The Effect of Using Free Online Keyboarding Applications on Typing Speeds & Attitude

Action Research

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Masters Project: Action Research Study

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Abstract

Forty Grade 5 students participated in an action research study that examined the effects of using free online keyboarding applications to improve typing speeds. A two group, pre and post test design was used to measure speed and attitude. Attitude was measured using a Likert Scale survey. Typing speed was assessed using an online typing test. The treatment group practiced their typing for five minutes once a week in Information Technology class and for five minutes, four times per week at home over a six-week period. The control group worked on other software in IT class and did not practice their typing. Although there was an improvement in typing speeds, especially with boys, the results were not statistically significant.

Introduction

There is a common debate among educators concerning the amount of time spent on practicing keyboarding skills during class time. And, as The International School Nido de Aguilas' elementary school Information Technology program moves from a once-a-week IT class model to a fully integrated model, the question of how does keyboarding get taught has been brought to the surface.

Like many issues, the research and common practice vary greatly with regards to what age do you start, how do you teach typing, and how much time do you devote to learning keyboarding skills.

In a perfect world, all students at some point will type over forty words per minute (roughly the speed at which the average brain thinks). At worst, students should type faster than the eleven to sixteen words per minute that elementary students tend to write by hand. To become this accomplished with the keyboard, though, takes both time and practice.

On one side of the argument are those who spend little or no time on typing. One somewhat extreme argument is that keyboarding is a psycho-motor skill and as such, should be taught in the Physical Education classroom instead of the Information Technology class. A more pragmatic argument is that proper keyboarding techniques are losing out to texting, instant messaging, and email done at home, away from the watchful eye of the teacher. And, since we cannot reinforce proper technique at home, some argue, that it is a waste of time to practice keyboarding skills in the classroom.

There are other arguments against spending a lot of time on keyboarding skills in the IT classroom. Some argue that using typical typing programs such as Mavis Beacon makes

students good at dictation, much like the skills that secretaries need, but that is not what is needed in school. Students need to be able to compose their own work rather than type dictated passages. In addition, school budgets are often not there to buy programs like Mavis Beacon.

At the other end of the teaching spectrum, IT teachers will spend a large amount of time practicing and reinforcing typing skills. They cite the importance of typing speed and accuracy in today's technological world. Some educators will argue that typing speed and accuracy is more important than the software skills themselves.

What is certain is that typing must be taught. Students must have the "skills necessary for using computers competently. One of those necessary skills is, of course, keyboarding" (Starr, 2005). Former President Clinton and former Vice-President Gore challenged the people of the United States "to ensure that all children are technologically literate by the 21st century" (Hopkins, 1998). Our students need to type well.

Since typing is so important, there must be a middle ground in the way we can successfully teach keyboarding. There must be an approach where core software skills can be taught but not at the expense of keyboarding skills and speed. This approach should also be done in an entertaining and free way.

My approach in my elementary IT class is to focus on software skills and integrated projects and then keyboarding is practiced using free, online keyboarding applications with any remaining time in class. It seems to be working well with our Grade 5 students 'graduating' with speeds that more than double the school's expectations of eleven words per minute. But is this the best approach?

Most students in Grade 5 love to be online at home playing games, using social networking sites, chatting, and emailing. With the advent of many free, online keyboarding applications (referred

to as FOKAs from now on), learning to type can be easily done in an entertaining way. There are no budgets to worry about, the games themselves are accessible at home, in the classroom, the library, or on any computer with an Internet connection and not just in the IT classroom, and many FOKAs are very entertaining.

I believe that FOKAs can be a valuable and cost effective way to teach keyboarding skills in a time efficient and entertaining manner. And this can be done in a minimal amount of time.

Review of Literature

Research about keyboarding varies greatly but there are two points regarding keyboarding that everyone agrees on. One, the goal of any typing program should be to reach a point where the students can focus solely on their ideas (as cited in Fleming, 2002) and not on the typing process itself. Two, typing needs to be introduced and taught in elementary school (as cited in Fleming, 2002).

The age at which typing should be introduced and taught varies somewhat in the research. Younger children can have problems with finger size (as cited in Fleming, 2002) although some research suggests that typing can be introduced as early as 1st Grade (Zeitz, 2006) with good results. Although proper fingering is not necessarily taught, the basics of keyboarding can be taught to Grade 1 students.

Research states that eye-hand coordination and dexterity should be good enough by Grade 3 (Zeitz, 2006) although some research does not agree. Other research shows that 4th graders have the requisite hand-size and dexterity to properly and effectively keyboard (Hopkins, 1998). Others report that keyboarding should not be taught until 5th or 6th grade (as cited in Fleming, 2002). The research that I have read seems to emphasize that Grade 4 is the optimum time to start formal keyboarding training.

Regardless of the grade level that a school starts to teach keyboarding, research does show that older students tend to show more rapid improvement than younger students (as cited in Pisha, 1993).

The research concerning the appropriate age for beginning keyboarding instruction combined with classroom observation of our students' hand size leads me to believe that Grade 5 is an appropriate age with which to conduct this action research.

Once the choice of age or grade was made, the *how* was addressed. BBC's Dance Mat Typing was chosen for several reasons. One, it was free, online, and easily accessible by all of our students both at school and at home.

Another reason that BBC's site was chosen is that Dance Mat Typing does not use words with meanings in the initial levels of instruction, a feature recommended in the research (Starr, 2005). Rather, they should use a sequence of keys that force the hands to remember the keys' locations. This motor skill is stored in the neocortex of the brain, an area responsible for conscious thought. With practice, this skill moves deeper into the brain and gradually bypasses conscious thought (Starr, 2005).

Research also shows that the learning process should stress technique over speed (Bartholome, 1996). Dance Mat Typing does exactly that.

Dance Mat Typing also has the bonus of having onscreen animations teach proper typing techniques. The first instructor is a Scottish goat, who teaches students about the home row. Having an instructor has been shown to be very important when teaching keyboarding (as cited in Fleming, 2002) although the research was probably referring to human instructors.

One area that research shows Dance Mat Typing to be lacking in is in its' inability to track student's progress. When working on their keyboarding skills, it is important for the students to

have their progress tracked. An application's ability to track students' progress helps to increase their learning (Bartholome, 1996).

That is the reason why Typing Test #26 at www.freetypinggame.net was used to test speed and accuracy. This application helped to provide me a way to track the student's progress (Bartholome, 1996).

Unfortunately, although they may exist, I could find no research on FOKA's. However, based upon the literature reviews, there is considerable research to suggest that BBC's Dance Mat Typing in conjunction with www.freetypinggame.net used on Grade 5 subjects would have a positive effect on the typing speed of the students. This suggests to me that my research question concerning the effect of using free online keyboarding applications on typing speeds and attitudes is validated by research.

Method

Research Design

To test my hypothesis on using FOKAs, I used a two group pre/post test action research intervention. Typing Test #26 at www.freetypinggame.net was used at the beginning, at week number three, and at the end of the study to test the student's typing speed over a one-minute test (after a three-minute warm up period using other online applications).

The *Attitude Towards Online Typing* (Likert Scale) was also administered at the beginning and at the end of the study.

By administering these two tests, it was possible to compare both the attitude towards and the typing speed before and after the action research.

My hypothesis was that the students in the treatment group would have a better attitude towards typing and a greater increase in typing speed than the control group.

Intervention

Prior to the action research study, the students all received instruction on proper typing techniques such as hand position, home row, sitting up straight, and keyboard position.

Using BBC's Dance Mat Typing (http://www.bbc.co.uk/schools/typing/), the treatment group practiced their typing skills five minutes per week in their Information Technology class ,in addition to practicing their typing skills at home four times per week for five minutes per session. The students kept a log of the dates and time spent practicing while at home (Appendix B). This lasted over a period of six weeks. The rest of IT class was spent on the same integrated assignments that the control group used while in IT class.

The treatment group was to use BBC's Dance Mat Typing both in class and at home.

BBC's Dance Mat Typing was chosen because it is not game-based yet entertaining, has the keyboard on the screen, and the application teaches and reinforces proper fingering throughout the various stages that the subjects progress through.

Typing Test #26 at www.freetypinggame.net was used to conduct a one-minute timed typing test at the start of the intervention, at the end of the third week, and at the end of the research. The test itself is the story of "The Elves and the Shoemaker" by the Grimm Brothers so it replicates real sentence structure and punctuation. The program reduces the words per minute based upon the number of errors that a student makes, thus reinforcing accuracy.

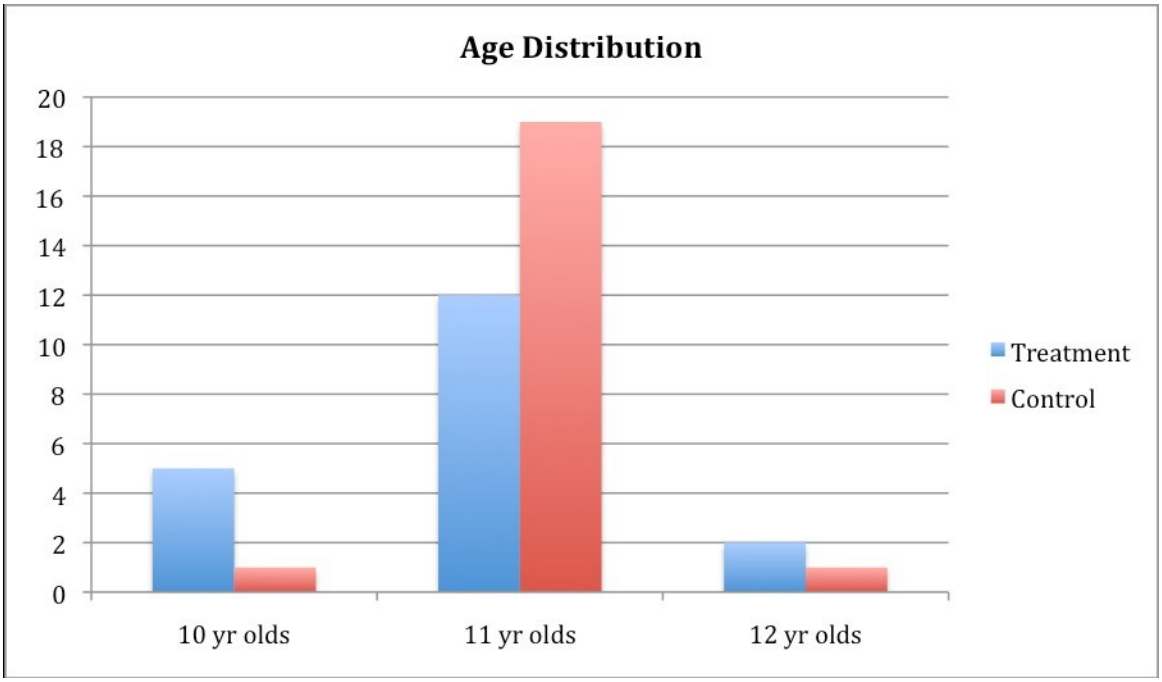
Sample

Both the treatment and control groups were randomly chosen from the five Grade 5 homeroom classrooms at The International School Nido de Aguilas. The classes were chosen the previous year by the Grade 4 homeroom teachers who attempted to balance the classes based upon

academic ability, behaviour, special needs, and ESL needs. The lists were modified slightly by the administration. The treatment group was composed of students from Grade 5A while the control group was composed of students from Grade 5D.

The treatment group had ten males with an average age of 10.8 years and nine females with an average age of 10.8 years. The control group had ten males with an average age of 11.1 years and eleven females with an average age of 10.9 years. In both groups, the ages ranged from ten to twelve years old.

Table 1



One student was removed from the treatment group. This student was new to the school that quarter when the research began and had no previous keyboarding experience. Using proper fingering was a new experience to him and while his typing speed Gain was -1, he was removed due to his inability to type using proper keyboarding techniques.

Instrumentation and Data Collection

Both the treatment and the control groups took a one-minute speed test using Typing Test #26 at www.freetypinggame.net in addition to the Attitude Towards Online Typing (see Appendix A). This simply gave a speed measured in words per minute that was adjusted by the number of mistakes made.

I created the Likert Scale used in this study and called it The Attitude Towards Online Typing scale (found in Appendix A). The ten-question Attitude Towards Online Typing scale was designed to assess the students' attitude towards keyboarding, the importance of keyboarding, and the attitude towards playing and working both on computers and while online.

Threats to Validity

There were several threats to validity in this action research. A History threat to validity existed. The pre-tests for speed and the Attitude Towards Online Typing scale occurred just after the earthquake (8.8 magnitude, 2010) happened in Chile. The earthquake affected students emotionally to varying degrees. Halfway through the study, the students experienced a major aftershock just before lunchtime while in school. This event left many students visibly upset and outside in the hot sun for the remainder of the day while the buildings were inspected for damage. Many teachers noted that attitudes towards school and work seemed to change.

There was a Testing threat to validity in that Typing Test #26 was used for all three tests. Even though the tests were taken three weeks apart, there is still the possibility that students improved based solely upon retaking the same test.

A Maturation threat to validity also existed. Grade 5 students, at this point in the year, are starting to grow and mature rapidly, which may affect their hand-eye coordination positively. It is possible that any gains in typing speed may be due to increased dexterity and hand-eye coordination.

The greatest threat to validity in this study, however, was trusting the students to be responsible and to follow the program at home. That meant the students had to type on their own, four times per week and at least five minutes per session. They also had to use proper fingering and other typing techniques, unsupervised.

Results

The results of the study did show that the treatment group improved their typing speeds more so than the control group but the gains were not statistically significant (t=0.5700, df=38, p=0.5720). This is shown in Table 2.

Table 2

	Pre-Test	Post-Test	Gains
Treatment	20.7 wpm	24.9 wpm	4.16 wpm
Control	21.8 wpm	25.1 wpm	3.3 wpm

Tables 3 and 4 show that males in the treatment group improved their typing speeds much more than those in the control, although this was not significant (t=0.8698, df=18, p=0.3958).

Table 3

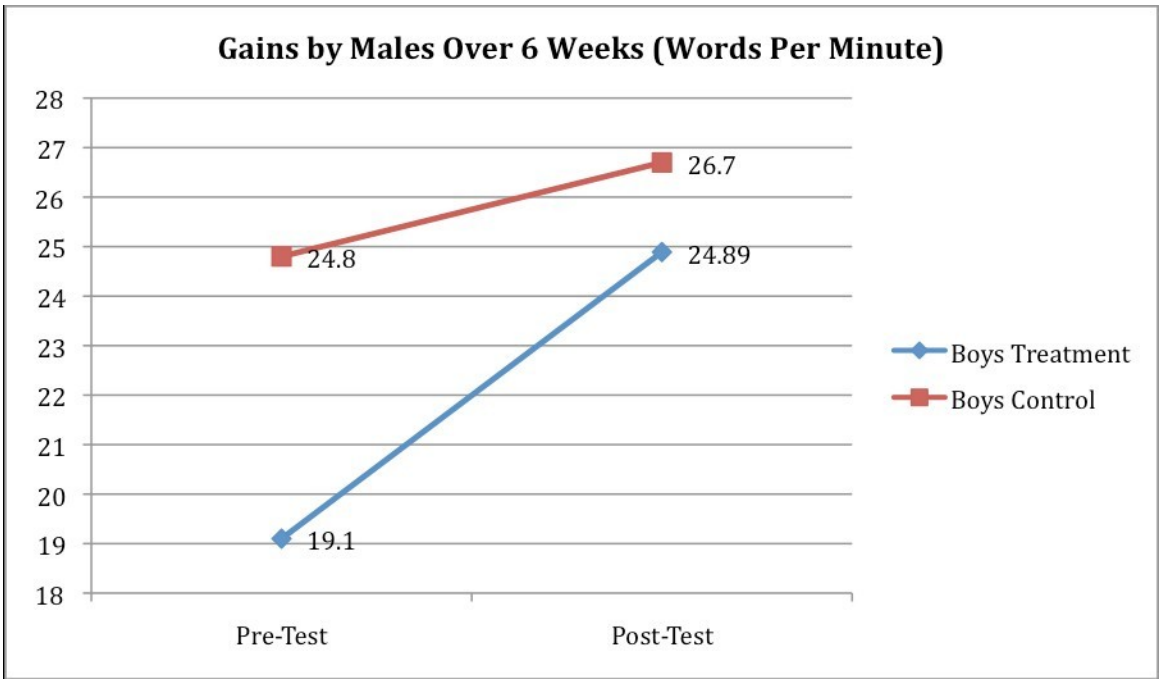
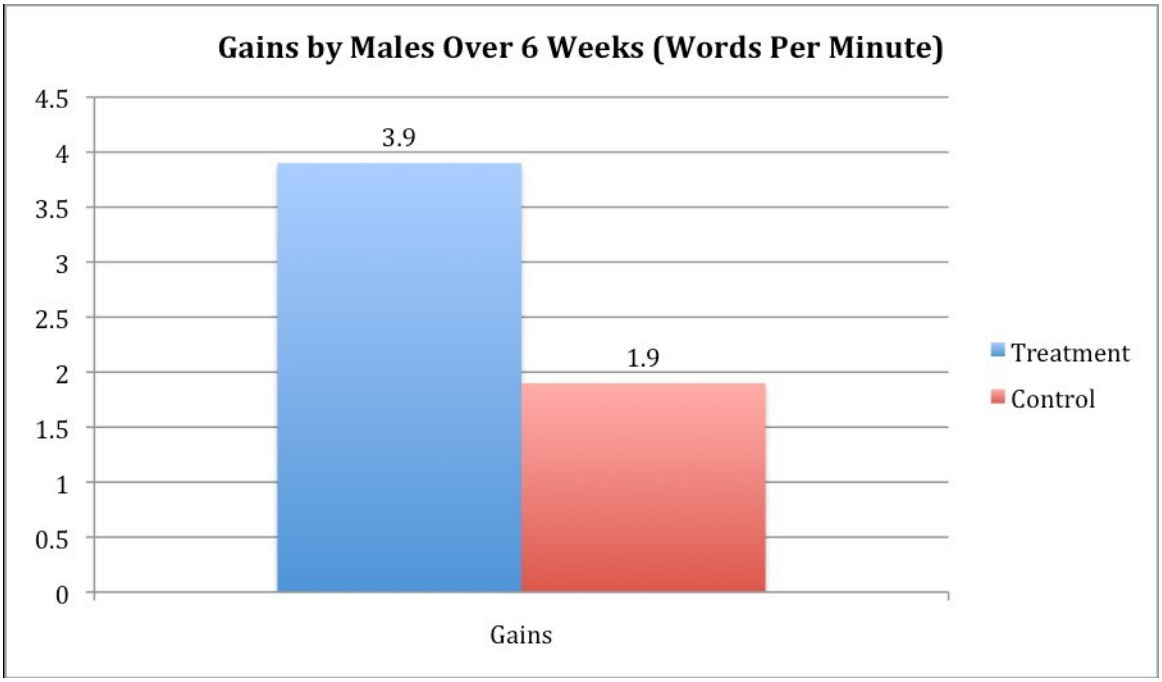

Gains by Males Over 6 Weeks (Words Per Minute)
28
27
26
25
24
23
22
21
20
19
18
26.7
24.8
24.89
19.1
Pre-Test
Post-Test
Boys Treatment
Boys Control

Table 4


Gains by Males Over 6 Weeks (Words Per Minute)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
3.9
1.9
Gains
Treatment
Control

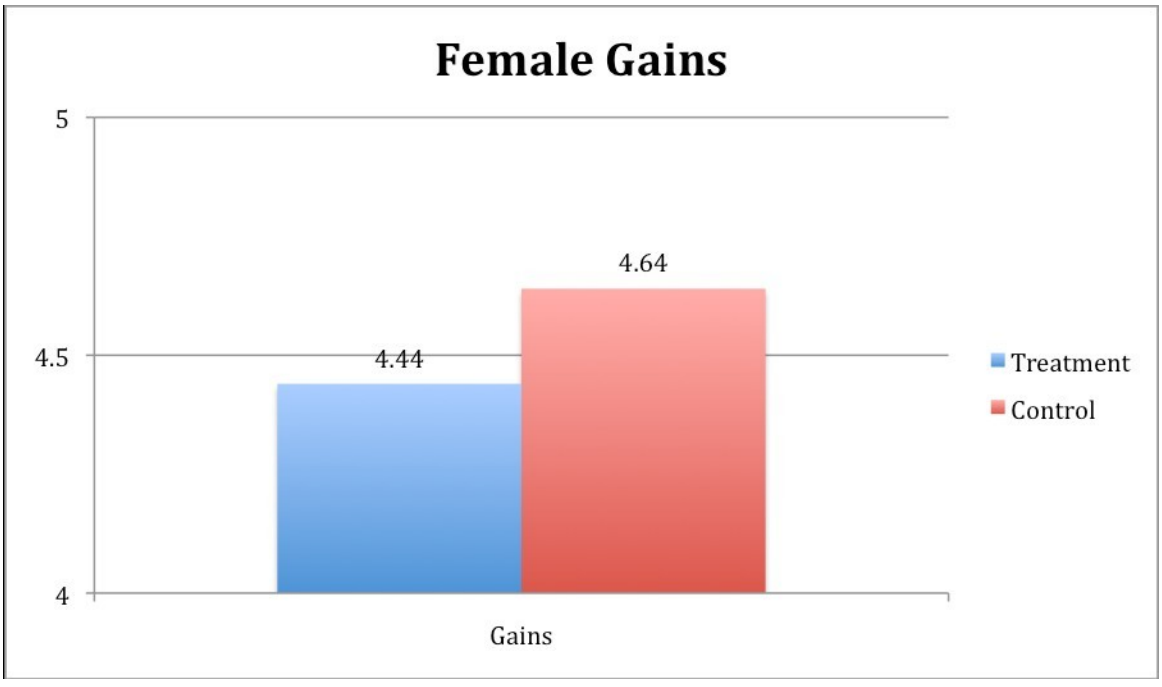
While the males in the treatment group gained more than the males in the control group, their scores on the Attitude Towards Online Typing scale decreased slightly while the control group's scores increased slightly. This is shown in Table 5.

Table 5

	Pre-Test	Post-Test	Difference
Treatment	28.0	27.1	-0.9
Control	27.7	28	+0.3

The females' in the control group actually improved more than the females in the treatment group, as shown in Table 6.

Table 6



The female's scores on the Attitude Towards Online Typing both improved slightly. These small improvements are shown in Table 7.

Table 7

	Pre-Test	Post-Test	Difference
Treatment	29.3	29.6	+0.3
Control	26.82	27	+0.18

The age distribution between the two groups is shown in Table 7. The ten-year-olds showed more improvement than the eleven-year-olds except for the one twelve-year-old student who improved by six words per minute. These results are shown in Table 8 and 9.

Table 8

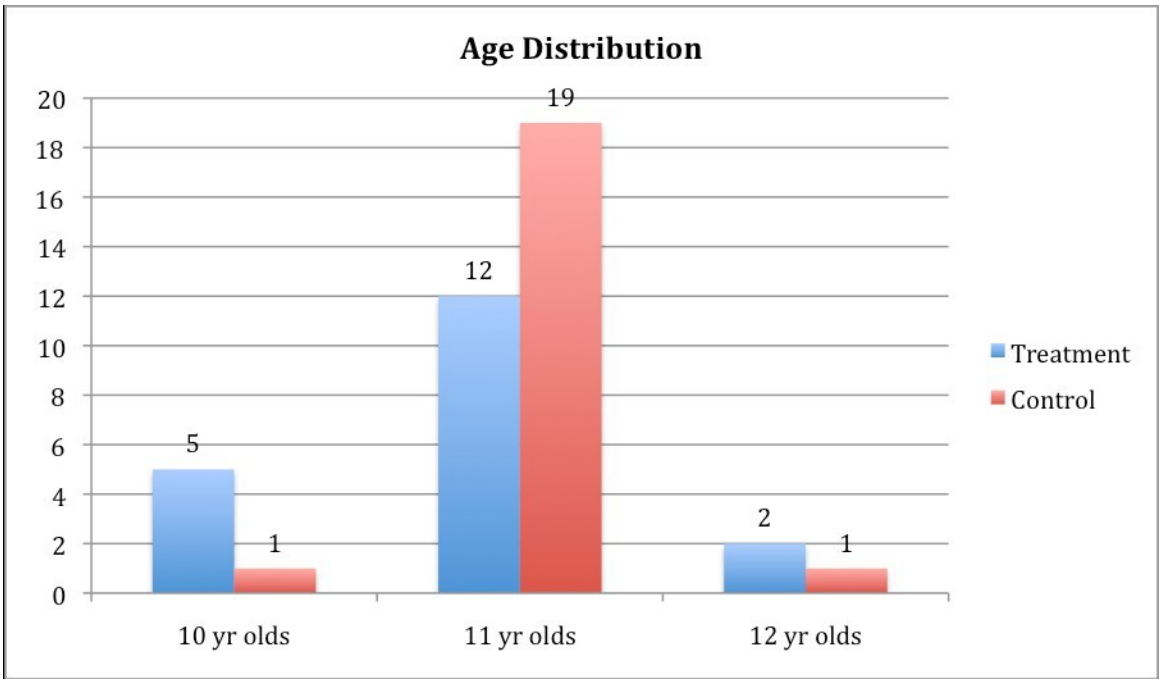
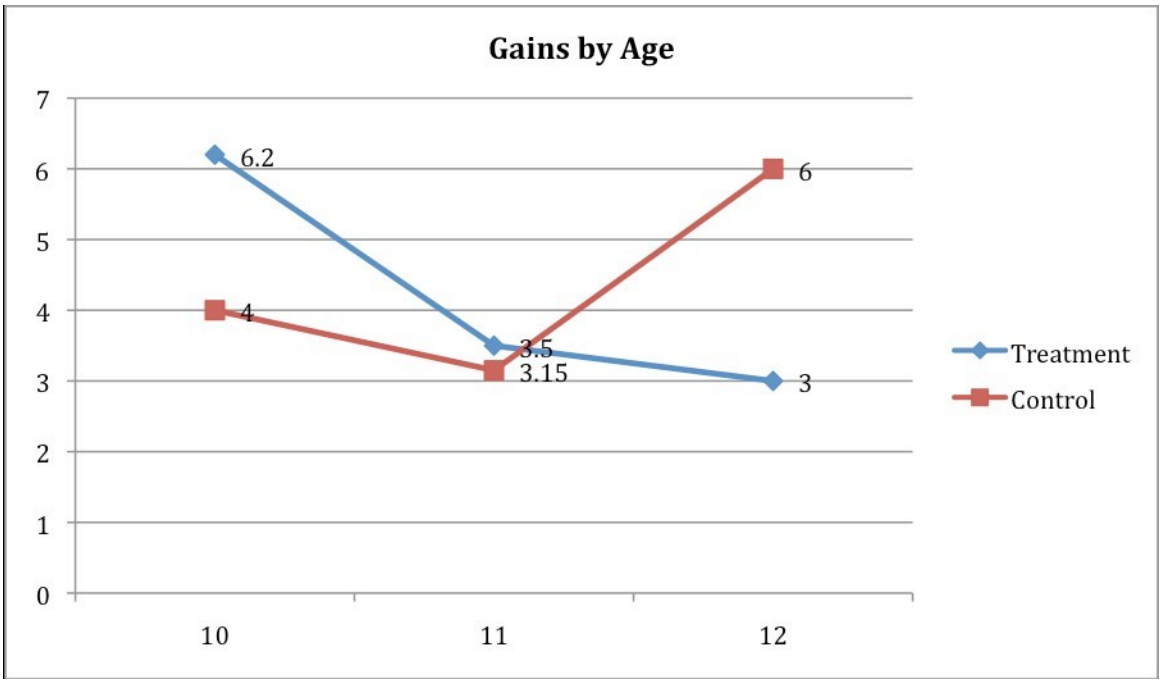


Table 9



The results of the Attitude Towards Online Typing Scale showed that the students' mean for Question #10 (Becoming a good typer now will make my life easier when I get to Middle School) was 3.6 (for both pre- and post-test) indicating a strong agreement concerning the importance of being good at keyboarding.

Question #5, "I like using Internet games to learn how to type," only received a pre-test mean response of 2.9 however, showing that students less than "mildly" agreed to enjoying using Internet games to learn how to type. Both the treatment and the control group went up by 0.2 on the Attitude Towards Online Typing.

Table 10

Treatment	Pre	Post
Question #5	2.9	3.1
Question #10	3.6	3.6
Question #5	2.7	2.9

Question #10	3.6	3.6

Discussion and Action Plan

The means for Questions #5 and #10 on the Attitude Towards Online Typing scores were interesting. Although the students realize the importance of typing, they only "*slightly agree"* that they enjoyed using online programs to help them to learn how to type.

This supports the classroom observation that students would rather be using other software such as Scratch, SketchUp, Google Earth, or GarageBand than learning how to type once they have completed their assignment in IT class. When we run through the class objectives at the beginning of each class, there's always a few "can we use SketchUp today instead of typing?" Still, we all know that typing is important so some plan must be put in place to help the students learn how to become competent keyboarders. This is a concern of our parent community as well as the staff and administration at Nido de Aguilas.

The difference between males and females was very interesting as well, although not statistically significant. The fact that the females in the control group slightly outperformed the treatment group could indicate that an intervention such as this is not that important for the females.

For the males, though, an intervention such as this may be more important considering the difference in the gains between the treatment and the control group. The decrease in scores on the Attitude Towards Online Typing show that the males may not like the intervention, but it is important.

Since the question of age is so disputed in the literature, the findings here are interesting, although not statistically significant either.

Except for the lone 12-year-old student in the control group, there was a trend downwards in gains as the students got older. This could indicate that the students are nearing their words per minute limit for 11-year-olds. In other words, perhaps they are nearing the point where they cannot physically type any faster. However, there are exceptions as we have a few students in other Grade 5 classes that test in the forty to fifty words per minute range.

My practice as an Information Technology teacher will not change significantly as a result of this study. I still believe that teaching software skills at the elementary level takes precedence over keyboarding. I will continue my practice of integrating with the classroom subjects using the various types of software that we use (word processing, spreadsheets, presentation software, music and photo editing, movie making, mind map creation, CAD, and animation software). When students finish their work, they will then practice their typing skills.

However, I will recommend to our administration that our school purchase an online subscription to a website that will teach keyboarding skills to our students. After reviewing the research literature and analyzing the results of this action research, this online application must be able to teach the students the proper fingering in a sequential manner, test, and track student progress. The advantage of using an online typing application over installed software is that the students can practice at home as well as at school.

I will also recommend to our school that our staff and parents are trained in the use of the online application and also on how to type. It is clear that proper typing techniques must be modeled to our students. It is also clear that our parent community must reinforce proper typing techniques at home otherwise the practice in the IT lab and classroom will be lost.

Our results are good now as our students are decent with the keyboard. But by subscribing to an online keyboarding application that teaches, reinforces, tests, and tracks progress for our students

from Grade 4 through middle school, our students will hopefully post results that are statistically significant.

I plan to share this action research beyond our school community as well. I plan to post this action research at lulu.com, docstoc.com, createspace.com, and Google Apps so that others may download and read the document. I will ensure that the document can be downloaded in various formats and read on computers, ebook readers, and other handheld devices. I will also contact BBC and make my research available to them, if they so wish.

Reference List

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Appendix A - Attitude Towards Online Typing (Likert Scale)

1 - Strongly Disagree 2 - Mildly Disagree 3 - Mildly Agree 4 - Strongly Agree

1. I like to type using proper fingering on my own.

1 2 3 4

2. I like to practice keyboarding using Internet games on my own time.

1 2 3 4

3. Keyboarding makes me feel good.

1 2 3 4

4. I like learning how to type properly.

1 2 3 4

5. I like using Internet games to learn how to type.

1 2 3 4

6. I enjoy spending my free time using the computer.

1 2 3 4

7. I like to go the computer lab during my lunchtime.

1 2 3 4

8. I am comfortable using proper typing techniques when I need to type.

1 2 3 4

9. It is important for me to type properly and quickly.

1 2 3 4

10. Becoming a good typer now will make my life easier when I get to middle school.

1 2 3 4

Appendix B Keyboard Logging Form

Student/Parent	Time Spent	Name:
Student/Parent		**Instructions**
		1. Go to ikeepbookmarks.com/nido
		2. Go to Typing -> BBC Typing
		3. Practice your keyboarding for
		at least 5 minutes 4 days a week
Student/Parent		4. Write in your Keyboarding Log
		5. Have your parent's initial the log
		Important Websites
Student/Parent		ikeepbookmarks.com/nido
Student/Parent		
Student/Parent		

Appendix C Screenshot of Dance Mat Typing

Source: http://www.bbc.co.uk/schools/typing/

Appendix D Screenshot of www.freetypinggame.net

Source: http://www.freetypinggame.net/