

Using Computer Technology to Develop Reading Speed

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Abstract

Reading at an appropriate rate is important for a second language learner, considering the consequent effects on reading comprehension and motivation. In this paper, I first introduce a one-month training program employing two online resources, Spreeder and Houghton Mifflin Textbook – Timed Reading, to improve learners’ reading speeds. Then, I report on the observations of one learner’s experience with the training program in order to evaluate the effectiveness of Spreeder. Finally, based on the results, I discuss Spreeder’s positive and negative affordances and make practical suggestions for teachers.

Introduction

For many learners, one of the most noticeable differences between reading in a first language and reading in a second language is the reading rate. According to Grabe (2009), fluent readers can read 250 to 300 words per minute (wpm.) Although there is relatively little attention to L2 reading fluency, it is true that most L2 learners read slowly, at one-half to one-third the reading rate by L1 readers (pp. 289-290). Chang (2010) observed that when L2 learners “lack automaticity of word recognition,” they have to recall or look up a word every time they find an unfamiliar word (p. 284). Consequently, many L2 readers tend to avoid reading since it is nothing but painful for them. However, reading fluency is an important element to become a successful learner. Grabe (2009) pointed out, “fluency is what allows a reader to experience a much larger knowledge beyond direct instruction, to develop automatic word-recognition skills to read for additional learning, to build reading motivation, and, in L2 university contexts, to read the large amounts of materials” (p. 290). In this paper, I review the importance of developing reading fluency for second language learners, then I outline a one-month training designed for English learners to improve their reading rate in English and report on one learner's experience with this training program.

Reading Speed in Second Language Learning

Speed reading to develop reading fluency has been gaining attention among language teachers and researchers. Reading fast, or reading at an appropriate speed, is actually not unrelated to reading habits and reading fluency. While spending a lot of time on reading would not be a problem as long as students are motivated enough to spend the extra time, stressful reading for a long time in a non-native language may discourage learners from reading. Some learners even avoid reading in the second language altogether. Second, slow reading can be a problem for comprehension. A reading rate between 200 and 300 wpm is best to understand content, as reading slower than that causes poor comprehension (Smith, 2004, p. 267.) Reading comprehension has a significant relationship with short-term



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memory, or our brain's capacity to hold and process information. This means that taking too much time to recognize each word prevents us from fully understanding the content. Reading at an appropriate speed is very important for remembering what is presented, which in turn affects comprehension of the text as a whole.

Reading fluency thus is very important in second language learning. Meyer (1999) defined reading fluency as “the ability to read text rapidly, smoothly, effortlessly, and automatically with little attention to mechanics of reading such as decoding” (as cited in Chang, 2010, p. 285). In fact, speed is one of the three components of fluency, along with accuracy and fluidity (Chang, 2010, p. 285.) In addition, Chang suggested that reading fluency involves lower-level processes, or linguistic processes including word recognition, and higher-level processes, or comprehension processes. Fluent readers can handle these two different-leveled processes at once automatically. In other words, both processes are crucial for fluent reading. When learners lack one or both, they become slow readers. The implication of this for teaching is that learners need to work on improving both aspects. It would be ideal to approach these components of reading fluency at the same time; however, it is also possible to target reading speed separately as a first step. In the project reported here, I target reading speed by using available computer technologies.

Technologies for Reading Speed Training

Currently, there are two notable reading speed training tools: A practice tool on Spreeder.com and a testing tool from Houghton Mifflin Textbook – Timed Reading (http://college.cengage.com/collegesurvival/watkins/learning_companion/1e/students/timed_reading.html). Spreeder divides a text into single words or two- to six-word strings as a user designates and shows each string at a user-selected speed, like flashcards. Spreeder thus can be used to help raise reading speed. In contrast, Houghton Mifflin Textbook – Timed Reading offers a weekly test to a learner to check their achievement in reading speed. It contains 24 reading exercises. After the learner reads a text and answers comprehension questions, a reading speed is calculated and displayed. Together, Spreeder and reading speed tests can form a training program in which Spreeder provides the learners with reading speed practice and the test series assesses changes in the learners' reading speed.

Although not much research has been done on the effectiveness of Spreeder, some English teachers have adopted this new technology with enthusiasm and reported positive responses from students. Cha (2013) conducted a case study at the University of Warwick, which aimed to make students avoid a back-skipping habit and sub-vocalizing while reading. She gave guidance in class before having her students practice in class as well as at home. The practice led students to overcome the cognitive habits, suggesting they would be able to read a large amount of texts. She also pointed out that Spreeder is a user-friendly and free web-based tool and, thus, is accessible to students and teachers interested in speed reading. In another study, McNabb (2013) targeted the problem of slow reading and its negative effects and reported on how Spreeder worked in his EFL classroom to improve students' reading efficiency. In his view, Spreeder is a tool to encourage ESL learners to read for pleasure. His instruction consisted of three main steps. First, selecting an appropriate reading material for the target audience is necessary. A wrong choice may discourage learners from reading more. Second, instructors are required to be familiar with the use of Spreeder. After these two preparations, in the third step, the teacher introduces the tool to students. McNabb encouraged his learners to read the same passage over time until they were able to read automatically at a designated speed. Consequently, this helped them to be aware of

grammatical meaning. These two reports show that Spreeder is a promising tool for reading speed training.

In the sections below, I will first describe a training program to improve learners' reading speed. Then, I will report on a small-scale study of the technologies' effects on one learner of English as a second language. Based on the learner's experience, I will discuss implications for teaching.

Reading Speed Training Program

Background Description

This training program consists of two activities designed for an English course at a public high school in an EFL context such as Japan. Students are from 17 to 18 years old and are at the Intermediate level of English proficiency. The main goal of the course is to master sophisticated reading abilities necessary for college admissions. This training targets their reading speed. The teaching objective is to improve their reading speed to 150 wpm. The course involves theme-based teaching. The theme of the readings is "English as a global language."

The training consists of two activities: weekly practice on Spreeder and the speed tests at Houghton Mifflin Textbook – Timed Reading. This training should be undertaken for a long term, ideally throughout a whole semester.

Weekly Practice

Teaching steps (25min)

- Show the Wordle image (http://www.wordle.net/show/wrdl/8235514/ESL_and_EFL) of the reading passage and the images related to the passage (1min).



Wordle image of sample text



Images related to the reading passage

(sources: <http://www.missouristate.edu/mcl/CareersandOutcomes.asp>
<https://plus.google.com/+NumberreferenceCom/about>)

- Have Ss guess what the passage will be about in pairs. Give Ss two tasks: to guess the title and to construct a text in relation to the word cloud. (7min)
Expected answers:
Title: The number of English speakers, English speakers in the world, ESL and EFL learners in the world, How English speakers communicate, Billions of English learners
Text: There are billions of people learning English all over the world.
Millions of people are currently learning English as a second or foreign language.
English is commonly spoken to communicate with foreign people.
Some people learn English for pleasure and others learn it on a daily basis.
- Combine two pairs and make a group of four. Ask Ss to share their title and text with the other pair. (5min)
- Ask Ss to visit the class website at <https://sites.google.com/a/my.hpu.edu/reading-class/> and copy the reading passage, which is presented below for reference. (1min)

English Learners in the World

How many people learn English in the world? It is estimated that over 1 billion people are currently learning English worldwide. According to the British council, as of the year 2,000 there were 750 million English as a

Foreign language speakers. In addition, there were 375 million English as a Second Language speakers. The difference between the two groups amounts to English as a Foreign Language speakers using English occasionally for business or pleasure, while English as a Second Language speakers use English on a daily basis. These impressive numbers are driven by adult speakers around the world who use English to communicate in the workplace. It is a commonly held misconception that these speakers need English to communicate with native speakers. While ESL is required for those living and working in English speaking cultures such as the UK and USA, it is equally true that English is used as the lingua franca between nations where English is not the primary language. In a globalized world, the number of English learners around the world is only expected to further grow.

(Adapted from:

http://esl.about.com/od/englishlearningresources/f/f_eslmarket.htm)

- Ask Ss to visit Spreeder.com and paste the passage. Ask Ss to set the speed at 150 wpm. (2min)



APPLICATION BLOG BOOKMARKLET



FAQ

Paste the text you'd like to speed read here:

How many people learn English in the world? It is estimated that over 1 billion people are currently learning English world wide. According to the British council, as of the year 2,000 there were 750 million English as a Foreign language speakers. In addition, there were 375 million English as a Second Language speakers. The difference between the two groups amounts to English as a Foreign Language speakers using English occasionally for business or pleasure, while English as a Second Language speakers use English on a daily basis. These impressive numbers are driven by adult speakers around the world who use English to communicate in the workplace. It is a commonly held misconception that these speakers need English to communicate with native speakers. While ESL is required for those living and working in English speaking cultures such as the UK and USA, it is equally true that English is used as the lingua franca between nations where English is not the primary language. In a globalized world, the number of English learners around the world is only expected to further grow.

speed!

Spreeder is a free service provided by eReflect Software. If you like this site, please have a look at our powerful [7 Speed Reading Software](#)

Spreeder.com

- Ask Ss to begin reading at once by clicking the “Speed!” button. (2min)
- Ask Ss to go back to the class website (<https://sites.google.com/a/my.hpu.edu/reading-class/>) and let Ss to read through the passage again. State that Ss are allowed to look up words in an online dictionary. (2min)
- Have Ss to be together with their group members. Ask Ss to compare differences between their predictions before reading the passage. (5min)

This activity is designed to be a routine. Steps 4 through 7 should be recycled and used for students' self-training at home. The class site contains some sample texts. This training program asks students to practice three times per week.

Speed Tests

At the end of every week, students take one test and fill out the survey to report a result to their instructor. The survey was made with Google Drive. Collected data will be organized in a Google Spreadsheet and analyzed.

Weekly teaching steps (10min)

- Ask Ss to take one test at Houghton Mifflin Textbook – Timed Reading (http://college.cengage.com/collegesurvival/watkins/learning_companion/1e/students/timed_reading.html).

The screenshot shows the Cengage Learning website interface. At the top, there is a navigation bar with tabs for 'Instructors', 'Students', 'Reviewers & Authors', and 'Booksellers'. Below this is a sidebar menu with options like 'Return to Discipline', 'Textbook Site Home', 'Tutorials', 'Web Links', 'Activities', 'Glossary', 'Self-Assessment', 'Student Success Skills', 'Resource Centers', and 'Go to Bookstore'. The main content area is titled 'Textbook Site for:' and lists 'E-Learning Companion, First Edition' by Ryan Watkins and Michael Cory. Below this, the 'Timed Reading' section is highlighted, with a sub-header 'Timed Reading' and a brief instruction: 'After you read a short passage and click the "finished" button, your reading rate for that passage will be displayed. Next, answer a few comprehension questions about what you read. We recommend you use the latest Internet Explorer or Netscape browser with the Timed Readings.' A list of 14 exercises follows, each with a blue hyperlink: Exercise 1: Global English; Exercise 2: Take a Nap Break; Exercise 3: Communication Styles of Men and Women; Exercise 4: Summer X Games; Exercise 5: Cars of the Future; Exercise 6: Leisure; Exercise 7: Okinawans Know the Formula for Longevity; Exercise 8: The Roots of Genealogy; Exercise 9: Compulsive Gambling: An Addiction; Exercise 10: The Body Shop: Businesses Can and Should Protect the Earth; Exercise 11: Kids Helping Kids; Exercise 12: The Stardust's Mysterious Final Message; Exercise 13: The Second "Battle of New Orleans"; Exercise 14: Deeper.

Houghton Mifflin Textbook – Timed Reading

- Ask Ss to take the online survey in order to report their progress.

Wrap-up

At the end of the training, students report what they have learned through these two activities based on survey results. Their report should include the following three points:

- What was your reading speed before the training and how much have you improved?

- Do you think this training has influenced your reading speed? Explain it if you find any change.
- Will you continue on training with these two online tools?

The Effects of Reading Speed Training on One ESL Learner

The Learner

The learner who undertook the training is a female English learner attending a college in Honolulu, Hawaii, at the time of the study. She attended high school in Japan and came to Hawaii to study at the college level. She was 20 years old when she took this training program and her first language is Japanese. She had been living in Hawaii for one and a half years and her English level was considered advanced. Although she was already enrolled in regular college classes with native speakers, she still struggled with reading in English. Reading a text in English was not as comfortable for her as in Japanese. According to the initial questionnaire and survey (Appendix 1, Appendix 2), her comfort level in reading in English was not very high. Regarding familiarity with technology, she had no negative feelings towards working with a computer. She had basic working knowledge of Word, Excel, and PowerPoint and regularly used a computer to work on school assignments and interact with friends.

The Training Process

The training ran for four weeks with practice sessions on Spreeder every week and a weekly test from Houghton Mifflin Textbook – Timed Reading. One article for practice each week was selected from KHON2, a local Hawaiian news website, since local news was very familiar to the learner. It was assumed that reading about a familiar and recent topic would have a positive influence on forming a positive attitude towards reading English. The other two articles were from VOA—Voice of America English News, a news website designed for the purpose of English learning. All stories were current issues, but the English was modified to suit non-native speakers. According to the questionnaire given to the learner (Appendix 2), the learner was most interested in the USA and Entertainment (out of nine provided categories). Thus, articles were selected from these two topics. Her reading speed for practice was set at 200 wpm first, since she scored 174 wpm on the Week 1 test. Then, I designated a speed every week based on her test result. The learner took a test five times including the initial one before the training began and the last one after all the training was done. Here, the initial one is called “Week 1” test and “Week 5” indicates the final test. After every test, she submitted a questionnaire (Appendix 3). All instructions were given through the a sample class website at <https://sites.google.com/a/my.hpu.edu/reading-class/>.

The Learner's Reading Speed Changes Over Time

According to the results of the weekly speed tests, the learner’s reading speed changed from Week 1 through Week 5 as follows: 174wpm, 210 wpm, 215 wpm, 198 wpm, and 248 wpm. Table 1 is a summary of the learner's responses to the weekly questionnaire and Figure 1 shows the overall results.

Table 1
Learner's Responses to Weekly Questionnaire

Week	Reading speed in wpm	Learner's degree of comfort with reading passage	Learner's level of interest in topic of passage	Correct answers out of 5 comprehension questions
Week1	174	5	3	5
Week2	210	5	4	5
Week3	215	4	2	4
Week4	198	3	2	5
Week5	248	3	2	2

Note. Degree of comfort and level of interest were rated on a scale from 0 to 5, with 5 being the highest.

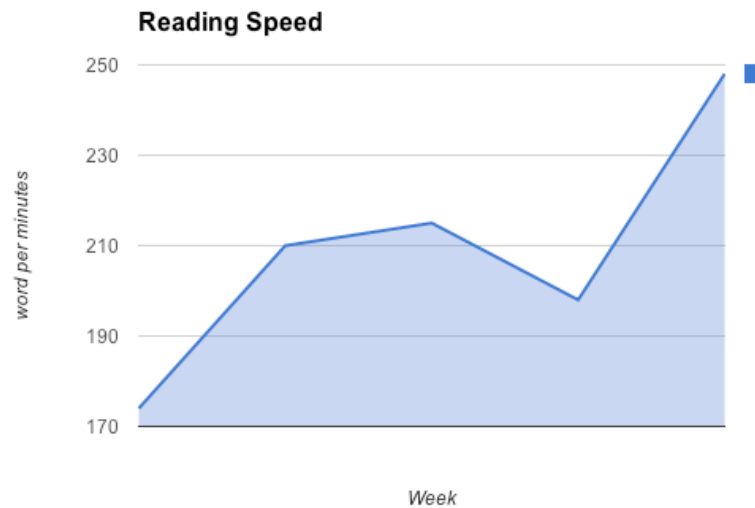


Figure 1. The Learner's Reading Speeds over Four Weeks

Overall, Figure 1 indicates a positive trend of progress in the learner's reading rate. However, there are two important considerations about the results. First, in Week 4, the learner's reading speed decreased to 198 wpm despite the gradual improvement by this point. One reasonable explanation can be made from the questionnaire response (Appendix 3.) According to her answer in Week 4, she was neither comfortable with reading the passage nor interested in the topic. This may have caused the negative outcome of her reading rate. Another point is that she was poor at answering the comprehension questions in Week 5 as the result (Table 1) shows, although her reading speed of this time was 248 wpm. The questionnaire also suggests that in Week 5, as well as in Week 4, she was uncomfortable with reading the given text and less interested in its content. This negative view towards the text may have resulted in poor comprehension. Despite these fluctuations, her overall reading

speed increased toward the end of the training and she was able to read as fast as at 248 wpm compared to 174 wpm in the beginning.

The Positive Affordances of the Reading Speed Training Technologies

As a whole, the usefulness of Spreeder can be seen to a certain degree based on the results. The learner recognized the overall positive outcome and said that she felt her reading became faster when she took a test right after practice (post-training interview).

Although the poor result of the learner's understanding of the text in Week 5 seems to complicate interpretations, it actually can be perceived in a positive way. This finding is similar to Chang's (2010) study, in which EFL college students improved their reading rates, which involved both reading speed and comprehension of a text (p. 284). Although Chang's training aimed to develop reading fluency in terms of reading rate, it also had a good influence on learners' comprehension level. Thus, Chang concluded that forming a habit of reading fast will eventually end up with an improvement in the comprehension process in the long run.

The learner's result of Week 5 shows noticeable progress in reading speed, in spite of poor comprehension of the text. This does not necessarily mean the data is invalid, but rather suggests her process of developing reading fluency. Chang (2010) pointed out that comprehension is not only affected by automaticity in word processing but also other factors such as purposes of reading, difficulty of a text, learners' familiarity or interests, and so on. Thus, the poor comprehension in Week 5 may stem from other factors or imply the learner's process of developing reading fluency.

Most importantly, the learner mentioned that she learned how to practice to improve her reading rate in her future studies. This means she learned the strategy of training for reading fluency. Before the training, she had always wished she could read faster, but she was not sure how to accomplish it. This training gave her the tools and method for self-training she can use outside of school. Spreeder thus can be said to provide the learner with autonomy and, in turn, confidence.

There are several points the learner liked as well as disliked about Spreeder. She liked the practice with Spreeder because:

1. The session does not take a lot of time.
2. The procedure is very easy and practice is not tiring.
3. It allows her to practice to increase her reading speed on her own.

First, each practice session did not take much time. For instance, one of the articles selected for practice contained 363 words and the designated reading speed was 200 wpm. The time she spent reading this article was less than 2 minutes. Even considering preparation such as going to the website to copy a reading passage and pasting it on the screen of Spreeder, the whole session only took 5 minutes. The training was very practical in terms of time efficiency.

In addition, as listed in (2) above, the reading practice with Spreeder was very easy for the learner. She basically sat in front of a computer screen and received each word as it appeared on the screen, just like watching TV. Comprehension questions were not included in a practice session with Spreeder, so she did not need to think much of the overall information. In other words, high-level cognitive processing was not really required, and as a result, the learner felt the training procedure as a whole was very easy.

Another positive feature of Spreeder is that it put no time pressure on the user, as opposed to other approaches such as short timed reading. This observation supports Chang's (2010) suggestion that paced reading, accelerated reading, and class- and self-paced reading, which are considered traditional ways to increase reading rate, force students to read under some degree of time pressure (p. 288). Of course, an appropriate degree of pressure encourages students to attain their goals in many cases, but it might also prevent them from engaging in learning. If a learner prefers training autonomously without teacher's pressure, practice with Spreeder should be recommended.

Nowadays, there are numerous articles online so learners are able to be exposed to English even in an EFL environment. Spreeder is one of the strategies to take advantage of the abundant resources on the web. However, finding a proper article can also be an issue, which is discussed below.

Some Negative Affordances of Reading Speed Technology

Spreeder also has some negative affordances. The result of Week 5 can potentially imply Spreeder's danger of fostering the habit of reading faster without equal progress on understanding content. In other words, students will be able to look at and perceive each word quickly, but they may not be able to understand the meaning of a text as a whole. However, this may not be important in a long run. While the learner's comprehension level did not match with her reading speed at this point, it is expected that the learner's comprehension level in accordance with her reading speed will improve through practice over time (Chang, 2010), which can lead her to becoming a true fluent reader.

Another important negative affordance by Spreeder is that it ignores the fact that readers usually recognize not individual words but chunks, several connected words with regard to meaning, when reading a meaningful text. Although this tool allows a text to be divided into a two-to-six-word strings as explained above, these strings are determined by an arbitrary number of words without any consideration of the semantic relationships among words. Spreeder's strings are of equal size but may not form any coherent semantic unity (a string may even include a period or comma). In contrast, natural chunks may vary in size but they are coherent semantic units. And yet, in reading, the processing of language into semantic chunks is very important for both speed and comprehension. Yamashita and Ichikawa (2010) showed that there is a significant relationship between chunking, connecting each word to make a meaningful unit, and reading based on their study. In other words, chunking is one of the fundamental processes to be a fluent reader. Their result shows that both advanced and intermediate learners can read faster when given a passage divided into a chunk or fragment than when given the same passage divided into single words, implying that the skill to chunk a text properly is a great advantage to be able to read faster (p. 273).

The learner gave a few comments to express her dislikes about Spreeder.

1. It is difficult to find a proper article to practice independently.
2. It was hard to understand how to use Spreeder at first.

One of the concerns related to an advantage of Spreeder is that a great amount of online resources are accessible, but, at the same time, it may be time-consuming as well as difficult for learners to find an appropriate article in terms of their language level and interests. In response to the problem, instructors can give some links of recommended websites, for instance, news websites designed for language learners or children and websites

for content-based learning. Also, an initial questionnaire to find learners' interests is important. These two steps help learners locate their favorite articles more easily.

Another issue regarding Spreeder is usability. Although the learner said the procedure of a practice session was easy once she figured it out, Spreeder might be new to a lot of computer users and not very user-friendly for the first time. Particularly, it is hard to notice that there is a setting button on the player bar. Additionally, terms such as "wpm" and "chunk" are unfamiliar for learners. This suggests necessity of guidance before starting training. In this training, the learner was given all instructions via the Internet; however, the best way is to demonstrate it in class while learners work on it by themselves simultaneously.

Discussion

There are some very important suggestions for future teaching with Spreeder. First, instructors have to be very familiar with Spreeder's functions and options and need to give guidance to students before starting practice on their own. Otherwise, students would not see the great benefits that Spreeder affords. Another suggestion to bear in mind as a preparation step is the importance of providing an appropriate article in terms of learners' level and interests. It would also be recommended to conduct training in a long run. In this way, both instructors and learners may find firm progress in their reading fluency. Finally, it is important to keep in mind that Spreeder only affords lower-level processing of text. It is possible that the learner's poor comprehension at some points in the training program despite the higher reading rate was due to the fact that her lower-level processing was developed but her higher-level processing was still developing at that point. Thus, it would be ideal to integrate semantically chunked reading into this training so that learners' reading fluency would be very steady from every aspect.

Some future questions for further research include: (1) What is the best chunk size for a learner? How can an instructor find it? (2) To what extent are learners' progress on reading rate and their interests towards reading content related? (3) Would training with Spreeder be applied to different levels of learners? And (4) How could we change it to be more appropriate for a specific level of students? More research is needed in this important area of second language teaching.

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Appendix 1

Questionnaire before timed-reading training

What topics interest you?

Check all applicable boxes

- USA
- Africa
- Asia
- Mideast
- Europe
- Science and Technology
- Health
- Entertainment
- Economy

How much are you comfortable with reading in English?

Compare it with in your first language.

1 2 3 4 5

Not at all Very much

Submit

Appendix 2

Quick survey before training program

What topics interest you?	How much are you comfortable with reading in English?
USA, Entertainment	2

Appendix 3

Questionnaire after Test

What was the reading speed in wpm?
e.g. 150wpm

How many did you get correct on comprehension questions?

How much were you comfortable with reading the passage?

1 2 3 4 5

Not at all Very much

How much were you interested in the topic of the passage?

1 2 3 4 5

Not at all Very much

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