

The Effects of Drill and Practice on Increasing Accurate Formation of Lower-Case Calligraphy Letters

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The rate of a 21 year old university student's corrects and learning opportunities (i.e., errors) in lower case calligraphy was examined. Constructing drill sheets with appropriate size lines and appropriate slant, plus size lines was effective in increasing correctly written calligraphy letters and reducing the learning opportunities during 3 minute timings. Results also showed steady accelerating learning trends related to correct letter formation of calligraphy handwriting, and dramatic decelerations of learning opportunities during the slow and easy experimental conditions. Benefits of teaching calligraphy were discussed.

Handwriting is viewed as an important communication skill (Hansen, 1978; Sweeney, Salva, Cooper, & Talbert-Johnson, 1992, 1993; McLaughlin, 1981). It can be difficult for a person reading a message to comprehend what is being communicated if the writer has written the message in an illegible manner.

A major goal in handwriting research has dealt with legibility (e.g. Brunner, McLaughlin, & Sweeney, 1993; Hansen, 1978; McLaughlin, 1981; Talbert-Johnson, Salva, Sweeney, & Cooper, 1991). Intervention strategies to assist and improve legibility have ranged from error drill (Brunner et al. 1993), academic positive practice (McLaughlin, Mabee, Byram, & Reiter, 1987), and self-management strategies (Sweeney et al., 1993).

Calligraphy comes from the Greek meaning beautiful and to write (D'Angelo, 1982). Calligraphy is a skill which has use for students. Teachers have noted that students appear to be highly motivated and feel that neatness is important when calligraphy is taught. Calligraphy also enjoys a great deal of attention with adults. It can be employed for writing invitations, making signs, or making another person feel special. Many times calligraphy is taught as part of industrial arts, vocational education, or in continuing education classes. Since calligraphy is a skill that has movement, is repeatable, and controllable, it can be improved employing specific Precision Teaching interventions and measurement strategies.

The purpose of the present research was to examine the effects of drill and practice with specialized practice sheets on a college student's performance in writing the lower case alphabet in calligraphy.

Method

Subject and Setting

The subject in this study was a 21 year old female university student majoring in special education. Although her handwriting was legible and stylish, she wanted to learn calligraphy to add a finishing touch to her performance. The study took place in various settings around the university. The student practiced calligraphy in her room, the library, the student center, athletic department offices, and friends' houses. Research was performed over five weeks, from March 29, 1993 to May 5, 1993. The study was conducted by the first author with another special education major present once a week for reliability checks. An engineering student, with expertise and experience in the writing and use of calligraphy, provided the standard for quality.

Response Definition and Observation Procedures

The movement cycle was to write 36 perfect letters of the alphabet in calligraphy, in order, during a 3 minute timing. Each letter was judged according to three criteria: size, slant, and formation. A template was employed for judging

the formation, size, and slant of the individual calligraphy letters. This template served as the standard for evaluating the three criteria used over the duration of the study. Therefore, each letter was broken into three responses. Thus, the goal for each trial was to obtain 108 correct responses and 0 learning opportunities.

Corrects. A correct, or perfect, response for each letter included a letter that was simultaneously formed correctly, had the correct slant, and the correct size. However, each letter could also receive partial credit (e.g. correct slant and size but incorrect formation = 2/3 point). A template was used and placed over the participant's writing to make such judgments.

Learning opportunities (i.e., errors). A learning opportunity occurred any time the student wrote a letter that did not match the standard. A learning opportunity was defined as a letter that was formed improperly, a letter that did not contain the correct slant (45 degrees), or a letter that was the incorrect size.

Experimental Design and Experimental Conditions

An ABCDE single subject replication design (Kazdin, 1982) was used to evaluate the effectiveness of the various strategies. A description of each follows.

Baseline. The baseline consisted of the student looking at the standard for quality and attempting to replicate it on a piece of white paper with horizontal lines drawn manually to guide the student. These data were taken for three days.

Lined paper. The first intervention employed computer-generated paper which provided guides for the actual size of the letters. This paper had horizontal lines to indicate the correct place for the top and bottom of the letter, as well as a line to show where "t"s and "f"s should be crossed. This procedure lasted four days.

Lined paper and vertical guides. The second intervention used the same paper, with the addition of vertical lines drawn at 45 degree angles across the paper to aid the student in acquiring the correct slant. Figure 1 is a sample of this intervention. This condition was in effect for three days.

Slow and easy. During the "slow and easy" intervention, the student reminded herself to slowly make each letter and form each correctly, rather than make as many letters as she could during the timings. These 3 minute sessions occurred 22 times.

Error drill. Lastly, to decrease the errors to zero, error drill on the letter "k" was employed for three sessions.

Reliability

Interobserver reliability or agreement was taken once during baseline and five times during the four interventions. The experimenter and the second special education student each regraded the trial of letters separately without seeing the other's results. The percent of interobserver agreement was calculated by dividing the smaller number of behaviors counted by one observer by the larger number of behaviors counted by the second observer and then multiplying by 100. The percent of interobserver agreement for correct letters was 85% with a range from 81% to 95%. The percent of interobserver agreement for incorrect letters was also 85% with a range from 81% to 95%.

Results

The data from Chart 1 indicate improvement in the legibility of written calligraphy letters. The frequency of correct responses related to size, slants, and individual letter formation increased for written calligraphy letters, while the frequency of learning opportunities (i.e., errors) dramatically decreased during the slow and easy and error correction conditions. All median scores are represented as ratios: frequency of response/3 minute timing period can be expressed as frequency/per minute (Whalen, Willis, & Sweeney, 1993). During baseline, the median frequency/per 3 minute timing of correctly written individual letters for the written calligraphy letters was 5 per minute with scores ranging from 5 to 6.67 per minute. The learning opportunities, during baseline, revealed a median frequency/per 3 minutes of 30 per minute with a range of learning opportunities from 25 to 36.67

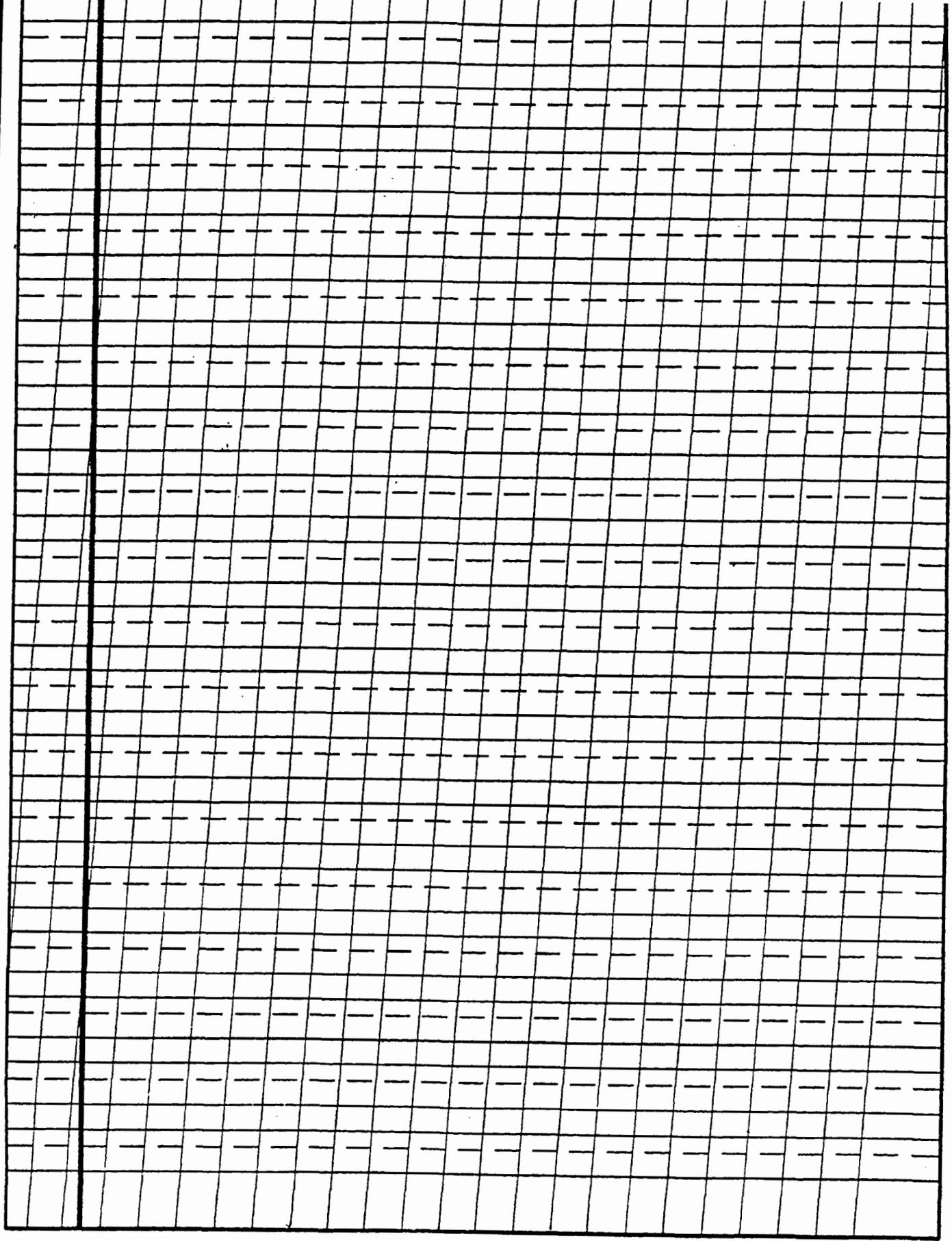
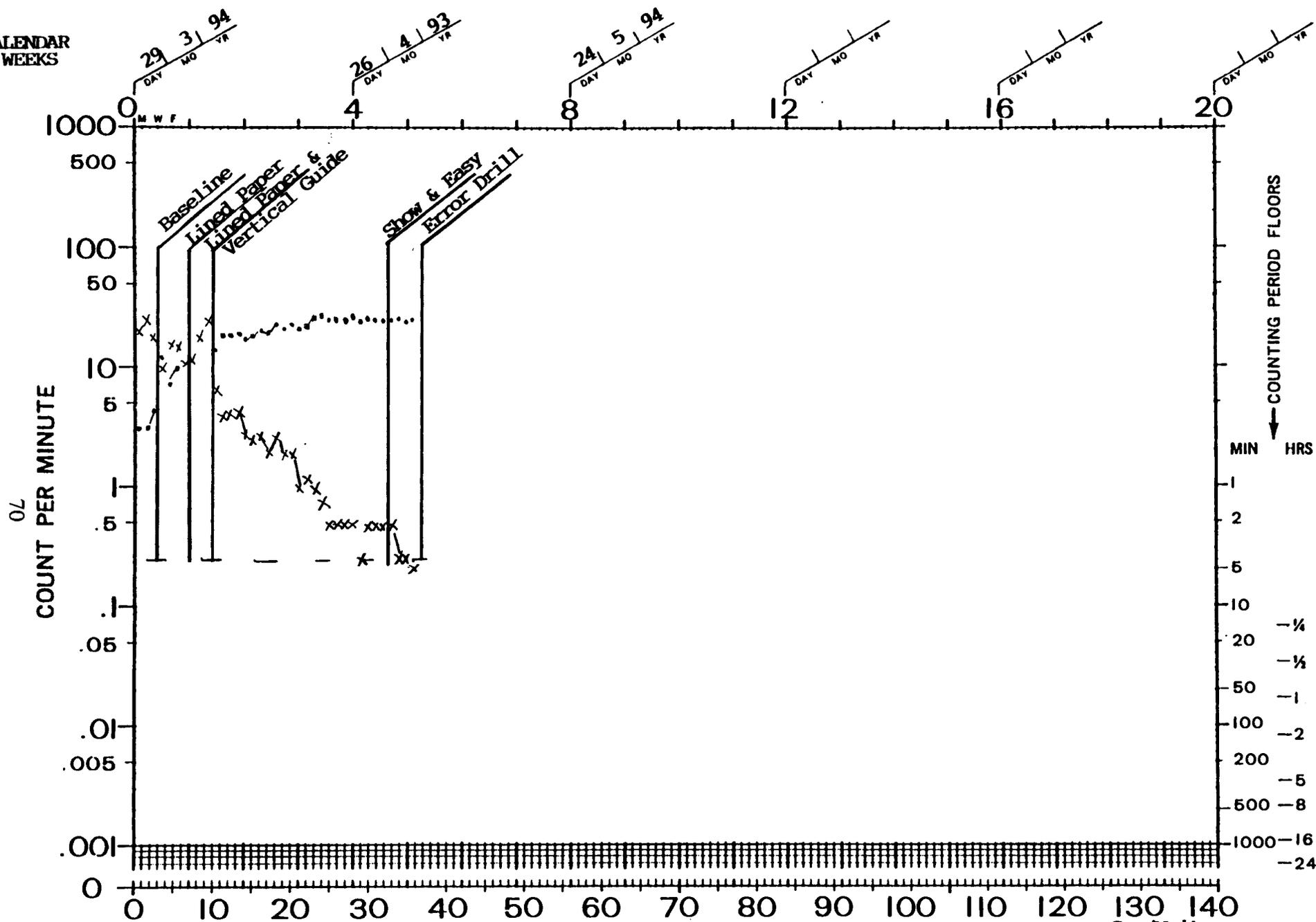


Figure 1. Lined paper with vertical guides practice sheet.

CALENDAR WEEKS



<u>T.F. McLaughlin</u>		<u>S.J. Sweeney</u>		<u>Sharon L.</u>		<u>21</u>		<u>See/Write</u>	
SUPERVISOR	ADVISER	MANAGER		BEHAVIOR	AGE	LABEL	COUNTED	<u>Written Calligraphy</u>	
<u>S. J. Sweeney</u>		<u>Gonzaga University - Sp. Ed.</u>		<u>Sharon L.</u>		<u>Sharon L.</u>		<u>S. J. Sweeney</u>	
DEPOSITOR	AGENCY	TIMER	COUNTER	CHARTER					

per minute on written calligraphy letters. The number of correctly written calligraphy letters accelerated x1.5 during the 3 baseline session. Even though corrects appeared to accelerate, learning opportunities decreased very slowly at ÷1.0 during baseline. The overall performance change for the number of correctly written calligraphy letters accelerated at x1.6, while the performance change for learning opportunities only decreased by ÷1.5 during the 3 baseline sessions.

In the second experimental condition, lined paper, the median frequency/per 3 minute timing of correctly written calligraphy letters was 13.3 per minute with scores ranging from 10.67 to 23.33. The median frequency/per 3 minute timing for learning opportunities of written calligraphy letters was 21.67 per minute with scores ranging from 14.00 to 21.67. The number of correctly written calligraphy letters decelerated at ÷1.3 during the lined paper condition. The learning opportunities accelerated x5.0 during the lined paper condition. The overall performance change for the number of correctly written calligraphy letters decreased by ÷1.8, while the performance change for learning opportunities only increased by x1.8 during the lined paper condition.

In the third experimental condition (i.e., lined paper and vertical guides), the median frequency/per 3-minutes timing for correctly written calligraphy letters was 27.33 per minute with scores ranging from 20.67 to 36.00. The median frequency/per 3-minutes timing for learning opportunities of written calligraphy letters was 25 per minute with scores ranging from 16.00 to 36.00. Data for the number of correctly written calligraphy letters accelerated by x6.0 during the lined paper and vertical guides condition. The learning opportunities also accelerated by x9.0 during this condition. The overall performance change for the number of correctly written calligraphy letters increased by x2.0, while the performance change for learning opportunities decreased by ÷2.5 during the lined paper and vertical guides condition.

This was compared with the slow and easy experimental condition that resulted in a median frequency/per 3 minute score for correctly written calligraphy letters of 34.17 per minute ranging from 21.67 to 38.33. Further, the learning

opportunities dramatically decreased during the slow and easy condition with a median frequency/per 3 minute of 1.67 ranging from .33 to 9.33 for correctly written calligraphy letters. The number of correctly written calligraphy letters accelerated by x1.25 per minute during the slow and easy experimental condition. The learning opportunities also decelerated by ÷2.3 per minute during this condition. Overall performance change for the number of correctly written calligraphy letters maintained (x1), while the performance change for learning opportunities decreased by a ÷30.0 during the slow and easy experimental condition.

During the final condition, error drill, the number of corrects remained stable with a median frequency/per 3 minute of 36.67, while the learning opportunities remained low, eventually decreasing to zero. Correctly written calligraphy letters remained stable during this condition, while the celeration for learning opportunities decreased by ÷6.0 and an overall performance change of ÷2.0 occurred across the 4 sessions in the error drill condition.

Discussion

Calligraphy performance improved through daily practice on lined papers with correct vertical slant guides. Although celeration of correct letter formation per minute was x6 during this condition, celeration of incorrect letter formation per minute was x9. Only when the subject was instructed to slow down did the error rate decelerate to ÷2.3. Reminding the student that her fluency would improve with practice if she slowed her pace proved fruitful. She eventually celerated her frequency of correct responses by x1.25, reaching a median frequency correct per minute of over 34. Since the letter "k" was most difficult for the subject to match to the standard, specific error drill for that letter decreased error rate to zero.

The procedures were practical in that they only required three minutes a day and a few copies of the practice sheets. No extra personnel or instruction was needed, and only minimal effort was required to obtain a standard for quality and a partner for interobserver reliability checks. The

use of the template for scoring made scoring very easy. Several researchers (Brunner et al., 1993; McLaughlin et al., 1987; Sweeney et al., 1993; Talbert-Johnson et al., 1991) have recommended the use of templates or black-out measurement techniques to assist in the scoring of both manuscript and cursive letters.

The only problem encountered in the study was the subject's disappointment that she could not immediately do something that appeared so "easy". Using the measurement techniques of Precision Teaching, her expressed difficulties declined. Obviously the various interventions could be used by anyone to learn calligraphy. The participant can use them to learn the capital letters and to learn the other four of the five different styles of calligraphy. Also, the subject's friends and family should feel completely special each time they receive a poem, card, or inspirational saying written especially for them in calligraphy.

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