoria Island, Lagos

APPENDIX B

PRE-TEST AND POST-TEST RAW SCORES DISTRIBUTION MEAN PERFORMANCE CALCULATION

$$\bar{X} = \frac{X}{N}$$

PRE-TEST

	EXPERIMENTAL	CONTROL
$\bar{X}$ =	$\frac{1164}{20}$	$\frac{1217}{20}$
$\bar{X}$ =	58.20%	60.85%

POST-TEST

$\bar{X}$ =	$\frac{1430}{20}$	$\frac{1175}{20}$
=	71.50%	58.75%

APPENDIX C

1. COMPUTER HISTOGRAPH PRINT-OUT SHOWING THE FREQUENCY DISTRIBUTION OF SCORES.
2. COMPUTER PRINT-OUT SHOWING DATA ANALYSIS FOR TWO-TAILED T-TEST AND ONE-WAY ANOVA.

MORE

EXP Pretest scores - experimental

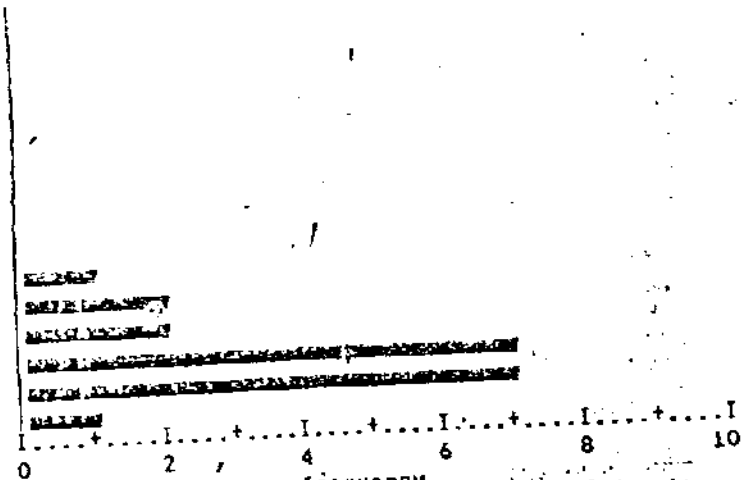
Value Label

Value	Frequency	Percent	Valid Percent	Cum Percent
47	1	5.0	5.0	5.0
50	2	10.0	10.0	15.0
55	1	5.0	5.0	20.0
57	1	5.0	5.0	25.0
60	4	20.0	20.0	45.0
62	2	10.0	10.0	55.0
63	1	5.0	5.0	60.0
65	3	15.0	15.0	75.0
66	1	5.0	5.0	80.0
68	2	10.0	10.0	90.0
69	1	5.0	5.0	95.0
71	1	5.0	5.0	100.0
Total	20	100.0	100.0	

MORE

EXP Pretest scores - experimental

Count	Midpoint
0	2.50
0	7.50
0	12.50
0	17.50
0	22.50
0	27.50
0	32.50
0	37.50
0	42.50
1	47.50
2	52.50
2	57.50
7	62.50
7	67.50
1	71.00



Valid cases 20 Missing cases 0

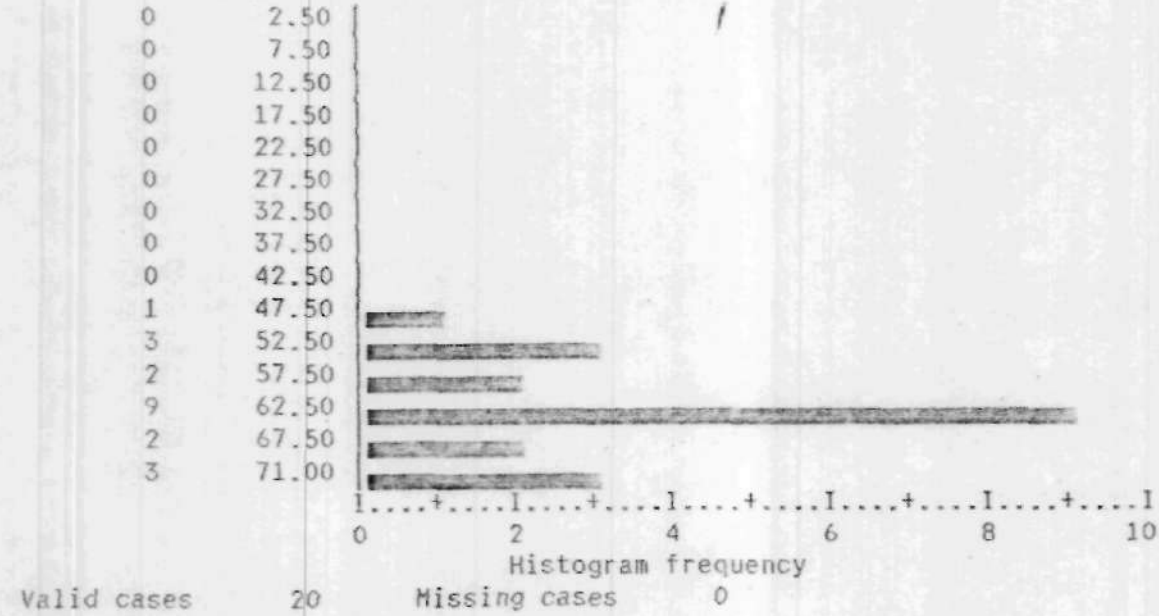
MORE

CONT Pretest scores -control

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	45	1	5.0	5.0	5.0
	50	1	5.0	5.0	10.0
	51	1	5.0	5.0	15.0
	53	1	5.0	5.0	20.0
	57	1	5.0	5.0	25.0
	58	1	5.0	5.0	30.0
	60	3	15.0	15.0	45.0
	61	1	5.0	5.0	50.0
	62	2	10.0	10.0	60.0
	64	3	15.0	15.0	75.0
	66	1	5.0	5.0	80.0
	69	1	5.0	5.0	85.0
	70	2	10.0	10.0	95.0
	71	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

MORE

CONT Pretest scores -control



Valid cases 20 Missing cases 0

MORE

EXP1 Post-test scores -experimental

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	62	1	5.0	5.0	5.0
	65	2	10.0	10.0	15.0
	68	3	15.0	15.0	30.0
	69	2	10.0	10.0	40.0
	70	2	10.0	10.0	50.0
	71	1	5.0	5.0	55.0
	72	2	10.0	10.0	65.0
	74	1	5.0	5.0	70.0
	75	1	5.0	5.0	75.0
	76	1	5.0	5.0	80.0
	77	1	5.0	5.0	85.0
	78	1	5.0	5.0	90.0
	79	1	5.0	5.0	95.0
	82	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

MORE

EXP1 Post-test scores -experimental

Count	Midpoint	
0	2.50	
0	7.50	
0	12.50	
0	17.50	
0	22.50	
0	27.50	
0	32.50	
0	37.50	
0	42.50	
0	47.50	
0	52.50	
0	57.50	
1	62.50	▬
7	67.50	▬▬▬▬▬▬▬
6	72.50	▬▬▬▬▬▬
5	77.50	▬▬▬▬▬
1	82.00	▬

I....+....I....+....I....+....I....+....I....+....I....+....I
0 2 4 6 8 10
Histogram frequency

Valid cases 20 Missing cases 0

MORE

CONT1 Post-test scores -control

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	40	1	5.0	5.0	5.0
	51	1	5.0	5.0	10.0
	54	2	10.0	10.0	20.0
	55	4	20.0	20.0	40.0
	58	1	5.0	5.0	45.0
	60	1	5.0	5.0	50.0
	61	1	5.0	5.0	55.0
	62	2	10.0	10.0	65.0
	64	3	15.0	15.0	80.0
	65	3	15.0	15.0	95.0
	68	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

MORE

CONT1 Post-test scores -control

Count	Midpoint	Histogram
0	2.50	
0	7.50	
0	12.50	
0	17.50	
0	22.50	
0	27.50	
0	32.50	
0	37.50	
1	42.50	
0	47.50	
3	52.50	
5	57.50	
7	62.50	
4	67.50	

I....+....I....+....I....+....I....+....I....+....I....+....I
0 2 4 6 8 10
Histogram frequency

Valid cases 20 Missing cases 0

MORE

Paired samples t-test: EXP Pretest scores - experimental
CONT Pretest scores -control

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
EXP	20	61.1500	6.627	1.482
CONT	20	60.8500	7.066	1.580

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
.3000	6.768	1.513	.513	.021	.20	19	.845

MORE

Paired samples t-test: EXP1 Post-test scores -experimental
CONT1 Post-test scores -control

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
EXP1	20	71.5000	5.166	1.155
CONT1	20	58.8500	6.596	1.475

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
12.6500	5.860	1.310	.526	.017	9.65	19	.000

MORE

Paired samples t-test: CONT Pretest scores -control
EXP1 Post-test scores -experimental

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
CONT	20	60.8500	7.066	1.580
EXP1	20	71.5000	5.166	1.155

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-10.6500	6.839	1.529	.409	.074	-6.96	19	.000

MORE

Paired samples t-test: CONT Pretest scores -control
CONT1 Post-test scores -control

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
CONT	20	60.8500	7.066	1.580
CONT1	20	58.8500	6.596	1.475

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
2.0000	5.506	1.231	.677	.001	1.62	19	.121

MORE

Paired samples t-test: EXP Pretest scores - experimental
EXP1 Post-test scores -experimental

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
EXP	20	61.1500	6.627	1.482
EXP1	20	71.5000	5.166	1.155

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
-10.3500	5.499	1.230	.590	.006	-8.42	19	.000

MORE

Paired samples t-test: EXP Pretest scores - experimental
CONT1 Post-test scores -control

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
EXP	20	61.1500	6.627	1.482
CONT1	20	58.8500	6.596	1.475

(Difference) Mean	Standard Deviation	Standard Error	2-Tail Corr.	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
2.3000	6.482	1.449	.519	.019	1.59	19	.129

MORE

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Variable MAFE male-female experimental-pretest age gro

By Variable AGE age of respondents- pretest age group se

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	84.3942	42.1971	.9563	.4041
Within Groups	17	750.1558	44.1268		
Total	19	834.5500			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	2	66.0000	4.2426	3.0000	27.8814 To 104.1186
Grp 2	7	62.2857	7.6966	2.9091	55.1676 To 69.4039
Grp 3	11	59.5455	6.1378	1.8506	55.4220 To 63.6689
Total	20	61.1500	6.6275	1.4820	58.0482 To 64.2518
Fixed Effects Model			6.6428	1.4854	58.0161 To 64.2839
Random Effects Model				1.4854	54.7589 To 67.5411

WARNING - Between component variance is negative
it was replaced by 0.0 in computing above random effects measures

Random Effects Model - Estimate of Between Component Variance -.3415

MORE

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Variable FEME female-male control -pretest age group s

By Variable AGE age of respondents- pretest age group se

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	75.7903	37.8951	.7381	.4927
Within Groups	17	872.7597	51.3388		
Total	19	948.5500			

MORE

- - - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	2	66.5000	3.5355	2.5000	34.7345 To 98.2655
Grp 2	7	59.5714	7.6345	2.8856	52.5107 To 66.6321
Grp 3	11	60.6364	7.1452	2.1544	55.8361 To 65.4366
Total	20	60.8500	7.0657	1.5799	57.5432 To 64.1568
Fixed Effects Model			7.1651	1.6022	57.4697 To 64.2303
Random Effects Model				1.6022	53.9564 To 67.7436

WARNING - Between component variance is negative
it was replaced by 0.0 in computing above random effects measures

Random Effects Model - Estimate of Between Component Variance -2.3794

MORE

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Variable MAFE male-female experimental-post-test age gro

By Variable AGE age of respondents- pretest age group se

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	Ratio	Prob.
Between Groups	2	53.3333	26.6667	.9993	.3888
Within Groups	17	453.6667	26.6863		
Total	19	507.0000			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	2	73.5000	3.5355	2.5000	41.7345 To 105.2655
Grp 2	6	73.5000	5.7533	2.3488	67.4624 To 79.5376
Grp 3	12	70.1667	5.0061	1.4451	66.9860 To 73.3474
Total	20	71.5000	5.1657	1.1551	69.0824 To 73.9176
Fixed Effects Model			5.1659	1.1551	69.0629 To 73.9371
Random Effects Model				1.1551	66.5298 To 76.4702

WARNING - Between component variance is negative
it was replaced by 0.0 in computing above random effects measures

Random Effects Model - Estimate of Between Component Variance -.0036

MORE

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Variable FEME female-male control -pretest age group s

By Variable AGE age of respondents- pretest age group se

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	43.5000	21.7500	.4776	.6284
Within Groups	17	774.2500	45.5441		
Total	19	817.7500			

MORE

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	2	59.5000	6.3640	4.5000	2.3221 To 116.6779
Grp 2	6	56.5000	10.0946	4.1211	45.9066 To 67.0934
Grp 3	12	59.7500	4.5151	1.3034	56.8812 To 62.6188
Total	20	58.7500	6.5604	1.4670	55.6796 To 61.8204
Fixed Effects Model			6.7486	1.5090	55.5662 To 61.9338
Random Effects Model				1.5090	52.2570 To 65.2430

WARNING - Between component variance is negative
it was replaced by 0.0 in computing above random effects measures

Random Effects Model - Estimate of Between Component Variance -4.4063

MORE

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Variable MAFI male-female experimental-pretest secret

By Variable ~~AGEYOE~~ Years of Ed. of respondents- pretest secretaries

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	92.4500	46.2250	1.0589	.3686
Within Groups	17	742.1000	43.6529		
Total	19	834.5500			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	10	63.3000	6.3953	2.0224	58.7251 To 67.8749
Grp 2	3	59.0000	5.2915	3.0551	45.8550 To 72.1450
Grp 3	7	59.0000	7.2801	2.7516	52.2671 To 65.7329
Total	20	61.1500	6.6275	1.4820	58.0482 To 64.2518
Fixed Effects Model			6.6070	1.4774	58.0330 To 64.2670
Random Effects Model				1.5332	54.5533 To 67.7467

Random Effects Model - Estimate of Between Component Variance .4251

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable FEME female-male control -pretest secretaries

By Variable ~~AGE~~ YOE ~~Age of respondents~~ Years of Educ. - pretest secretaries

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	112.2214	56.1107	1.1406	.3429
Within Groups	17	836.3286	49.1958		
Total	19	948.5500			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	10	63.1000	7.9784	2.5230	57.3926 To 68.8074
Grp 2	3	57.0000	3.6056	2.0817	48.0432 To 65.9568
Grp 3	7	59.2857	6.2906	2.3776	53.4679 To 65.1035
Total	20	60.8500	7.0657	1.5799	57.5432 To 64.1568
Fixed Effects Model			7.0140	1.5684	57.5410 To 64.1590
Random Effects Model				1.7062	53.5086 To 68.1914

Random Effects Model - Estimate of Between Component Variance 1.1430

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable MAFE male-female experimental-post test secre

By Variable AGE age of respondents- post test secretarie

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	91.4000	45.7000	1.8693	.1846
Within Groups	17	415.6000	24.4471		
Total	19	507.0000			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	10	73.2000	3.9665	1.2543	70.3625 To 76.0375
Grp 2	3	67.0000	6.2450	3.6056	51.4864 To 82.5136
Grp 3	7	71.0000	5.7155	2.1602	65.7141 To 76.2859
Total	20	71.5000	5.1657	1.1551	69.0824 To 73.9176
Fixed Effects Model			4.9444	1.1056	69.1674 To 73.8326
Random Effects Model				1.6155	64.5489 To 78.4511

Random Effects Model - Estimate of Between Component Variance 3.5129

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable FEME female-male control -post test secretari

By Variable AGE YOE years of exp. of respondents- post test secretarie

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	2	27.8262	13.9131	.2994	.7451
Within Groups	17	789.9238	46.4661		
Total	19	817.7500			

MORE

- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	10	57.6000	8.3693	2.6466	51.6130 To 63.5870
Grp 2	3	59.3333	5.1316	2.9627	46.5856 To 72.0811
Grp 3	7	60.1429	4.2201	1.5951	56.2399 To 64.0458
Total	20	58.7500	6.5604	1.4670	55.6796 To 61.8204
Fixed Effects Model			6.8166	1.5242	55.5341 To 61.9659
Random Effects Model				1.5242	52.1917 To 65.3083

WARNING - Between component variance is negative
it was replaced by 0.0 in computing above random effects measures

Random Effects Model - Estimate of Between Component Variance -5.3807

APPENDIX D

LETTERS OF INTRODUCTION/REPLY

Department of Vocational & Technical Education

AHMADU BELLO UNIVERSITY, ZARIA—NIGERIA

Vice-Chancellor: **Professor D.I. Saror**
B.Sc., DVM(KSU), M.Sc.(Minn.), Ph.D.(ABU)
Head of Department: **Olu-Audu O.**
B.Sc., M.Sc., PGDE

Faculty of Education

Telephone: 069/51755; 50692
Telegrams: Unibello, Zaria

Your Ref:.....

Our Ref:.....

Date: 14th February, 1994

TO WHOM IT MAY CONCERN

PRINCE E. ADEKUNLE AROMOLARAN II - PH.D. (BUSINESS EDUCATION) CANDIDATE

We are pleased to introduce Prince E. A. Aromolaran, one of our Ph. D. candidates in the Department of Vocational and Technical Education, Ahmadu Bello University, Zaria.

As part of the requirements for the award of the Ph.D. degree in Business Education, he is expected to conduct various researches in the area of Business Education and other contemporary issues from different sources - public and private institutions and individuals from different walks of life.

The data which he collects would only be for research purposes and, therefore, be kept in strict confidence.

The Department of Vocational and Technical Education will remain ever grateful to you for any extent of your support and cooperation in this regard.

Dr. Paul I. Nwachcha
Head of Business Section

Department of Vocational & Technical Education

AHMADU BELLO UNIVERSITY, ZARIA—NIGERIA

Vice-Chancellor: **Professor D.J. Saror**
B.Sc., DVM(KSU), M.Sc.(Minn.), Ph.D.(ABU)
Head of Department: **Olu-Audu O.**
B.Sc., M.Sc., PGDE

Faculty of Education

Telephone: 069/51755; 50692
Telegrams: Unibello, Zaria

Your Ref:.....

Our Ref: Ph.D/EDUC/9763/1992-93

Date: 9th June, 1994

The Assistant General Manager,
Training and Manpower Development,
Union Bank of Nigeria PLC,
Victoria Island,
Lagos.

PRINCE E.A. AROMOLARAN

Ph.D RESEARCH PROJECT

We are happy to inform you that our Ph.D Degree Program in Business Education provides for students' research activities at the final year of their studies. This is, infact, an attempt to make our teaching realistic and practical oriented to Nigerian situation. Such researches are on the problems related to Business and other Vocational Education in Nigeria.

Consequently, the final-year Ph.D students of this Department are required to collect relevant data from different sources - public and private institutions and individuals of different walks of life in Nigeria.

The data collected are kept strictly confidential and are used only for academic purposes. We firmly believe that you will extend your full co-operation for the success of this attempt in making our University Education more suitable and applicable to the needs of the country.

Prince E.A. Aromolaran is a final-year Ph.D Student of Business Education. He is soliciting your co-operation and assistance in the process of collecting data required for his approved research project: "EFFECT OF AUTOMATION ON THE PERFORMANCE OF SECRETARIES IN UNION BANK OF NIGERIA, PLC LAGOS".

The Department of Vocational and Technical Education will remain ever grateful to you for any extent of your support and co-operation in this regard.

Olu-Audu O.
Head of Department

UNION BANK OF NIGERIA PLC.

UNION BANK OF NIGERIA PLC.
Head Office
Training & Manpower Development Dc.
PC33, Adeola Hopewell Street,
Victoria Island
Lagos.
Tel ,610088, 613563
Fax;669873

RC6262

16th June, 1994

Head of Department
Department of Vocational & Technical Education
Ahmadu Bello University
Zaria

RE: PRINCE E. A. AROMOLARAN
PHD RESEARCH PROJECT

We are pleased to acknowledge receipt of your letter dated 9th June 1994 requesting us to allow Prince E. A. Aromolaran to use our Bank for his Ph.D Research Project.

By this letter, we hereby grant approval for the study. Prince Aromolaran should let us know the areas in which he requires our assistance.

ALHAJI (CHIEF) M. K. ADETONA
FOR: ASSISTANT GENERAL MANAGER
(TRAINING AND MANPOWER DEVELOPMENT)

BOARD OF DIRECTORS
Green Onyekaba Nwankwo (Chairman), Muhammed Imam Yahaya (Managing Director & Chief Executive),
Zubairu Abdullahi, Edoleyi Andrew Egonmwan, Gbolahan Olukayode Folayan, Olusegun Olusanya, Shamsuddeen Usman
Hussaini Muhammed - Bazza, Ibrahim Halilu, Martin Patrick Uwomano Obaro, Nathaniel Ederivbalo Ogbe, Florence Olufunke Oyinsan (Mrs.)

Type the following in DOUBLE LINE spacing on a Plain Paper provided.

AN OVER-VIEW OF SHORTHAND SYSTEMS / Cl. Caps + u/s

"Shorthand is one of the corner stone subjects of business education," said Crank. Shorthand has a perceived notoriety of being a very difficult subj. Because of this belief, students are literally "running away" from it.

|← Historical Background of Sh'd System / In. Caps + u/s

N.P. What then is the 'mystery' of Shorthand? It is a well-known fact that sh'd is unique because it is the art of writing symbols th. represent sounds. The development

N.P. of use of sh'd is as old as antiquity. Crank et al (1982) wrote th. during the time of the Roman Empire, sh'd was generally used to record the history of this very strong, popular & powerful nation. Credit for the first Latin system of sh'd is often given to Marcus Tullius Tiro, a Roman slave who was freed by his master, Cicero. Tiro's

l.c. Latin Shorthand System lasted for abt 100 yrs.

The following is a descriptive partial

(3 contd.)

List of such sh'd systems & their publication dates as mentioned by Crank et al (1982):

u.c. Arrange in date order

Briefhand (1957); Century 21 (1974); Forkner (1952); Gregg (1885); machine Sh'd (1950); Stenospeed ('53); Pitman (1837); Quickhand (1974); Speedwriting (1923); & Stenoscript (1950).

(a) PITMAN SHORTHAND: This ~~British~~ modern geometrical system, was invented in 1837 by Sir Isaac Pitman who was born in Trowbridge, England. He learned the Taylor's shorthand system, then developed his own wh. he called "stenographic Sound-Hand".

uc

δ) Three major systems have evolved from Pitman's original work. These are Pitman New Era, Pitmanscript & Pitman 2000.

δ) (b) GREGG SHORTHAND: The ~~wooden~~ modern cursive sh'd system was the "baby" of John Robert Gregg who was born in Ireland in 1867. History has it th. he was a student of Pitman. At the tender age of 18, he developed the Gregg shorthand. By the time he was 20 yrs of age, he had published his sh'd book. He took his invention to the United States in 1893.

uc

(3 contd.)

(c) SPEEDWRITING (ABC) SHORTHAND: It was developed by Emma Dearborn in 1923. The system uses the letters of the alphabet & familiar marks found on the typewriter to represent sounds.

h (d) BRIEFHAND: This system now known as P.S. or Personal Shorthand uses the 26 alphabetic letters but no symbols. Dictation can be recorded at the typewriter or by pencil or pen.

This f (e) FORKNER SHORTHAND: was developed by Hamden Forkner, Senior, in the late 1940s and published in '52.

6) i (f) CENTURY 21: A system published in 1974, it makes use of symbols to represent sounds. Its features were derived from computer processing of vocabulary, numerical & phonetic data following analysis of hundreds of shd systems.

d (g) MACHINE SHORTHAND: This is another system wh has bn in use primarily for high speed court reporting since Moles Bartholomew (1879) & Ward Stone Ireland (1910) patented their machines. Like other sh'd systems, machine shd is phonetically based. The two leading sh'd machines are steno-graph & stenoprint.

(3 contd.)

e(h) STENOSCRIPT : This was first published in 1950. It uses all 26 letters of the alphabet + three punctuation marks.

g (i) STENOSPEED : has been marketed since 1953, + was revised in 1973. The system uses abbreviated longhand characters which

(j) QUICKHAND : This was written by Grossman, ~~was~~ + published in 1974. It uses programming techniques to facilitate independent study.

Secy

Change (a) to (j) to Arabic Numerals + use para heading.

Display this task on A4 paper.

Wages Sheet for week ending 31/10/93 ← Centre in caps & U/S

	Names	age	Gross Wages	Tax Due	EMPLOYEES Nat Insu.	EMPLOYEES Grand Prison	Total Deductions
2	K. Asuquo	21	16 ~~20~~ 12	2.50	0.68	0.30	3.48
13	M. Usman	36	16.00	2.50	0.68	0.30	3.48
7	D. Green	34	17.50	—	0.68	0.36	1.04
3	O. Bassey	32	19.00	1.85	0.68	0.38	2.91
12	A. Suleiman	61	19.75	2.90	0.68	0.38	3.97
4	E. Arthur	45	15.10	0.20	0.68	0.26	1.14
16	M. Gabbay	51	18.50	2.50	0.68	0.38	3.56
14	O. Fatoki	17	14.50	2.15	0.45	0.24	2.84
11	K. Okoro	26	15.85	1.00	0.68	0.29	1.97
9	A. Kwame	41	13.50	0.10	0.68	0.19	0.97
10	P. Odey	23	15.90	2.45	0.68	0.29	3.42
8	R. Isaacs	17	12.75	1.60	0.45	0.16	2.21
15	C. Fisher	38	16.87	2.75	0.68	0.33	3.77
9			211.44	22.50	8.38	3.86	34.76

① Type out in the numbered order but leave out the numbers pls.

Sec ~~② Names must be sorted out into alphabetical order~~

③ Surnames must appear first with initials following

APPENDIX G

TEST MATERIAL 1: MODEL ANSWER (MANUAL METHOD)

AN OVERVIEW OF SHORTHAND SYSTEMS

"Shorthand is one of the cornerstone subjects of business education," said Crank. Shorthand has a perceived notoriety of being a very difficult subject. Because of this belief, students are literally "running away" from it.

HISTORICAL BACKGROUND OF SHORTHAND SYSTEM

What then is the 'mystery' of shorthand? It is a well-known fact that shorthand is unique because it is the art of writing symbols that represent sounds. The development and use of shorthand is as old as antiquity.

Crank et al (1982) wrote that during the time of the Roman Empire, shorthand was generally used to record the history of this very strong, popular and powerful nation. Credit for the first Latin system of shorthand is often given to Marcus Tullius Tiro, a Roman slave who was freed by his master, Cicero. Tiro's Latin shorthand system lasted for about one hundred years.

The following is a descriptive partial list of such shothand systems and their publication dates as mentioned by Crank et al (1982); Pitman (1837); Gregg (1885); Speedwriting (1923); Machine Shorthand (1950); Stenoscript (1950); Forkner (1952); Stenospeed (1953); Briefhand (1957); Century 21 (1974); and Quickhand (1974).

(1) **PITMAN SHORTHAND**: This modern British geometrical system, was invented in 1837 by Sir Isaac Pitman who was born in Trowbridge, England. He learned the Taylor's shorthands ystem, then developed his own which he called "Stenographic Sound-Hand".

Three major systems have evolved from Pitman's original work. These are Pitman New Era, Pitmanscript and Pitman 2000.

(2) **GREGG SHORTHAND**: The modern cursive shorthand system was the "baby" of John Robert Gregg who was born in Ireland in 1867. History has it that he was a student of Pitman. At the tender age of 18, he developed the Gregg Shorthand. By the time he was 20 years of age, he had published his shorthand book. He took his invention to the United States in 1893.

(3) **SPEEDWRITING (ABC) SHORTHAND**: It was developed by Emma Dearborn in 1923. The system uses the letters of the alphabet and familiar marks found on the typewriter to represent sounds.

(4) **MACHINE SHORTHAND**: This is another system which has been in use primarily for high speed court reporting since Moes Batholomew (1879) and Ward Stone Ireland (1910) patented their machines.

Like other shorthand systems, machine shorthand is phonetically based. The two loading shorthand machines are stenograph and stenoprint.

(5) **STENOSCRIPT**: This was first published in 1950. It uses all 26 letters of the alphabet and three punctuation marks.

(6) **FORKNER SHORTHAND**: This was developed by Hamden Forkner, Senior, in the late 1940s and published in 1952.

(7) **STENOSPEED**: The system which uses abbreviated longhand characters has been marketed since 1953, and was revised in 1973.

(8) **BRIEFHAND**: This system was known as P.S. or Personal Shorthand uses the 26 alphabetic letters

but no symbols. Dictation can be recorded at the typewriter or by pencil or pen.

(9) **CENTURY 21**: A system published in 1974, makes use of symbols to represent sounds. Its features were derived from computer processing of vocabulary, numerical and phonetic data following analysis of hundreds of shorthand systems.

(10) **QUICKHAND**: This was written by Grossman and was published in 1974. It uses programming techniques to facilitate independent study.

APPENDIX H

TEST MATERIAL 2: MODEL ANSWER

WAGES SHEET FOR WEEK ENDING 31/10/93

Names	Age	Gross Wages	Tax Due	EMPLOYEES		Total Deductions
				Nat. Insu.	Grand Prem.	
		N	N	N	N	N
Arthur, E.	45	15.10	0.20	0.68	0.26	1.14
Asuquo, K.	21	16.12	2.50	0.68	0.30	3.48
Bassey, O.	32	19.00	1.85	0.68	0.38	2.91
Fatoki, O.	17	14.50	2.15	0.45	0.24	2.84
Fisher, C.	38	16.87	2.75	0.68	0.33	3.77
Garba, M.	51	18.50	2.50	0.68	0.38	3.56
Green, D.	34	17.50	--	0.68	0.36	1.04
Isaac, R.	17	12.75	1.60	0.45	0.16	2.21
Kwame, A.	41	13.50	0.10	0.68	0.19	0.97
Odey, P.	23	15.90	2.45	0.68	0.29	1.97
Okoro, K.	26	15.95	1.00	0.68	0.29	1.97
Suleiman, A.	61	19.75	2.90	0.68	0.38	3.97
Usman, M.	36	16.00	2.50	0.68	0.30	3.48
		211.44	22.50	8.38	3.86	34.76

APPENDIX I

TEACHING MATERIALS FOR THE EXPERIMENTAL TRAINING

(LESSON PLANS)

(5TH SEPTEMBER - 14TH OCTOBER, 1994)

LESSON PLAN FOR THE FIRST WEEK

5th - 9th September, 1994

Subject: Information Processing

Time: 10.00 - 11.00 a.m.

Day: Monday, Wednesday, Friday (MWF)

Course Objectives:

At the end of the lesson the subject should be able to:

(a) Define electronic typewriter.

(b) Identify the major parts of an electronic typewriter and explain their functions.

(c) Identify paper and carrier movement keys.

(d) Identify the printwheel, ribbon and erasing automatically in 10, 12 and 15 pitch.

(e) Understand the concept of making space for extra character on the electronic typewriter.

I. Background:

Subjects have known how to produce mailable correspondence using manual typewriters at the speed of 50 words per minute.

II. Contents:

(a) Production of Pre-test.

(b) Introducing electronic typewriter through Chart and physical equipment.

1. Definition of electronic typewriter.

2. Differences between manual and electronic typewriter.

3. Parts of the electronic typewriter and their functions.

4. Turning the electronic typewriter's display on and off.

5. Adjusting the display/display screen.

6. Keyboard Height Adjust Levers.

7. Keyboard Layout and Code Key.

8. Line Space Key.

9. Typematic (Repeat) Keys.

10. Page End Indicator and Scale.

11. Keyboard Clicker and Inserting Paper.

12. Shift and Lock Keys.

13. Caps Function.

14. Printwheel Identification/Choosing a Printwheel.

15. Automatic Pitch Selection/Pitch Scale.

16. Margins/Display Margin Scale.

17. Margins/Tabs and Tab Format.

18. Erasing Manually in 10, 12 and 15 Pitch.

19. Erasing Automatically in 10, 12 and 15 Pitch.

20. Relocate Key.

21. Making a Space for an Extra Character.

22. Electronic Typewriter Type :

    (a) Wheelwriter 50 Series II.

    (b) Wheelwriter 60 Series II.

    (c) Word Processors, etc.

III. Procedures:

(a) Define electronic typewriter.

(b) Explain the various parts of the electronic typewriter and functions. Subjects must feel and touch electronic typewriters as each part is mentioned and discussed (could alternate machines if not adequate).

IV. Teaching Aids:

(1) Electronic Typewriter's Chart.

(2) Electronic Typewriter (equipment).

(3) Chalkboard.

V. Assignment:

Subjects must learn from the Operators' Guide (photo-copied), the various parts of the electronic typewriter as discussed in the Typing Pool.

VI. Summary:

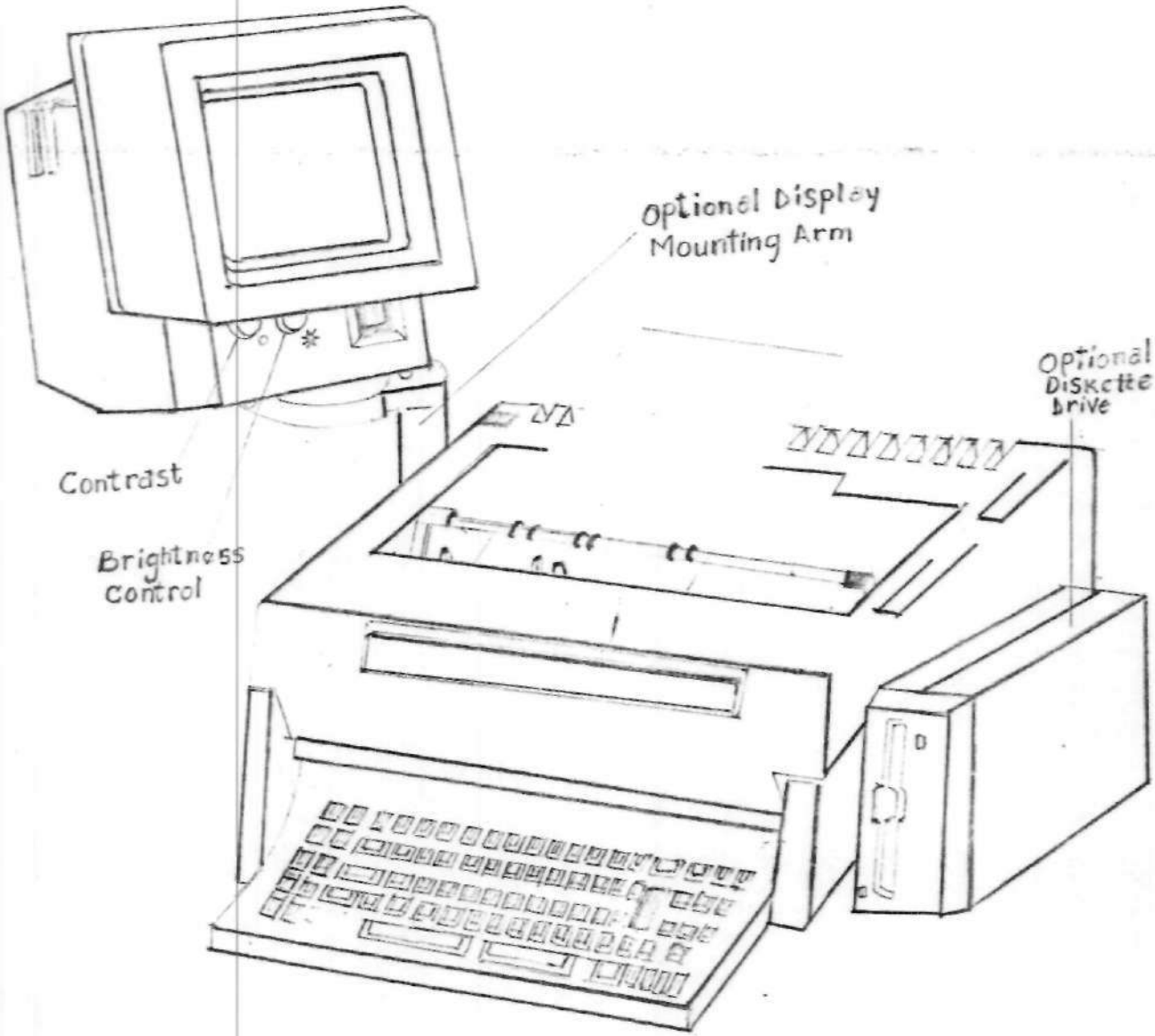
(a) Summarise key concepts.

(b) Evaluation of subjects' knowledge of the lesson through questions :

(i) Define electronic typewriter.

(ii) Mention some parts of the electronic typewriter, etc.

FIG. 1: SPECIMEN OF AN ELECTRONIC TYPEWRITER WHEELWRITER 50 SERIES II



*Adapted from IBM Wheelwriter 50 Series II Operator's Guide, First Edition

LESSON PLAN FOR THE SECOND WEEK

12th - 16th September, 1994

Subject: Information Processing

Time: 10.00 - 11.00 a.m.

Day: M, W, F.

Course Objectives:

At the end of the lesson the subject should be able to:

(a) Understand the remaining parts of the electronic typewriter (from the previous lesson).

(b) Understand the advanced operations of the electronic typewriter.

I. Background:

Subjects have learnt about definition, parts and functions of the electronic typewriter.

II. Contents:

1. Automatic Carrier Return.
2. Required Space and Hyphen.
3. Underlining and Centring.
4. Right Flush; Subscripts and Superscripts
5. Bold Print.
6. Decimal Tabulation.
7. Justification.
8. Changing Printwheel.

III. Procedures:

Explain different advanced operations listed. Subjects must feel and touch electronic typewriters in each operation.

IV. Teaching Aids:

(a) Electronic Typewriters.

(b) Chalkboard and Printwheels.

V. Assignment:

Subjects must learn from the Operator's Guide the various parts of the electronic typewriter; its basic and advanced operations.

VI. Summary:

(a) Summarise key concepts in basic and advanced operations of the electronic typewriter.

(b) Evaluate subjects' knowledge of the lesson through questions:

(i) Touch some of the basic advanced operations of the electronic typewriter.

(ii) What are the functions of the "underlining and centring"?

LESSON PLAN FOR THE THIRD WEEK

19th - 23rd September, 1994

Subject: Information Processing

Time: 10.00 - 11.00 a.m.

Day: M, W, F.

Course Objectives:

At the end of teh lesson the subject should be able to:

(a) Understand the uses of function keys.

(b) Apply the function keys in creating simple documents.

I. Background:

Subjects have known the basic and advanced operations of the electronic typewriter.

II. Contents:

Full Screening Storage

1. Storing/playing back of stored job.
2. Print/Screen Key.
3. Margin and Tab Formats (for indentation)
4. Text Entry.
5. Stop Codes and Stop Code Applications.
6. Storing a Job in Proportional Spacing.
7. Required Page Ends.
8. Deleting Text/Stored Job.
9. Deleting All Storage Areas.

III. Procedures:

Explain and demonstrate on the electronic typewriter full screen storage operations.

IV. Teaching Aids:

(a) Electronic Typewriters.

(b) Chalkboard.

V. Assignment:

Subjects practise full screen storage operations on the electronic typewriters using the manual photo-copied for them.

VI. Summary:

Summarise the lesson and evaluate the subjects by marking job done.

(c) Row 3

1. Play - Play back store jobs.

2. RMar - Right Margin Setting.

(d) Row 4

1. Del - Delete.

2. T Set - Tab Set.

(e) Row 5

1. Menu
Display
Print - Display Menu on Screen
Print Job Key.

2. T Clr - Tab Clear Key.

III. Procedures:

Explain an demonstrate on the electronic typewriter the applications of the left-hand side revision/function keys.

IV. Teaching Aids:

(a) Electronic Typewriters.

(b) Photo-copied portion of the Operator's Guide.

(c) Chart showing the left-hand side revision/function keys.

V. Assignment:

Subjects practise the applications of the left-hand side revision/function keys on the electronic typewriters.

VI. Summary:

Summarise lesson and check subjects' work.

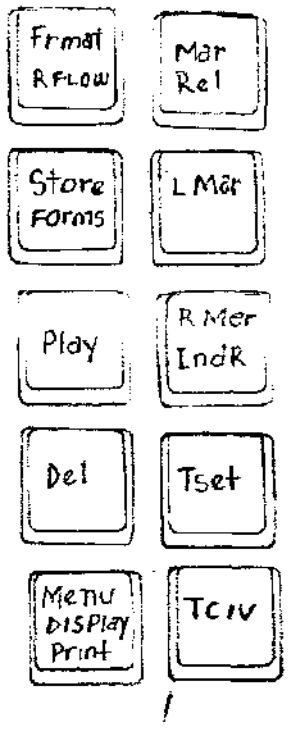


FIG. 2: SPECIMEN OF THE LEFT-HAND SIDE REVISION KEYS

*Adapted from IBM Wheelwriter 50 Series II Operator's Guide, First Edition

LESSON PLAN FOR THE FIFTH WEEK

3rd - 7th October, 1994

Subject: Information Processing

Time: 10.00 - 11.00 a.m.

Day: M, W, F.

Course Objectives:

At the end of the lesson the subject should be able to:

(a) Identify the right-hand side revision/function keys.

(b) Apply the right-hand side revision/function keys in creating/producing documents.

I. Background:

The subjects have been taught the left-hand side revision/function keys on the electronic typewriter.

II. Contents:

(a) Row 1

1. Home - BgnL — Moves to the beginning of the current line by pressing Code + BgnL buttons.

2. Paper Up - Micro — Moves the paper up the typing line by one-half line; especially for typing Subscripts.

3. Type screen- — Allow the user to interrupt typing a job into full screen storage, perform any typewriter application, and quickly return to entering user's original job into storage.

(b) Row 2

1. End EndL - Moves to the end of the current line pressing Code + End EndL buttons.

2. Paper Down - Micro - Moves the paper down the typing line by one-half line; especially, for typing superscripts.

3. Screen Up - Jstify - Shifts the screen so that the current line moves to the bottom of the screen.
   - If the current line is already at the bottom of the screen, the screen shifts up 18 lines.
   - If the cursor is on lines 1 through 21 pf the first page, the screen shifts so that line 1 becomes the current line.

(c) Row 3

1. Insert Find - Causes words on the display to move over in order to insert new text.

2. Reloc Line Space - Returns the carrier to the last typing position after you move the cursor.

3. Screen Chng - Shifts the screen so that the current line moves to the top of the screen.
   - If the current line is already at the top of the screen, the screen shifts down an additional 18 lines.

(d) Row 4

1. ^ Line - Moves the cursor to the previous line.

(e) Row 5

1. <-- Word - Moves one character to the left.

2. v Line - Moves the cursor to the next line.

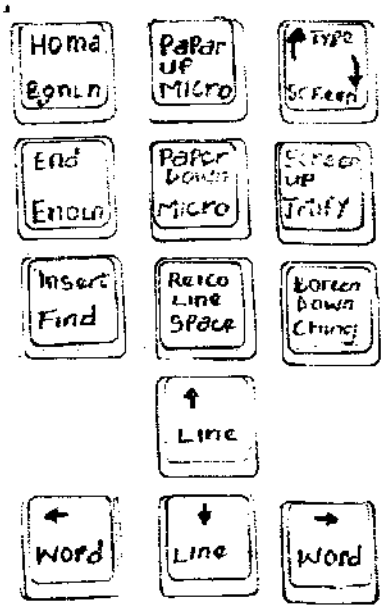


FIG. 3: SPECIMEN OF THE RIGHT-HAND SIDE REVISION/FUNCTION KEYS

**Adapted from IBM Wheelwriter 50 Series II Operator's Guide, First Edition*

LESSON PLAN FOR THE SIXTH WEEK

10th - 14th October, 1994

Subject: Information Processing.

Time: 10.00 - 11.00 a.m.

Day: Monday, Wednesday and Friday (M,W,F.)

Course Objective:

At the end of the lesson the subject should be able to produce mailable correspondence with a high degree of accuracy.

I. Background:

Subjects have been introduced to the elementary concepts of Information Processing on the IBM Wheelwriters 50 and 60 Series (Electronic Typewriters).

II. Contents:

(a) Revision on parts of electronic typewriter, its revision/function keys at both the left and right-hand sides of the electronic typewriter.

(b) Production of the Post-test.

III. Proceduces:

(a) Revise the concepts and applications of the electronic typewriter with subjects.

(b) Request subjects to produce Post-test.

IV. Teaching Aids:

(a) Chalkboard.

(b) Electronic Typewriters.

V. Assignment:

Production Typewriting (Post-test).

VI. Summary:

Production Typewriting (Post-test).

TEXTBOOKS:

1. Business and Economics Education: Principles and Methods by E. T. Ehiametalor, First Edition.

2. IBM Wheelwriter 50 Series II Operator's Guide, First Edition.

EMMANUEL ADEKUNLE AROMOLARAN