Journal of Education and Human Development
June 2014, Vol. 3, No. 2, pp. 181-201
ISSN: 2334-296X (Print), 2334-2978 (Online)

Published by American Research Institute for Policy Development

The Use of Online Typing Programs In Combination with Public Posting with and without Consequences to Increase the Typing Fluency and Accuracy for Seven High School Students with Severe Behavior Disorders

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Abstract

The purpose of the present investigation was to examine the effects of public posting with and without consequences on keyboarding. This was evaluated in an ABCAD single case design. The participants were seven high school students with severe behavior disorders The final consequence music was chosen by the participants and added to the awarding of candy.. The behavior measured the number of correct and error characters typed. These data were taken in a self-contained classroom using the computers already present in the classroom. Increases in student performance were found when public posting was employed. Larger increases were found when consequences were added as an additional incentive. When the class was allowed to choose their consequence, additional improvement in keyboarding was found. Three of the participants did not decrease their performance when a return to baseline was employed. The benefits of increasing keyboarding were noted. The procedures were easy to implement and evaluate in the classroom.

Keywords: keyboarding, public posting, consequences, feedback, ABCAD single case design, high school students, behavior disorders

The Use of Online Typing Programs In Combination with Public Posting and With and Without Consequences to Increase The Typing Fluency and Accuracy for Seven High School Students with Behavior Impairments

One of the most important computer skills a child can learn is typing (Jackson & Berg, 1986). Modern society has become dependent on computers and keyboarding.

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In the United States, just 20% of the U. S. population does not have computers. Also, these individuals are often older and less educated (Johnson, 2010). Having appropriate typing skills is a necessity in this age where most job applications can be completed online. In addition, a overwhelming majority of jobs requiring some sort of computer based skill, a simple skill, such as keyboarding, becomes a valuable asset (Johnson, 2010; McLean, 1994). In addition having a technical skill such as keyboarding as been shown to keep high school students from dropping out (Jackson & Berg, 1986, Plank, DeLuca, & Estacion, 2008).

Accurate typing allows a child, who has to concentrate on the mechanics of writing, to focus on what they want to write or text (Jackson & Berg, 1986). Handwriting can be an issue for some children and typing or keyboarding has been suggested as a possible way to overcome issues with handwriting, spelling, or both (Graham, 1999; Koenke, 1987; McGee & McLaughlin, 1992). However, few school systems require typing or keyboarding, although they should, sine it is important to everyday life and future careers (Jackson & Berg, 1986). The development of keyboarding skills requires constant practice and the use of consequences for these skills to be acquired and maintained (Olinzock, 1998). Instead of developing inadequate "hunting and pecking" skills it is important for students to learn the correct way to touch-type (Koenke, 1987).

Students who are identified as having a behavioral impairment and placed into a self-contained behavioral impairment special education setting are students who have behavioral excesses, deficits, and/or inappropriate behaviors for the situation. These students often resist classroom interventions as a function of the severity, chronicity, generalization, and tolerance of the behavior (Gresham, 1991). When teaching typing skills to student with behavioral disorders, typing games may provide a avenue for children who might otherwise not be willing to concentrate on a task.

Public posting is when scores or occurrences for each individual are posted for everyone else to see (Van Houten, 1981; Van Houten, Hill, S., & Parsons, 1975).

The development of such a technique can accelerate progress towards academic objectives and public posting has also proven effective in a variety of settings and behaviors (Houghten, Wheldall, Jukes, & Sharpe, 199).

Public posting has been proven to be effective to improve the performance of psychiatric aides and attendants (Panyan, Boozer, & Morris, 1970), classroom tutors (Barnard, Christophersen, & Wolf, 1974), swimmers (McKenzie & Russell, 1974), and school-aged children in their classroom (Kastelen, Nickel, & McLaughlin, 1984; McLaughlin, 1992; Van Houten, Hill, & Parsons, 1975), on the playground (Holland & McLaughlin, 1982), in the hallway (Staub, 1990). Public posting and feedback has shown to be most effective when used in conjunction with other reinforcement systems (Holland & McLaughlin, 1982; McGee & McLaughlin, 1992; McLaughlin, 1992; Staub, 1990).

The purpose of this study was to increase the typing accuracy and fluency skills of a group of students with behavioral impairments with the use of public posting with and without rewards. Public posting with rewards should be an appropriate motivation system for this population of high school students to increase their computer skills. In addition, we want to improve computer keyboards as they are viewed as necessary as a part of functional life and employment after high school graduation.

Method

Participants and Setting

The participants of this study were seven ninth-grade students from a high school located in the Inland Pacific Northwest. These students were all enrolled in a self-contained special education program specifically designed to meet the needs of students with behavioral disorders. Seven of the students were males and one was female; all of the students had been identified as needing specific behavioral interventions in one or more skill areas. The students ranged in age from 14 to 15 years of age. One male was Native American and another male as African American; the remaining males and female were considered white (or non-Hispanic). The female student qualified for special education under the learning disability category in math. Two of the male participants qualified under the category of learning disabilities for math, reading, and writing.

Two males qualified under both the learning disability category for writing as well as the category Other Health Impairment (OHI) for Attention Deficit Disorder (ADD). One male was diagnosed with Asperger's syndrome and the remaining male was identified with an intellectual disability.

The setting for this study took place at a high school where 43% of the students qualified for free and reduced lunch. These data were taken by the first author during third period. This was the 55-minute class period where the students typically were taught World History. The classroom could be described as a quiet and relaxed environment and was located directly across the hallway from the office and next to the main doors that lead outside. Five to eight students, on average, were present during this period along with one teacher and the first author. The room was set up in traditional classroom fashion, with four rows of three desks and computers with individual carrels lining the walls. The master teacher's office area was directly adjacent to the outside door of the classroom. The students sat at the computers that lined the walls. The teacher would assign computers to the students based on the behaviors of each individual student and their interactions with other students. The first and fourth authors maintained a highly structured classroom with times designated for each typing program and then again for the typing test.

Materials

The materials used in this study consisted of seven computers, which were already in the classroom. Each of these computers was connected to a printer, had Internet access, and a word processing program. An online free typing program was accessed at: http://www.sense-lang.org/typing/ by the students through the use of the high school's Internet. Computers were located in the classroom because the participants were not permitted to use the computers in the school library. Therefore, the library staff was more than willing to place computers in the classroom. Each student had one copy of each of the passages to record their own progress, a total of seven copies of each passage were used (see Figures 1 and 2). The public posting bulletin board was created from a large size of cardstock paper with different colored markers for each student, (see Figure 3). The modified token reward system in place allowed to the students to gain access to candy, music through their own personal MP3 players, and a pizza party.

Dependent Variable and Measurement

The dependent variable was the number of characters typed within a five-minute period by each student. Correct characters were defined as being either a letter or punctuation mark typed in the correct order and location from the passage given within the allotted amount of time. The responses that would prevent a character from being marked correct would be if a character was skipped or not typed, if extra characters were typed, or if the characters were typed after the allotted amount of time had passed. In this study, if a student forgot to leave a space between words, or if an extra space was placed between characters, it was not marked incorrect; likewise, correct spacing's were not counted as correct responses, but as errors. Once the students had typed their passages they would save their passages to the first author's account. The "word count" feature, typically installed on word processor programs, was then used to calculate the total number of characters typed without spaces. This number was recorded on the master copy. The first author would then print two copies of each student's typing sample. Incorrect responses were then calculated and subtracted from the total number of characters typed. This final total would then be recorded as the student's score.

Experimental Design and Conditions

The experimental design was an ABCAD single-subject replication design (Kazdin, 2010). An intervention of typing skills using an online typing program with public posting was implemented for 2 sessions. A second intervention, which combined the first intervention with a reinforcement system, was implemented for two more sessions. A return to baseline was conducted for one session to assess the intervention package. As intervention continued throughout this study the students were asked to increase the amount of correct characters typed each session. The amount of time spent on each session and the amount of work the students were asked to complete stayed consistent.

Baseline 1. During baseline, typical classroom procedures were followed. Data taken for baseline occurred in the same classroom during the same time of the day each week. During baseline the students were asked to open up a Word document and type their name.

Then, each student was given the first passage and told that they had five minutes to type as much of the passage as quickly and accurately as they could. The same procedure was repeated with the second passage. The first author then had each student save his or her passages to her flash drive for scoring. So that the students would understand better the scoring procedure, a sample typing passage was shown to the class with errors marked. Then, the students were shown how to calculate their overall scores. Baseline scores were marked onto the public posting poster and each student was assigned a number for anonymity. Goals were set for each passage and it was explained to the students that they would receive a pizza party if they were able to reach the goals set.

Online typing programs + public posting. Each session of the intervention process began by the students using their assigned computers to access specific online typing tutor programs and typing games. The students would spend 15 minutes on the typing tutor program and another 15 minutes playing typing games. The students were monitored by the teacher and first author to make sure they were participating appropriately and staying on-task. Once the students had completed the online practice they were asked to open a blank word document and type their names. Then they were given five minutes and the same first passage as in baseline and were told to type as quickly and accurately as they could. During these five minutes the students continued to be monitored to ensure that no cheating was happening (i.e. opening old documents, copying and pasting, etc). Once five minutes had expired, the student were asked to stop typing and push "enter" twice, then the students were given the second passage and another five minutes to type as much as they could. Once the students had completed both five-minute sessions their passages were scored as in baseline. The students' total scores would then be posted on the bulletin board in class.

Online typing programs with public posting and rewards. A phase change was implemented after session four because of a lack of overall improvement in scores (see Figures 4.1 – 10.2). Original intervention procedures were still implemented along with the public posting system as a score keeping record and motivation system; however, now a reward system was also in place. Under this new condition the students would receive access to candy when they were able to beat their previous scores.

Baseline 2. A return to baseline was implemented on Session 7 to determine if the reinforcement system was necessary for increasing the accuracy and fluency of the students' typing skills. Previous intervention procedures were followed; however, the students were not allowed access to candy and were not required to beat their own scores. However, their scores were still placed on the public posting bulletin board

Online typing programs with public posting and student choice rewards. A return to intervention was implemented in Session 8, but the reward was now different based upon what each student preferred. Basic intervention procedures were followed; however, now the students were able to choose if they would like access to their MP3 players for 10 minutes or candy. The students would now be given access to their MP3 players or candy if they were able to beat their previous scores. The students' scores continued to be posted publicly on the poster.

Reliability of Measurement for the Dependent and Independent Variables

The first author and the fourth author scored and collected data for inter-observer agreement for 50% of the sessions. Each observer would take turns sitting at each of the computers and calculating the total number of characters typed (via the word processor) and the total number of errors. During this period no discussion between the first authors occurred. Interobserver agreement was calculated using the following formula: (Agreements/Agreements + Disagreements) x 100 = % agreement. The first authors used a total interval per session ratio. The mean agreement score was 96 % with a range of 93% to 100%.

Reliability as to the proper implementation of the various experimental conditions was gathered on three different occasions. The second author came to the classroom and observed the students typing. The second author was provided with a written description of the various experimental conditions and then determined which experimental condition was in effect. Reliability of as to the appropriate implementation of experimental condition on those sessions was 100%.

Results

The overall outcomes for each of our participant can be seen in Figures 4.1 through 10.2. **Baseline.** The results of baseline can be found in figures 4.1 through 10.2. During baseline typing accuracy and fluency scores ranged from 91 correct characters typed to 310 correct characters typed with a mean score of 214 correct characters for Passage 1. Scores also ranged from 0 incorrect characters typed to 10 incorrect characters typed with a mean score of 3 incorrect characters typed for Passage 1. For Passage 2 correct characters typed ranged from 95 to 441 characters with a mean score of 228 correct characters typed. Incorrect characters for Passage 2 during baseline ranged from 0 to 18 characters with a mean score of 6 errors. When a return to baseline occurred scores ranged from 47 to 425 correct characters typed with a mean of 226 for Passage 1. Scores for Passage 1for incorrect characters ranged from 0 to 22 with a mean of 6 errors. For Passage 2 the number of correct characters ranged from 12 to 489 characters typed with a mean of 266 characters. For incorrect characters typed in Passage 2 the scores ranged from 0 to 30 characters with a mean of 8 incorrect characters typed. When a return to baseline occurred an overall decreasing trend existed across four of the participants and an increasing trend was maintained by three of the participants.

Online typing programs and public posting. The results of this intervention can be found in figures 4.1 through 10.2. For Passage 1 the number of correct characters typed ranged from 95 to 363 and incorrect characters typed ranged from 0 to 8. The average number of correct characters typed was 257 and the average number of incorrect characters typed was 1.5. For Passage 2, during this intervention, correct characters ranged from 91 to 556 with an average of 338 correct characters typed. The amount of incorrect characters typed ranged from 0 to 142 with an average of 14 errors.

Online typing programs with public posting and rewards. The results of this intervention can be found in figures 4.1 through 10.2. For Passage 1 the number of correct characters typed ranged from 127 to 396 and incorrect characters typed ranged from 0 to 20. The average number of correct characters typed was 264 and the average number of incorrect characters typed was 4 across all participants.

For Passage 2, during this intervention, correct characters ranged from 102 to 560 with an average of 313 correct characters typed for all our participants. The amount of incorrect characters typed ranged from 0 to 15 with an average of just 4 errors.

Online typing programs with public posting and choice rewards. The results of this intervention can be found in figures 4.1 through 10.2. For Passage 1 the number of correct characters typed ranged from 154 to 524 and error characters typed ranged from 0 to 34. The average number of correct characters typed was 303 and the average number of incorrect characters typed was 5. For Passage 2, during this intervention, correct characters ranged from 146 to 635 with an average of 390 correct characters typed. The amount of incorrect characters typed ranged from 0 to 25 with an average of 5 errors.

Discussion

The results of this study do show an increase in the fluency and accuracy typing rates of high school students with behavioral impairments. Experimental control was achieved due to the overall increasing trend of student scores and the final increase in their overall scores. The overall scores during baseline showed that the majority of the students did not have functional typing skills. Not having functional computer skills has been linked to dropping out of high school (Plank et al., 2008). Initially, our students often focused on making every letter correct rather than trying to type faster in the beginning so the average amounts of errors in baseline were low. Overall, the students showed an average increase of 89 to 162 correct characters typed within the allotted amount of time. The amount of errors was variable throughout the study but did become slightly lower than in baseline. Student 4 had the highest number of errors (142) on Passage 2 during Session 3. The student with the highest number of errors was Student 7 with 18 errors. If student 4's score was not included in the data the average for the amount of error characters typed would have been 3, instead of 14.

The first author in this study relied on previous testing scores, informal assessments, and interviews with the classroom teacher to determine the specific intervention strategy.

It was decided that public posting would be an appropriate tool for use in the classroom because of the competitive nature of the students (Van Houten, 1981). The intervention was modified twice because of a lack of motivation and a lack of improvement. The students were asked what they would like to work for and they responded with candy and music; therefore, these were the consequences chosen.

The ease of employing both public posting and changing the intervention was important to the classroom staff. This allowed for adjustments to be made as well as allowing for data-based decision-making on the part of the classroom staff. This is a strength of employing a time series in the classroom. Several authors (McLaughlin, Williams, Williams, Peck, Derby, Bjordahl, & Weber, 1999; Shapiro, 2011) have advocated their use for just this reason.

The ability of a student to be able to type quickly and accurately has significant implications both in the school setting and in the workplace setting (Erickson, 1993). The majority of jobs today require computer literacy. Without acquiring typing skills the students in this classroom would have a limited job outlook. Learning how to type quickly and effectively will increase a student's ability to graduate high school and get a job after graduation.

Future research could compare specific typing programs to each other and lengthen the amount of sessions the study was conducted. Employing an alternating treatments design (Kazdin, 2010) would be an effective design to allow such a comparison. Also, conducting the sessions more frequently may well maintain typing skills more effectively and allow more data to be taken. Finally, it is recommended that Passage 2 should have been really Passage 1 and vice versa. Passage 1 was much more complex than Passage 2. Some type of assessment to determine the relative difficulty of the passages should have been carried out. This is something that is recommended for those who would replicate out procedures.

There were limitations in the present research. Student attendance affected our outcomes. For example, those students who were in attendance for every session had the most positive outcomes. Students, who missed one or more sessions did not improve as much, or not at all. For purposes of replication (Jasny, Chin, Chong, & Vignieri, 2011), some type of additional consequence for attendance should be employed.

The failure of three of our participants to decrease their corrects was of interest. When we surveyed these students, they reported that they simply did not want to decrease their performance and wanted to see it continue to improve. The ultimate goal for high school special educators is for their students to successfully graduate from high school and integrate themselves to be productive members in society. A successful student can type with fluidity and accuracy in any given situation. The ability to type is an integral part of every successful student who hopes to graduate from high school. This is even more important part of life for those people looking for jobs after high school.

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Figure 1. Passage 1.

Who is Dr. Seuss?

While many children and adults have enjoyed books by Dr. Seuss, very few actually know anything about Dr. Seuss himself. Dr. Seuss was born in 1904 and was given the name Theodor Seuss Geisel. He grew up in Springfield, Massachusetts and left town as a young man to attend Dartmouth College in New Hampshire. In college, he wrote for the school newspaper. Geisel created the name Dr. Seuss, a penname he would continue to write under for the rest of his life. Seuss first entered college with the idea that he would become a professor, but a classmate who saw him sketching thought he should become an artist. He soon pursued his passion for drawing. After college, he got a job working as a cartoonist for a newspaper.

However, once the United States became involved in World War II, Seuss wanted to use his talent to help in the war effort. He worked for the Army making different types of war movies and animated films that were used to train soldiers. Publishers who saw his work during the war wanted Seuss to illustrate a children's book. The war experience, along with his experience as a journalist, led to his desire to write and illustrate his own children books.

Dr. Seuss had a slow and difficult start as an author. His first book almost did not get published. However, after many months of being turned down his persistence paid off. Seuss soon signed with a new publisher. This small success was enough to keep Dr. Seuss writing and illustrating. While writing, he often put on silly hats to help to reduce the stress of finishing a story. Shortly after his first work was published, Dr. Seuss wrote and published *The Cat in the Hat*, the book that made him famous. For years afterwards, Dr. Seuss continued to write and illustrate many books in his own unique style, which was very different than other authors. He won many awards for his books throughout his writing career, and many were adapted for television and movies. The name, Dr. Seuss, became very popular in children's literature. Though Theodor Seuss Geisel, also known as Dr. Seuss, passed away at the age of 87 in 1991, his books and illustrations continue to live on.

Figure 2. Passage 2

Blueberries

Do you know how blueberries grow? They grow on bushes. Each blueberry is small and round. Many blueberries can grow on one bush. At first, the blueberries are green. The green berries are not ready to eat yet. They need a lot of sun and rain to help them become fat and sweet. When the berries turn blue, they are ripe and ready to be picked.

Some farmers grow blueberries in big fields. The people who live nearby can earn money by helping to pick the blueberries. Each one takes a pail out to the field and fills it with blueberries. They work fast so that they can fill many pails. They want to earn as much money as they can. When they are done picking, their fingers are blue from the juice of the berries!

After the blueberries are picked, they are put into boxes and sent to stores. People buy the blueberries and take them home to eat.

Some people like to wash the berries and eat them one by one. Other people like to cook with blueberries. They make blueberry muffins and pancakes.

No matter how you eat them, blueberries taste great!

Figure 3: A Picture of the Public Posting Poster Employed in the Research and Posted in the Classroom. Note That Students one and Nine Were Dropped from the Study Because they Were Expelled at the Beginning of the Study

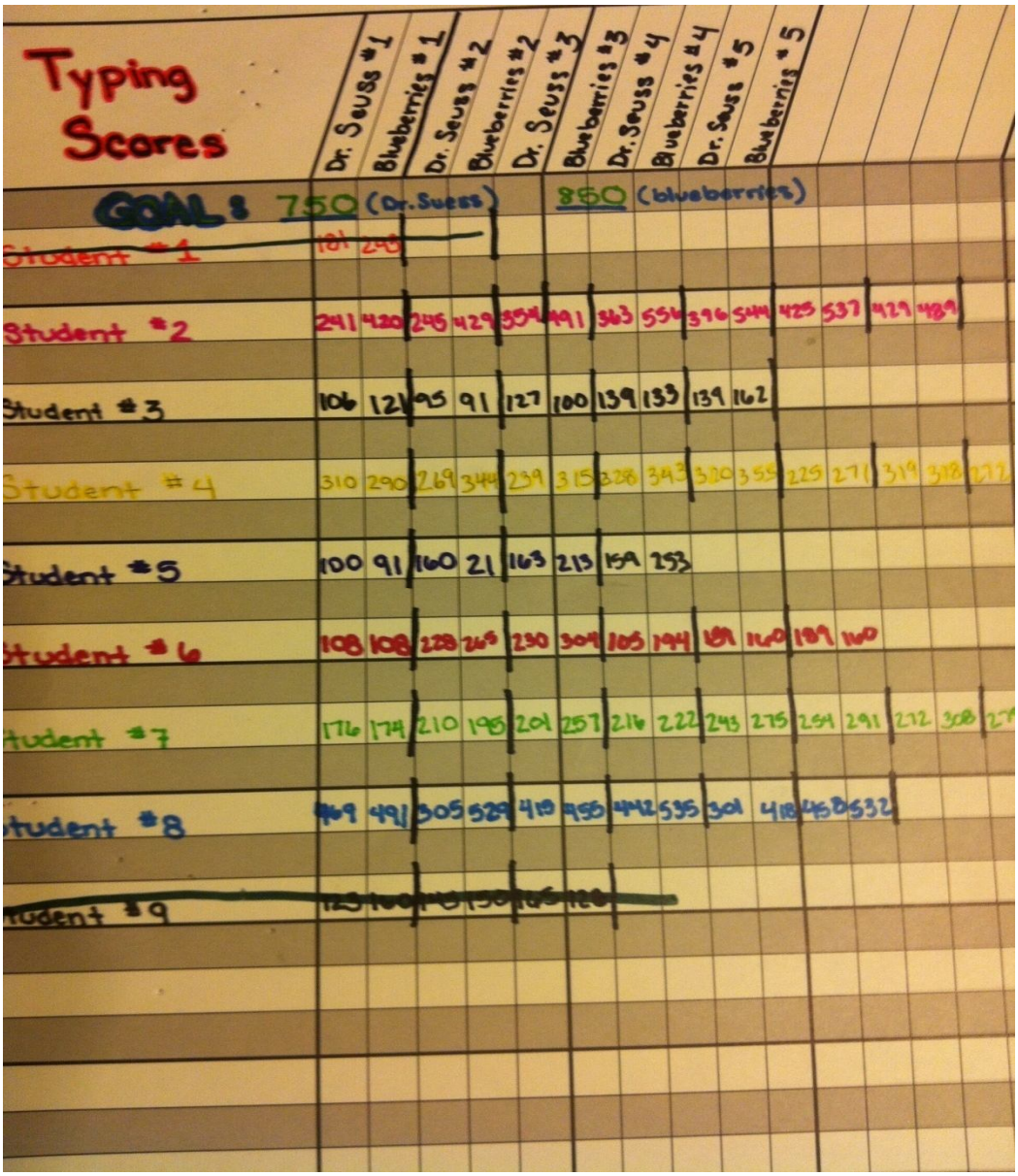

Figure 4.1: Student 1, number of correct and incorrect characters typed for Passage 1

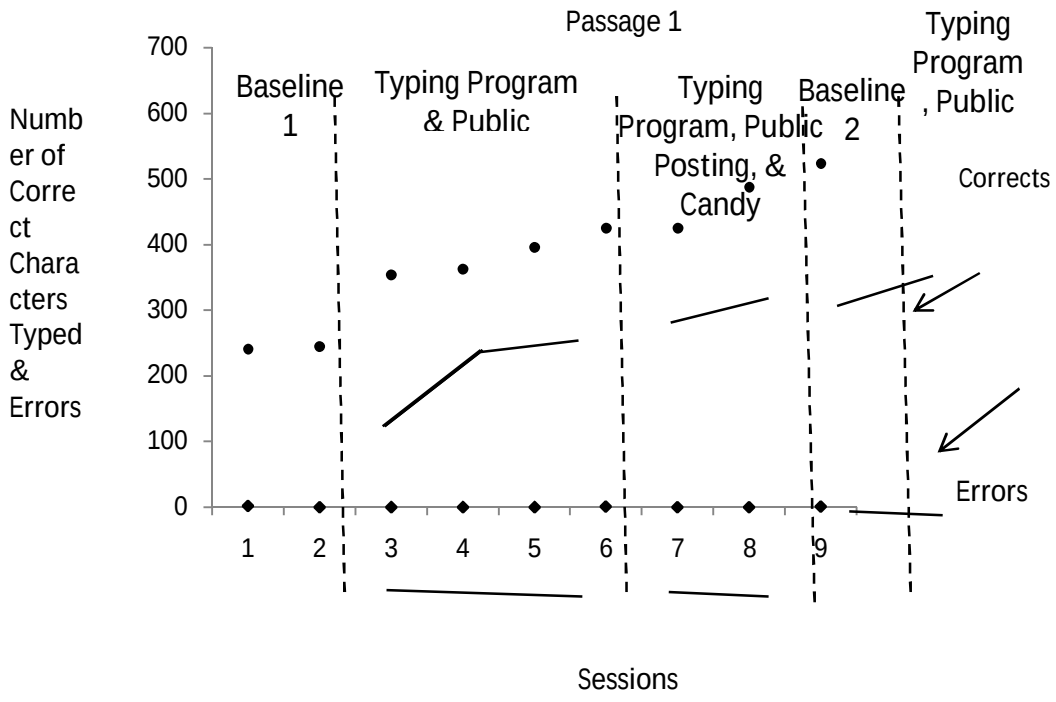

Figure 4.2: Student 1, number of correct (closed circles) and errors (closed diamonds) characters typed for Passage 2

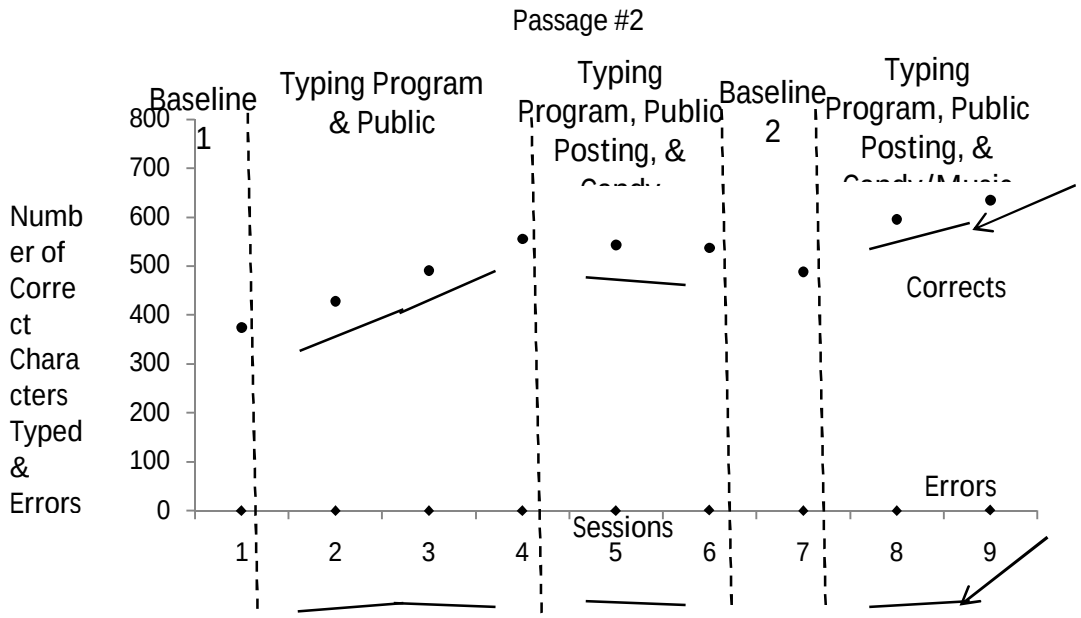

Figure 5.1: The Number of Correct and Error Characters Typed for Passage 1 for Student 2.

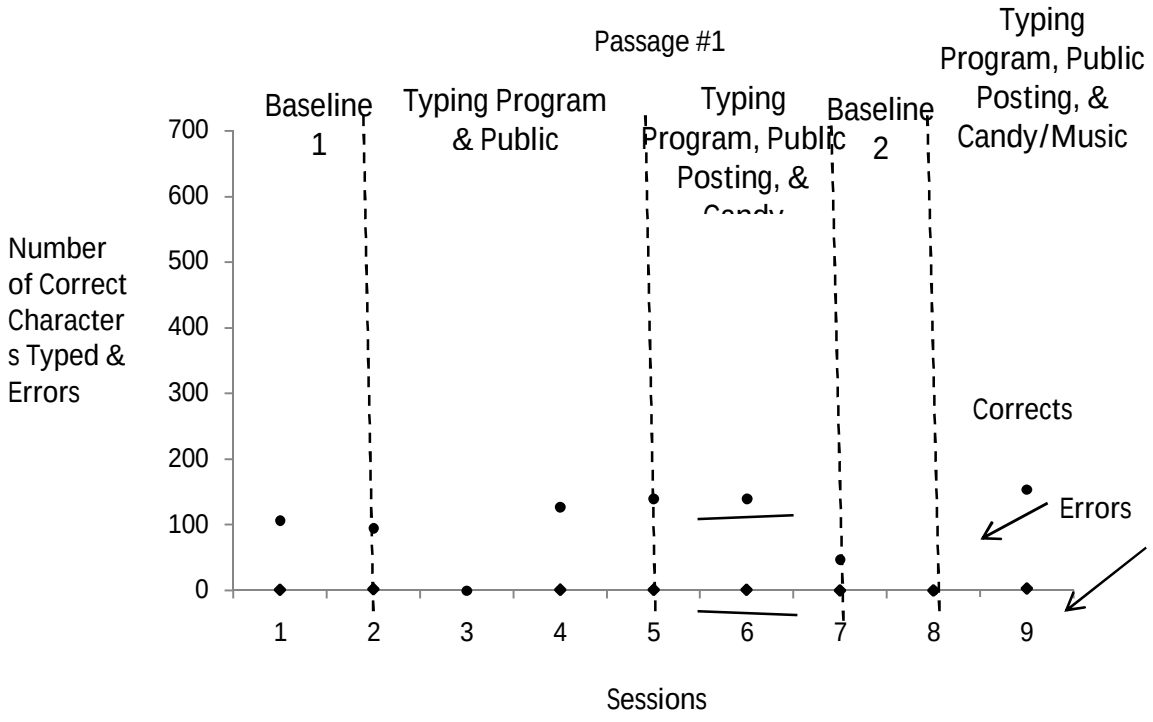

Figure 5.2: The Number of Correct and Errors Typed for Passage 1 for Student 2

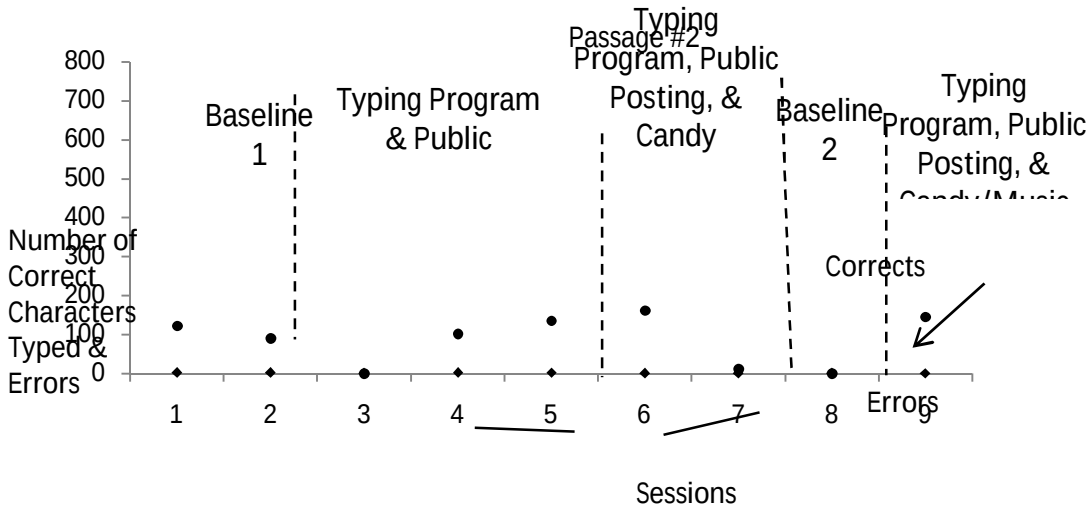

Figure 6.1: The Number of Correct and Error Characters for Passage 1 For Student 3

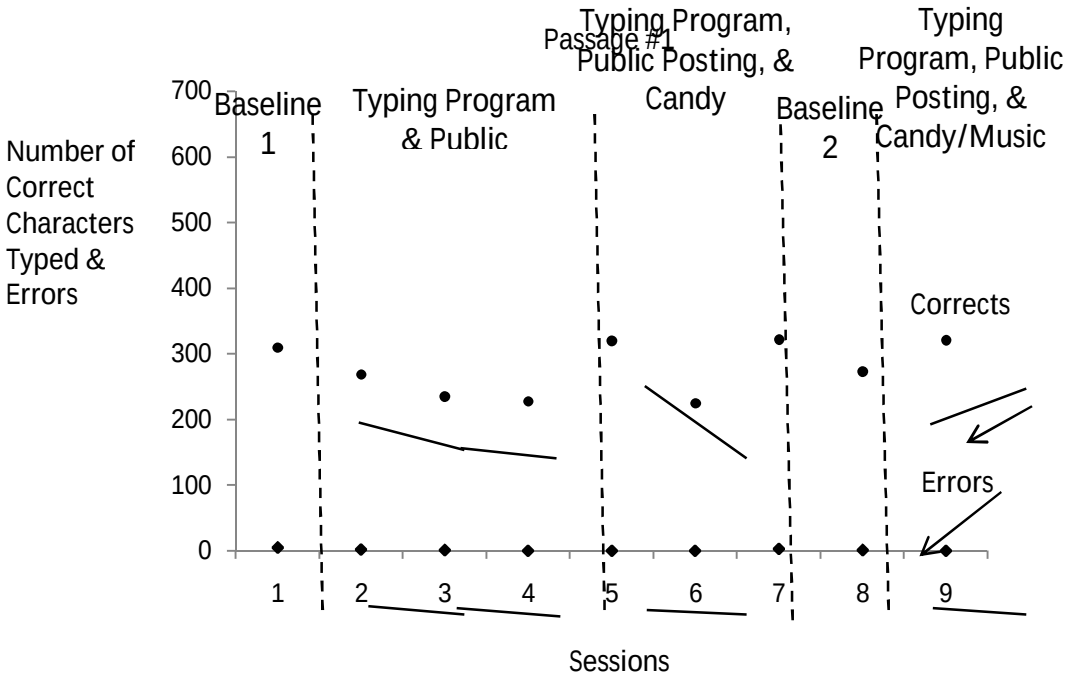

Figure 6.2: Number of Correct and Error Characters for Passage 2 by Student 3.

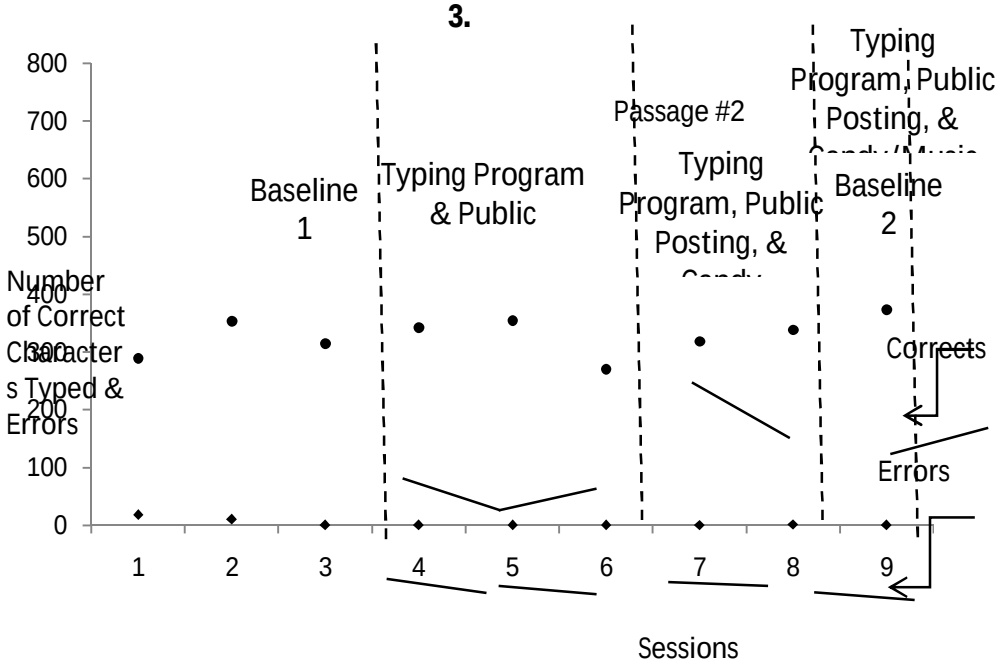

Figure 7.1: The Number of Correct and Errors Typed for Passage 1 by Student 4.

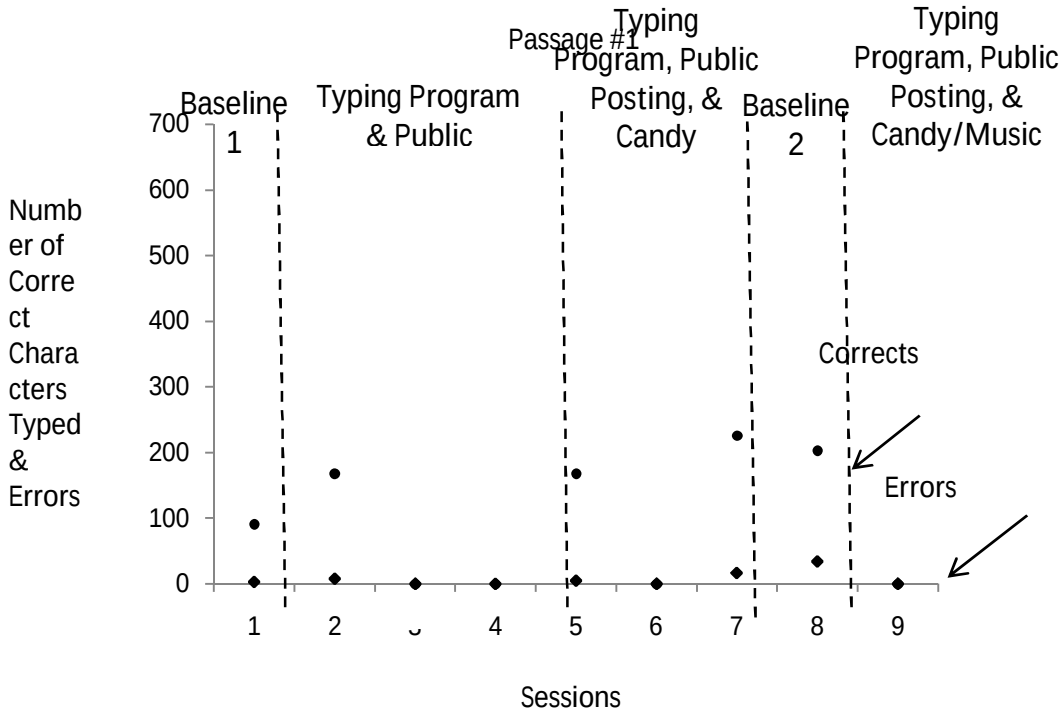

Figure 7.2: The Number of Correct and Errors Typed for Passage 2 by Student 4.

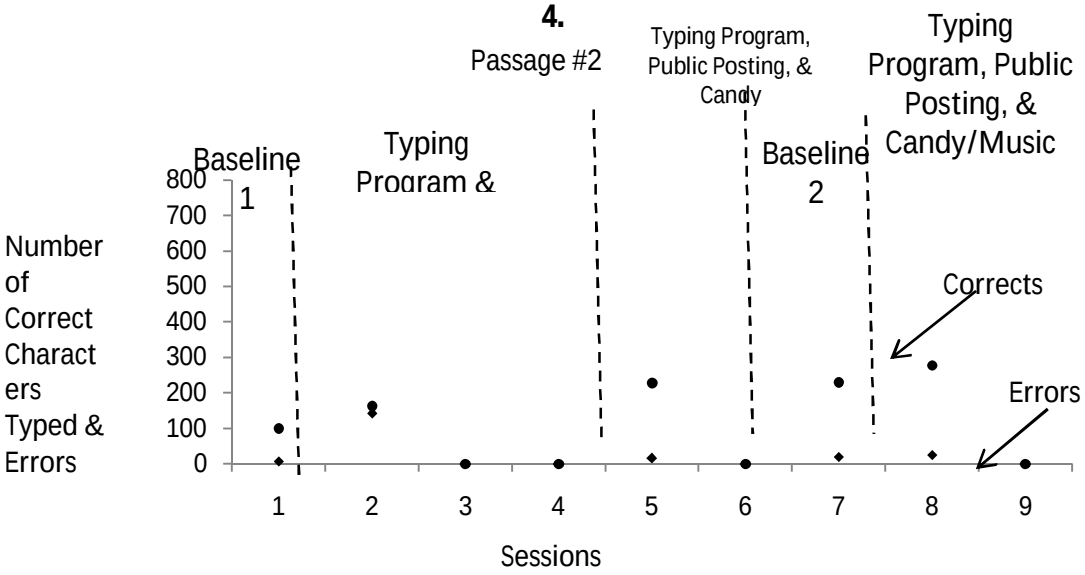

Figure 8.1: The Number of Correct and Errors Typed for Passage 1 by Student 5

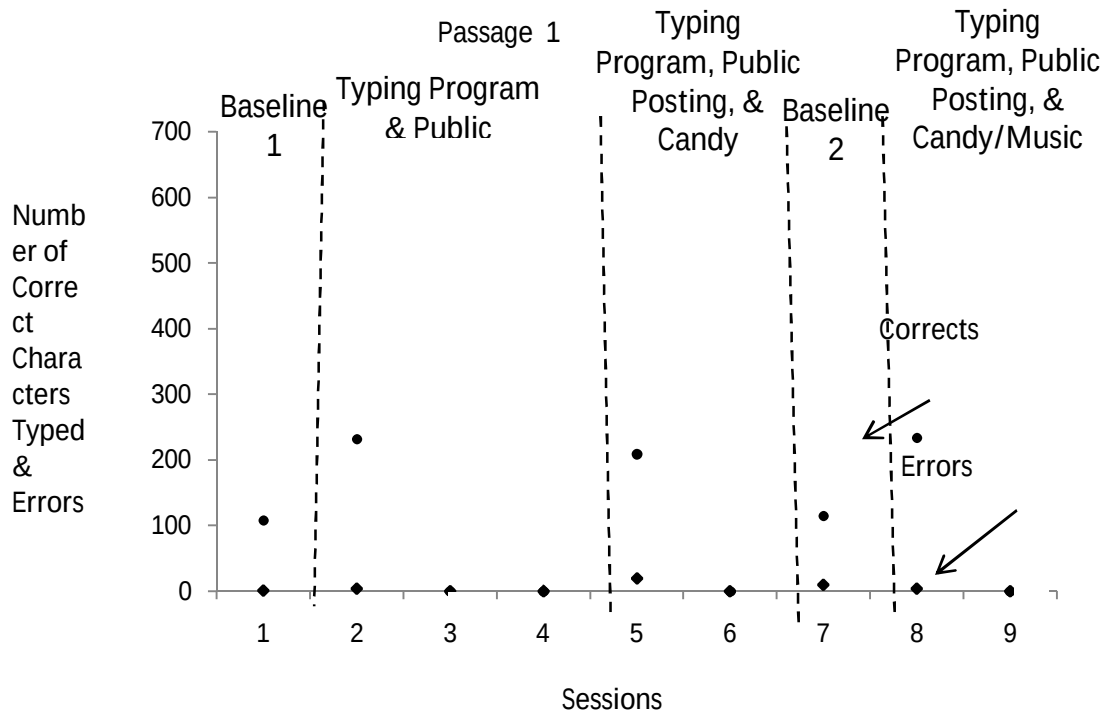

Figure 8.2: The Number of Correct and Error Characters Typed for Passage 2 by Student 5.

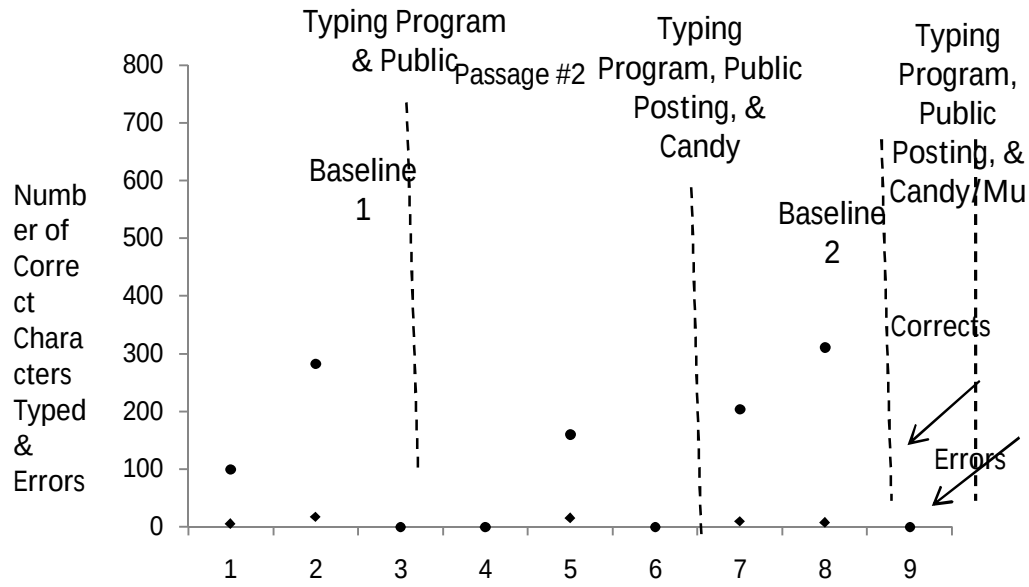

Figure 9.1: The Number of Correct and Error Characters Typed for Passage 1 by Student 6.

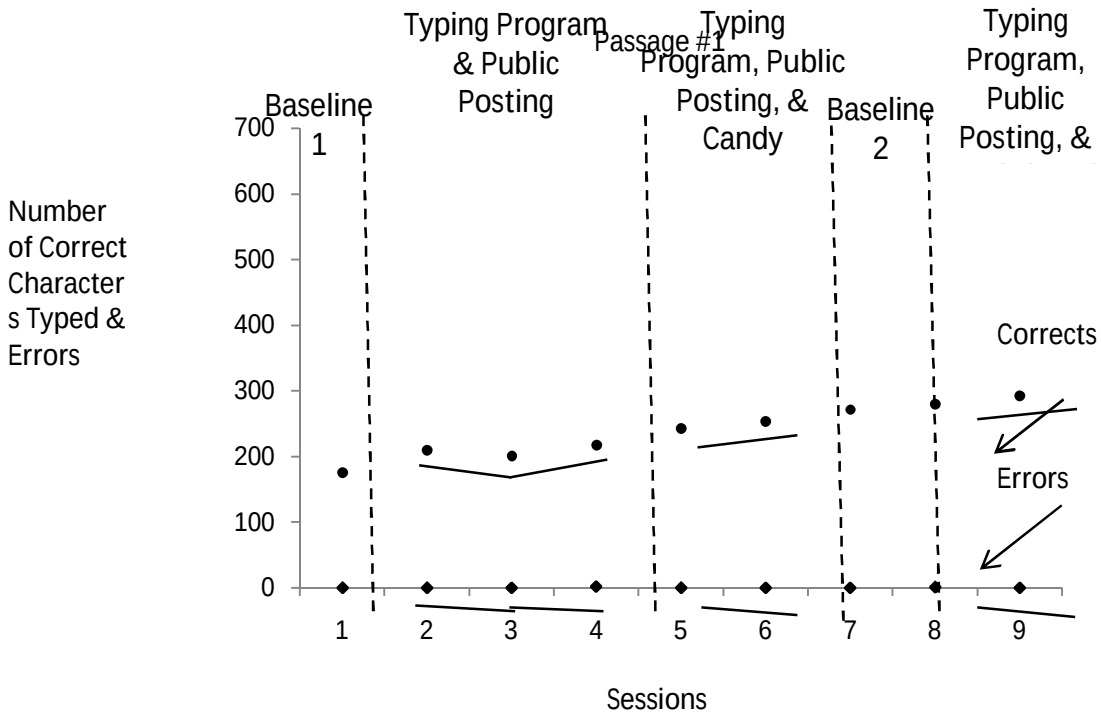

Figure 9.2: The Number of Correct and Error Characters Typed for Passage 2 by Student 6.

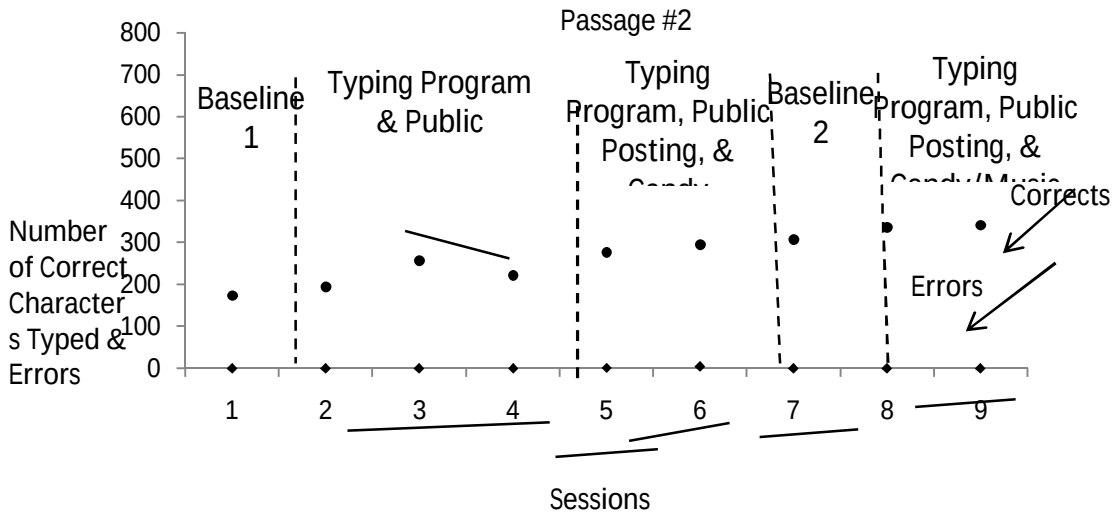

Figure 10.1: The number of correct and incorrect characters typed for Passage 1 for Student 7. The star on Session 9 indicates that the student was having significant issues at home that day.

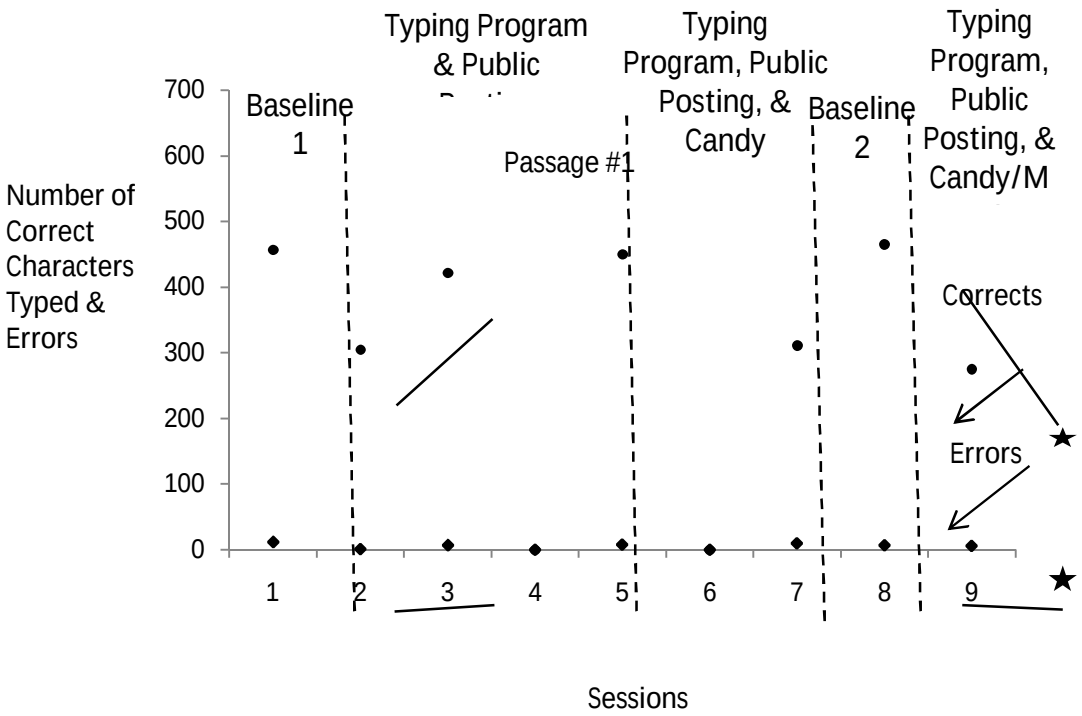

Figure 10.2: The number of correct and error characters typed for Passage 2 for Student 7. The star on session nine indicates that the student was having significant issues.