

We can...can they? Touch Typing for First Graders

Carol L. Gillespie
Media Center
Oakland Elementary School
GA, United States
lgillespie@henry.k12.ga.us

Lars Leader, Ph.D.
Department of Curriculum & Instructional Technology
Valdosta State University
GA, United States
lfleader@valdosta.edu

Abstract: The purpose of my study was to determine if first-grade students had the developmental skills and the interest necessary to learn how to touch type on the computer keyboard without looking at their hands. Six students each from three different first-grade classes participated in the study. None of the students had received instruction in keyboarding prior to the study. All students received instruction for thirty-five minutes daily, over a course of nine days and were monitored for correct keyboarding technique while working. Accuracy was stressed over speed. Daily practice work was printed so the instructor could check for accuracy. At the end of the intervention the students answered questions about their keyboarding experience. The increase in typing speed from the pretest to the posttest was negligible, however at the end of two weeks all eighteen learners could easily type words and short sentences without looking at the keyboard and were eager for continued instruction.

Introduction

As a media specialist working in a library that is in close proximity to the computer lab, I have often observed students as they worked at the keyboard. It has been my experience that more often than not the method used to input information left much to be desired. Most students in kindergarten through fifth grade use one or both index fingers when typing, and must hunt for each letter on the keyboard, resulting not only in slow and low productivity, but more importantly resulting in the development of a habit that several research studies claim would be increasingly hard to break the more it is practiced (Bartholome, 1999; Brown, 1998; Santo, 1998; Wiseman, 2000).

It is not the fault of the teachers that students are not learning how to type. Although keyboarding software is available, this activity is often neglected in favor of lab activities that have a higher priority, such as reviewing for standardized testing. It is not the fault of the students, as they have no knowledge that any other input method exists, or is preferable over the one they are accustomed to. It is not the fault of curriculum planners because they are attempting to incorporate as many of the state criterion referenced skills into the local curricula as possible. Somehow, though it is not anyone's fault, the vital skill of correct keyboarding technique is not included as an objective any earlier than middle school. This is a commonplace occurrence. Few elementary school curricula provide for touch-typing instruction, resulting in a generation of children who often do not learn to type properly (Brown, 1998).

Because today's students will depend more heavily on computers than any past generation, my research targeted the viability of beginning keyboarding instruction as early as first grade. From a theoretical standpoint, Bart Pisha suggests that the early school years are the ideal time for teaching keyboarding. At this age it is actually less cognitively and physically demanding for students to locate and depress the keys than it is for them to repeat the fine motor movements necessary for forming handwritten letters (Pisha, 1993). In addition, Keith Wetzel, author of "Keyboarding Skills: Elementary My Dear" in *The Computing Teacher* (1985), stated that children as young as five or six who are unfamiliar with keyboards can compose more quickly and easily on computers than by hand, possibly because keyboarding requires fewer fine motor skills than handwriting.

It is mandatory that learners be equipped as young as possible with the skills needed to accept the unique challenges of information technology. Bartholome's research study and that of others concluded that direct instruction by the teacher was proven to be the most effective delivery method for introducing the keyboard and teaching correct techniques, as the teacher can check to ensure that the student is using the correct fingers to strike the keys (Bartholome, 1999; Erthal, 1998; Hoot, 1987; Shuller, 1989). I felt this was true and wished to observe for myself if such was the case. To investigate whether first grade is not too soon to begin this instruction, I designed and taught a keyboarding curriculum meant to be appropriate for these young learners and at which they could achieve proficiency and success. Using this supposition for background, the following research questions were addressed in this study:

1. How do the students use the keyboard before, during and after intervention?
2. What information about keyboarding do participants provide before, during and after the intervention?
3. What is the response of the participants as they are taught touch-typing through direct teacher instruction?
4. How did touch typing impact participants' perceptions of themselves and their computer keyboard skills?

Method

Setting and Participants

My action research project was conducted at an elementary school in the northern part of Georgia, in one of the fastest growing counties in Georgia. The school's current enrollment of 620 students in kindergarten through fifth grade is comprised of 2% Asian, 34% Black, 5% Hispanic, 55% White, and 4% multiracial.

The learners who participated in the research project were eighteen first-grade students from three different first-grade classes. Each of the three sponsoring teachers chose six students from her class, with no particular criteria for selection defined. The youngest of the students was 6 years, 5 months old and the oldest was 8 years, 1 month old. Five boys and 13 girls took part in the intervention. This group was comprised of ten White children, six African American children and two Hispanic children.

Instruction

The students attended instruction at a time convenient for the classroom teacher and when it would not be a detriment to regular classroom instruction or activities. One keyboarding session took place in the morning and two took place in the afternoon. All classes were conducted on the six computers available in the media center.

Daily instruction began with the location of the bump keys and the home row keys followed by the introduction of one or two new letters. Previously learned letters were reviewed as part of each lesson. In addition the two vowels, E and I, were introduced and thereafter the children received practice in typing short three or four-letter words comprised of the home row letters and the vowels. Daily drill took place through an online program (www.senselang.com) in which I could paste the letters and/or words, which I wished the students to practice. After drill the children practiced by typing letters and words from a hard copy, and were timed as they did so. However, technique and accuracy were emphasized, not speed. Two copies of each child's typed work were printed out each day. One copy was given to the child so he or she could have something to take home, and one was kept for data collection purposes. Students were monitored and encouraged by me either alone or with an assistant.

Data Collection

To achieve a good overall view of the instructional impact on the first graders, several different data collection instruments were used. A pre-intervention questionnaire was used to determine learners' knowledge of right and left, location of home row and other specific keys and current frequency and type of computer usage.

With prerequisite skills determined, students were then asked to type 24 short, 3-4 letter words. This pre-assessment was timed. While completing the typing pre-assessment the learners were observed for knowledge of technique, key stroking, posture, and accuracy. Learners were also asked interview questions regarding their desire to learn to type words and sentences without looking.

During the course of instruction the students' behaviors were observed while at drill or during practice typing from a hard copy and observation logs were kept. Students' daily typed work was timed then printed as part of the data collection process.

Following instruction the learners were again assessed as to their knowledge of the home row and other specific keys. A timed post-intervention typing assessment consisting of the same list of words as the pre-assessment was administered, and students were asked seven Likert-type questions and three open-ended questions concerning their learning experience. They were also encouraged to add any other comments they wished to make about their typing class.

Procedures

Color-coded name labels were made for each child and these were placed on the computers in the morning before the first session. After each session, the name labels for the next set of students were placed on the computers. This allowed the children to know which computer to use, and also served as identification for the purpose of the observation logs. After the typing pretest, the first lesson consisted of instruction in correct typing posture, location of the "bump" keys ('f' and 'j'), home row keys, and correct hand position on the keyboard. The hand position was demonstrated and compared to the way a puppy hold its paws when walking. Thereafter, when children prepared to type, they were instructed to make sure their hands looked like "puppy-dog paws". They understood easily and complied.

Daily instruction began with a review of all previously learned material, and each day one or two new letters were introduced. The children identified which finger touched the new letter(s) and practiced lightly typing the letter(s) without really depressing the key. They then opened the online program (www.senselang.com) in which the previous letters and the new practice letters or words had already been pasted. After two to three minutes of practice drill they were told to stop and put their hands in their laps, or else to wiggle their fingers to rest them.

After a short time the students then opened a Word document, which had already been labeled with the lesson number and date. They were instructed to type their name, and to make sure their fingers were on the home row when doing so. They were provided with a printed hard copy, which duplicated what they had practiced in the online drill, and were asked to type while trying to look only at the hard copy. A common beginning time and individual finishing times were recorded. However, technique and accuracy were stressed above speed. During the hard-copy practice, the students were observed and their learning and behavior responses were recorded. In addition they were videotaped, and several still shots were taken with a digital camera. Following the hard-copy practice, two copies of their work were printed and they were encouraged to take their copy home to show parents.

Ethical and Legal Research Practices

Before the research study began, each student was given a parental consent form to take home and have signed. There was a place on the form for both the parent and student to sign. From the original group of eighteen, all but one form was returned, so a new student was chosen who returned the signed form the following day. In addition, the principal was informed about the proposed research study and her permission was secured before the study began.

Findings

Observation

The most common response behavior observed was extreme concentration. The first graders appeared to be very focused on this grown-up task. They succeeded, for the most part, at keeping their fingers on the home row keys, and if they moved their hands to touch enter or backspace (to correct a mistake), they would immediately locate either the bump keys with their index fingers, and then let their other fingers naturally touch the keys to each side, or they would place their pinkie finger on the "a" key and then allow their other fingers to fall into place, skipping the "g" and "h" and then starting with the "j" on the right hand.

Although the correct typing posture was reinforced every day, and often two or three times during a lesson, some of the learners appeared more comfortable with their feet tucked beneath them in their seat. After several days of observing this response, I finally told them that if they could reach the keyboard more easily

then it was all right for them to sit this way. Occasionally there was giggling and laughing, especially when the final words to be typed for the day were "fiddle faddle", "kiss a kid", "feel a dill", or "deaf seals sled".

While typing, many of the children would say the letters or words out loud. Most tried to not raise their fingers as they located the additional letters that were needed to type their names. They were taught to use their thumbs on the spacebar, and this became as easy for them as the home row keys. As more and more lessons were concluded they had to be reminded less and less often to keep their fingers on the home row keys. One child became very protective of his work and brushed my hand away when I attempted to reach for the backspace to correct his mistake. The most notable observation, and one that was totally unexpected, was the ability of the students to "feel", rather than see, when they had made a typing mistake. The first time this happened I had my hands over a child's eyes, and was spelling a word aloud as she typed. I watched her hands as the words appeared on the monitor and I noticed the mistake but decided to say nothing. She, however, "felt" the error, and began to act frustrated, wanting to correct it, but not being able to see the backspace key with her eyes covered. When I uncovered her eyes I told her that I had noticed that she knew when she made a mistake and asked her if it was because she felt it in her fingers. She said yes. This action was observed in other students and served as a welcome affirmation that the memory of the keys was beginning to be in their fingers.

I only heard one negative comment during instruction ("Oh, my arm's hurting") but several positive ones: "I typed it without looking!" "This is fun!" "I didn't look at the computer!" "I typed without looking!" and "Look, I typed a period. I did it again!" One child gave himself a thumbs up after looking at the monitor and finding that he had typed some words while my hands covered his eyes.

Daily Printed Work

Every day two copies of the students' typed practice work were printed out and the students were allowed to take one home. The total time spent typing the daily practice lesson was recorded, and these times were used to calculate the average typing speed for all lessons.

Table 1 below shows that the mean typing speed during Lesson One was 5.10 words per minute with a standard deviation of 1.63, compared to a speed of 5.91 words per minute in Lesson Seven with a standard deviation of 2.01.

	Mean	Standard Deviation
Lesson 1	5.10	1.63
Lesson 7	5.91	2.01

Table 1: Comparison of Average Student Typing Speeds of Two Lessons

Although the increase in speed is negligible, the emphasis during the lessons was not on an increase in speed, but rather attention to accuracy. The highest average daily typing speed was 8.06 WPM and the lowest was 2.92 WPM.

Knowledge of Keyboard Components

There were two parts to the post-intervention assessment. The first tested the learners' ability to identify certain components on the keyboard. Figure 1 below shows a comparison of the students' ability to identify keyboarding components before and after the intervention. Daily instruction and repetition of the use of the reminders, "find the bump keys", "use the bump keys to help your other fingers find the home row", resulted in the majority of students being able to correctly identify these keys and to place their hands on the keyboard correctly in preparation for a lesson.

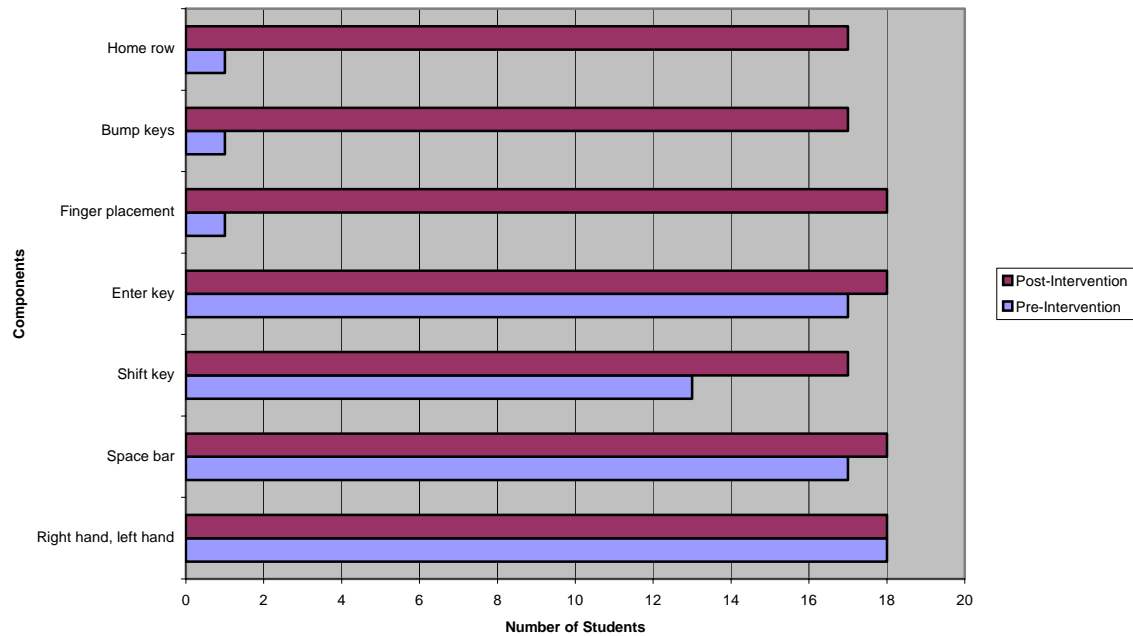


Fig.1: Students' Ability to identify keyboard components

Skill Assessment

The second part of the post-intervention assessment was a timed typing test. This was an exact duplicate of the timed typing test administered before instruction began. This test was administered individually and each learner's total time spent typing was recorded. Shown in Table 2 below is a comparison of student typing speed and accuracy both prior to and after the intervention took place. To calculate errors, actual misspellings were counted in addition to run-on words. The table shows the mean of all errors for the pretest and posttest, which both contained the same 24 words to be typed. The first graders had an overall improvement in speed of almost one word per minute, but the greatest improvement was in accuracy. These young learners improved their typing accuracy from an average of slightly more than two errors on the 24-word pretest to less than one-half an error for the entire 24-word posttest.

	Speed (WPM)		Accuracy
	Mean	Range	Errors (Mean)
Pretest	3.95	2.28 to 6.5	2.05
Posttest	4.88	2.8 to 10.0	.38

Table 2: Comparison of Typing Speed and Accuracy

Student Interview Questionnaire

Finally, the students were interviewed one-to-one after the last lesson had been completed. There were seven Likert-type questions which addressed their like or dislike of typing class, favorite activities, and whether or not they would continue to use what they had learned. Table 3 below shows the students' responses to the first seven questions on the Student Interview.

	Yes	Not sure	No
Did you like learning to type?	18	0	0

Did you think typing class was fun?	18	0	0
Did you think typing class was hard?	0	0	18
Was it fun to type without looking at your hands?	15	2	1
Do you try to remember to use your home row keys now?	18	0	0
Do you try to type now without looking at your hands?	16	1	1
Will you keep practicing not looking at your hands?	17	1	0

Table 3: Student responses to Interview Questions

All eighteen learners asserted that they liked learning to type and that it was fun. All eighteen responded that typing class was not hard. Fifteen thought it was fun to type without looking at their hands, two weren't sure about this, and one replied in the negative. All eighteen claimed that they now used the home row when typing and 16 said they tried to type without looking at their hands. Of the eighteen interviewed, 17 promised to keep practicing without looking at their hands.

Tables 4 and 5 below address the question of the learner's ability and desire to type letters and words without looking at the keyboard, both before and after instruction took place.

	Question	Yes	No
Prior to Intervention (Usage Question 10)	Can you type any letters of the alphabet on the computer, without looking at the keyboard or your hands?	0	18
	Would you like to learn how to type letters of the alphabet on the computer without looking at your hands?	18	0
Following Intervention: (Interview Question)	Did you like learning how to type letters of the alphabet on the computer without looking at your hands?	18	0

Table 4: Response to learning how to type letters without looking at keyboard

	Question	Yes	No
Prior to Intervention (Usage Question 11)	Can you type any real words on the computer, without looking at the keyboard or your hands?	0	18
	Would you like to learn how to type real words on the computer without looking at your hands?	18	0
Following Intervention: (Interview Question)	Did you like learning how to type real words on the computer without looking at your hands?	18	0

Table 5: Response to learning how to type words without looking at keyboard

Table 6 below shows a comparison of students' responses related to computer usage both before and after the interview.

	Question	Play Games	Paint	Internet	Type
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Prior to Intervention (Usage Question 12)	What is your favorite thing to do on the computer?	14	3	2	0
Following Intervention: (Interview Question)	What is your favorite thing to do on the computer?	10	0	0	8

Table 6: Response to favorite computer activity

After the intervention, the majority of students still preferred playing games to any other computer activity. However, eight answered that typing was their favorite activity, and of the ten that still preferred game playing, four listed typing as their second favored activity.

Three open-ended questions were also asked. When questioned about what they liked best about typing class, four responded that they didn't have any one favorite activity. The other responses included typing letters, being on the computer, typing big words and sentences, closing your eyes and being able to type, and being able to teach a brother or sister how to type. Only two children responded in the negative when asked if there was something not liked about typing class. One didn't like "getting mixed up when I pushed the L" and the other was not particularly fond of "having to type for a long time".

Discussion

One of the topics I wished to explore was whether the touch-typing lessons would have any effect on how the participants used the keyboard. Before touch-typing instruction began, the majority of students responded that game playing and painting were their favorite computer activities and a few mentioned surfing the net. None, however, listed typing words or sentences as their favored usage. Although the students were actively engaged in typing short words and sentences during the lessons, at the conclusion of the intervention they related they still used the keyboard mainly for playing games. However, four students listed typing words and sentences as the second favorite activity.

A second area in which I was interested was the knowledge the participants had about how to use the keyboard before instruction began. Most of the students in this group knew how to use the space bar, enter key, and shift key, but only one was familiar with the term, "home row". During instruction they all became proficient at using these major function keys, in addition to the bump keys and home row keys. They also learned the function of the Home and End keys. In a post-intervention interview they informed me that they would continue to use the bump keys as a method to find the home row, and that they would try to continue typing without looking at the keyboard.

A third research question addressed student engagement. How would these young learners respond to learning touch-typing through direct teacher instruction? I found that they eagerly anticipated their time to be picked up and escorted to typing class, and once there they were anxious to get started reviewing and learning new letters. Without my constant monitoring they would sometimes forget to keep their fingers on the home row keys. During the first few touch-typing lessons, it was often necessary for me to remind them to keep their fingers on the home row keys. Without constant monitoring, eight fingers striking the keys instead became one, and that one was hunting and pecking. The need for a teacher to monitor and watch for this type of relapse was supported by Bartholome's comment that direct teacher instruction serves the purpose of monitoring finger placement whereas instruction by software instruction alone can not (Bartholome, 1999). As the lessons progressed, verbal reminders were needed less and less and the students began to realize it was easier to position their fingers on the home row as a starting point rather than to search for each letter. During direct observation they were often heard to remark, "this is fun", or "this is great". One child remarked that he was going to teach his brother how to type.

The touch-typing instruction also answered my fourth research question concerning impact on the participants' perceptions of themselves and their computer keyboard skills. They expressed pleasure that they could type words and sentences without looking. When the parents arrived at the celebration event, their children rushed to the computers and asked if they could start typing. I've passed many in the hall who have asked, "Are you going to get us today?" or "When are you going to pick us up?" It is my belief that they

enjoyed most aspects of the instruction, and that they felt proud that they could do something that experts said they were unable to do.

Limitations of the Study

The most regrettable limitation of this study was the scope and duration of time in which the students were able to participate. By the end of the second week they were well on their way to mastering the correct technique for touch-typing and had already learned how to strike nine letters from memory. A yearlong program would cement their present mastery and allow them to master the entire alphabet, thereby preventing the beginning of the regrettable and hard-to-correct habit of hunting and pecking. The first graders who participated in instruction expressed dismay at the conclusion of the lessons and wished to continue. Their parents were given the website that was used and an explanatory letter on how best to continue instruction at home in the hopes that they would continue to encourage their children to practice.

The second greatest limitation was the height of the tables on which the keyboards were placed. Greater proficiency could possibly be realized if the learners were able to use keyboards at the correct height for their small body size. They appeared to have no problems reaching the correct keys with their small fingers, but they did sit on their feet in order to reach the keyboard.

Next, these young learners were hindered by their limited spelling ability. Although the only words they were asked to type were simple words that they could read and understand, they often had to refer back to the hard copy just to check the spelling. For more mature keyboardists who have a better command of spelling, this would not be a problem.

Another consideration for future studies would be the length of the sessions. Some of the participants in the study seemed to tire easily after a 5-7 minute drill session. Short drills in the eight- fifteen-second range would probably be more advisable for learners this young (Jackson & Berg, 1986).

In addition, interruptions in the media center seemed to distract the learners from their concentrated efforts to strike the correct keys. A quiet, undisturbed atmosphere is to be desired.

Lastly, as the students became more comfortable with the instructor and with being pulled from their regular classrooms for "special" lessons, they became more talkative and apt to socialize more often. Even though accuracy was stressed above speed, this tendency to socialize resulted in practice work that took longer to complete in Lesson Nine than that in Lesson Five.

Because students learn initially by sub vocalization, talking at this time is a detriment to learning and should be discouraged (Starr, 2001). As the students' proficiency improved, typing speed should have improved also, but this was not always the case. Rewards for staying on task would probably go far toward correcting this problem and the words per minute speed of students would possibly improve.

Conclusions

The response of the participants to keyboard instruction was a positive experience both for the participants and the participant instructor. The students' hand size did not serve as an obstacle to being able to keyboard. Observations which were supplemented with videotapes of the students at the keyboard offered proof that first graders were able to perform the correct keystrokes and to concentrate on keeping their hands on the home row keys. By doing so, they were able to achieve the same typewriting technique as adult keyboarders.

During the intervention the learners were often surprised when they were still able to find and type the correct letters as the instructor orally spelled a word and covered their eyes as they typed. They grew increasingly enthusiastic about their new proficiency and expressed elation at many times when they were able to type whole words and even sentences without looking at the keyboard.

The inclusion of printed work as part of the daily lesson was an important motivational factor. Because the students could quickly correct any mistakes, the end product was usually flawless and something they could take home proudly.

Although typing speed was not stressed and improved only slightly, the participants had to be reminded less and less to find and use the home row keys. When they made a mistake they often realized it before they noticed it on the monitor, and sought to correct it. Their fingers began to attain the memory of the keys, a skill enjoyed by mature keyboardists.

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