

1991

Handwriting: Past to present

Carol Collins
University of Northern Iowa

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Collins, Carol, "Handwriting: Past to present" (1991). *Graduate Research Papers*. 2226.
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Abstract

Is handwriting becoming a lost art? In this technological society where forms must be printed or typed clearly are we losing our ability to write our language? When the typewriter came into popular use, it was claimed handwriting would no longer be a needed skill. This has not been proven true. Templin (1960) concluded that while the typewriter gradually supplanted handwriting for making permanent records, "there is strong evidence to support the belief that all children now in school will need handwriting in their business and social lives for many years to come" (p. 164).

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

by

Carol Collins

June 15, 1991

This Research Paper by: Carol Collins

Entitled: Handwriting: Past to Present

has been approved as meeting the research paper requirement for the
Degree of Master of Arts in Education

June 17, 1991
Date Approved

Marvin Heller

Director of Research Paper

June 17, 1991
Date Approved

Marvin Heller

Graduate Faculty Adviser

June 20, 1991
Date Approved

Marcus Yoder

Graduate Faculty Reader

June 19, 1991
Date Approved

Peggy Ishler

Head, Department of Curriculum
and Instruction

Handwriting: Past to Present

Is handwriting becoming a lost art? In this technological society where forms must be printed or typed clearly are we losing our ability to write our language?

When the typewriter came into popular use, it was claimed handwriting would no longer be a needed skill. This has not been proven true. Templin (1960) concluded that while the typewriter gradually supplanted handwriting for making permanent records, "there is strong evidence to support the belief that all children now in school will need handwriting in their business and social lives for many years to come" (p. 164).

In this age of technology, several trends are evident. The use of computers will increase in homes, schools, libraries, and businesses. The portability of computers will increase while the cost of computers will decrease. Word processing programs for children and adults will be widely used (Furner 1985).

Yet, it will be difficult to see that electronic print will completely take the place of handwriting. Handwriting will still be needed to sign forms, checks, and documents and to write notes, shopping lists, and other non-permanent material. The art of handwriting will be needed in business and social life for many years to come.

With the increased pressures in the school day with the myriad of things to do and the increased use of technology, is handwriting instruction being pushed aside? With the advent of whole language instruction for reading and language arts and the use of word processing on the computer, is the teacher leaving out the teaching of handwriting skills? A review of the literature on this question shows that many of the teachers who began teaching in the last 25 years have little or no formal training in handwriting (Graham & Miller, 1980). Handwriting instruction is unpopular with teachers and students and is frequently regarded as using up valuable instructional time (Greenblatt,

1962). Because of changes in school practices, teacher training, and the wide use of electronically processed print, handwriting instruction is receiving less time in the curriculum.

Assuming that there is little argument about the need to teach handwriting in our technological age, questions remain to be answered. This paper will address the following questions: What are the current styles of handwriting being taught? What instructional techniques will facilitate learning in handwriting? Can computer-assisted instruction (CAI) provide instructional help for some or all learners? What handwriting form is learned most easily and is best suited for use in a technological age?

Current Handwriting Practices

The skill of handwriting or penmanship has been taught in our public and private schools since their origin. One of the most troublesome areas in elementary education is what "kind" of penmanship to teach. Research

has attempted to establish which style is the most legible and the fastest to write. But there are conflicting reports as to the superiority of any one style for handwriting instruction (Duvall, 1985; Peck, Askov, and Fairchild, 1980).

A brief description of the historical development of four handwriting styles is provided. In this description, cursive, manuscript, italic, and D'Nealian will be focused on.

Cursive Handwriting Style

Platt Roger Spencer, a writing master, can be credited with standardizing the teaching of handwriting. In 1848, he published Business Penmanship and began to mass-produce materials for instruction.

Spencer established the Spencerian College of Penmanship. Spencer's highly ornamental cursive longhand was appealing to elementary schools and commercial businesses. This cursive style longhand led to the wide use of copper plate engraving and was used for reproducing copybooks for school use at the

time. The influence of engraving led to a style in which letters began to be joined, capitals elaborated, and slant of letters increased.

G.A. Gaskell published a handwriting manual around 1880, followed by Charles Paxton Zaner in 1894, and Austin Palmer in 1910. Zaner and Palmer introduced the use of uniform thin lines in writing (Lehman, 1976).

The Industrial Revolution and the availability of handwriting manuals brought about standardized business operations, including handwriting used in transactions and record keeping. The commercial schools were responsible for the promotion of writing, because of the need for record keeping with the onset of the Industrial Revolution. Handwriting courses for the teaching of handwriting to be used in public schools were developed from these commercial schools.

Current publishers of cursive handwriting materials in America adapt letter models from Zaner and Palmer with the exception of the italic handwriting programs (Duvall, 1985a).

Duvall (1985b) states that handwriting is judged as cursive if letters are joined, small ascender and descender letters have loops, and small letters are elliptically shaped and the writing appears to be slanted. (See figure 1 in the appendix).

Manuscript Handwriting Style

Manuscript writing can be traced to the late nineteenth century. There was a revival of interest in traditional letter models in book making, print, and letter design in England.

William Morris revived the study of letter design and attracted the interest of many educators. One of his associates, Edward Johnston, in 1908, published Writing & Illumination & Lettering. Johnston gave a lecture to the annual Conference of London Teachers in January, 1913. Johnston suggested an ideal course. Children would begin with Roman capitals and their origins and then progress into an italic hand (Fairbank, 1968). But he published no models for the schools; therefore, London schools began experimenting

without consulting with Johnston. Johnston's ideal scheme proved too difficult for teachers to adopt.

Misinterpretations of his recommendations led to the development of a handwriting style using circles, half circles and vertical lines. This is now referred to as manuscript handwriting (Duvall, 1985a; Fairbank, 1968; Lehman, 1976).

Margaret Wise introduced manuscript style of writing to the United States in 1921 when she taught a course in manuscript handwriting at Columbia University. The style Wise introduced was an italic style.

This handwriting was first used in laboratory and private schools. The teachers adapted the manuscript and it became more rigid and geometric than Wise had intended. This ball and stick style was spread by Edith Connard. This became the current style referred to as manuscript writing. It has been universally adopted in our nation's schools (Lehman, 1976).

Duvall (1985b) judges handwriting to be manuscript if the writing has no slant, no letters are joined, and the small letters are round in appearance. (See figure 2 in the appendix).

Italic Handwriting Style

Italic handwriting evolved at the Renaissance time. Roman letters with penlifts were being used. There was a need for fast writing and fluency. From this need, the italic style of handwriting was developed.

Italic handwriting was originally recommended by Edward Johnston in 1908. Before that Monica Bridges published a book of 16th century italic letter models for the instruction of children. In 1928 Marion Richardson developed materials for schools. Alfred Fairbank developed italic models for children in 1932.

Margaret Wise in 1921 introduced a style of handwriting based on Alfred Fairbank's italic models. The italic letters she introduced were changed and modified into what is now known as manuscript writing. Wise

rejected this manuscript writing as ill-advised and misused. She supported the italic models developed by Alfred Fairbank (Lehman, 1976; Duvall, 1985a).

Lehman (1976) characterizes italic handwriting as being faster, being written more easily and rapidly, and lays a strong foundation for later joined letters. It allows a more natural transition from print to cursive by eliminating the confusing transition from ball and stick manuscript to looped cursive.

Handwriting is judged to be italic print if the writing has little or no slant, no letters are joined and the small letters are elliptical in appearance. Italic cursive has small letters that are elliptical. Some but not all of the letters are joined; small ascender and descender letters do not have loops; and the writing has little or no slant (Duvall 1985b). See the appendix, (Figure 3).

D'Nealian Handwriting Style

The D'Nealian program was developed by Donald N. Thurber and published by Scott,

Foresman and Co. in 1978. Although Thurber considers D'Nealian an adaptation of manuscript/cursive, writers of language arts text suggest teaching it as an alternative to the traditional manuscript/cursive (Henning, 1982).

The D'Nealian approach is a rhythmic flow from the start, rather than the start and stop writing required by most print forms. Letter size is also simplified. Legibility is promoted by providing a more flexible handwriting style beginning in kindergarten. (Wood, Webster, Gullickson, & Walker, 1987) note that individual handwriting variations are more acceptable in the program.

The D'Nealian manuscript forms are slightly oval and slanted showing more resemblance to the cursive letters rather than round and vertical as in the traditional manuscript letters. Children are taught to slant their writing from the beginning. Cursive D'Nealian follows the general characteristics of cursive letters in other writing systems (Duvall, 1985a).

(See figure 4 in the appendix).

Today these four styles of handwriting, cursive, manuscript, italic, and D'Nealian are grouped into three major systems for teaching handwriting (Masters, 1987). Masters (1987) indicates that most of the published handwriting programs can fit into one of these categories:

1. Ball and stick manuscript
(called circle and line by some publishers) followed by cursive.
2. Continuous stroke manuscript followed by cursive.
3. Italic (unconnected) followed by cursive (or connected) italic. (p. 7)

Ball and stick manuscript followed by cursive. Ball and stick manuscript as presented by the Palmer Company is characterized by five straight lines and curved line strokes. The letters are presented vertically with no slant. Cursive writing is usually introduced in third grade.

At this time the students must also start slanting their writing to the right. The letter formations vary a great deal from the vertical print to the flowing slanted cursive writing (Wood, Webster, Gullickson, & Walker, 1987).

The Zaner-Bloser program is similar to the Palmer Company's program. The manuscript is presented with six curved and straight lines strokes with no slant. Their cursive program begins with curved lines in late second grade or early third grade. Again the cursive letter formation varies markedly from the print style (Wood, Webster, Gullickson, & Walker, 1987).

Continuous stroke manuscript followed by cursive. D'Nealian presents a continuous stroke manuscript emphasizing a rhythmic flow. Printed letters are not the ball and stick ones. D'Nealian manuscript forms are slightly oval and slanted, much closer to the cursive form. Children are taught to slant their writing from the beginning. Students only need to add connecting strokes to their

printed letters to achieve cursive handwriting (Wood, Webster, Gullickson, & Walker, 1987).

Italic (unconnected) followed by cursive (or connected) italic. Italic print is characterized with the small letters being elliptical in appearance. Writing has little or no slant, and the letters are not joined (Duvall, 1985). Italic cursive has small letters that are elliptical in shape. Some but not all letters are joined. Small ascender and descender letters do not have loops, and the writing has little or no slant (Duvall, 1985).

To conclude this section on current handwriting practices a summary of an international survey of current practices in handwriting instruction will be provided. The survey was conducted by the Committee on Later Childhood Education of the Association for Childhood Education International. Questionnaires were distributed to over 400 urban and rural teachers for grades kindergarten through third in ten U.S. states and one Canadian province. Ninety-two percent

of the teachers responded. A summary of the results yielded the following information (Peck, Askov, & Fairchild, 1980):

1. Handwriting instruction is fairly uniform throughout the United States and Canada.
2. Manuscript writing is taught in the first grade and instruction in cursive writing begins in third grade. Formal classes in handwriting are given in kindergarten by 34 percent of the rural teachers and 15 percent of the urban teachers.
3. Handwriting is regarded as having a "close" or "very close" relationship with the "other language arts."
4. The entire class is taught at one time in most schools. The length of the lessons range from eleven to twenty minutes per day.
5. First grade teachers spend the

- most time on handwriting.
6. Three-guideline paper and pencils are preferred by most teachers.
 7. Only 30 percent of the teachers use workbooks. However, copying is practiced through the use of chalk-boards, overhead projectors, workbooks, and ditto sheets.
 8. Left-handed children are generally given special instruction in handwriting.
 9. Seventy percent of the schools give grades for handwriting. Also, evaluation of handwriting is almost always made by teacher observation rather than through the use of evaluative scales. (p. 290)

Instructional Techniques

Handwriting Programs

Most schools encourage good handwriting legibility through the use of a handwriting

program. Most handwriting programs are from a commercial series. Materials and methods for manuscript and cursive handwriting abound.

For example, El-Hi Textbooks and Serials in Print, 1985 contain 63 entries under the heading "Handwriting" (Koenke, 1986). Most schools relate their teaching to a published course using the pupils' books and worksheets as resources and models of good practice (Wood, Webster, Gullickson, & Webster, 1987).

A survey of four midwestern states showed that 70 percent of 630 school systems had formal handwriting programs with 58 percent of them offering a minimum of 50 minutes per week on handwriting instruction (King, 1961). The length of lessons usually range from eleven to twenty minutes per day with first grade teachers spending the most time on handwriting (Addy & Wylie, 1973). Handwriting instruction is usually taught as a separate subject in the curriculum (Rubin & Henderson, 1982).

Manuscript is usually introduced in first and second grade and instruction in cursive

writing is usually begun in third grade (Miller & Graham, 1980).

The majority of handwriting programs follow nearly the same format. That format usually consists of a teacher's manual, which the teacher uses to assist her or him in relaying the objectives of the lesson; and the child's booklet or recorder, which is used to read, practice, and record the daily assignments. Along with these two main parts, most companies offer additional instructional materials, such as charts, transparencies, pens and filmstrips, that most schools do not include in the program, primarily because of the added cost. Specially lined paper is recommended by the companies. A study by Trap-Porter, Cooper, Hill, Swisher and LaNunziata (1984) showed that when children are being introduced to both printing and cursive handwriting they perform better when they use special paper.

Most handwriting series follow a progression pattern with each grade level having its own particular area of emphasis.

Generally, most series implement the following progression: The kindergarten year is spent in readiness for manuscript printing, drawing circles and making sticks to use in the printing. In grade one the manuscript letters are introduced and developed. In grade two, the manuscript writing is mastered, and by the end of this year some children show aptitude for the beginning of cursive writing. By the fourth grade students practice and master the cursive style of writing. Grades five and six are spent perfecting the skills, and most children begin to develop their own style of writing. Legibility and pride are emphasized during the last years in elementary school.

The programs differ in the area of sequencing of program content. Some follow the order of the alphabet, first presenting all the lower case or "small" letters, and then the upper case or "capital" letters. Some present both lower and upper case letters together by alphabetical order. Others present grouping of similar letters. However, there is no apparent research to show that one

way is better than another (Graham & Miller, 1980). Meyer (1973) examined whether teachers

Handwriting as a Perceptual Motor Skill

Traditionally handwriting has been taught as a motor skill (Furner, 1985). Furner (1985) contends that effective handwriting instruction must be based on the recognition that handwriting is a perceptual motor skill. Furner (1985) claims that accurate perceptual representations are necessary for the development of legible fluent writing and the child must be able to form mental representations of letters, numerals, punctuation marks, and general procedures of writing. Furner developed a handwriting method. She then assessed the method in a six year longitudinal study. This study supports her contention that "perceptually-based" methodology, which involved multi-sensory stimulation, verbalization of procedures, and self-evaluation, was effective as a means of instruction (Furner, 1985, p. 7).

Several studies have examined the effectiveness of perceptually based

instructional techniques. Hirsch and Niedermeier (1973) examined whether teachers should encourage children to copy or trace during handwriting practice. Askov and Greff (1975) replicated the preceding experiment using a different tracing technique. The results from both of the studies show that copying is preferable to tracing in promoting correct letter formation behavior.

Hayes (1982) conducted an experiment with kindergarten and 3rd-grade children. He looked at copying practices employing visual and verbal demonstrations to assist in learning to reproduce model letter-like forms. The study concluded that copying can be enhanced by providing perceptual prompts, such as visual and verbal cues, resulting in significantly increased accuracy in reproducing letter forms.

Williams (1975) compared the effectiveness of copying and visual discrimination on the ability to reproduce letterlike forms. Forty black, low socioeconomic four and five year-olds (20

males and 20 females) were randomly assigned to four training conditions: reproduction (copying), discrimination (matching-to-sample), a combination of reproduction and discrimination, and no-training control. The results of this experiment indicated that effects of training were quite specific and that discrimination between letters and ability to copy letters must be considered as separate tasks.

Sovik (1976 and cited in Peck, Askov, & Fairchild, 1980) did a laboratory study at the University of Wisconsin involving 24 eight-year-olds identified as above and below average handwriters. He compared three techniques of instruction: copying still letterlike figures (still illustration); attending to an experimenter's hand while the figure was drawn and then copying the letter like figure (modeling); and listening to detailed explanations while the experimenter drew the figure and then responding by copying the stimulus figure (a combination of modeling and verbal instruction). Sovik found that

verbal instruction combined with demonstration improved subjects' performance.

Wright and Wright (1980) compared the effectiveness of still model letters versus motion models on handwriting legibility and letter formation of 120 first-grade students. To compare the two techniques, flipbooks for lowercase manuscript letters were constructed. As a subject flipped through the book, the given letter appeared in a manner similar to an animated cartoon. This was used by subjects assigned to the motion group. Subjects in the still group were given traditional still models of letters. The results showed that the motion group performed significantly better than the still group.

LaNunziata, Cooper, Hill, and Trap-Porter (1985) investigated the effects of still illustrations, motion illustration, and live modeling on lower-case manuscript letter formation of 14 kindergarten students. The results indicated that the live modeling condition produced an increase in letter accuracy.

Together, these studies support the use of perceptual-learning techniques. Copying led to better results than just tracing or discrimination training. Live modeling increased letter accuracy; and demonstration, when combined with verbal instructions such as rules for correct letter formation, helped children do even better.

Specific Instructional Recommendations

In a series of articles, Furner (1969, 1969, 1970) described a program of handwriting instruction in which the perceptual-motor nature of learning is emphasized. The following points summarize Furner's specific instructional recommendations (Otto, McMenemy, & Smith, 1973):

1. Involve pupils in establishing a purpose for each lesson.
2. Provide many guided exposures to formation of letters; e.g., focus attention upon different aspects of the formational process in subsequent trials, in order to assist the child in

building a mental image of the letter form.

3. Encourage a mental as well as a motor response from each child during the writing process; e.g., have the child describe the process as he writes, or have him visualize or write a letter as another child describes it. This procedure makes use of multisensory stimulation.

4. Stress self-correction by emphasizing comparison and improvement rather than writing many samples.

Practice in sustained writing to develop speed and stamina

should be given in sessions

other than those devoted to

developing the perceptual

aspects of writing.

5. Provide consistent letter-form

models. (The teacher's writing

should conform to the style adapted by the school.)

6. Keep expectations regarding quantity of writing consistent with what children can realistically produce. (Furner for example, found that the average first grader can write only 16-17 letters per minute. This amounts to only about 30 words in ten minutes.)
7. Limit the use of unsupervised writing or copywork. Prolonged writing periods not monitored by the teacher are apt to be detrimental to both the perceptual and the motor aspects of writing. (p. 343)

Furner's recommendations put stress on the perceptual-motor aspect of handwriting. Furner's recommendations do not prescribe the specific letter form models to be used; but stress that the forms chosen should be thoroughly learned and efficiently produced.

Sources of Difficulty in Handwriting

Since effective handwriting instruction should be based on the perceptual-motor nature of learning, an examination of sources of difficulty in handwriting is needed.

Gertrude Hildreth (1947) made a summary of the sources of difficulty in handwriting in her book, Learning the 3 R's. She divided the deficiencies into two main groups: factors that are inherent in the writer, and factors that arise from inadequacies of the instructional program.

Under factors inherent in the writer, Hildreth (1947) lists the following problems (p. 672-673);

- inaptitude for learning motor and language skills
- unstable and erratic temperament
- disinclination to practice
- difficulty in retaining visual impressions
- left-handedness and ambidexterity
- defective vision necessitating glasses, especially for astigmatism

paralytic, spastic, or crippled conditions

Under factors arising from inadequacies in the instructional program, the following are listed by Hildreth (1947):

- premature instruction that fails to insure readiness
- too highly formalized instruction
- lack of adequate supervision
- lack of consistent, regular practice
- stilted styles and inappropriate position
- unduly long practice periods
- Uniform, undifferentiated group drills
- too high standards of achievement in early grades
- practice of error due to lack of guidance
- inappropriate writing materials, pencils, pens, paper
- incorrect position of paper

difficulties due to transition from one style of writing to another (Ham and Miller (1969) state that underpractice on some letters and adolescent mannerisms and neglect of writing practice in high school.

premature pressure to speed up Examination of handwriting indicates that a few errors account for a large percentage of illegibilities in writing. Lewis and Lewis (1965) reported a study of errors in the formation of manuscript letters by first-grade students. Lewis and Lewis (1965) found that errors were most frequent in letter forms in which curves and vertical lines merge--J, U, f, h, j, m, n, r, u; errors were least frequent in letter forms constructed of vertical lines or horizontal and vertical lines--E, F, H, I, L, T, l, t.

An early study by Newland (1932) examining cursive handwriting samples of 2,381 people, ranging from elementary school age to adult, indicated that a very small number of

frequently appearing forms of illegibilities accounted for 50 percent of all illegibilities studied. Graham and Miller (1980) state that only four symbols-a, e, r, and t-account for 50 percent of the malformed letters at any grade level. (Phelps, 1985)

A study, conducted by Stennett, Smithe, and Hardy (1972), showed that children in grades kindergarten through three had more difficulty copying lowercase than uppercase primary print letters. The data indicated that uppercase letters appeared to be mastered by the second grade, but lowercase letters remained difficult for third grade subjects to copy. The most difficult letters were those requiring greater visual motor control (r, u, h, t). (Graham and Miller, 1980).

Fluency is an important consideration and teachers need to be aware of the difficulties when students cannot adjust their rate of writing. Speed is an essential element in note-taking, writing down one's thoughts, and completing certain timed exercises (Graham & Miller, 1980; Enstrom, 1964). Students must

be able to get their ideas down without having to struggle with either fast, but illegible writing or laboriously slow, but perfect writing. Rate seems to be a more difficult problem for many children than the actual formation of the letters (Phelps, 1985).

There are procedures which will help students to increase fluency. After the mechanics of handwriting have become automatic, the students can practice the skill on meaningful written assignments. Occasional timed exercises or speed drills can also increase fluency. These procedures are important in the elementary school handwriting program because by secondary school there is no planned handwriting program to assist students (Graham and Miller, 1980).

All of the above factors, along with errors in letter formation, should be considered when attempting to uncover the causes of handwriting difficulties and to plan remedial teaching.

Remedial Instruction

To be effective, an instructional program in handwriting should have a means for helping individual students remedy specific difficulties. Tagatz, Otto, Klausmeier, Goodwin, and Cook (1968) contend that generalized teaching to a whole class is less efficient than individualizing instruction. Tagatz, Otto, Klausmeier, Goodwin, and Cook (1968) designed a study to determine the effects of three different approaches to handwriting instruction in grades three and four. The three approaches were formal group approach, formal-individualized approach, and individualized-diagnostic approach. The formal group approach was to follow the instructional plan outlined in commercial system adopted by the school. The formal-individualized approach was to follow the sequence of instruction outlined in Penskills II, An Individualized Handwriting Skills Program published by Science Research Associates (1965 and cited in Tagatz, Otto, Klausmeier, Goodwin, and Cook, 1968). The

Individualized-diagnostic approach did not make use of systematic commercially prepared materials. Individuals were assisted and encouraged to recognize errors and malformations in their own writing and to work specifically on the elimination of personal difficulties. The individualized approaches were superior to the formal group approach; and the individualized-diagnostic approach was superior at grade three, but not at grade four.

Graham and Miller (1980) offer a combination of various instructional and motivational procedures to teach letter formation. These procedures include:

Modeling-The teacher writes the letter and names it. The student observes the number, order, and direction of the strokes.

Noting critical attributes-The teacher compares and contrasts the stimulus letter with letters that share common formational characteristics.

Physical prompts and cues-The teacher physically directs the student's hand in forming the letter. Additionally, the direction and order of strokes can be guided through use of arrows or colored dots outlining the letter shapes.

Tracing-The student forms the letter tracing dot-to-dot patterns, dashed letters, a faded model, raised letters or an outline.

Copying-The student copies the letter on a piece of paper or in wet sand (calling upon the tactile sense).

Self-verbalization-The student verbalizes the steps as the letter is written (using the auditory mode).

Writing from memory-The student writes the letter without the aid of cues.

Repetition-The student practices

forming the letter, through concentrated multisensory drills. Self-correction and feedback-The student corrects malformed letters with the assistance of a visual aid (e.g., desk, or wall alphabet charts) or under the teacher's direction.

Reinforcement-The teacher praises the student and gives primary reinforcers for correct letter formation. (p. 9)

Instructional Errors in Teaching Writing

Hofmeister (1973) lists five common instruction errors in teaching handwriting. She stated that without guidance the teacher attempting remedial instruction could make errors that would reduce the effectiveness of the remediation. The errors listed were

(Hofmeister, 1973):

1. Massed practice without supervision.
2. No immediate feedback.
3. Emphasis on rote practice sample and

rather than discrimination.

4. Failure to provide good models.

5. No differentiation between good

and poor work. (p. 30)

Hofmeister (1973) developed the progressive approximation approach program to help the teacher with effective remedial instruction. The program uses worksheets with a model at the top and space for several practice lines below. The procedure has four major steps taking the child through a series of progressive approximations towards more legible handwriting. (See figures 5, 6, 7, and 8 in the appendix).

Evaluation Techniques

Evaluation is essential to handwriting instruction. There must be an assessment of a student's present level, strengths, weaknesses, and progress.

The evaluation of a student's progress is twofold—the teacher's and the student's own evaluation. The teacher's evaluation tends to be subjective. The judgment of quality is based on a "total" reaction to the sample and

In comparison of the child's work with the model letters given by the company and writing samples collected from other children's work in the class. Time does not allow the teacher to evaluate carefully each letter (Manning, 1988).

Armitage and Ratzlaff (1985) state teachers are generally unfamiliar with and unaware of the specific criteria for judging legibility. Graham (1986) states there are two general reasons teachers have not adopted standardized instruments. First, most of the handwriting programs currently available have been designed to provide instruction but not to measure the effectiveness of that instruction. Second, handwriting has not received much attention in either teacher training programs or in field settings; and as a result, many practitioners have not been exposed to various handwriting measurement techniques.

However, the research indicates handwriting evaluation, whether for diagnostic purposes or assigning grades, can be

objective, accurate, and take several forms (Manning, 1988). Alston (1983) performed a study to determine whether handwriting could be evaluated consistently using a legibility index. Alston (1983) concluded that handwriting could be measured and that evaluation measuring scales could be constructed.

In 1976, Helwig, Johns, Norman, James, and Cooper constructed transparent overlays to measure the deviation of student samples from model letters. (See Appendix I). The need for a reliable instrument to measure the rate and quality of handwriting led to the development of the Children's Handwriting Scale constructed by Phelps and Stempel in 1985.

In regard to the children's evaluation, self-evaluation is especially important because few teachers make use of handwriting scales but rely too heavily on neatness and personal opinion (Manning, 1988). Self-evaluation helps place both the responsibility for change and the decision

about whether change is necessary on the student.

However, studies show that students have difficulty judging the quality of their work. A study by Harris and Herrick (1963) reports that few children can judge the quality of their own handwriting and make improvement, and that poor handwriters were even less successful at judging the quality of their own handwriting than were good handwriters.

Studies by Jones, Trap, and Cooper (1977) and Johns (1977) did report that teachers can train to students to evaluate their own handwriting. Jones, Trap, and Cooper (1977) report that first grade pupils evaluated their own handwriting using transparent overlays and demonstrated high reliability scoring when evaluating handwriting performance.

Johns (1977) examined the effects of using evaluative overlays to train students to recognize and form letters. Johns (1977) also examined the effects of using overlays to help students self-record and chart legible manuscript letter strokes. Johns' (1977)

conclusions were that first graders were able to accurately and reliably use overlays and self-record manuscript strokes.

Evaluation of a student's progress should be made individually. A suitable analysis should consider readiness for formal instruction, general handwriting level, and immediate causes of poor performance (Graham & Miller, 1980).

Legibility and fluency should be considered when establishing a basis for corrective teaching. Students' handwriting should be rated for legibility at frequent intervals. To judge legibility, the teacher should concentrate on letter formation, uniformity and degree of slant, alignment, line quality, spacing between letters and words, letter size, general neatness, beginning and ending strokes, and, where appropriate, the joining of letters.

Fluency is determined by the number of letters a student can copy accurately per minute over a short time. Teachers need to be concerned about the remediation of writing

speed because if writing is not reasonably fluent, the pupil cannot function efficiently in written school work.

Various standardized scales are available for measuring a student's handwriting legibility and fluency. Frank N. Freeman developed a series of scales for rating manuscript (grades 1-2) and cursive (grades 2-8). On the Freeman Scale, Freeman (1915 and cited in Otto, McMenemy, & Smith, 1973) suggested speed norms for grades two through eight. Speed is expressed in letters produced per minute in the following chart:

Grade one.....	23 letters
Grade two.....	30 letters
Grade three.....	40 letters
Grade four.....	50 letters
Grade five.....	60 letters
Grade six.....	67 letters
Grade seven.....	74 letters
Grade eight.....	80 letters

(Freeman, 1915, as cited in Otto, McMenemy, & Smith, 1973, p. 346)

Ayres developed an eight-step scale measuring the general legibility of a student's

student's cursive writing. Legibility would be measured by examining letter form, uniformity of slant, uniformity of letter alignment, quality of line, and spacing between letters and words. Ayres constructed the scale with eight degrees of quality for grades two through eight. The numerical values assigned to these degrees of merit are 20, 30, 40, etc., up to 90. The norms in the following chart are based on the Ayres Scale (1917 and cited in Otto, McMenemy, & Smith, 1973):

Grade two.....	30
Grade three.....	40
Grade four.....	50
Grade five.....	60
Grade six.....	67
Grade seven.....	74
Grade eight.....	80

The following table is the one in the book (p. 347):

Because using handwriting scales on a day-to-day basis is impractical, most handwriting evaluation is done informally (Addy & Wylie, 1973). One way of diagnosing a

student's handwriting problems is to obtain samples measuring fluency and legibility. Brueckner and Bond (1955) suggest copying and free writing exercises. On a copying exercise a student is given a sample sentence to reproduce. The sentence should contain all the lower case alphabet letters. The student should know the phrase thoroughly and know how to spell each word. On a free writing exercise, the student is asked to write from memory a sentence or simple selection.

In securing either a copying or free writing sample, the teacher's recommendations affect a student's performance (Otto, McMenemy, & Smith 1973). Otto, McMenemy, and Smith (1973) recommend that a teacher obtain a sample of each of the student's usual, best, and fastest writing. The student should become familiar with the selected sentence. The teacher instructs the student to write the sentence "at your usual rate" for at least a two- or three-minute time period. After a period of relaxation, the teacher gives instructions for the "best" sample. The

student is to take all the time that is needed and is told to write "as well and as neatly as you can." Finally, after another relaxation period, the student is instructed to write the test sample "as rapidly as you can in three minutes."

When the three samples have been obtained, the teacher has a basis for comparing handwriting. The teacher can use various handwriting scales or informal procedure to identify students that do not meet minimum standards of legibility or fluency.

Children are different, with different strengths and weaknesses. The teacher must identify these specific characteristics and provide for this. One way is to have small groupings or individualize instruction so that a student's practice is confined to the problem area.

Computer Assisted Instruction

Few studies have examined the effectiveness of utilizing computer assisted instruction (CAI). However, Furner (1985)

states that computer assisted instruction (CAI) involves interaction of the learner with the computer to teach new skills and information or for practice. Characteristics of CAI involve activities that help the learner concentrate attention on the task as a whole and on those aspects relevant at each stage, and exercise fine control over the learning process. CAI should also provide activities that are challenging (but not too difficult) and at the same time enjoyable, include individualization of the rate of learning based either on computer analysis of responses or by the learner, provide feedback on both moment to moment and overall performance, and reinforce successes (Lally & Macleod 1982).

CAI in Handwriting

An Australian research study using CAI to improve formation of lower-case letters and numerals was conducted by Lally in 1981. Nine boys between nine and sixteen years of age from a special school in Canberra were selected to participate in the study. The

selection was based on their poor quality of handwriting. The handwriting program used a computer connected pen as the interface between the learner and the machine. Positive results were obtained using this technique (Lally, 1981).

Abboud (1972) conducted a study utilizing CAI to teach handwriting skills. He utilized the computer to teach the Arabic writing system to English-speaking adult students. Use of the CAI was warranted because it permitted "many more options for individualizing instruction, immediate feedback, management of a complete system of events of great complexity, and the capability to control a variety of complex display and response entry devices" (Abboud, 1972, p. 196).

Macleod and Overheu (1977) also documented the positive affects of CAI in structuring learning experiences, not only for handwriting but for other basic skills. The project aimed at applying computer techniques to assess and develop basic skills in mildly

intellectually handicapped children. A DIGIVUE dot-matrix discharge panel on which lines, text, and other graphic detail can be displayed, and a pen with a pressure-activated switch were used by the students. The research study indicated that the techniques developed were appropriate to more severely handicapped children.

Herman and Singer (1989) have developed a computer handwriting software program for Singer Consultants Custom Software. It is called Write Now for the Apple IIc, IIe, and IIgs. The Apple II program consists of eight lessons that are to facilitate the teaching of manuscript writing. Each lesson shows the students how to form the curves and lines, where strokes start, in which direction to go, and what the proper proportions are. The authors state that this program has been used with special education classes, kindergarten through second grade classes, and in a literacy program for dyslexic inmates at the Nassau County Correction Center.

There are few studies about utilizing CAI to teach effectively handwriting skills. Furner (1985) states that carefully designed, computer-based programs of instruction can be of value for some, if not all, learners. There is no reason to believe that technology will reduce the need to learn the skill of handwriting for personal use. Technology, however, will be able to guide the children as they practice writing by providing the right kind of practice at the right time (Masters, 1987). A well conceived computer-assisted instruction program can be an efficient and effective method of accommodating individual differences (Abboud, 1972).

Most Easily Learned Style

There is much debate about which handwriting system—manuscript or cursive—should be taught in instructional programs. Both systems have been taught in the United States and Canada for about 90 years. A study by Sloan in 1977, indicated that there is strong support from both parents and teachers for the practice of instructing

children in both cursive and manuscript writing.

Despite the widespread practice of teaching both styles, some experts claim that manuscript writing would be the best choice for use in our technological society (Furner, 1985; Hildreth, 1963; Templin, 1964; Freeman, 1940). There are several reasons for this recommendation.

Studies performed by Furner (1985, 1969a, 1969b) indicate that manuscript writing is the best form for initial learning because it is perceptually easier. In cursive writing the unit of perception is with the whole word rather than with just the stroke or letter in manuscript. Also, closed forms that are in vertical orientation to the baseline are more easily perceived than irregular forms that are in slanted orientation to the baseline (Furner, 1985).

Because of its resemblance to print, manuscript facilitates learning to read. Plattor and McQueen (1986) stated that since manuscript letters are more like the print

symbols in early readers, the complex task of learning to read is eased.

Students and adults can write manuscript as fast as or faster than cursive (Jackson, 1971). With increases in speed, the quality of manuscript writing deteriorates less rapidly. Manuscript can be produced as rapidly as cursive writing while being more legible (Jackson, 1971; Templin, 1960).

Manuscript writing is accepted by both adults and big business. Groff (1964) sent a questionnaire to the personnel or public relations directors of 115 large corporations. Ninety-two of these executives, or 80 percent, responded. There was favorable opinion or no opposition from 85.7 percent of the respondents to the use of manuscript by their employees. They indicated that they wanted the most legible handwriting possible regardless of the style that was taught.

CAI is being used more widely across the curriculum. The similarity of electronic print to manuscript will make the use of the manuscript form of handwriting crucial.

The change from manuscript style writing to cursive writing is unnecessary. Instructional time can be saved by teaching only one form. Manuscript is more easily learned, is more legible (Graham and Miller, 1980) and is as fast to produce as cursive handwriting (Jackson, 1971). With the increased use of computer technology, the inefficiency of a dual handwriting system will be even more noticeable. In a crowded curriculum, children should be allowed to develop manuscript as a handwriting form and then devote the time to purposeful written expression.

However, other handwriting authorities Cruickshank, Bentzen, Ratzeburg, and Tannhauser (1961) promote the use of cursive writing for these reasons: The child uses a continuous flowing motion which carries him along to completion of whole words. Since words are written as connected wholes, improper connections are not the problem as they often are in manuscript. Connections between letters emphasize left-to-right

progression. Cursive results in less directional confusion than manuscript and, therefore, there are fewer reversals.

Sloan and Triplett (1977) indicate there is much support for the use of the cursive handwriting style among both teachers and parents. Also, cursive writing is highly motivating among students. Students want to learn this "grown-up way to write."

Enstrom (1964) agrees that cursive writing style should be taught. In all-print experiments, students tend to join print into a poor form of cursive. He thinks students should be taught an efficient cursive handwriting. Enstrom also claims that cursive handwriting style is swifter and less tiring than manuscript handwriting style.

Advocates of cursive handwriting think that manuscript writing is not the answer to all communication needs. It is thought cursive writing is easier, more rhythmic and speedier to write than manuscript. Cursive writing is continuous and connected and, therefore, is perceived as whole units. In

cursive writing, commonly confused letters no longer look alike. Cursive writing is preferred by both teachers and parents.

Conclusions

The skill of handwriting or penmanship has been taught in our public and private schools since their origin. It has always been the teacher's responsibility to help children learn the art of reproducing the alphabet in such a way that others may read and understand their ideas and the knowledge they wish to communicate. In earlier times this task of teaching handwriting was not very uniform. There were no special series of specified letter formations, charts, sequences of skills for the teacher to follow. Today there are complete programs specifically intended for the instruction of handwriting. A problem in elementary education has been what style of handwriting to teach. Research does not support the superiority of any single style of handwriting to be taught.

There is considerable evidence that the manuscript form of handwriting should be

taught and maintained throughout the instructional program. Manuscript looks more like the typeset letters found in books, and leads to greater gains in reading achievement. It is more easily learned, is more legible, and is at least as fast to produce as cursive handwriting. Manuscript is similar to electronic print. Manuscript writing is an accepted form and is used by many adults for both occupational and personal purposes (Groff, 1964).

However, the evidence is not conclusive that manuscript is the best choice. It can be recommended that once a student acquires legible and fluent manuscript, the instructor should teach cursive when it is appropriate. For many children learning two styles doesn't present a problem and many children are eager to learn cursive. Cursive writing should not be considered as a replacement for manuscript writing, but as an extra skill to be used for communicating.

Since there does not seem to be a best method, some guidelines are needed for

handwriting instruction such as the following recommendations.

(1) Handwriting should be viewed as a perceptual motor skill. The program should combine verbal and visual feedback with rewriting or reinforcement (Furner 1985). Effective handwriting programs should provide opportunities for students to verbalize the rules of letter formation and evaluate their own success.

(2) Teachers should encourage beginning writers to copy. Copying leads to better results than tracing or discrimination training (which helps one to read a letter). Copying can be enhanced by visual analysis of letters and perceptual prompts; the teacher states the direction or curve of the letter while the child actually writes.

(3) Evaluation of students in a handwriting program should combine formal procedures and informal procedures based on teacher observation and student work samples. Teachers should provide individual diagnosis and remedial instruction from informal

procedures or use various evaluation scales, Freeman, Ayres, or, Phelps and Stempel's CHES.

(4) There is conflicting research about self-evaluation. Studies show that students have difficulty evaluating their work. However, other studies indicate that self-evaluation is an important aspect for improvement of handwriting and students should be encouraged to use self-evaluation of letter formation. When necessary, the teacher should offer guidance to help students realistically evaluate their performance and progress in handwriting.

(5) The preference for electronically processed print rather than the penned hand has influenced handwriting instruction in schools. Well conceived computer assisted instruction programs will be needed. Computer-based instruction that can accommodate individual differences has been shown to be effective with students at the lower end of the ability spectrum.

Masters (1987) states that, "handwriting is a primary tool of communication and

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Appendix A

Figure 1. An example of the small letters
handwritten by Dr. Betty Duvall based on
the Palmer Cursive models.

a b c d e f g h i j k l m
n o p q r s t u v w x y z

Appendix B

Figure 2. An example of the small letters
handwritten by Dr. Betty Duvall based on
Zaner-Bloser manuscript models.

a b c d e f g h i j k l m
n o p q r s t u v w x y z

Appendix C

Figure 3. An example of small letters handwritten by Dr. Betty Duvall based on the Duvall Italic print models.

a b c d e f g h i j k l m
n o p q r s t u v w x y z

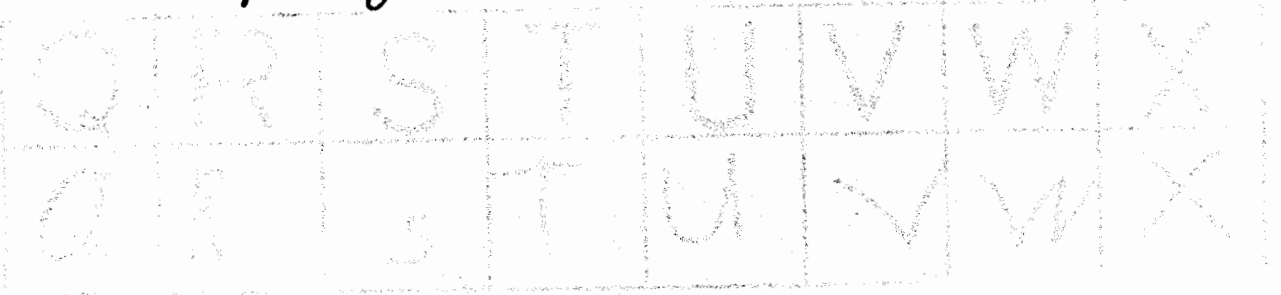
Appendix D

Figure 4. An example of the small letters handwritten by Dr. Betty Duvall based on D'Nealian manuscript model.

1970-71, p. 60-69.

Figure 5

a b c d e f g h i j k l m
n o p q r s t u v w x y z



Appendix E

Progressive approximation approach program
developed by Alan M. Hofmeister (1973).

Let's get it write. Teaching Exceptional
Children, 6, 30-33.

Figure 5

Step 1. The child completes the first
line and informs the teacher.

Q	R	S	T	U	V	W	X
Q	R	s	T	U	v	w	X

Appendix F

Figure 6

Step 2. The teacher corrects by overmarking with a "high-liter" (transparent colored felt tip marker).

Letters which represent significant improvement are not corrected and the child is not required to repeat this

letter. The teacher should try to incorporate as much as possible of the child's efforts in her overmarking.

Q	R	S	T	U	V	W	X
Q	R	s	T	U	v	w	X

Appendix G

Figure 7

Step 3. The child erases incorrect portions of letters and traces over the teacher's high-lighter making. Note: the pupil must trace the whole letter, not just the incorrect portions.

Q	R	S	T	U	V	W	X
Q	R	S	T	U	Y	W	X

Appendix H

Figure 8

Step 4. Then move to the next line. The same procedure is followed, except that the child repeats only the letters which were incorrect on the preceding line.

Q	R	S	T	U	V	W	X
Q	R	S	T	U	V	W	X
Q	R	S		U	V	W	X

Appendix I

Helwig, J., Johns, J., Norman, J., & Cooper, J. (1974). The measurement of manuscript letter strokes. Journal of Applied Behavior Analysis, 2, 321-236.

Figure 9. Illustration of the evaluative overlay and the correct use of the overlay to measure the letter "m". The vertical stroke of the letter was not totally within the confines of the overlay; therefore it did not meet criteria for a correct response. The two-hump strokes met all criteria of the behavior definition (Helwig, Johns, Norman, & Cooper, 1976).

