

1993

## Elementary keyboarding curriculum in a small public school setting

Sharon Lynn Keehner  
*University of Northern Iowa*

*Let us know how access to this document benefits you*

Copyright ©1993 Sharon Lynn Keehner

Follow this and additional works at: <https://scholarworks.uni.edu/grp>



Part of the [Education Commons](#)

---

### Recommended Citation

Keehner, Sharon Lynn, "Elementary keyboarding curriculum in a small public school setting" (1993).  
*Graduate Research Papers*. 2672.

<https://scholarworks.uni.edu/grp/2672>

This Open Access Graduate Research Paper is brought to you for free and open access by the Student Work at UNI ScholarWorks. It has been accepted for inclusion in Graduate Research Papers by an authorized administrator of UNI ScholarWorks. For more information, please contact [scholarworks@uni.edu](mailto:scholarworks@uni.edu).

**Offensive Materials Statement:** Materials located in UNI ScholarWorks come from a broad range of sources and time periods. Some of these materials may contain offensive stereotypes, ideas, visuals, or language.

---

## Elementary keyboarding curriculum in a small public school setting

### Abstract

The microcomputer is creating a revolution in the workplace and having a major impact on educational programs in the school. With this emphasis on the use of computers, keyboarding is a skill needed to survive and succeed in both educational and occupational settings. Regardless of the ultimate career objectives of students, the keyboarding skills taught today will help them open the doors of tomorrow. The job of business educators is to help students make keyboarding a life-long tool. Hinson and Dickey (1984) pointed out that whether their students go out and work in a warehouse entering inventory or whether they become presidents of Fortune 500 companies and use complex integrated software, they will all use a keyboard in some phase of their work. Modilin (1984), editor for Business and Office Education at Gregg/McGraw-Hill, stated, "Keyboarding must be a requirement of every student in your school" (p. 4).

**ELEMENTARY KEYBOARDING CURRICULUM  
IN A SMALL PUBLIC SCHOOL SETTING**

---

**A RESEARCH PAPER**

**Presented to**

**Dr. Melissa Heston**

**Department of Educational Psychology and Foundations**

**University of Northern Iowa**

---

**In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts in Education**

---

**by**

**Sharon Lynn Keehner**

**July, 1993**

**This Thesis/Research Paper by:** Sharon Keehner

**Entitled:** Elementary Keyboarding Curriculum in a Small Public  
School Setting

**Has been approved as meeting the research paper  
requirement for the Degree of**

**Master of Arts in Education  
Educational Psychology: Teaching  
in the Department of  
Educational Psychology & Foundations  
at the University of Northern Iowa  
Cedar Falls, Iowa 50614**

**approved on**

**July 28, 1993**

---

Melissa L. Heston

**Co-Director of Paper**

---

Len Froyen

**Co-Director of Paper**

---

Melissa L. Heston

**Graduate Faculty Advisor**

---

Barry J. Wilson

**Department Head**

---

## Table of Contents

<b>CHAPTER I. Introduction . . . . .</b>	<b>1</b>
Overview of Problem . . . . .	1
Statement of the Problem . . . . .	3
Significance of the Paper . . . . .	4
Definition of Terms . . . . .	6
<b>CHAPTER II. Review of Literature . . . . .</b>	<b>9</b>
Historical Background of the Typewriter . . . . .	9
Historical Background of the Computer . . . . .	14
Earlier Keyboarding Studies . . . . .	22
Critical Questions . . . . .	26
Why implement an elementary keyboarding program? . . . . .	27
What competencies and at what age will keyboarding be introduced? . . . . .	29
How much keyboarding is necessary? . . . . .	41

Where is keyboarding in the curriculum? . . . . .	45
Who is responsible for teaching keyboarding? . . . . .	47
Summary . . . . .	50
CHAPTER III. Recommendations . . . . .	51
The Situation . . . . .	51
Rationale for the Program . . . . .	51
Suggested Keyboarding Curriculum for the Guttenberg School . . . . .	54
Course Objectives and Competencies . . . . .	55
How much keyboarding and where is fits in the Curriculum . . . . .	57
Who will be responsible for teaching keyboarding? . . . . .	57
Third Grade Keyboarding Course Scope and Sequence . . . . .	58
Fourth Grade Keyboarding Course Scope and Sequence . . . . .	59
Fifth Grade Keyboarding Course Scope and Sequence . . . . .	60
Sixth Grade Keyboarding Course Scope and Sequence . . . . .	61
Discussion . . . . .	62
Recommendations for Research. . . . .	63
Implications for Practice. . . . .	63
REFERENCES . . . . .	65

APPENDIX A.	Typing Technique Chart . . . . .	68
APPENDIX B.	Third Grade Lesson Plans . . . . .	69
APPENDIX C.	Fourth Grade Lesson Plan . . . . .	73
APPENDIX D.	Fifth Grade Lesson Plan . . . . .	75
APPENDIX E.	Sixth Grade Lesson Plan . . . . .	77

## Chapter 1

### Overview of the Problem

The microcomputer is creating a revolution in the workplace and having a major impact on educational programs in the school. With this emphasis on the use of computers, keyboarding is a skill needed to survive and succeed in both educational and occupational settings. Regardless of the ultimate career objectives of students, the keyboarding skills taught today will help them open the doors of tomorrow. The job of business educators is to help students make keyboarding a life-long tool. Hinson and Dickey (1984) pointed out that whether their students go out and work in a warehouse entering inventory or whether they become presidents of *Fortune* 500 companies and use complex integrated software, they will all use a keyboard in some phase of their work. Modilin (1984), editor for Business and Office Education at Gregg/McGraw-Hill, stated, "Keyboarding must be a requirement of every student in your school" (p. 4).

School administrators, teachers, and parents increasingly realize that students must be computer literate. An essential part of computer literacy is the ability to operate a keyboard by the touch method quickly and accurately. Elementary keyboarding courses are being created by educators to meet the needs of elementary students.



Keyboarding is not a course that replaces our traditional typewriting course, which not only teaches the alphanumeric keyboard, but also involves formatting documents and achieving a typing speed of at least 35 words per minute. Rather, keyboarding is simply the introduction of the alphanumeric keyboard which helps students locate various keys so they may input information using a keyboard. According to Moen et. al. (1985), keyboarding skills may be developed through several instructional phases beginning in kindergarten or the early elementary grades and continuing through high school. This approach raises the question of whether business teachers or elementary school teachers should teach keyboarding when implementing a keyboarding program within a particular school district. Do elementary teachers need to become certified to teach keyboarding? Or, do high school business teachers need to become certified to teach elementary students?

Several other problems often arise when starting an elementary keyboarding program besides who should teach it. Where does keyboarding best fit within the curriculum? Keyboarding easily fits into the elementary curriculum when keyboarding is considered as a communication tool or skill (Headley, 1983). Keyboarding is a tool or skill that can be incorporated into the language arts program within the elementary curriculum. However, the issue of exactly when

elementary school students should begin instruction in keyboard skills is somewhat controversial.

Many different views exist as to the age level at which keyboarding should be introduced. If students are not taught the touch method of typing at an early age, it is extremely difficult to teach students to keyboard correctly after they have been exposed to the computer for extended lengths of time without formal instruction. Students often develop poor habits, such as one finger typing and poor posture; it is easier to learn correct habits and techniques initially than to unlearn something that has been done incorrectly for several years.

Bluth (1984) pointed out that before we attempt to resolve problems associated with starting a keyboarding program, all aspects of the curriculum, the available facilities, and the teachers affected must be considered. When to start teaching keyboarding is an individual problem within each school district. Headley (1983) stated, "It (Keyboarding) should not be considered as a threat, but rather as a means to enhance our present programs and those we develop as we move into an age of high technology" (p. 19).

#### Statement of the Problem

The purpose of this paper was to provide an integrated review of literature relative to providing an elementary keyboarding curriculum

for students in grades K-6. The historical development of the typewriter and computers will be discussed in order to understand how the need for keyboarding skills developed. Early research in elementary keyboarding will provide the reader with important background information. And, critical questions in the development and implementation of an elementary keyboarding instructional program will be answered. This research paper will use current research to address the following questions:

1. Why implement an elementary keyboarding program?
2. What criterion ought to be set for elementary keyboarding competencies and at what age will keyboarding be introduced?
3. How long does a keyboarding class need to meet to accomplish the criterion set by the school district?
4. Where does keyboarding "best fit" in the curriculum?
5. Who is responsible for teaching keyboarding?

#### Significance of the Paper

The computer keyboard exists to accept and to enter information. Computer keyboarding skills are defined as striking desired keys accurately and quickly, including the skills needed to correctly use special keys such as ESC and CTRL (Wetzel, 1985, p. 15). Students who have developed adequate keyboarding skills and do not use the "hunt and peck" method, which is defined as keying

information using only one or two fingers and no set pattern as to which fingers control each key, use their time at the computer efficiently. Adequate keyboarding skills allows students to concentrate on problem solving or composing rather than on the mechanics of keyboarding. This level of keyboarding skills then allows the students to use the technology at a more complex level in all areas of the curriculum.

It is important to understand the impact technology is having on the school curriculum. Rhodes (1989) has concluded:

This nation is engaged in an information revolution that is characterized by the universal proliferation of microcomputers. A failure to impart to each citizen productive keyboarding skills--the ability to effectively and comfortably interact with the device--will be nothing less than gross educational neglect (p. 35).

With computers being introduced in lower elementary school and used throughout high school the "hunt and peck" method will be used unless schools accept the challenge to teach elementary students the "touch" method of keyboarding which allows students to concentrate on computer applications rather than searching for the correct keys to touch.

### Definition of Terms

For the purpose of this paper, the following terms have been defined:

Alphanumeric Keyboard a keyboard that has both alphabetic and numeric symbols.

Correct Keyboarding Techniques are defined as preparing the work station for keying, keeping eyes on copy, correct body position while keying, keystroking techniques, striking the space bar, return key, and shifting keys. A technique evaluation form has been provided for further clarification in Appendix A.

Elementary Grades are defined as kindergarten through sixth grade.

Formatting is the skill of being able to correctly arrange typed material such as reports and letters using a computer or typewriter.

Function Keys are the return key or enter key, shifting keys, space bar, tab key, back space, and correction key or delete key.

Gross Words Per Minute refers to the total words per minute typed by the student not subtracting for errors. A word will consist of 5 keystrokes.

Home Row Keys are the keys on a keyboard where the fingers are placed during keying. For the left hand, these keys are a, s, d, f, and for the right hand, they are j, k, l, ;.

Hunt and Peck Method is defined as keying information using only one or two fingers and no set pattern as to which fingers control each key. The student simply looks for the key and strikes it with a finger of the student's choice.

Input is defined as the act of keying information into a computer.

Keying is the striking of keys.

Keystroking is using the proper fingers on all keys while maintaining an even rate.

Keyboarding is "the act of placing information into various types of equipment through the use of a typewriter-like keyboard.

Typewriting and keyboarding are **not** synonymous. The focus of a keyboarding course is on input rather than output" (Sormunen, 1988, 48).

10-Key Pad is the numeric pad that is on the right side of the computer keyboard. This pad contains the numbers 0-9 and basic mathematic symbols.

Text Entry is the inputting of words and/or numbers.

Touch Method of Typing is defined as the ability to key information using all of your fingers while not looking at the keys. Thus you type by touch.

Typing skills are defined as striking the desired keys on the alphanumeric keyboard accurately and quickly, and having the skills and knowledge needed to correctly use this skill to format documents.

Output is defined as the amount of work produced in a given amount of time.

Production Rate is defined as the number of words typed in correct format on documents such as letters or reports, within a pre-determined time period.

## Chapter II

Today, the typewriter and the computer have been accepted as equipment that has been with us always. In fact, they have become part of our everyday lives, our educational system, and our business community. Only 100 years ago, a typewriter was a luxury, and there were only a few in use. Today, millions of typewriters and computers are a vital part of our world.

### Historical Background of the Typewriter

The first patented writing machine was invented by Henry Mill in 1713 and was patented by Queen Anne of England. It was due to this initial experiment and the inventions of several men that the first practical typewriter was successfully designed and patented in 1886 by Christopher L. Sholes and Carlos Glidden of Milwaukee, Wisconsin.

In the early 1860s, Sholes and Glidden decided to work together to produce a writing machine. This first machine was presented to Philo Remington of W. Remington & Sons, manufacturers of guns, sewing machines, and farm equipment in Iliion, New York. W. Remington & Sons was persuaded to manufacture the typewriter for the commercial market. Six years later, in 1886, Remington & Sons placed the first



commercial typewriter on the market. This early model, called the "Remington", had a cylinder, or carriage, to hold the paper, along with line-spacing and carriage-return mechanisms. A device called an escapement moved the carriage after each letter was struck. Type-holding rods were arranged in a semicircle so that when the keys were depressed each rod struck at the proper point on the paper. An inked ribbon, against which the raised letters on the rods struck, transferred the letters' images to the paper. A keyboard similar to that of present-day typewriters was used.

Frank E. McGurrin, a Court Reporter from Grand Rapids, Michigan, is credited with developing the first touch typing system using all fingers. W. Remington & Sons, in 1895, helped McGurrin establish a school to teach typewriting, using the Remington Typewriter as a school practice machine. It was a success, and this was when the first keyboarding skills were taught.

In 1901, the first portable typewriter was introduced. The Sun Portable Typewriter was the first portable writing machine. This typewriter cost approximately \$50.00. The portable typewriter soon became a household convenience that created a need for keyboarding skills.

Typewriters evolved quickly in the next 20 years until the electric typewriter was invented in 1921 by Carl Schliens of Berlin, Germany. This typewriter was produced by Mercedes Buromaschinen-Werke of Berlin, Germany. This machine included a box housing the motor on the right side of the frame, which operated the fluted shaft running through the machine. The typewriter was known as the Mercedes Elektra Model 1. The first American electric typewriter was produced by Remington Typewriter Company in 1925. The first International Business Machines (IBM) electric typewriter was introduced in 1933.

From 1930 to 1965, most students learned to type on manual typewriters. During the next decade, electric typewriters steadily became more common in the schools, until 1975 when electric machines began to outnumber manual typewriters in schools.

The typewriter became a vital part of our society and the United States war effort in World War II. On March 5, 1942, the War Production Board froze all sales of new and used typewriters, and prohibited rentals. The order overrode all sales agreements or any priority claims for new and used typewriters. Jones (1956) reported a survey from 1942 which

indicated the number of typewriters that were required by the government for use in World War II:

<u>U.S. Department</u>	<u>No. of Typewriters</u>
Army	446,502
Navy	199,096
Maritime Commission	12,600
Board of Economic Warfare	47,390
Lend-Lease	40,125
Other Government Departments	105,000
	(p. 55)

The government executed a plan to buy typewriters from users and ask the public to voluntarily release spare typewriters for use by the government. All of the typewriter companies except for Woodstock Typewriter Company, which produced approximately 18,000 typewriters annually, were converted to arms production for the war effort.

The next technological change in typewriter operation appeared in 1961. International Business Machines invented a typewriter that eliminated the letter rods, using instead a small, rotating ball or typehead with the type symbols covering it. This typewriter also used a stationary carriage over which the

typehead moved and printed the letter with greater speed. In the '70s, IBM made another change in the typewriter that further increased the speed of the typewriter--the daisy-wheel printer. This is a plastic disk with flexible spokes each of which ends in a character. The wheel rotates rapidly to bring a particular character into printing position, the spoke is struck against a carbon-backed plastic ribbon, and its impression appears on the paper.

In the late 1970s the influence of electronics made another technological change in typewriters. These electronic typewriters were able to center text, check spelling, and store documents in an internal memory system. The electronic typewriter evolved into word processors. The term, word processor, refers to a personal computer that is dedicated to the task of word processing (typing, editing, rearranging, saving, and printing a document using a word processing program on a computer) and can perform no other function. This merging of the computer and the typewriter started a new generation of technology and software applications. In order to understand how this new generation of technology was developed, one must understand how the personal computer evolved.

### Historical Background of the Computer

The earliest computing instrument was the abacus, which has been known and widely used for more than 2,000 years. It is a wooden rack holding parallel wires on which beads were strung.

Blaise Pascal is widely credited with building the first "digital calculating machine" in 1642. These mathematical machines developed rapidly over the years. In 1812, Charles Babbage of Chambridge, England, designed an automatic mechanical calculating machine called a "difference engine." Ten years later, Babbage invented the "analytical engine." This machine introduced the idea of punch cards (a rectangular card in which holes are punched indicating information a computer could read and summarize) which could be read by the machine from any of several reading stations. The size of the machine was about 10 feet high, 10 feet wide, and 5 feet deep (Williams, 1985, p. 172) and its cost was about \$104,000 in 1842.

In 1890 Herman Hollerith, while working with the U.S. Census Bureau, used punch cards to automate the department. He developed a system that could automatically read the information that had been punched into the cards without human intervention. This machine worked so well that the

Census Bureau was able to give a preliminary total count six weeks after the complete data were delivered to Washington. The world was impressed, and newspapers proclaimed a new age.

By the late 1930s when IBM joined the market, punch card techniques had become well established and reliable. The IBM team, led by Howard Hathaway Aiken, developed the "IBM Automatic Sequence Controlled Calculator (ASCC)." This machine resulted from a merging of Babbage's and Hollerith's ideas. Aiken's machine was an electromechanical analytical engine. It received instructions by punch tape (a continuous tape which has program information punched on it that a computer can read) and data by punch cards. The ASCC would add or subtract two numbers of twenty-three digits in  $\frac{3}{10}$  of a second, multiply them in four seconds, and divide them in ten seconds. The ASCC was not elegant, and it had more than 750,000 parts. Aiken's machine, which was finished in 1944, was considered the first automated computer. It could complete six months of calculations in one day.

In Ames, Iowa, a mathematician and physicist named John Vincent Atanasoff and his assistant Clifford Berry, were working with electronics as well. They developed the ABC (Antanasoff-

Berry Computer) prototype in 1939, which was the first machine to demonstrate the use of electronic techniques in digital calculation, and the first machine to incorporate a regenerative memory (memory that can be reproduced over and over again). The ABC had a huge influence on the rapid development of electronic computing machines even though the Second World War prevented it from ever being commercially produced.

The outbreak of World War II produced a desperate need for computing capabilities, especially in the military. New weapons systems were produced for which trajectory tables and other essential data were lacking. In 1942, John W. Mauchly, John Presper Eckert, Jr., and their associates at the Moore School of Electrical Engineering at the University of Pennsylvania decided to build a high-speed electronic computer to do the job. This machine became known as ENIAC, for Electronic Numerical Integrator and Computer. It was able to handle numbers of 10 decimal digits, and it would multiply two such numbers at the rate of 300 products per second. ENIAC is generally acknowledged to be the first successful high-speed electronic digital computer (EDC) and was productively used from 1946 to 1955. The size of the ENIAC, by the time it was

complete, was 8 feet high, 3 feet wide, almost 100 feet long. It weighed 30 tons, and consumed 140 kilowatts of power. Core Memory units (storage units for storage of results and for internally stored programs) were added in 1952. Each memory unit could store 100 numbers of ten digits each and required a cabinet about 2 feet 6 inches long, 2 feet wide, and 7 feet high. According to Williams (1985), the final cost of the ENIAC, to the Army was \$486,804.22. The ENIAC was shut off for the final time on October 2, 1955. It has been noted that during the ten years of ENIAC's useful life, this machine did more arithmetic than had been done by the whole human race prior to 1945.

In 1945, John Von Neumann, a mathematician, demonstrated that a computer could have a very simple, fixed physical structure and yet be able to execute complex computations when proper program control was in place. Von Neumann's idea of a stored program technique became fundamental for future generations of high-speed digital computers.

The first generation of modern programmed electronic computers to take advantage of these improvements appeared in 1947. These computers included random access memory (RAM is a memory unit to which data can be constantly added or from



which data can be constantly removed, in a random manner), which is a memory designed to give almost constant access to any particular piece of information. These machines had punch card or punch tape input and output devices, and RAMs of 1,000 word capacity with faster access time. These computers was smaller than the ENIAC and included EDVAC and UNIVAC, which were the first commercially available computers.

EDVAC or Electronic Discrete Variable Arithmetic Computer was the first machine with which data was input through a keyboard to a magnetic wire, rather than through punch cards. This technique received much attention, but eventually was abandoned because of extreme difficulties of programming. The EDVAC users had to resort to a punch tape reader. When the machine was finished in 1952, it stood 7 feet high, took up 500 square feet of floor area, and could perform addition in about 1 millisecond, while multiplication and division took about 3 milliseconds each.

The UNIVAC (UNIVersal Automatic Computer) was the first computer produced for sale by the Remington-Rand Company which in 1951 was the world's first large-scale computer company. Forty-six UNIVACs were sold between the first installation to the U.S. Census Bureau in 1951 and 1957.

Each machine was a rectangle about 10 feet wide, 14 feet long and 9 feet wide. The machine used nickel-coated bronze tapes to store data. This machine also included UNITYPERS (electric typewriters) which were used as the main console control device to control and input information.

International Business Machines' involvement in computer development between 1946 and 1950 include the NORC (Naval Ordnance Research Calculator), and the IBM 701, a commercial model. NORC was ordered by the U.S. Navy's Bureau of Ordnance to solve large ballistic computational problems. International Business Machines had always cultivated the image of a company that was willing to offer its services in the national interest, and they continued by offering to produce the NORC on a nonprofit basis. This machine was considered the fastest of its time. It could perform addition in 15 microseconds and a multiplication in 31 microseconds. The NORC computer was a pioneer in its time. It used magnetic tapes and new drives that were capable of reading or writing 70,000 digits per second, five times faster than any other existing equipment. The NORC was delivered on December 2, 1954, and was used until 1968. International Business Machines also had a commercial line of computers during this period of time, referred to as the "700

series." These machines evolved quickly over the next ten years and included the introduction of transistor electronics and the development of disk storage technology. The innovation of disk drives became standard on computers produced in later years.

In the 1960s, efforts to design and develop the fastest possible computers with the greatest capacity produced the LARC (Livermore Atomic Research Computer). This was the last big project to be designed around a decimal-only memory storage system. Decimal-only memory means the ability to only store numbers and not words. Only two LARC's were ever installed. The cost of the LARC was so high, and the potential customer demand so low that it was taken out of production. Both machines were in use until 1969.

In 1964, IBM invaded the market with an announcement of over 150 new products, services, and devices. These were all centered around the new "System/360" family of computers. The keyboard was the standard input device for these computers, and the need for keyboarding skills increased. It has been estimated that the initial research and development cost of introducing the System/360 series of machines amounted to at least five billion dollars, but this series made IBM the leader in

the computer industry, a position which the company still maintains.

In the 1970s a more powerful, centralized computers with a broader range of applications was developed. Also, the '70s introduced the "computer chip" (a small disc of silicon on which an integrated circuit is printed). These "chips" help introduce the programmable minicomputers supplied with software packages. Reduction in the size and expense of personal computers by Apple and Radio Shack made the personal computer affordable to the family.

In the 1980s, the ability to integrate hundreds of thousands of transistors on a single chip brought more change to the industry. The falling cost and size of the computer made them affordable to an average family and to educational systems. By the late 1980s, some personal computers were run by microprocessors that could process about 4 million instructions per second. Microprocessors equipped with ROM (read-only memory is a memory unit containing unchanging data or instructions that can be accessed randomly), computers which stored fixed programs, now performed an increasing number of tasks, such as testing ignition systems in cars and production -line inspection tasks in manufacturing.

The '80s and '90s brought on new, smaller, more powerful machines which allow input and interaction through the use of a keyboard. The cost of computers continue to drop. According to the National Center for Education, there were more than 10 million computers in public schools in 1986 (Graham, 1986, p. 1). The computer field is experiencing tremendous growth and having a major impact on business and schools. It is this merge of technology and education that has created a need for keyboarding skills for all ages, including elementary students.

#### Early Studies in Keyboarding

According to Tootle (1965), the typewriter was used experimentally with elementary school students as early as 1916. He reported a more recent University of North Dakota study conducted during the summer of 1958 and the Royal-McBee study which began in 1958-1959 academic year at Boston University, Columbia University, and the University of Illinois. Tootle concluded that these studies were concerned with determining whether or not students in elementary school could master the operation of the typewriter. Conclusive results were found, and further experimentation was recommended.

Wood and Freeman (1932) conducted a two-year study of the educational influences of the typewriter when used as a part

of the regular classroom equipment in kindergarten and elementary school grades in eight cities. Subjects in eight public school systems and five private schools participated. In this study, 8824 students and 239 teachers served as control group subjects, while 6125 subjects and 180 teachers received the experimental treatment. It was believed by the researchers that the large number of students (nearly fifteen thousand) and teachers (over 400) could be safely considered as representative of United States elementary schools in general, and that school results could be pooled into groups large enough to afford statistically reliable comparisons.

Students in kindergarten and first grade averaged between 50 and 80 minutes a week on the typewriter. The remaining grades averaged between 90 and 130 minutes a week. Students had access to the machines from early September 1929 until June 1931, two full school years. Elementary teachers were required to teach the students how to type before the students were allowed to use typewriters for everyday activities.

It was concluded that for children in kindergarten through second grade, there was no significant difference between the control and experimental groups as measured the Gates Reading Tests. Woods and Freeman chose the Gates Reading test

because in 1930 this test gave them the broadest possible measure of general educational progress for grades one and two. In grades three to six, however, partial correlations indicated that the influence of the classroom typewriter on Stanford Achievement Test gains was positive, and that gains were shown for both school years. The most significant finding of Wood and Freeman's research was the effect the typewriter had on the output of written material. Output in original material increased significantly, as did the length of students' work. Wood and Freeman concluded that it was feasible to use the typewriter in the conduct of the ordinary work in the elementary classroom, and that use of the typewriter stimulated elementary school students to produce more written material than they would otherwise produce. Wood and Freeman also posited that the use of the typewriter raised the level of achievement in some fundamental school subjects without observable losses in any subject.

Tootle's (1965) research concentrated upon the use of the typewriter as a tool of written communication. He used the students from three elementary schools in Columbus, Ohio. Three experienced teachers were chosen to teach the experimental classes. Eighty students were enrolled in these

classes. An effort was made to match these students with students in control classes. Control classes were located in the same schools as the experimental classes, and two control classes were used in each school in order to lessen the effect of teacher differences. Experimental and control students were equated on the basis of grade placement, school attendance, sex, age, intelligence quotient, spelling ability, and creative writing ability. On these criteria, only a total of 48 pairs of students were matched, 25 male pairs and 23 female pairs.

After the students were matched, measurements were made in the areas of handwriting speed and quality, reading, arithmetic, science, social studies information and study skills. These tests were taken to determine the effect of typewriting on the general education development of fifth-grade students.

The Remington Rand Portable Typewriter Division of Sperry Rand Corporation provided 95 new typewriters for the experiment. The students used the machines from October 3, 1960, until June 9, 1961. Instructional periods were 20 to 25 minutes in length daily. Teachers were encouraged to have the students use the typewriter for whatever work could be accomplished on it as soon as the keyboard was covered.



Mastery of typewriting was accomplished by June 9, 1961. Gross typing speeds (counting five stroke words without counting errors) ranged from 13 to 52 words per minute, with a mean of 24.8 words per minute. This typing speed was more than double the student's handwriting speeds which ranged from 11 to 22 words per minute. Errors ranged from 0 to 9, with a mean of 2. Tootle concluded that there was justification for teaching typing to fifth-grade students. Tootle recommended more research on the long-term effects of teaching fifth-graders to type.

It was this early research that caused schools to re-evaluate teaching elementary keyboarding in the early 1980s when millions of computers entered elementary classrooms. However, many critical questions must be answered by school district personnel who are developing and implementing an elementary keyboarding program.

### Critical Questions and Answers

In order to examine elementary keyboarding in depth, this section provides an integrated review of literature relative to the development and implementation of an elementary keyboarding curriculum for grades K-7 based on current research. In this

review of literature, an attempt will be made to answer five critical questions:

1. Why implement an elementary keyboarding program?
  2. What criteria ought to be set for elementary keyboarding competencies, and at what age will keyboarding be introduced?
  3. How long does a keyboarding class need to meet to accomplish the criteria set by the school district?
  4. Where does keyboarding belong within the elementary school curriculum?
  5. Who should be responsible for teaching keyboarding?
- These are all questions that must be addressed when starting an elementary school keyboarding program.

#### Why implement an elementary keyboarding program?

Over the ages, methods of processing data have changed from pictures drawn on the walls of caves by a variety of ancient people to the very sophisticated computer systems of the present day (Headley, 1983). Modern information systems have introduced new problems for educational institutions and will have a greater impact on education than ever before. Moreover, microcomputers are having an impact on everyone. According

to statistics from the National Center for Education, there are more than 10 million computers in public schools today (Graham, 1986). This technology is creating a need for keyboarding proficiency at every level of education.

"Why should keyboarding be implemented?" is not a difficult question to answer. In the early 1980s, formal keyboarding instruction at the elementary level was limited and short-lived. Money to buy equipment and software for elementary schools was also limited. However, the recent infusion of money and technology into the educational process at the elementary school level has rekindled interest in providing formal keyboarding instruction at the elementary level. Computers are being utilized throughout elementary curriculums. Balajthy (1988) stated, "Lack of keyboarding skills is the most often cited hindrance to effective use of computer in the classroom" (p. 41). As Graham (1986) pointed out, "Using the computer without learning the keyboard is like trying to play a tune on a piano without knowing where the various keys are located!" (p. 1).

Consequently, when students try to use a keyboard without prior instruction, they must resort to a "hunt and peck" method of keyboarding. This process is slow, frustrating, and often error

filled. This problem is avoidable by teaching students to keyboard early in their educational careers. This concept leads to two more major concerns when starting an elementary keyboarding program: At what age should keyboarding be introduced? And, what competencies should be attained in an elementary keyboarding course?

Age and competencies considerations for an  
elementary keyboarding course?

Age and developmental level is a major concern when setting up an elementary keyboarding curriculum. There are many conflicting views in this area. Sormunen (1988) has reviewed the development of children focusing on Piaget's developmental stage theory. According to this theory, at approximately seven years of age, children move into a concrete operational stage which is characterized by the ability to reason logically. This is consistent with the idea that students of that age are able to handle certain kinds of learning activities. Students ages, seven and up also have the psychomotor skills needed for keyboarding. Sormunen concluded that when considering placement of keyboarding in Grades 3, 4, 5, and 6, there was no one grade level that would be the most effective time to teach keyboarding. She suggested that placement

decisions be based on other factors such as when students are required to keyboard words and sentences in their classwork.

Moen et. al. (1985) suggested five instructional phases (see Table 1.1) that included all grades, kindergarten through twelfth. Each phase is based on the physical and mental development of the students. In the Readiness Phase, kindergarten through second grade, teachers can help their students learn to locate the keys on the keyboard using their index fingers. After students learn where the keys are located, they should then learn to use the left index finger for the left half of the keyboard and the right index finger for the right half of the keyboard. The only objective of this phase is to teach the students where the keys are and to distinguish between their right and left hands.

Phase I is introduced in the third or fourth grade; students then learn finger placement on the home row keys and basic techniques, such as, keystroking. The students are already familiar with the placement of the keys from the readiness phase. The basic objectives of this keyboarding phase are using correct fingering when keyboarding and proper keystroking techniques, teaching the basic function keys (eg. return or enter key, space bar), operating the microcomputer hardware, and

**Table 1.1 KEYBOARDING PHASES**

<p><b>READINESS PHASE</b> K-2</p>	<p>--Each phase leads into the next. Phases I, II, and III were designed for grade levels 3-7 depending on individual school situation.</p>
<p>Keyboarding recognition Right/Left hand key identification</p>	
<p><b>PHASE I</b></p>	<p>--It is import to reinforce students each year so skill is not lost and building can occur.</p>
<p>Learn the keyboard Basic Function Keys Technique and Confidence</p>	
<p><b>PHASE II</b></p>	<p>--It is also important that keyboarding skills be taught at a grade level prior to computer use so bad habits will not develop which would impair future skill development.</p>
<p>Review the Keyboard &amp; Technique Language Arts Application Intro. Composition Intro. Proofreading</p>	
<p><b>PHASE III</b></p>	<p>--Phase III is not the end of keyboarding. After completion of this phase, students need reinforcement and can further their skills by taking classes in Typing, Formatting, Word Processing, Computer Application, Computer Programming, etc.</p>
<p>Quick Review of Keyboard &amp; Technique Create, Edit, Save, Print Text Develop Keyboarding Skill Computer Terminology Composition Skill</p>	
<p><b>ADVANCED PHASES</b></p>	
<p>Includes Computer Application, Programming, Formatting (Typing I)</p>	

**Note.** From Keyboarding For Elementary Students (p. 3) by Moen, N., Kidney, J., Burke, L., Smith, M., Reed, J., 1985, Des Moines: Iowa State Department of Public Instruction, Division of Career Education, & Cedar Falls: University of Northern Iowa.

acquiring confidence through skill development. The importance of reinforcing keyboarding every year after a program has been introduced was heavily stressed by Moen et. al. (1985). Once the students have completed the Readiness Phase and Phase I, Phase II must follow the next year. Only by using their keyboarding skill consistently will the students develop speed and accuracy.

In Phase II, students review finger placement, and then begin to further develop their speed and accuracy. Language arts applications on the keyboard help students develop more interest in using the computer as a tool for communication. The objectives for this phase are: (a) review of appropriate fingering and keyboarding techniques; (b) development of keyboarding skills such as speed and accuracy; (c) introduction of production rates, beginning composition, language art skills, and proofreading.

Phase III students are ready to begin creating, editing, saving, and printing material with a word processing package. This phase deals extensively with word processing. Moen et. al. (1985) suggested an interdisciplinary approach by involving the language arts teachers. In this method, students are encouraged to produce a rough draft using a word processor. Then the

rough draft is edited and a final draft is printed. Creating, editing, saving, and printing text are all taught in this phase. Speed and accuracy are also stressed. This is the final phase and is taught at the middle school or junior high level. It was also suggested that these phases be followed with advanced phases for the high school students. This entire approach gives suggestions for the age at which each phase be introduced. Moen et. al. (1985) believed, however, that the exact grade level at which keyboarding is introduced was not important. They concluded that elementary keyboarding programs do vary with each school district, the equipment available, and the established curriculum. What was important was that keyboarding be taught before poor habits of keystroking are established. This means that keyboarding needs to be introduced before students are asked to type in one or two word responses when using the computer.

Kaser (1984) conducted a study to determine at what age children were able to learn keyboarding most effectively and to develop goals for an elementary keyboarding course. A six week summer school keyboarding course was developed for kindergarten through sixth grade students. The 140 kindergarten through sixth grade elementary students who



registered for the course were divided into five class sections. The children were divided into two age categories (grades kindergarten through third, and grades fourth through sixth).

This keyboarding course concentrated on learning proper techniques (eg. keystroking, posture) and the development of speed on the keyboard. Kaser (1984) listed the following as goals for all students taking the six week summer keyboarding course:

1. Students will be able to keyboard using the touch system.
2. Students will be able to use proper keyboarding techniques.
3. Students will be able to compose responses and sentences at the keyboard.
4. Students will be able to keyboard 20 to 40 words per minute.
5. Students will be able to build confidence by increasing their speed on the keyboard.

An additional goal for fourth-sixth graders was:

6. Students will be able to figure margins for different line lengths and set up simple tabulation problems properly. (p. 16)

Kaser observed that the students in kindergarten through second grades showed short attention spans, and did not possess the eye/hand coordination or dexterity to type at 20 to 40 words per minute. The kindergarten through second grade students did type 8-15 words per minute, and only 40% of the students could type without looking at their hands. None of the kindergarten through second grade students were able to meet the keyboarding course goal of 20 to 40 words per minute. He concluded that the data indicated that K-2 pupils were not able to fully benefit from a keyboarding course because they were unable to complete the course goals.

The most interesting discovery was that third graders were the most capable group in accomplishing the goals of this elementary keyboarding course. The third graders were typing 15 to 25 words per minutes by the end of the six weeks. Kaser reported that all the third graders used proper finger placement on the keyboard, and 75% of the third graders could type without looking at their hands. Kaser further concluded that third graders possessed the concentration and eye/hand coordination necessary for achieving the objectives of an elementary keyboarding course. Students in grades 4-6 typed 20-40 words per minute, and 80% of the students were able to

keyboard without looking at their hands. Kaser concluded that students in grades third through sixth grades had longer attention spans, better dexterity, and greater maturity needed to meet the goals of the keyboarding course.

Wetzel (1985) also conducted a study to determine the best age at which to introduce keyboarding. He observed students using a "computers-in composition" program. He observed 26 third, fourth, and fifth graders with no formal keyboard training using word processors. The average rate of transfer of text from paper to screen was 2.5 gross words per minute (gwpm). This rate was slower than their handwriting speed. Through Wetzel's review of literature, he found out that Graham, in 1980, measured fourth through sixth graders to see how fast students could copy text using handwriting. Graham (1980) discovered most fourth through sixth graders could copy from seven to ten gwpm by hand. Wetzel concluded a keyboarding speed of ten words per minute allowed the elementary students to make adequate use of the computer for tasks which require keyboard entry. Through observation, he concluded that keyboarding may be most easily taught in grades fourth through sixth. He based this on the fact that students in fourth through sixth grades not only possessed the motor skills

required, but they also had a greater need for keyboarding skills and were more motivated. He concluded students definitely need keyboarding before grade six.

Patricia Headley (1983), an office education coordinator and department chairperson at Orono High School in Long Lake Minnesota, started an elementary keyboarding program in her school and has reported that in her experience, fifth graders benefitted most from this keyboarding program. She claimed that the motor skills, reading skills, and general interest and motivation necessary for a keyboarding course were developed by this age. Reading skills are sometimes forgotten in the development of an elementary keyboarding program. Headley also concluded that keyboarding could be taught at one grade level lower or higher. Headley's competencies for an elementary program included teaching students the alphanumeric keyboard, the symbols, and the function keys (eg. return or enter key, shift) using the touch method. She also posited that speed work was not necessary, and, in fact, was detrimental to the development of the young typists.

Truman H. Jackson is the Business Education Program Specialist for the Minnesota State Department of Education. He has been developing elementary keyboarding programs for

schools within the state. Dianna Berg is an elementary keyboarding instructor for Crestwood Elementary School in East Grand Forks, Minnesota. Jackson and Berg (1986) conducted a study that concluded keyboarding should be taught just prior to the students' required use of the keyboard to key words and/or numbers such as spelling lists or paragraphs. They concluded that students need to be taught keyboarding before they are introduced to a word processor. Jackson and Berg also concluded that the goal for elementary keyboard instruction for grades kindergarten through second grade should be to aid students in locating keys on the keyboard. Beginning in the third grade, formal development of correct keyboarding technique should be introduced, focusing on the alphabetic keys. In the upper elementary grades (grades fourth through sixth), Jackson and Berg suggest that numbers, symbols, and function keys (eg. shift) should be introduced along with a simple word processor. This multiple level approach allows for the different developmental levels of the students.

Graham (1986) performed a review of literature and concluded that the general consensus is that keyboarding can be taught to students in grades third through sixth. He also posited that the goal of the course is to teach students how to keyboard

by touch, not by sight, and that proper techniques be stressed throughout the course. Graham believed two areas of student achievement goals should be set and evaluated by each district. These two areas were: (1) the techniques of operation, to be assessed through teacher observation, and (2) students' keyboarding fluency, to be assessed using measures of speed and accuracy. The teacher observation is performed using a technique evaluation form provided by McGraw/Hill (See Appendix A). This form is very thorough and provides the students with immediate and individual feedback on their progress. Standards for speed and accuracy are based on the ages of the students as well as on the amount of instruction they have received. Graham also argued that the main objective in any elementary course is to learn the keyboard accurately and that speed goals should be used only as a motivational device. He suggested timings be taken for very short periods of time, only 15-30 seconds. This focus on keyboarding accuracy over speed may reduce the anxiety levels of the students and make learning more fun. Students measure their own speeds by learning how to count their timings and compete with themselves.

Age and competencies are major concerns when setting up an elementary keyboarding program. After a review of literature, it may be concluded that students in grades 3-6 possess the physical and mental qualities needed to benefit from a structured keyboarding class. It is also noted that K-2 students can benefit from learning their right/left hands, and two finger typing. The critical issue appears to be to introduce keyboarding before the students must keyboard one- and two-word responses to computer programs they are using. I also conclude that students need to achieve a speed level of at least ten words per minute to avoid high frustration levels. Elementary keyboarding needs should be determined on a district level taking into account factors such as, equipment availability, curriculum, and teaching staff. Once school personnel have determined at what age they are going to teach a basic keyboarding course, and what goals they have set for the course, they need to determine how long the course must be to achieve those goals. This leads to the question of how much time is needed to introduce keyboarding and achieve an established criteria?

### How much keyboarding is necessary?

From my review of literature, it can be concluded that an elementary keyboarding program can consist of different phases. However, a basic keyboarding class needs to be offered as a short almost exploratory course, at an elementary grade level of the school's choice; and that once keyboarding has been introduced, it must be reinforced in each following year.

Kaser (1984) found that lack of time to implement an elementary keyboarding program into the curriculum and lack of funds were problems he had to solve in order to start an elementary keyboarding program in his school. He solved those problems by offering a summer keyboarding program which met five days a week for six weeks with class periods of 55 minutes in length. Kaser found that variety in the 55-minute class sessions was very important for keeping the attention of the students. He also concluded that for students in grades kindergarten through second, a 55-minute class period was too long. However, classes of this length seemed to be acceptable for students in grades third through sixth.

Holmquist (1983) has argued that based on her reading and experience, an elementary keyboarding course should run for three to four weeks for 20- to 30-minutes a day. She also



noted that students should then have time to use the computers on a regular and individualized basis to reinforce the keyboarding skills students have developed throughout their elementary years.

Headley (1983) suggested that students need a total of 15- to 20-hours of instruction and practice divided into class periods of 30-minutes. In her experience, Headley has found that this amount of time seemed to be adequate to accomplish her course objectives. She also suggested that the keyboarding skills of elementary children needed to be reinforced throughout the curriculum, through activities such as vocabulary word games and composing at the computer.

Sormunen (1986) recommended 28 hours of instruction delivered in 30-minute periods for an elementary keyboarding course. In this study, students achieved speeds of 21 to 25 words per minute within this time frame. In 1988, Sormunen published a study designed to determine the minimum number of hours of instruction needed in an elementary keyboarding course. She concluded that students needed a minimum of 12- to 15-hours of instruction in 30-minute periods to achieve the keyboarding course goals. Students were able to achieve speeds of 11 to 16 words per minute with a course of this length.

Moen et. al. (1985) suggested 20 to 40 minute class periods each day depending on the school's curriculum and grade level. They posited a minimum of three weeks were needed to achieve the competencies of an elementary keyboarding program.

Jackson and Berg (1986) collected information from existing elementary keyboarding programs and found 30 hours of instruction at the elementary level were necessary to achieve program goals. Schools could either break that down to 15-hours of instruction for two consecutive grades or 10 hours of instruction in three consecutive grades. They found that both choices worked. Jackson and Berg suggested 20- to 30-minute daily class periods worked best for elementary students. Weekly 30-minute review sessions were recommended throughout the rest of each year to help maintain keyboarding skills.

Robinson (1985) suggested a 6-week course for an elementary keyboarding program with 35 minute class periods daily. Robinson pointed out that the rate of learning was important and the course shouldn't be compressed to save time. Students needed review sessions to allow needed practice on keyboarding skills.

Graham (1986) recommended a longer course of 9- to 18-weeks in length with 30-minute instructional periods. However, both South-Western Publishing Company and Gregg Division/McGraw-Hill Book Company were quick to point out that parts of their keyboarding programs could be taught over the course of a few years. School administrators and teachers must consider the level of keyboarding competence they want students to achieve and set instructional time accordingly.

Wetzel observed that the benefits of an elementary keyboarding warrant 35 minutes a day for 4-weeks for children in grades four through six. He based this conclusion on his review of research. Students will average 10 gwpm in such an instructional format. If this format is extended to nine weeks, he found the average student will type 15 to 20 gwpm. West (1986) warned schools to avoid getting locked into a typical school calendar, making keyboarding a full-semester course. He argued that keyboarding instruction should not exceed the 5-9 weeks needed to establish the gross stroking speeds necessary for a beginning keyboarding course.

My review of literature suggests that 30-minute class periods for four to six weeks seem to produce the minimum level of keyboarding skill essential to basic computer activities.

Elementary curriculums are under many competing pressures to teach a wide variety of subject areas in the course of a day. A keyboarding program has merit and school personnel will have to assess their students' needs and the time and equipment available to determine how long their keyboarding program should be. The real problem for most schools is finding the instructional time necessary to implement a four to six week program within the elementary school's curriculum.

Where should keyboarding be placed in the curriculum?

The only general consensus is that keyboarding be taught just prior to the required use of the keyboard for text entry, that is the inputting of words and/or numbers. One curriculum option has been to offer elementary keyboarding as a separate class. However, even as a separate class, the instructional time needed to teach elementary keyboarding will have to replace other instructional time in the curriculum. In most cases, time for keyboarding instruction has been found during language arts instruction. Jackson & Berg (1986) have suggested that keyboarding has shown great potential as a contributor to language arts skill development. Keyboarding is a skill that enhances students' ability to learn new words and definitions, create spelling lists, sentences and paragraphs, and perform in

many other language areas, such as creative writing. An elementary keyboarding program must begin as a concentrated highly structured course, and then the ongoing program may be more easily implemented into other subject areas such as math.

Another suggestion has been made by Kercher (1983) who recommended that schools offer a course entitled "Life-Skills" for fifth and sixth graders. This course was implemented very successfully at Laramie University Laboratory School in Wyoming.

Skills in several general areas were taught, including keyboarding, personal banking, and telephone techniques.

Another recommendation from Kaser (1984) was the implementation of keyboarding as a summer enrichment program. As an alternative option, keyboarding could be offered before and after school as an enrichment class. However, these latter two options may not be feasible for all students, and thus should only be considered when offering keyboarding within the regular school curriculum is not possible.

Wherever schools decide to place an elementary keyboarding course, educators should ask themselves four basic questions before starting an elementary keyboarding program (Wetzel, 1985):

- Has an academic area been identified that needs to be improved through the use of computers?
- Can the identified problem best be solved by a computer solution?
- Are enough computers available for students to achieve the goals of the program?
- Does the computer application require frequent and repeated use of most of the keyboard? (p. 17)

Wetzel concluded that if answers to the above questions were all "yes," a keyboarding program should be introduced prior to requiring students to enter text, and that the subject area which requires the most keyboarding should include the instruction for keyboarding. This in turn presents another problem--who will teach the keyboarding course? It is commonly assumed that any instructor can teach keyboarding; however, this has not been found to be true.

#### Who is responsible for teaching keyboarding?

Disagreements must be resolved on this issue. Many elementary teachers do not feel qualified to teach keyboarding, and many business teachers are not certified to teach on the elementary level. According to Wetzel (1985), regular classroom elementary teachers should instruct elementary students. He

has argued that the logistical problems and costs associated with using business teachers for keyboarding instruction must be balanced against the feasibility of such business teachers training regular classroom teachers to do the instruction. Moen et. al. (1985) agreed that elementary teachers should be inserviced by business teachers as to how to teach keyboarding, and that elementary teachers should then teach keyboarding to their students. Moen et. al. also suggested that the business teachers act as consultants and keep in contact with the elementary teachers. This contact would allow elementary teacher to ask questions and perhaps prevent some of the frustrations that come when starting a new program.

Alternatively, Holmquist (1983) argued that only persons such as business education majors and minors were qualified to teach elementary keyboarding. She posited that elementary teachers did not understand the mechanics, techniques and methodology involved in teaching keyboarding, and that there was more to teaching keyboarding than just teaching the students. Equipment problems and software considerations were two of the keyboarding associated problems that business teachers have been taught to handle on a day to day basis.

Another suggestion was to teach keyboarding using team teaching techniques. Rigby (1983) concluded that by combining the business educator's knowledge of teaching keyboarding with the elementary teacher's knowledge of the elementary students' learning patterns, a more effective course could be developed. She claimed that business teachers did not know the learning strategies needed to adapt instruction in keyboarding to elementary students, and that elementary teachers did not know the correct techniques that must be used in developing keyboarding skills. A final approach would be to certify the business educator to teach at the elementary level or to certify the elementary teacher to teach keyboarding. In either case, teachers would need to take additional courses or workshops to develop the skills needed. Rigby posited that most elementary students learning the correct techniques of keyboarding would benefit from the attention of both the elementary and business teachers. School personnel agree this would be the ideal situation; however, the cost of paying two teachers for a class has kept most school administrators from adopting this method.



### Summary

Elementary keyboarding is not a new idea. During the typewriter revolution in early 1900s the idea of elementary students typing was introduced. However because of time, equipment and lack of money to implement elementary keyboarding programs, the idea died. We are now in the middle of another revolution--the computer revolution. We as educators must meet the challenge to implement elementary keyboarding programs and overcome the same obstacles of time, equipment, and money. Sormunen et. al. (1990) concluded:

Effective keyboarding skill is an important foundation block upon which many other academic skills are built. Therefore, action to address keyboarding skill development must be well planned and executed carefully and quickly because keyboarding is too important to be left to chance. (p. 172-173)

In summary, the literature suggest that it is time for teachers and administrators to find new ways to work together and provide an elementary keyboarding program to meet the needs of their students.

## Chapter III

### The Situation

The Guttenberg Community School system currently introduces a keyboarding course in the seventh grade. The course is 6 weeks in length with daily classes lasting 43 minutes. This course is not reinforced formally until the tenth grade when a one-year typing course is available to students as an elective. Because of their attendance at a parochial elementary school (Kindergarten through 8), approximately one-third of the students who come into high school have no formal keyboarding experience.

I met with the elementary school faculty and school administration to receive their input into the keyboarding program and to discuss problems of which I might not be aware. I also received a commitment from the administration to arrange for me to have nine weeks of class time to implement an elementary keyboarding program. The nine weeks would be taken from an exploratory computer class I currently teach for the local parochial school.

### Rationale for the Program

This program is designed to help students develop familiarity with computer keyboarding through the touch system

of keyboarding applicable to the typewriter or computer. Along with skill building techniques, students will be encouraged to develop an awareness of the vital link between keyboarding and careers.

Moen et. al. (1988) suggested that keyboarding be taught in different phases. Each phase leads into the next and is characterized by different goals. It is important to reinforce students' skills each year so skill is not lost. From my research, I also found it is important that formal keyboarding skills be taught at a grade level prior to computer use so poor habits, which would impair future skill development, do not develop. The current first real use of computers to input words and compose is in the fourth grade. Thus, in this school district, third grade is an appropriate time to introduce keyboarding. After discussing the idea with our elementary faculty to avoid scheduling problems, it was determined that the basic keyboarding class could be placed in the third grade curriculum and take the place of a recess. To avoid further scheduling problems with access to equipment, we decided to teach both third grade sections at the same time. This would be approximately 35 students at one time. This may seem like too many students, but with two teachers team teaching--one

business teacher and one third grade teacher--the student/teacher ratio will be only 17 students. The school's cost is minimal; the students can walk to the high school computer lab which is in the building next door; and, they do not have to go outside.

Fourth grade keyboarding will be taught for two weeks during the language arts class. This follow up will also be team taught by the language arts teacher and the business teacher. Both fourth grade sections will be taught at the same time, and the high school equipment will be used. The fifth grade keyboarding will meet for two weeks also. One week will be taught during the language arts class. This class will include an introduction to word processing and basic report style. The second week will be during the math class, and the students will be introduced to the 10-key number pad. Both of these weeks will be team taught (math or language arts teacher and business teacher), and both sections of the class will come at one time to the high school lab. The sixth grade will have only one week of keyboarding instruction. This week will be placed in the language arts curriculum, and the block letter will be taught. The class will be team taught, and both sixth grade sections will meet at the same time in the high school lab (see table 3.1).

**TABLE 3.1**  
**SUGGESTED KEYBOARDING**  
**CURRICULUM FOR THE**  
**GUTTENBERG SCHOOL**

<b>THIRD GRADE</b>
<p>Basic Keyboarding Class            Replaces a recess.            Meets 43 minutes a day            for four weeks.</p>
<b>FOURTH GRADE</b>
<p>Review and introduction to a            word processing program.            Taught during Language Arts class.            Meets 43 minutes a day            for two weeks.</p>
<b>FIFTH GRADE</b>
<p>Review and introduction to basic report styles            taught for one week during Language Arts class.            Introduction to the 10-key pad            taught for one week during Math class.            Classes will meet for 43 minutes a day.</p>
<b>SIXTH GRADE</b>
<p>Review and introduction to a basic letter style            taught for one week review in Language Arts.            Class will meet for 43 minutes a day.</p>

### Course Objectives and Competencies

It is the purpose of this section to provide the basic objectives and competencies for third, fourth, fifth, and sixth grades. Sample lesson plans have been provided in Appendix B, C, D, and E for reference.

Third grade students will:

- operate the alphabetic keyboard by touch.
- operate the function keys correctly.
- realize the importance of developing good keyboarding techniques.
- type words, sentences, and paragraphs using good keyboarding techniques.
- type 10 to 15 words per minute.

The fourth grade students will:

- review keyboard reaches and techniques.
- learn how to load a word processing program.
- learn how to create, edit, save, and print using a word processing program.

The fifth grade students will:

- review keyboard reaches and techniques.
- review how to create, edit, save and print using a word processing program.

- learn formatting guides for a basic report style in language arts class.
- learn the home row base keys and reaches on the 10-key pad.
- learn the touch method of keying on the 10-key number pad.

Sixth grade students will:

- review keyboard reaches and techniques.
- review how to create, edit, save, and print using a word processing program.
- learn formatting guides for a basic letter in language arts class.

Keyboarding skills will be reinforced throughout curriculum on a day-to-day basis. Teachers are using the computer programs and games to reinforce math and language arts skills. These games require one- and two-word entries. Elementary teachers will monitor computer time and reinforce the skills developed in keyboarding class. Elementary teachers will receive inservice instruction from the business teachers on how to monitor and reinforce keyboarding skills.

### How Much Keyboarding and Where it Fits in the Curriculum

Keyboarding will be required for third graders as a four week course (see table 3.1). It will be taught in the high school business lab. Class periods will be 43 minutes in length and meet daily (see table 3.2). This class will replace a recess. Keyboarding will be reinforced in the fourth grade with a two-week class (see table 3.3). The curriculum will cover a keyboard review and an introduction to a word processing program during the language arts class. In the fifth grade (see table 3.4), one-week will be spent on review of the keyboard in language arts class, during which basic report styles will be taught, and one-week will be spent during math class on an introduction to the 10-key numeric pad. Sixth graders will have a one-week class (see table 3.5). Instruction this week will be during the language arts class and will cover a basic letter style and keyboard review.

### Who Will Be Responsible For Teaching Keyboarding?

The keyboarding curriculum will be team taught by the business teacher and an elementary teacher. By combining the business teacher's knowledge of psychomotor skill development with the elementary teacher's knowledge of the learning



Table 3.2

### Third Grade Keyboarding Course Scope and Sequence

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	I: Class & Equip. I: Home Row Keys I: Space Bar I: Return or Enter I: Keystroking & Posture	R: Home Row Keys, Space Bar, & Return or Enter R: Keystroking & Posture	I: G & E keys R: Keystroking & Posture R: Eyes on Copy	R: All Keys Learned R: All Theory T: Type to Music T: Cover Keyboards T: 10 second timings	I: H & R keys R: Posture
Week 2	R: All letters learned I: Technique Chart T: Type to Music	I: U & T key R: Keystroking	R: Review R: Technique Chart T: 30 second (sec.) timings	I: M & I Keys R: Correct Typing Position	I: V & N Keys T: Hand back Technique Charts
Week 3	R: All letters learned T: 30 sec. timings T: Cover Keyboards	I: W & Right Shift R: Technique Chart	I: Period & C R: Keystroking T: Type to music	I: Y & Left Shift R: Posture	I: Review all Keys T: 1" timings T: Hand back Technique Charts
Week 4	I: O & B Keys R: Practice typing their names	I: Comma & Z Keys R: Technique Chart T: Type to Music	I: X, Q & Question mark T: Practice typing their names	R: All keys learned T: 1" timings I: Top row Numbers	R: All keys learned T: 1" timings R: Top row Numbers T: Handout Certificates

Key: T=Tasks/Topic R=Review I=Introduction  
 Text: Elementary Keyboarding, Gregg Division/McGraw-Hill Book Company, New York, NY, 1986, David L. Graham.

Table 3.3

### Fourth Grade Keyboarding Course Scope and Sequence

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 during Language Arts	R: Letters A to F R: Typing Posture & Techniques	R: Letters G to L R: Typing Posture Techniques	R: Letters M to S R: Rhythmic typing Techniques T: Type to music	R: Letters T to Z R: Typing Posture & Techniques	R: Numbers R: Typing Posture & Techniques T: 1" timings
Week 2	I: Word Processor I: Create & Edit T: Type a paragraph	R: Create & Edit I: Save & Print T: Type, edit, save, & print a paragraph	I: Proofreading R & P: Save, edit, create & print T: Type a written assignment	R & P: Proofreading I: Composing at the keyboard T: Composing exercise	R & P: Proofreading R & P: Save, edit, create, & print T: Type something the student wrote

Key: I=Introduction T=Task/Topic R=Review P=Practice  
 Text: Elementary Keyboarding, Gregg Division/McGraw-Hill Book Company, New York, NY, 1986, David L. Graham.

Table 3.4

### Fifth Grade Keyboarding Course Scope and Sequence

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 during Language Arts	R: Letter Keys R: Typing Posture & Techniques R: Create, Save, edit, & print	I: Basic Unbound Report Style T: Type a 1-page Report I: Proofreading	P: Proofreading R: Report Style T: Type a report	P: Proofreading T: Type a 2-page report	P: Proofreading R: Reports T: Type a report
Week 2 during Math Class	I: 10-Key Number Pad R: Techniques I: Home row keys (4, 5, 6, & 0) I: Enter Key	R: Techniques I: 7, 8, & 9 R: 0, 4, 5, & 6	R: 4, 5, 6, 7, 8, & 9 R: Techniques I: 1, 2, & 3	R: All numbers & Techniques I: decimal point & +, -, *, /, &= T: Type math facts	T: The number pad using their math assignments.

Key:

I=Introduction

T=Task/Topic

R=Review

P=Practice

Table 3.5

Sixth Grade Keyboarding Course  
Scope and Sequence

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 during Language Arts	R: Letters & numbers R: Typing Posture & Techniques R: Create, edit, save, & print T: Drills & type a paragraph	T: Drills to review letters and numbers Techniques T: 1" timings	R: Proofreading I: Block letter style T: Type a Block letter	R & P: Block letter style R & P: Proofreading	T: Compose & Type a letter in block format

Key: I=Introduction      T=Task/Topic      R=Review      P=Practice

patterns of elementary students, we hope to create effective keyboarding curriculum.

### Discussion

Implementing an elementary keyboarding curriculum will not only affect the elementary curriculum, but also the seventh grade program and high school course offerings. These are issues that will have to be handled as they arise. At this time, I believe the elementary keyboarding program needs to be implemented and a needs assessment performed as students enter the junior high and high school.

Schools are just beginning to understand how the computer will affect the way we deliver the curriculum to students. Students need to know how to keyboard--it is an investment in more efficient learning. The research seems to favor teaching keyboarding before grade six. Schools should do a needs assessment to determine when students are asked to input one- or two-word responses using a keyboard. Educators and administrators need to resolve the critical questions discussed in this paper and start an elementary keyboarding program.

Computers in the classroom are here to stay. Only those schools with the foresight to meet the demands of the changing

educational climate will produce students who succeed. Elementary keyboarding is one of these demands. School administration and faculty must make a conscious decision to offer keyboarding.

### Recommendations for Research

In light of the literature reviewed in this paper, more research is needed in the area of elementary keyboarding. Researchers need to compile data relevant to addressing the following questions: How much remedial work is required when students do not have keyboarding before a computer course? Who should be certified to teach keyboarding: elementary or business teachers? What is the impact of keyboarding skills on an elementary language arts program? What is the impact of students entering one- or two-word responses on the computer prior to formal keyboarding instruction?

### Implications for Practice

Four recommendations are made as a result of this study.

1. Students should not start keyboarding before the third grade, but it is important to introduce keyboarding before students need to keyboard long responses to computer programs. Students in kindergarten through second grade can

benefit from dexterity drills, right/left drills, and two-finger typing.

2. A 30-minute daily class period for 4- to 6-weeks seems to produce the minimum level of keyboarding skill that is essential to basic computer activities.

3. Elementary keyboarding be offered as a separate class and keyboarding curriculum reinforcement should be implemented in language arts and other subject areas.

4. Elementary keyboarding should be taught by elementary and business teachers using team teaching techniques. This will combine the business teacher's knowledge of psychomotor skill development with the elementary teacher's knowledge of the learning patterns of elementary students.

## References

- Balajthy, Ernest, (1988). Keyboarding, language arts, and the elementary school child. The Computing Teacher, 15(5), 40-43.
- Bluth, D., (1984). Implementing an electronic typewriting program. Business Education Forum, 38(4), 18-19.
- Graham, D. L., (1986). Teacher's manual for elementary keyboarding. New York: Gregg Division/McGraw-Hill Book Company.
- Headley, P. L., (1983). Keyboarding instruction in elementary school. Business Education Forum, 38(3), 18-19.
- Hinson, C. W., & Dickey, L. H., (1984). A practical approach to keyboarding instruction. Business Education Forum, 38(7), 10-13.
- Holmquist, D., (1983). Business Education: Some controversial questions. Business Education Forum, 37(5), 3-4.
- Jackson, T., & Berg, D., (1986). Elementary keyboarding--is it important? The Computing Teacher, 13(6), 8-11.
- Jones, C. Leroy, (1956). Typewriters Unlimited: History of the Typewriter. Springfield, MI: Rocky's Technical Publications.



- Kaser, K., (1984). Keyboarding course for K-6. Business Education Forum, 39(2), 16-17.
- Kercher, L., (1983). Life-skill learning for preadolescents. Business Education Forum, 37(9), 4.
- McClurg, P., Kercher, L., (1989). Keyboarding instruction: A comparison of five approaches. Journal of Educational Computing, 5(4), 147-169.
- Modilin, G., (1984, Spring). It's our turn. Business Education World, 4-5.
- Moen, N., Kidney, J., Burke, L., Smith, M., Reed, J., (1985). Elementary Keyboarding. Des Moines: Iowa State Department of Public Instruction, Division of Career Education, & Cedar Falls: University of Northern Iowa.
- Rigby, S., (1983). Keyboarding is for everyone. Business Education Forum, 38(1), 13-14.
- Robinson, J. W., (1985). Computer keyboarding: An elementary course. Cincinnati: South-Western Publishing Company.
- Sormunen, C., (1986). A comparison of two methods for teaching keyboarding on the microcomputer to elementary grade students. Delta Pi Epsilon Journal, XXVIII(2), 66-77.

- Sormunen, C., (1988). A comparison of speed achievement of students in grades 3-6 who learn keyboarding on the microcomputer. Delta Pi Epsilon Journal, XXX(2), 47-57.
- Sormunen, C., Adams, M. E., Berg, D., & Prigge, L., (1990). Teaching Keyboarding: Instructional Practices of Elementary School Teachers. Delta Pi Epsilon Journal, XXXII(4), 157-173.
- Tootle, John D., (1965). Typewriting in the written communication activities of the fifth grade. Delta Pi Epsilon Journal, VII(3), 65-76.
- West, L. J., (1986). Some cautions about keyboarding courses. The Delta Pi Epsilon Journal, XXVIII(2), 79-84.
- Wetzel, K. (1985). Keyboarding skills: Elementary, my dear teacher? The Computing Teacher, 12(9), 15-19.
- Williams, Michael R. (1985). A History of Computing Technology. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Wood, Ben D. & Freeman, Frank N., (1932). An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom. New York, NY: The Macmillan Company.

## APPENDIX A

*Technique Evaluation Form*

Evaluations should be done periodically and the results shared with the learner as the basis for improvement.

RATING SUPERIOR 3 POINTS AVERAGE 2 POINTS NEEDS IMPROVEMENT 1 POINT	RATING PERIODS		
	1	2	3
<b>WORK STATION</b>			
1. Keyboard even with front of desk			
2. Book positioned so it is easy to read			
<b>EYES ON COPY</b>			
3. Eyes on copy in book when keyboarding			
<b>POSITION AT TYPEWRITER</b>			
4. Body centered opposite the J key			
5. Feet on the floor			
6. Back straight and arms relaxed			
7. Wrists flat and fingers slightly curved over home keys			
8. Head erect and eyes on the copy			
<b>KEYSTROKING</b>			
9. Proper fingers used on all keys			
10. Keystroking at an even rate			
<b>SPACE BAR</b>			
11. All fingers remain in home position			
12. Space bar struck quickly with right thumb			
13. No hesitation before or after striking space bar			
<b>RETURN OR ENTER KEY</b>			
14. All fingers in home position while extending little finger of right hand to return key			
15. Return or enter key struck quickly and finger returned to home position			
16. Eyes on copy at all times			
17. No hesitation before or after the return			
<b>SHIFT KEYS</b>			
18. Other fingers kept in home position			
19. No hesitation before or after striking shift key			
<b>HANDLING PAPER (ON TYPEWRITER ONLY)</b>			
20. Paper guide and release used properly			
21. Paper inserted quickly and straight			

Note. From Teacher's Manual For Elementary Keyboarding (p. 10) by Graham, D. L., 1986, New York: Gregg Division/McGraw-Hill Book Company.

## Appendix B

### Third Grade Keyboarding Lesson Plan for Day 3 Week 1

#### Learning Outcomes

The student will:

- learn how to reach the F finger or left index finger to strike the G key.
- learn how to reach the D finger or middle finger to strike the E key.
- practice the correct typing position, hand position, and keystroking techniques.
- practice the touch method of typing by concentrating on watching the copy and not the keyboard.

#### Class Outline

##### I. REVIEWING TECHNIQUES

- A. Work station
  1. Keyboard even with front of desk.
  2. Book positioned so it is easy to read.
- B. Eyes on Copy
  1. Eyes on copy in book when keyboarding.
- C. Position at Typewriter
  1. Body centered opposite the J key.
  2. Feet on the floor.
  3. Back straight and arms relaxed.
  4. Wrists flat and fingers slightly curved over home row keys.
  5. Head erect and eyes on copy.
- D. Keystroking
  1. Proper fingers used on all keys.
  2. Keystroking at an even rate.
- E. Return Key
  1. All fingers in home position while extending little finger of right hand to return or enter key.
  2. Return or enter key struck quickly and finger returned to home position.

3. Eyes on copy at all times.
4. No hesitation before or after the return or enter key is used.

## II. PRESENTING NEW KEYS

### A. The G Key

1. Place your fingers on the home row keys.
2. Use the F finger or index finger to strike the G key and return to the home row position.
3. Feel the reach from F to G and back to F.
4. Say each letter to yourself as you type, and keep your eyes on the book.
5. Turn to the drill on page 4 of your text. Look at line 1, key this drill as I say it out loud.
6. Type lines 2 to 8 more than once remembering correct techniques.

### B. The E Key

1. Place your fingers on the home row keys.
2. Use the D finger to strike the E key.
3. Feel the reach from D to E and back to D. (Keep the A finger at home.)
4. Say each letter to yourself as you type, and keep your eyes on the book.
5. Turn to the drill on page 5 of your text. Look at line 1, key this drill as I say it out loud.
6. Type lines 2 to 8 remembering correct techniques.

### Unit Activities

Drills in Textbook on pages 3, 4, & 5

### Unit Resources

Text: Elementary Keyboarding, Gregg Division/McGraw-Hill Book Company, New York, NY, 1986, David L. Graham.

### Evaluation

Teacher observation  
 Completion of drills  
 Handed in assignment

Third Grade Keyboarding  
Lesson Plan for Day 1 Week 4

Learning Outcomes

The student will:

- learn how to reach the L finger or right ring finger to type the O key.
- learn how to reach the F finger or left index finger to type the B key.
- practice the correct typing position, hand position and keystroking techniques.
- practice the touch method of typing by concentrating on watching the copy and not the keyboard.
- learn how to type from handwritten copy.

Class Outline

I. PRESENTING NEW KEYS

A. The O Key

1. Place your fingers on the home row keys.
2. Use the L finger to strike the O key and return to the home row position.
3. Feel the reach from L to O and back to L.
4. Say each letter to yourself as you type, and keep your eyes on the book.
5. Turn to the drill on page 28 of your text. Look at line 1, key this drill as I say it out loud.
6. Type lines 2 to 8 remembering correct techniques.

B. The B Key

1. Place your fingers on the home row keys.
2. Use the F finger to strike the B key.
3. Feel the reach from F to B and back to F. (Keep the A finger at home.)
4. Say each letter to yourself as you type, and keep your eyes on the book.
5. Turn to the drill on page 29 of your text. Look at line 1, key this drill as I say it out loud.

6. Key lines 2 to 8 remembering correct techniques.

## II. TYPING FROM HANDWRITTEN COPY

- A. Type the student's name
- B. Type a handwritten spelling list

### Unit Activities

Drills in Textbook on pages 27, 28, & 29  
Type spelling list

### Unit Resources

Text: Elementary Keyboarding, Gregg  
Division/McGraw-Hill Book Company, New York,  
NY, 1986, David L. Graham.

### Evaluation

Teacher observation  
Completion of drills  
Handed in assignment

## Appendix C

### Fourth Grade Keyboarding Lesson Plan for Day 1 Week 2

#### Learning Outcomes

The student will

- describe some of the advantages of a word processing program has over a typewriter.
- identify the parts of a word processing program window and create a new document.
- learn to enter text and make simple corrections to documents.
- type a paragraph and make corrections.

#### Class Outline

- I. DISCUSSION OF WORD PROCESSORS
  - A. Advantages vs. Typewriter.
  - B. Discuss Hardware and Software.
- II. WORD PROCESSING FUNDAMENTALS
  - A. Creating a Document.
  - B. Naming a Document.
  - C. Text Entry.
  - D. Text Deletion.
  - E. Insertion Point Movement.

#### Unit Activities

Lecture and Computer Demonstration on Overhead  
Type a paragraph.

#### Unit Resources

Teacher's notes



**Evaluation**

**Weekly Technique Chart (Appendix A)  
Teacher Observation and Self Evaluation**

## Appendix D

### Fifth Grade Keyboarding Lesson Plan for Day 2 Week 2

#### Learning Outcomes

The student will

- review home row keys of 4, 5, 6 and enter.
- learn how to reach the four finger or right index finger to the seven.
- learn how to reach the five finger or right middle finger to the eight.
- learn how to reach the six finger or right ring finger to the nine.
- practice the reach of the four to the seven.
- practice the reach of the five to the eight.
- practice the reach of the six to the nine.
- practice the touch method of typing by concentrating on watching the copy and not the keyboard.

#### Class Outline

- I. REVIEW
  - A. Home Row Keys are 4, 5, 6.
  - B. The Enter Key is Typed with the Little Finger.
  - C. The 0 is type with the right thumb.
  
- II. PRESENTING NEW KEYS
  - A. Place Your Fingers on the Home Keys.
  - B. Use the 4 Finger on the 7 Key.
  - C. Use the 5 Finger on the 8 Key.
  - D. Use the 6 Finger on the 9 Key.

#### Unit Activities

Drills in Textbook on pages 66 & 67.

### Unit Resources

Text: Elementary Keyboarding, Gregg  
Division/McGraw-Hill Book Company, New York,  
NY, 1986, David L. Graham.

### Evaluation

Weekly Technique Chart (Appendix A)  
Teacher Observation  
Completion of drills

## Appendix E

### Sixth Grade Keyboarding Lesson Plan for Day 3 Week 1

#### Learning Outcomes

The student will

- exercise proofreading skills.
- demonstrate the ability to type a block letter.

#### Class Outline

- I. REVIEW PROOFREADING SKILLS
  - A. Review Proofreading Symbols.
  - B. Discuss the Mind Set Necessary to Finding Errors.
  - C. Discuss Common Errors.
  - D. Practice Finding Errors.
  
- II. PRESENTING BLOCK LETTER STYLE
  - A. Everything on the Left.
  - B. No Indentations.
  - C. Discussion of the Parts of the Letter.
  - D. Open Punctuation.
  - E. Type Letter From Arranged Copy.

#### Unit Activities

Proofreading exercise handout  
Block letter exercise handout

#### Unit Resources

Teacher's notes  
Block letter on a handout

#### Evaluation

Teacher Observation  
Completion of letter  
Completion of proofreading exercise