A Preliminary Study on Sight Word Flash Card Drill: Does it Impact Reading Fluency?

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Abstract

The purpose of the study was to assess the effectiveness of a tutoring intervention for sight word acquisition and to examine whether progress was matched by improvement in oral reading fluency. Three primary students were selected based upon teachers' referral for poor reading fluency. Flashcards were used to assess accuracy of recognition of vocabulary words listed in each student's current and previous reading books. Number of words correctly identified was recorded for each child. In addition, reading rate in the form of correct words and errors per minute was also assessed. Reading passages for evaluating rate were chosen randomly from each student's current reading book. A single-case A-B design was used. Both sight word recognition and reading fluency were assessed one to two times weekly for each student throughout the study. Analysis indicated all three students improved slightly in rate of sight-word acquisition during treatment; interestingly, oral reading fluency did improve markedly for all students.

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Reading is probably the single most studied basic skill in the curriculum. An exceedingly complex task, it involves a host of motor and neurological skills, all simultaneously executed (Fuchs, Fuchs, & Hosp, 2001). According to the National Center for Education Statistics (NCES, 2003), about one-third of fourth-graders read below the basic level. It is not surprising, then, that most referrals for special education services are for concerns about reading skills (Joseph, 2002).

Recently, the National Reading Panel (NRP, 2000) examined the individual components of reading and reported that reading fluency, in particular, is a crucial component of reading proficiency. Without fluency, the student cannot comprehend the material: too much attention must be devoted to decoding individual words, leaving little room for processing and understanding the content of the passage (Carnine, Silbert, Kame'enui, Tarver, & Jungjohann, 2006).

A key component of fluency is *automaticity*, or the ability to readily recognize words in isolation (Carnine et al., 2006). Automaticity allows the reader to group words into "chunks" or phrases, thus speeding up the process and facilitating comprehension.

Many reading interventions for fluency include a flashcard drill to develop automaticity. The underlying assumption for this decision is that a flashcard drill using targeted words will not only increase automaticity, but will also indirectly affect oral reading fluency in a positive direction.

The purpose of this study was to assess the effectiveness of a tutoring flashcard intervention for word-recognition and oral reading fluency. Specifically, we measured progress in recognition of vocabulary words throughout the intervention period, and whether this progress was matched by an improvement in reading fluency.

Method

Participants

The students targeted were three second-graders. Two had been identified as having a learning disability in reading, and one had been identified as cognitively delayed. Participation was voluntary; consent was obtained from both the student and the parent.

Materials

Ten oral reading samples were randomly selected from the textbook used in instruction. Each sample contained from 60 to 90 words, and selection was evenly distributed throughout the textbook.

A recording form in which the tutor logged the number of words mastered during each session also was kept inside the tutee's folder. A reinforcement chart with 12 spaces was provided. A selection of reward items was provided, based upon a poll of student preferences.

A work mat (a paper mat with spaces marked for organizing the different sets of flashcards) also was provided for the use of the tutor. This folder had pockets for storing the different groups of cards.

Flashcards were prepared of all the vocabulary words in the reading texts, up to and including the text, which would be used in the classroom (a total of 257 words). Each child had two sets of flashcards, one for probe purposes, the second for tutoring.

Dependent Measures

There were three dependent measures, (a) correct reading rate, measured as correct words per minute on oral reading probes, (b) incorrect reading rate, measured as errors per minute on oral reading probes, and (c) number of words in isolation (flashcards) correctly identified.

Procedures

Tutoring structure. The tutoring procedure was a type of "folding-in" technique (Shapiro, 2004), adapted from that developed for sight words by Murphy and Fasko (1990) and Fasko (1994). In a folding-in drill, the tutor works with the student using a deck of 10 cards that include both known and unknown sight words. The majority of the words are already known to the student, usually about 70%, so that the student 1) can experience frequent successes during the tutoring sessions, and 2) increase automatic recognition on those words (Daly, Chafouleas, & Skinner, 2005).

Probes. An initial probe of vocabulary words was administered to assess which vocabulary words had already been learned. Each word was presented and the student was allowed three seconds in which to say the word. No feedback was given during this or subsequent word probes. Incorrect words were placed in one pile, correct ones in another. After all the words had been presented, those that had been correctly identified were re-presented in an attempt to control for guessing. If the child identified the word correctly both times, it was assumed that the word had been learned. The number of words was recorded. During subsequent probes, words already learned were not re-presented; additional words learned were simply added to a running total.

Oral reading fluency probes were also administered. The child was given a randomly selected passage from the reading probes and asked to read. At the end of 1 minute, correct reading rate as well as error rate were computed and recorded. Both word probes and fluency probes were administered one to two times per week throughout the study.

Preparation of flashcards. The cards used in tutoring were prepared using information obtained in the initial word probe. Those which were recognized in the initial probe were marked on the back with a green dot; those which were not recognized were marked with a red dot. The first ten cards to be drilled were prepared for each tutee, using a proportionate mixture of 30% unlearned to 70% learned. These ten cards were called the drill set.

Tutor training. The experimenter trained all tutors during a 1-hr. session using modeling and role-playing. Tutors were assessed individually by the experimenter for readiness at the end of the session, and were considered ready to begin tutoring when, during practice with other tutors, they correctly performed 100% of the tasks on a procedural reliability checklist. In addition, the experimenter closely supervised the first tutoring session, giving prompts and coaching to the tutors when necessary.

Design. A single-case A-B design was used to assess the effects of the intervention upon word recognition and reading fluency. Data were recorded across sessions, that is, days of school. It became necessary to record in this way because of an unprecedented number of snow days (16) which randomly interrupted normal school attendance.

Baseline. During this phase, no tutoring occurred. On the first day of the study, the teacher introduced the new reading book and the first story. Word probes and oral reading fluency probes were administered one or two times weekly throughout this phase, which lasted 27 days.

Tutoring. Throughout the tutoring phase, word probes and oral reading fluency probes continued to be given one or two times weekly. Each tutoring session lasted about 15 minutes each day and occurred in the reading teacher's classroom.

Tutors began by opening out the work mat and the flash cards. The previously learned cards had a green dot; the unlearned cards had a red dot. These decks were called the red and green decks, and they were stored in the corresponding pockets on the work mat. The tutor took the previously prepared drill set of ten cards. The drill cards were shown one by one to the tutee, who had three seconds to respond correctly by reading the word.

If the response given was correct, the tutor confirmed this by saying "That's right!" or "Good!" placed the card in the area marked "Correct," and went on to the next card. If an

incorrect or no response was given, the tutor said "No," in a firm voice, stated the correct word, and had the tutee repeat it. The tutee confirmed it if correct. The card was then marked on the back with an X and placed behind the next card in the drill deck, and the tutor then went on to the next card.

After all 10 cards were shown (and any repeats), the tutor marked an O on the back of those cards that were identified correctly within the time limit. The cards were shuffled and the procedure was repeated with the same ten cards. At the end of the session, a line was drawn under the X's and O's to separate each day's marks. When a card had at least five O's in a row on the back *and* going across two days, it was considered mastered. The card was then placed on the spot marked "mastered" and replaced with a new card from either the red or the green deck, depending on the type of card mastered, thus retaining the ratio of previously-learned to unlearned words.

At the end of each session, the number of mastered cards was counted and recorded by the tutor on the recording form, and the tutee recorded the corresponding number of marks on the reinforcement chart. When the 12 spaces of the reinforcement chart were completed, the tutee was allowed to select a reward from the reward box, and a new reinforcement chart was started. At the end of each session, each group of cards (the new deck, the drill deck, and the mastered deck) were put away in the appropriate pocket in the tutee's folder.

Results and Discussion

Data from probes were collected by the experimenter and recorded on graphs. Procedural reliability was assessed by the experimenter at 20% of the sessions for each dyad through direct observation, using a checklist designed for this purpose. Percent of agreement for the observations averaged 98%, ranging from 91% (when tutors did not mark the cards properly) to 100%.

To assess interscorer agreement, a special education teacher familiar with the procedures tallied agreements and disagreements with the experimenter during 20% of the probe sessions. The calculation required dividing the number of agreements per word by the number of agreements plus disagreements and multiplying by 100. Agreement for word recognition ranged from 98 to 100%, with a mean agreement score of 99%; that for fluency ranged from 98 to 100%, with a mean of 99%. Disagreements primarily occurred regarding one student, who had a speech impediment that made her difficult to understand at times.

Cumulative words acquired indicated slight improvement in rate of acquisition of sight-words after initiation of the intervention for the three students. All three showed improvement in fluency.

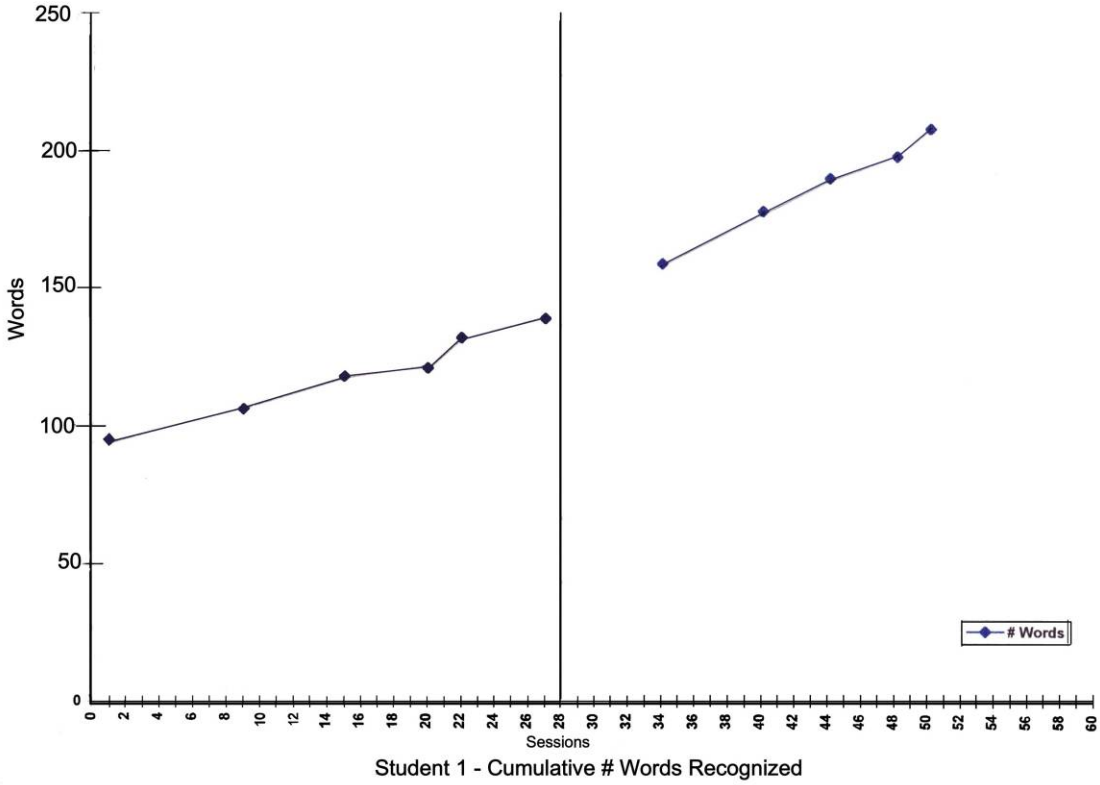
As illustrated in Figure 1, Student 1’s rate of acquisition of sight-words improved only slightly after the intervention was initiated. She acquired an average of 1.43 words per day during baseline; during tutoring, she averaged 3.18 per day. However, the intervention had a more distinct impact on her reading fluency; her correct reading rate rose from an average of 15.5 words per minute during baseline to 47.5 during intervention, and her error rate dropped from 5 errors per minute to 3.

Similar results were obtained for Student 2 (Figure 2). On sight-word acquisition, Student 2 improved from 1.32 per day to 3.26 per day, while her reading fluency improved from 14 words per minute to 30, and errors decreased from 7 to 4.

For Student 3 (Figure 3), acquisition improved from an average of .6 per day during baseline to 2.95 per day during tutoring. Fluency improved from an average of 15.8 words per minute during baseline to 42 correct during tutoring, and errors dropped from 9 to 4.25.

All students showed fluctuation in their correct reading rates after onset of the intervention. Perhaps, as time went on, there was increasingly greater likelihood that the oral reading probe randomly selected each time was from a story they had already read in class. Hence, they had already "practiced" it. Of the five points collected during the intervention phase, only that on day 48 was from a story not previously read in class. In addition, since the sight-words were taught in a random order, they may or may not have been taught the particular words in any one reading passage.

In summary, the results of this study offer some promising preliminary information about the effectiveness of flashcard drill for increasing speed and accuracy in word recognition. The data provide some empirical evidence that improving word automaticity leads to increased oral reading fluency. Stronger evidence may be obtained in future studies by using standardized, grade-appropriate reading probes for monitoring fluency progress, rather than stories in the textbook. Also, the addition of a maintenance phase would strengthen confidence in the results.



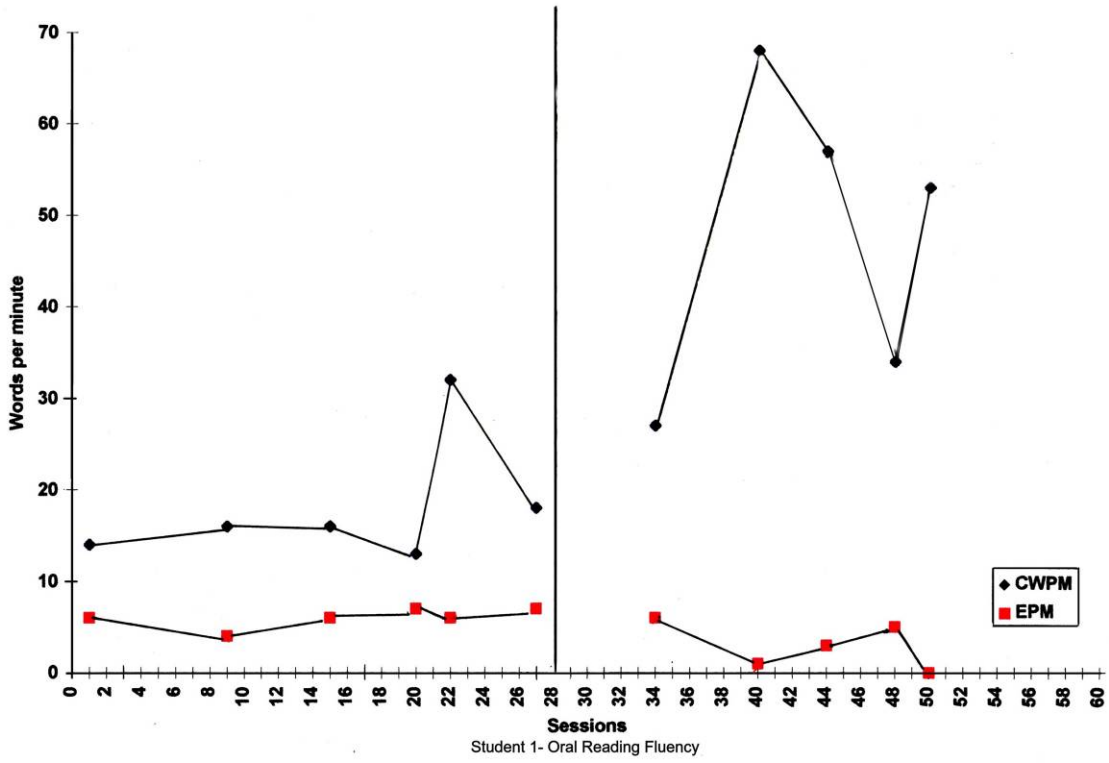


Figure 1. Student 1. CWPM = Correct Words per Minute; EPM = Errors per minute.

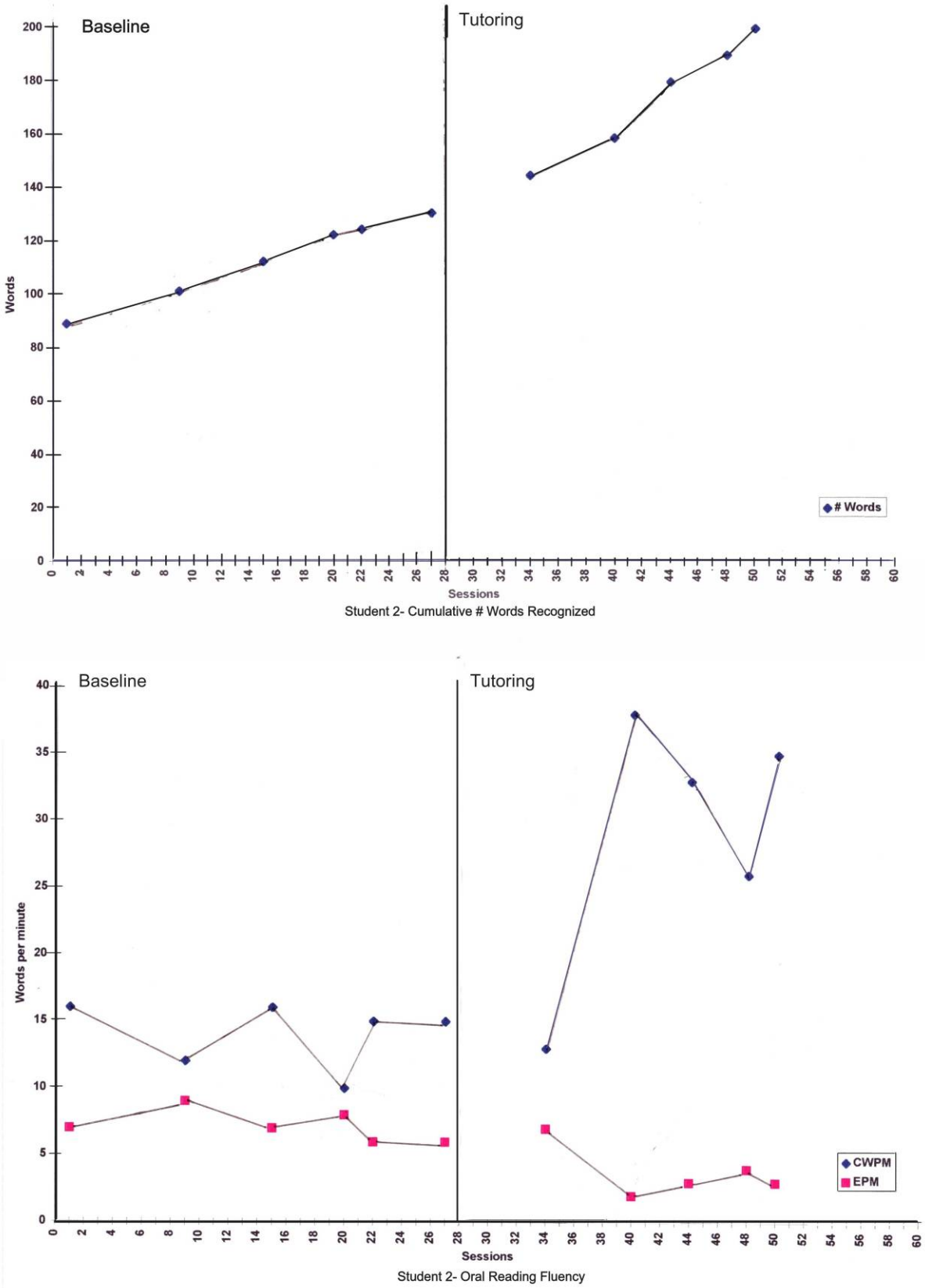
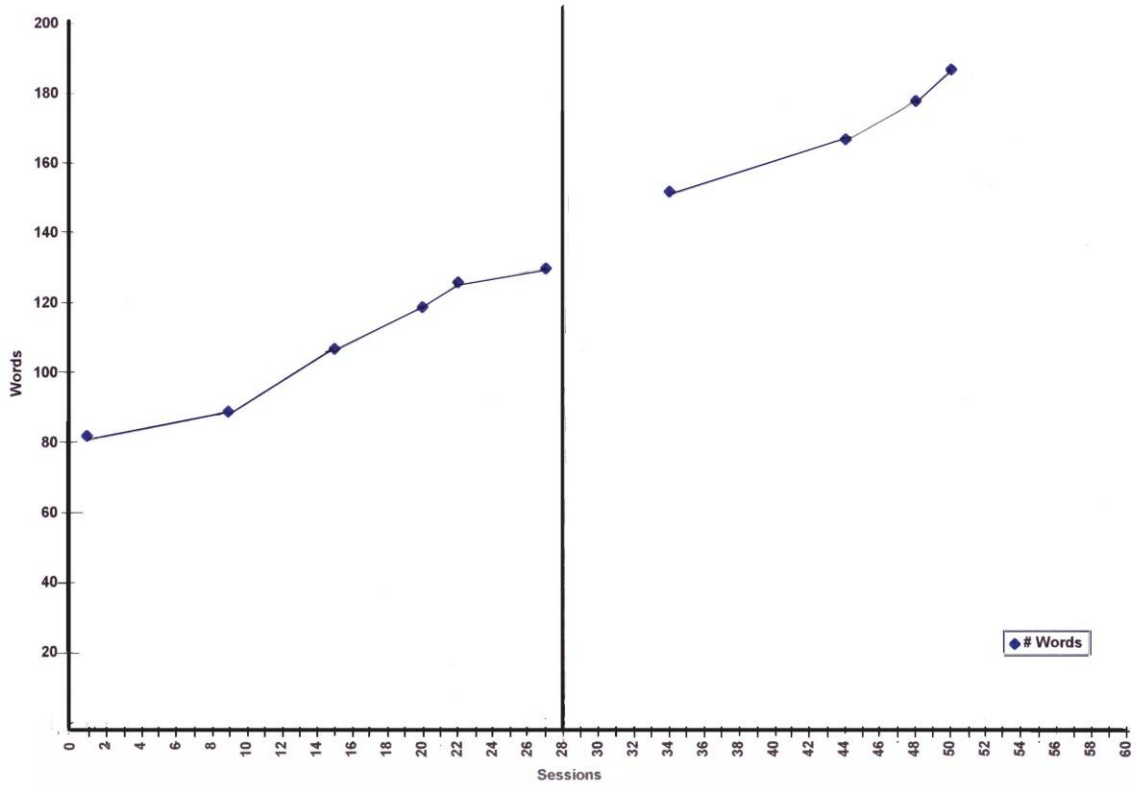


Figure 2. Student 2. CWPM = Correct Words per Minute; EPM = Errors per minute.



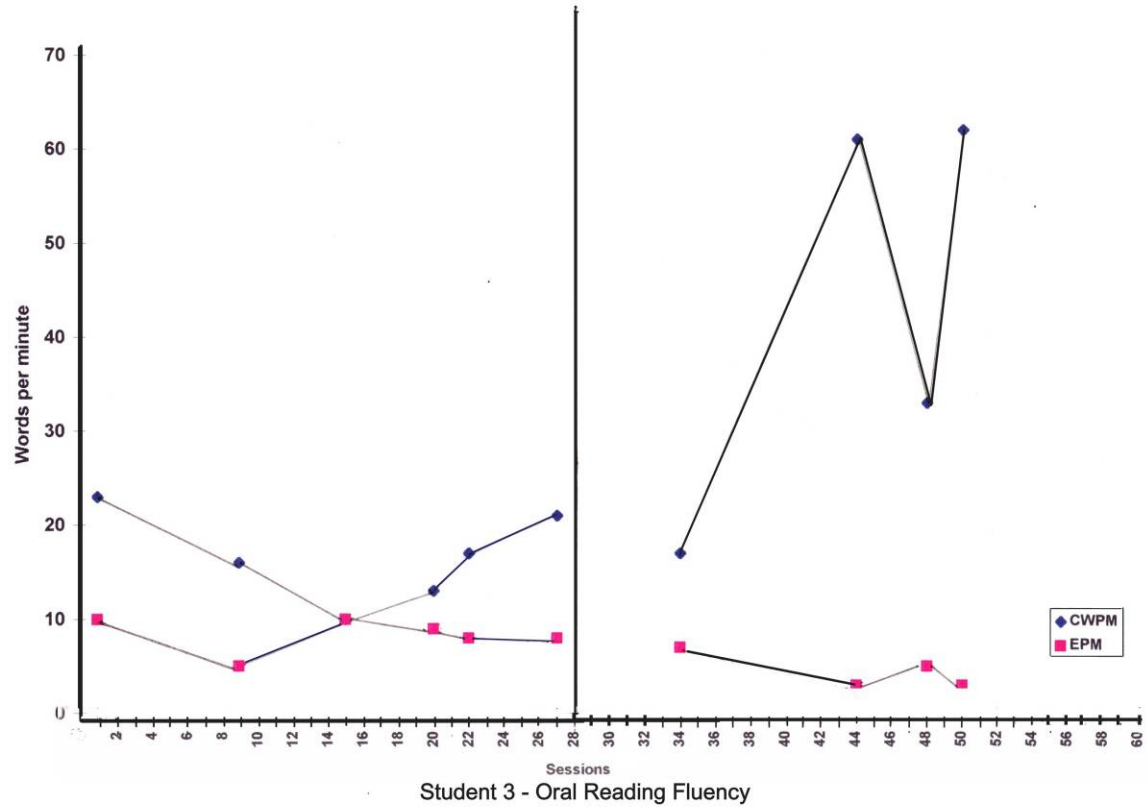


Figure 3. Student 3. CWPM = Correct Words per Minute; EPM = Errors per minute.

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