

The Use of a Computer-based Reading Rate Development Program on Pre-university Intermediate Level ESL Learners' Reading Speeds

John Haupt
Ohio University

ABSTRACT

Improving L2 learners reading fluency has been identified by leading L2 reading researchers as an important aspect of L2 reading instruction (Grabe, 2004, 2009; Nation, 2009). A number of studies have been conducted on the use of paper-based fluency development methods on ESL and EFL students reading speeds and showed positive results (Al-Homoud & Schmitt, 2009; Bell, 2001; Chang, 2010; Chung & Nation, 2006; Chung, 2010; Gorsuch & Taguchi, 2008, 2010; Iwahori, 2008; Macalister, 2008, 2010; Taguchi & Gorsuch, 2002; Taguchi, Takayasu-Maass & Gorsuch, 2004). The study presented in this article investigated the use of a computer-based reading rate development program on five intermediate-level ESL students' reading speeds. Results of the study showed that as a group, students increased their reading speeds on average 40 words per minute (wpm) and made a total percentage increase of 42.8% in reading speeds. Additionally, survey and interview data showed that students perceived gains in motivation toward reading and gains in other areas of language development. The results provide educators and students with the knowledge that computer-based reading rate development programs have the potential to help improve reading speeds and indicate that more research needs to be conducted into the use of computer-based reading rate development programs.

INTRODUCTION

Reading in a second or foreign language is a challenging process that requires learners to develop the ability to simultaneously decode a text, accurately recognize words in a text and comprehend a text (Samuels, 2006). The development of quick decoding skills and accurate word recognition abilities in a second or foreign language is necessary for maximum text comprehension. Making the simultaneous decoding, recognizing and comprehending task more difficult is the fact that humans have a limited processing capacity available for carrying out cognitive tasks (Kuhn & Stahl, 2003; Randall, 2007). Thus, humans can only devote a finite amount of their processing capacity to one task at a time without interfering with the processing of another task. In the case of second or foreign language reading, if a learner devotes too much of their processing capacity to decoding a text or the word recognition processes, a learner will have difficulty using their processing capacity to comprehend the meaning of the text (Randall, 2007; Kuhn & Stahl, 2003). Therefore, second and foreign language readers need to develop the ability to automatically, or quickly, decode text and recognize words in order to improve their reading comprehension abilities.

Decoding skills and word recognition abilities are components of what is referred to as reading fluency. According to Grabe (2009), reading fluency is composed of four parts: automaticity, accuracy, reading rate, and prosodic structuring. Automaticity refers to the ability to rapidly or effortlessly process a text without the use of external resources, accuracy refers to

the accurate processing of words in a text, reading rate refers to the speed at which a text is read, and prosodic structuring refers to the fact that fluent readers do not simply read words quickly and accurately, but they also read using prosodic features of language, such as rhythm. All four aspects of fluency play a major role in the comprehension of a text. Therefore, improving L2 learner's reading fluency should be a part of reading instruction and further investigated by L2 reading researchers (Grabe, 2004, 2009; Nation, 2009).

According to the National Institute of Child Health and Human Development (2000), reading fluency is an important aspect of skilled reading and fluency can be taught. Furthermore, leading researchers in the field of L2 reading have stressed the importance of teaching reading fluency to students, and the need for more research to be conducted on reading fluency development in multiple L2 settings (Grabe, 2009; 2004; Nation, 2009). Therefore, the purpose of this research article is to expand upon the field's knowledge of the impact of reading fluency training on L2 students by investing the use of computer-based reading rate development program with adult intermediate level ESL students, and its impact on their reading speed.

LITERATURE REVIEW

Reading Fluency Training

A large number of studies have investigated the use of multiple types of reading fluency development training practices on students of various ages and in various settings focusing their results mainly on the increases in student reading speeds (Al-Homoud & Schmitt, 2009; Bell, 2001; Chang, 2010; Chung & Nation, 2006; Chung, 2010; Gorsuch & Taguchi, 2008, 2010; Iwahori, 2008; Macalister, 2008, 2010; Taguchi & Gorsuch, 2002; Taguchi, Takayasu-Maass, & Gorsuch, 2004). These studies have focused on three types of practices used for improving students reading speeds: extensive reading, repeated reading and speed reading programs.

Extensive Reading

Extensive reading is a reading activity in which students are exposed to large amounts of texts with controlled vocabulary over extended periods of time focusing their attention on the general meaning of a text. Studies have shown that extensive reading improves both student comprehension abilities and reading rates (Al-Homoud & Schmitt, 2009; Bell, 2001; Iwahori, 2008). Due to the fact that the methodology used in this study does not use extensive reading, further discussion of its benefits will not be included. Instead, discussion will focus on repeated reading and speed reading.

Repeated Reading

The practice of repeated reading (RR) consists of students reading a simplified text three or more times until they are able to reach a target words per minute reading speed. There are two types of RR practices, one type, assisted RR, involves the use of an audio tape that has students reading along with an audio recording of a text, and the other type, unassisted RR, involves students reading independently without listening to an audio recording of the text and recording their reading times (Taguchi & Gorsuch, 2010). There are a limited number of studies that have

investigated the impact of RR on L2 students reading speed and comprehension (Blum et al., 1995; Taguchi, Takayasu-Maass, & Gorsuch, 2004; Taguchi & Gorsuch, 2002; Gorsuch & Taguchi, 2008, 2010).

Blum et al. (1995) investigated the use of home-based assisted RR on five first-grade English as a second language learners and its impact on their reading fluency, motivation, self-monitoring and reading behavior. Results showed that the students increased their motivation toward reading and were able to read more fluently and maintain this fluency while reading more difficult text. Taguchi and Gorsuch (2002) investigated the use RR on nine EFL Japanese high school-level students to determine if it helped increased their silent-reading rate and comprehension of new passages over a 10-week period. Students read 28 passages, reading each passage five times. The first time the text was read the students timed themselves with a stop watch and then marked their times on a reading log. For the second and third readings, students read along with an audio CD of the text. For the fourth and fifth readings, students read and timed themselves and then marked their times on a reading log. It was found that students did not make significant gains in reading speed or comprehension abilities. One possible explanation given for the lack of improvement was that the program was too short and the students did not read an adequate number of texts.

As a result of Taguchi and Gorsuch (2002), Taguchi, Takayasu-Maass, and Gorsuch (2004) investigated the use of an identical RR program on ten university level Japanese students over a 17-week period. Participants in this study participated in 42 RR sessions. Furthermore in this study, the results for the participants in the RR program were compared with the results of ten participants who participated in an extensive reading program over the same period of time. Results of the study showed that the students in the RR group on average increased their reading speeds from the first reading of the program to the forty-second reading of the program by 23 wpm. Additionally, results of the comparison between the RR group and the extensive reading group showed that the RR group outperformed the extensive reading group on posttest reading speeds. Finally, results showed that students in both groups improved in their comprehension abilities from pretest to posttest. Results of this study support the notion that RR can be used as a method to help students develop reading fluency in a second language.

To further exemplify the positive impact of RR on L2 readers reading fluency, two recent studies by Gorsuch and Taguchi (2008, 2010) have shown that students who participate in a RR program improve in reading speed and comprehension from the beginning of the program to the end of the program. In Gorsuch and Taguchi (2008) students who participated in an 11-week RR program significantly improved their reading speeds and comprehension abilities compared to a control group who did not participate in the RR program. Additionally, Gorsuch and Taguchi (2010) showed that students improved in reading speed and comprehension over a 12-week period. Results showed that the average gain in reading speed was 54 wpm.

The results of the studies discussed above clearly indicated the benefits of RR on reading fluency and comprehension in a second language. Although in the majority of the studies discussed above a combination of assisted and unassisted RR was used to improve students reading fluency, the study presented in this article will use unassisted RR to help students improve their reading speeds. The use of RR with a computer-based reading rate development program has not been investigated in the field of L2 reading. Therefore, the results of this study will provide insight into how RR with a computer-based reading rate development program helps improve students' reading speeds.

Speed Reading Programs

Speed reading programs have been posited as a quick way to improve students reading speeds (Chung, 2010). In a speed reading program, an L2 reader reads a short passage, records their reading time on a graph and answers comprehension questions based on the reading. Readers' main focus should be on improving their reading rate and maintaining comprehension at or above 70%. Courses usually contain 20 to 25 readings and last roughly 7 to 12 weeks (Chung, 2010; Nation, 2009). A limited number of studies have been conducted on the use of speed reading programs with ESL and EFL learners, and all of the studies have shown that the majority of the participating students make gains in reading speeds (Chang, 2010; Chung, 2010; Chung & Nation, 2006; Macalister, 2008; Macalister, 2010).

Three studies have investigated the use of a speed reading program on students without the use of a control group for comparison (Chung, 2010; Chung & Nation, 2006; Macalister, 2008). Chung and Nation (2006) investigated the use of a speed reading program on 49 university-level Korean EFL students and found that 47 out of the 49 students made increases in reading speed with an average increase of 79 wpm. Macalister (2008) examined the use of a speed reading program on 29 pre-university ESL students and found that 25 out of the 29 students increased their readings speeds, with increases ranging from 5 to 149 wpm. Finally, Chung (2010) replicated her Chung and Nation (2006) study and found that all the participants increased their reading speeds with an average increase of 106 wpm.

Two studies have investigated the use of a speed reading program and compared the results of the treatment group to the results of a control group. Macalister (2010) showed that 24 ESL students who participated in a speed reading program increased their reading speeds from the beginning of the program to the end of the program, but only 7 out of the 12 of the students who did not participate in the program increased their reading speeds. Additionally, he found that the gains made by the speed reading program group were greater than the gains made by the control group. Moreover, Chang (2010) found that 46 EFL students who participated in a speed reading training program increased reading speeds on average 29 wpm, and the control group of 38 EFL students increased their reading speeds on average 7 wpm.

All five studies mentioned above determine gains in reading speeds by using an averaging technique used by Chung and Nation (2006). Chung and Nation (2006) advocate that this method is the most conservative way of measuring increases in reading speed. In this method pretest reading speeds are averaged and are subtracted from the average of the posttest reading speeds. This method will be used in this study to determine if gains were made in reading speeds.

All of the studies presented in this literature review have investigated reading speed development using paper-based reading methods. No studies to date have used a computer-based program to improve students reading speeds. Therefore, information presented in this article will focus on answering the following questions regarding the use of a computer-based reading rate development program on ESL students reading speeds:

1. Overall, what impact did the use of an online reading rate development program have on students' reading speeds?
2. If gains in reading speed occurred, are there differences between the gains made on paper-based texts and the gains made on computer-based texts?
3. How did students perceive the use of an online reading rate development program on their reading and language development?

METHODS

Subjects

The participants in this study came from an intensive English program at a large Midwestern university and were preparing to pursue undergraduate degrees at the university. All students at the intermediate level in the program were invited to participate in the reading rate development program. All students asked to participate were placed at the intermediate level either by scoring between a 400 and 449 on the paper-based TOEFL or by advancing after successful completion of the program's beginning level. In total, 5 students agreed to participate in the program. Three male students came from Arabic speaking countries with ages ranging from 19 to 22, and two female students came from China with ages ranging from 20 to 21. For all students, it was their first time taking classes at this level, and all self-reported that they had never participated in a reading rate development program.

Materials

Reading Materials

Twenty-four nonfiction 400-word texts were chosen from *Timed Readings: Fifty 400-word passages with comprehension question for building reading speeds, Book 1*. All texts were written at a Flesch-Kincaid Grade level of a 5 or 6. Every text was accompanied by 10 multiple-choice comprehension questions.

Six texts were used for the pretests and the posttests. All six texts were typed into word documents with identical formatting. Three texts were printed off and used for paper-based pretests and posttests, and three tests were converted into PDF files and used for computer-based pretests and posttests. Comprehension questions for all pretests and posttests were photocopied from *Timed Readings: Fifty 400-word passages with comprehension question for building reading speeds, Book 1*. An answer sheet was developed for students to record their reading times and answer comprehension questions.

The final eighteen texts were used for the computer-based texts used in the reading rate development program. All eighteen texts were typed into word documents and proof read for mistakes by the researcher. Then movie files were made for each text using iMovie. Within iMovie texts were formatted and inserted into a scrolling credit feature that allows texts to be scrolled from the bottom of the screen to the top of the screen in a predetermined amount of time. A ratio of movie time to words per minute was determined by dividing the amount of words in the text, 400, by the desired words per minute and then multiplying by 60. For each text, 34 movies were made starting at 75 wpm and increasing 5 wpm until the final movie was made at 240 wpm. After all the movies had been made, they were placed on a website that the students in the program could access. All comprehension questions were made into online comprehension questions using Google Forms and accompanied the movie files on the website. The links provided in the Table 1 are links to one sample reading and set of comprehension questions.

Table 1. Examples of a Reading Video and Comprehension Questions

Reading: 150 WPM	http://youtu.be/TE8825fvtog
Comprehension Questions	https://docs.google.com/spreadsheet/viewform?formkey=dDRvblBkbWx0MEx3WC03YnhDNi1wU2c6MQ

Survey

A twelve-question survey was developed to gain a better understanding of student perceptions of the computer-based reading rate development program (See [Survey](#)). The survey consisted of three parts: (1) Reading Habits, (2) Perception of the Program and (3) Future Programs. The Reading Habits section questions focused on the amount of time students read, what medium they preferred to read on, paper or computer, and their perceptions of the importance of reading through different mediums. The Perception of the Program section questions focused on the students' perceived benefits of the program on different aspects of language development. Finally, the Future Programs section questions focused on their preferences for future reading rate development programs.

PROCEDURE

One week before the computer-based reading rate development program began students took a pretest to determine their initial reading speeds. Students read two paper-based texts and two computer-based texts from *Timed Readings: Fifty 400-word passages with comprehension question for building reading speeds, Book 1*, recorded their times after reading each text, and answered comprehension questions based on the texts. Initial reading speeds were then determined by averaging the reading rates on all four pretest texts. Additionally, average comprehension scores were determined by averaging the comprehension scores on all four pretest texts.

Once an average initial reading speed was determined for each student, a beginning reading rate was assigned to each student. This rate was assigned by taking the average initial reading speed and increasing it to the nearest movie reading speed above the average initial reading speed. For example, if a student's average initial reading speed was 107 wpm, their beginning reading rate would be 110 wpm, and this student would begin the program by reading the movie of the first text at 110 wpm. Table 2 below shows beginning reading rates and finishing reading rates for all students who participated in the program.

Table 2. Beginning Reading Rates and Finishing Reading Rates of Students

Students	Beginning Reading Rate (WPM)	Finishing Reading Rate (WPM)
S1	110	200
S2	115	205

S3	80	185
S4	80	180
S5	110	200
Group Average (WPM)	99	194

Note. Some differences in speed are over 95 wpm since students were able to request 10 wpm increases from one reading to the next.

During the program, students read two texts each week for nine weeks. The first text was read at the students beginning reading rate, and students increased their reading speed by 5 wpm for each new text they read. Thus, from the beginning of the program to the end of the program students would increase their reading speed by 95 wpm. Additionally, students were able to request a 10 wpm increase if they felt that the reading speed was not fast enough for them and wanted a greater challenge on the next reading. Students did not automatically get to increase their reading speeds after each reading, but instead, they were required to score a 60% or higher by their second attempt at answering comprehension questions. If they were unable to attain this score, they were required to read the next reading at the same reading rate as the previous reading.

Students read each text using a modified repeated reading method introduced by Taguchi and Gorsuch (2002). Students were first required to read a text and answer comprehension questions. Then students read the text four more times. After the fifth reading, students answered the comprehension questions again. This method was adopted because the computer-based texts forced students to read above their average reading speeds. In the beginning of the program, an increase of 5 or 10 wpm might not be difficult for students to achieve, but at the end of the program, students were required to read at 80 or 90 wpm above their average reading speed, which is a difficult task for any student. Since Taguchi and Gorsuch (2002) and Gorsuch and Taguchi (2008, 2010) showed that as students reread text they increased their reading rate on the same texts and as a result of pilot study interviews, in which students indicated that rereading allowed them to develop the ability to read the text at the specified speed, using the method of repeated reading was adopted as a means to allow students to develop the ability to read at the specified speed and develop their ability to comprehend texts reading at that speed.

On the last day of the program immediately after students read their eighteenth text, they completed the survey based on their experiences with the computer-based reading rate development program. The survey was given before the students completed the posttest to gain insight into their perceptions of the program before students knew the results of the posttest. It was thought that if students knew the results of the posttest, their responses on the survey might be positively or negatively influenced by the results. Therefore, students completed the survey without any knowledge of their posttest reading rates.

One week after the completion of the program, students completed a posttest consisting of six readings, 3 paper-based and 3 computer-based readings. As in Chang (2010), four of the readings were the same readings used during the pretest. In regards to these texts, it is important to note that during the pretest, students were not told that they would be reading these texts again in the future. Furthermore, two of the readings were new readings, one paper and computer, that the students had never read before. These were used to make sure that if gains in speed occurred they were not solely a result of repeated exposure to a familiar text. Finally, in an identical

manner to the pretest, students read the texts, recorded their times and answered comprehension questions.

After the completion of the posttests, students were invited for interviews that focused on their responses to survey questions and their overall experience participating in the program. Every student agreed to participate in the interviews. All interviews were held within two weeks after the completion of the program. Additionally, all interviews were recorded and transcribed by the researcher for later analysis.

ANALYSIS

In order to measure the impact of the reading program on students reading speeds, pretest reading speeds were averaged and subtracted from the average of the posttest reading speeds. The differences were then averaged to find an average total increase for the group. Furthermore, a total percentage increase in reading speed was found for each individual student and for the group. Finally, average comprehension scores for pretests were calculated and average comprehension scores for posttests were calculated in order to make sure students maintained comprehension at or above 70%.

In order to answer the second research question on whether there was a difference in gains on paper-based readings versus computer-based readings, differences in average reading speeds on paper-based pretests and posttests were found and differences in average reading speeds on computer-based pretests and posttests were also found. These differences were then averaged and tabulated. No statistical test was run to determine if the difference in change was significant due to the small sample size and large standard deviations within the groups.

Student survey data and interviews were used to determine student perceptions of the impact of the reading rate development program on their reading and language development. Student responses to section two of the survey, Perceptions of the Program, were tabulated to determine how many students agreed or disagreed with the statements presented in the section. Furthermore, interview data was used to provide deeper insight into student survey responses.

RESULTS

Overall, what impact did the use of a computer-based reading rate development program have on students' reading speeds?

Table 3 shows the results of student pretests and posttests along with average comprehension scores on the pretests and posttests. Results of the pretests and posttests showed that all five students who participated in the program increased their reading speeds and maintained comprehension at or above 75%. Average individual increases in reading speed ranged from 20 wpm to 70 wpm. As a group, the students in the program made an average increase of 40 wpm and a total percentage increase of 42.8%. Furthermore, the results of this study are similar to the results found in other studies investigating the use of speed reading and repeated reading programs (Chung, 2010; Chung & Nation, 2006; Macalister, 2008, 2010; Taguchi & Gorsuch, 2002; Gorsuch & Taguchi, 2008, 2010). Finally, student participants in this study made larger gains in reading speeds in comparison with the control group in Chang (2010),

who only increased on average 7 wpm, and the control group in Blum et al. (1995), who only increased on average 14 wpm.

Table 3. Changes in Students' Pre/Posttest Scores on WPM and Comprehension

Students	Pretest WPM	Posttest WPM	Increase in WPM	Total Percentage Increase	Average Comp. (Pretest)	Average Comp. (Posttest)
S1	107	138	32	29%	85%	87%
S2	111	131	20	18%	80%	77%
S3	76	104	28	37%	78%	85%
S4	80	132	52	65%	85%	77%
S5	107	177	70	65%	88%	75%
Average Total	96.2	136.4	40.2	42.8%	83.2%	80.2%

If gains in reading speed occurred, are there differences between the gains made on paper-based texts and the gains made on computer-based texts?

Table 4 shows the results of student gains made on paper-based texts and computer-based texts.

Table 4. Average Differences between Pre/Posttests Paper and Pre/Posttests Computer Reading Speeds (WPM)

Students	Pretest Paper (WPM)	Posttest Paper (WPM)	Differences in Speed (Paper)	Pretest Computer (WPM)	Posttest Computer (WPM)	Differences in Speed (Computer)
S1	102	128	26	111	148	37
S2	106	126	20	116	134.6	18.6
S3	73	96	23	79.5	111	31.5
S4	70	119.6	49.6	80	143	63
S5	102	175.6	73.6	111.5	177.6	66.1
Average Total	90.6	129	38.4	99.6	142.8	43.2

The difference in gains on paper-based texts and on computer-based texts was relatively small at 4.8 wpm. Furthermore, three out of the five students made larger gains on computer-based texts than they did on paper-based texts. As a group, the average gain on paper-based readings was 38.4 wpm and the average gain on computer-based readings was 43.2 wpm. The results show that students were able to achieve gains in reading speeds on both paper-based text and computer-based texts through using the computer-based program.

How did students perceive the use of an online reading rate development program on their reading and language development?

Table 5 shows student responses to the Perceptions of the Program section of the survey.

Table 5. Student Survey Responses to Questions Asked in the Perceptions of the Program Section

The computer-based reading rate development program...	Total number of responses given for each survey response option				
	S. Agree	Agree	Neutral	Disagree	S. Disagree
helped me increase my reading speed	3	2	0	0	0
improved my ability to read computer-based texts	2	3	0	0	0
improved my ability to read paper-based texts	2	3	0	0	0
improved my motivation toward reading	1	4	0	0	0
helped me read better in my intensive reading class	2	3	0	0	0
improved my English grammar and writing ability	0	2	3	0	0
improved my English listening and speaking ability	0	1	2	2	0
helped me learn new vocabulary	1	4	0	0	0

Results of the survey show that every student agreed that the program helped improve their reading speeds. Additionally, students indicated that the program improved their abilities to read texts on paper and on computers. During interviews, students indicated that these improved abilities allowed them to comprehend texts better and concentrate better while reading. One student even stated that the program helped him develop his ability to use context clues and focus on the general meaning of paragraphs instead of focusing on the meaning of every word. Moreover, all students agreed that the program helped them read better in their intensive reading classes, helped them learn new vocabulary and improved their motivation toward reading.

Student responses varied on questions relating to the programs usefulness in improving language skills other than reading. For example, only two students indicated that the program helped them improve their grammar and writing. During the interviews with these two students, they both stated that while reading during the program they recognized grammar that they had learned during grammar class and used reading as a way to reinforce their learning. Furthermore, only one student indicated that the program helped him improve his listening and speaking. He stated during his interview that the program allowed him to know how to use new words or words he already knew in his speaking. The readings provided him with examples for use. The students who agreed with these statements clearly showed that they developed strategies to help them improve other areas of English through reading.

DISCUSSION

The study presented in this article set out to determine what impact the use of a computer-based reading rate development program would have on ESL students' reading speeds. The results of the study showed that the use of the program helped students increase their reading speeds on average 40 wpm. Furthermore, results showed that although the program was computer-based students were able to increase their reading speeds on both paper-based texts and computer-based texts with only a small difference being found between the average gains in speeds. Finally, on a survey and in interviews, students indicated that the program not only helped them improve their reading speeds, but also helped them improve their motivation toward reading, helped them read better in reading class, helped them improve their ability to read on paper and from a computer and helped them learn new vocabulary. The results of this study showed that the computer-based reading rate development program used in this study can have a positive impact on ESL students' reading speeds and language development.

Implications

The major difference between this study and other studies that have used different methods to improve students' reading speeds is that the program used in this study was 100% computer based. The results of this study have shown that gains made using a computer-based program are similar to gains made using paper-based programs (Chang, 2010; Chung, 2010; Chung & Nation, 2006; Macalister, 2008; Taguchi & Gorsuch, 2002; Gorsuch & Taguchi, 2008). This means that teachers and students can begin to have other options when it comes to increasing student reading speeds, which might include other programs similar to the one presented in this study or online resources such as computer-based graded readers. Furthermore, due to the similar gains made on paper-based texts and computer-based texts, teachers should not be worried that using a computer-based program will only help students develop their reading speed and abilities on computers. Students in the program did indicate that they believed their ability to read paper-based texts improved and that the program helped them in their intensive reading course, which uses a paper textbook.

Using a program similar to the program used in this study has a number of benefits for both teachers and students. First, students can work on increasing their reading speed outside of the classroom. Teachers do not necessarily have to use class time two or three times a week to have students work on a speed reading or repeated reading program. This frees up more time to focus on other areas of reading development. Second, although one can argue that students can work on speed reading programs and repeated reading programs at home outside of class, often times it is difficult for a teacher to determine if students are doing their work or doing it honestly. Computer-based programs can allow teachers to track student behavior and manage students outside of the classroom. This allows teachers to hold students more accountable for work they do outside of class and make sure students are completing the program in the proper manner. Third, text movies like the ones used in this study force students to read at rates faster than they normally would. This has the potential to help every student to increase his or her reading rate because increases in reading speed do not rely on students to push themselves beyond their normal abilities, which might be difficult for certain students. The scrolling texts provide students with assistance to gradually increase their reading speeds. In the end, the benefits

mentioned in the paragraph highlight why using a computer-based program can be helpful for students and teachers.

In addition to increases in reading speeds, one of the most important aspects of student development that resulted from student use of the program was the impact it had on students' motivation to read in English. Every student indicated that they agreed with the fact that the program helped increase their motivation. Furthermore, three participants indicated that reading slowly in English made it frustrating for them to read. Due to the fact that reading provides a rich source of input for both ESL and EFL learners, finding ways to relieve students of this frustration in reading and improve their motivation to read is extremely important. One option to do this, as found in this study, might be to have students participate in a computer-based reading rate development program.

Another interesting point of discussion from the study comes from two of the students who indicated that other areas of language improved through participation in this program. These students clearly had developed strategies to use to develop other language skill areas through reading, while other students who participated in the program had not. Due to this, introducing strategies to students on ways to develop other areas of language while participating in reading fluency development programs might be of interest to teachers. Using strategies, such as noticing previously learned grammatical structures while reading or thinking about new ways to use vocabulary in reading or writing through examples found in text, might be a way for students to benefit the most from fluency development programs.

Limitations and Future Research

This study presented in this article had two major limitations. First, the sample size was very small. This makes it difficult to run any statistical tests that would allow the results of the study to be generalized to the general population. The second limitation was the fact that there was no control group. The gains made by students who participated in the program could not be compared to students in the same population that did not participate in the program.

Currently, there are numerous computer-based programs on the Internet that promote reading rate development, such as Spreeder and Readspreeder. Future research should investigate the systematic use of these programs and the program created in this research study to increase ESL and EFL students' reading speeds on larger sample populations. Furthermore, the need for a control group and an experiment group is needed to determine if the gains are significant compared to students in the same language program who do not participate in the reading rate development program. Finally, research into the use of reading rate development programs on tablets, smart phones and other hand held reading devices needs to be conducted. Results of a studies focusing on the use of these devices have major implications due to the accessibility and convenience of these devices.

CONCLUSION

The results of this study provide researchers, educators and students with the knowledge that computer-based reading rate development programs can have a positive impact on students reading speeds. As with programs completed on paper, the use of a computer-based program must be systematic and routine in order for students to benefit the most from its use.

Furthermore, with the ever increasing presence of technology in the classroom and in our everyday lives, there is no better time than now to development computer programs that help students improve their reading skills. These programs have the potential to empower learners and help them to independently develop their reading skills and language abilities. Therefore, future investigations into the use of computer-based reading rate development programs will be beneficial for all those involved in language teaching and language learning.

John Haupt

Ohio University
Department of Linguistics
383 Gordy Hall
Athens, OH 45701

Email: jh296910@ohio.edu

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