

## Improving Reading Speed and Biology Conceptual Understanding using Speed Reading Method on Students of X-MIA Class

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**Abstract:** Speed reading method helps students to learn effectively, efficiently, and independently in understanding a reading. This study aims to improve the reading speed and understanding of students' biology concepts by applying *speed reading* method. This research was conducted in SMA Bina Bangsa Surabaya in Odd Semester of Academic Year 2015-2016. This research is qualitative research which was done by employing reading speed test and comprehension test of biology concept. The subject of this research was 41 students of X-MIA class in SMA Bina Bangsa Surabaya. The data were analyzed by employing descriptive qualitative. The results showed an increase in average reading speed of 481 wpm, with an average understanding of the concept of 73%.

**Key Words:** speed reading, biology conceptual understanding, reading speed

**Abstrak:** Metode *speed reading* membantu siswa untuk belajar secara efektif, efisien, dan mandiri dalam memahami suatu bacaan. Penelitian ini bertujuan untuk meningkatkan kecepatan membaca dan pemahaman konsep biologi siswa dengan menerapkan metode *speed reading*. Penelitian dilakukan di SMA Bina Bangsa Surabaya pada semester ganjil tahun pelajaran 2015-2016. Jenis penelitian ini adalah penelitian kualitatif yang dilakukan dengan uji kecepatan membaca dan uji pemahaman konsep biologi. Subjek penelitian ini adalah 41 siswa kelas X-MIA SMA Bina Bangsa Surabaya. Data tersebut dianalisis secara deskriptif kualitatif. Hasil penelitian menunjukkan terjadi peningkatan rata-rata kecepatan membaca 481 kpm, dengan rata-rata pemahaman konsep 73%.

**Kata kunci:** *speed reading*, pemahaman konsep biologi, kecepatan membaca

Reading is one of the important skills to obtain information. During the 21st era, reading skill takes a role as the essential life skill (Trilling and Fadel, 2009). Reading culture has become the paramount program of government to improve education quality in Indonesia (Muhammad, 2015). Since 2015, the students are asked to read any book before the lesson begin. It takes 15 minutes before the lesson starts every day. This program intends to habituate students to love reading which in the long-run it could contribute to the improvement of education quality. In the same year, the regional government of Surabaya, Education Office of Surabaya, challenge all students from all level of schools, both state and private schools to succeed 2 million books reading. This aims at generating Surabaya as literacy city. Students along with

their school provide books to accomplish the challenge. Then, each school registered as a participant and uploaded the book titles that have been read by students.

According to the initial observation, it obtained information that reading speed of students in X-MIA SMA Bina Bangsa Surabaya is 181 wpm with 34% of conceptual understanding. Such reading speed is classified as low (Mullis *et al.*, 2012) or average (Konstant, 2003). This low reading speed is presumably due to the absence of speed reading training method and students' habit of speed reading skill.

Speed reading method has become one of the appropriate alternatives in obtaining information promptly. Speed reading is a method of reading to train students in reading brief text sleekly, yet they still understand the contents (Quinn, 2007). Some

researchers report that the method of speed reading improves the reading ability of high school students (Purba, 2012; Ratnasari, 2013), helps students to obtain essential information in a relatively short time (Bell, 2001; Macalister, 2010; Jodai, 2011), encourages students' activity in the classroom (Anderson, 1999), and increases students' ability to predict a particular reading (Rasinski, 2002).

In accordance with the aforementioned explanation, thus, it requires a research to examine the improvement of reading speed and Biology conceptual understanding using speed reading method.

**METHOD**

This research is a qualitative research which was conducted using reading speed test and Biology conceptual understanding. This research was conducted in the Odd Semester of Academic Year 2015/2016. This study took 41 students of X-MIA Class SMA Bina Bangsa Surabaya. The indicator used for reading speed and conceptual understanding were criteria developed by Sutz and Weverka (2009) while reading speed category were used Konstant's classifications (2003). Pre-test and Post-test and topic summary of Virus and Bacterial within students' worksheet were used as the instrument.

**Table 1. Students' Reading Speed Results**

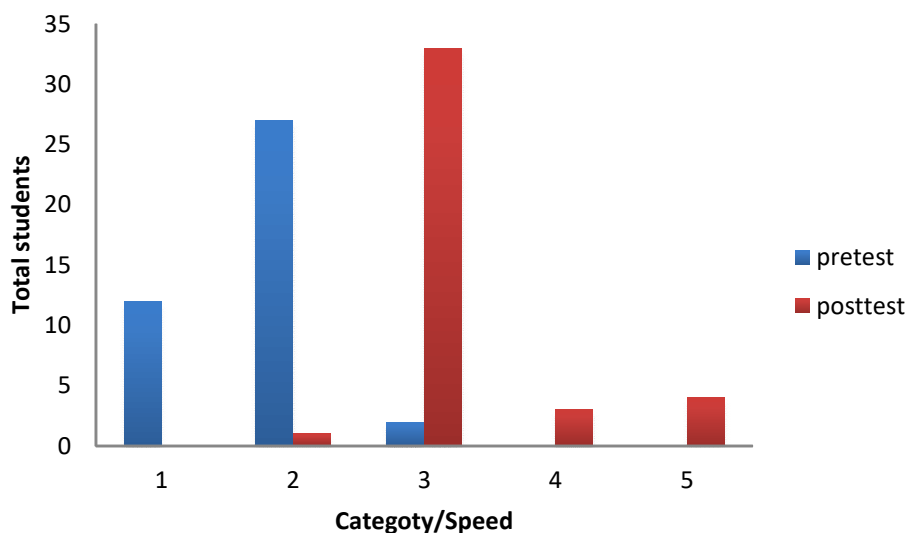
Speed	Category	Pre-test	Post-test
		Total students	Total students
0-150	Slow	12	0
151-300	Average	27	1
301-500	Fast	2	33
501-750	Very fast	0	3
751-1000	Eloquent	0	4
Total		41	41

The data obtained regarding reading speed and conceptual understanding of students were analyzed in descriptive qualitative approach to obtain the depiction of students' reading speed and conceptual understanding improvement on Virus and Bacterial topics.

**RESULTS**

**Speed Reading**

Speed reading data during pre-test shows that 12 students are categorized as a slow reader, 27 students are categorized as an average reader, and two students are categorized as a fast reader. During the post-test, no students are categorized as a slow reader, one student is categorized as an average reader, 33 students are categorized as a fast reader,



- Remarks:
- 1 = Slow reader (reading speed 0-150 wpm)
  - 2 = Average reader (reading speed 151-300 wpm)
  - 3 = Fast reader (reading speed 301-500 wpm)
  - 4 = Very fast reader (reading speed 501-750 wpm)
  - 5 = Eloquent reader (reading speed 751-1000 wpm)

**Figure 1. Students' Reading Speed Category Improvement**

three students are categorized as a very fast reader, and four students are categorized as an eloquent reader (see Table 1). The data presented in Table 1 affirms that speed reading method is able to improve students' reading speed. In addition, it confirms that students' category of reading also changed. At the beginning, students were categorized as a slow reader and after given speed reading treatment, they became an average reader, fast reader, until eloquent reader (see Figure 1).

According to the data obtained (Table 2), it also indicates that students who are categorized as fast reader possess better conceptual understanding than

students who are categorized as a slow reader. Students who are categorized as a slow reader with the reading speed is approximately 0-150 wpm only acquired limited understanding which includes structure concept and the initial stage of virus replication and some minor bacterial nature such as size and forms. In students who are categorized as average with reading speed of 151-300 wpm, they acquired more comprehensive understanding such as structure replication, habitat, and some benefits of the virus as well as bacterial nature and living. It amounted to 95% of students who were categorized as slow and average readers before given speed reading method.

**Table 2. Students' Reading Speed and Biology Conceptual Understanding Scale**

Speed	Conceptual Understanding	
	Virus	Bacteria
0-150	Virus structure, replication (adhesion stage, penetration)	characteristics (size, form, structure, function, cell wall (gram +/- bacteria))
151-300	Virus structure, replication (adhesion, penetration, replication, synthesizing, and budding stages)	(cell, gram +/-), plasma membrane, cytoplasm, ribosome, DNA, granule, capsule, flagumen, endospores), way of life (heterotrophic bacteria, autotrophs)
	Habitat (bacteria, eukaryote, plants, animal/human), classification (taxon, bacteria, microorganism, plants, animal), beneficial virus	
301-500	Virus structure, replication (adhesion, penetration, replication, synthesizing, and budding stages)	(cell, gram +/-), plasma membrane, cytoplasm, ribosome, DNA, granule, capsule, flagus, endospores), way of life (heterotrophic bacteria, autotrophs, aerobes, anaerobes), reproduction (asexual, sexual), habitat, beneficial bacteria (decay, fermentation, nitrogen binders, soil fertilizers, antibiotics), harm (decay, disease in humans)
	Habitat (bacteria, eukaryote, plants, animal/human), classification (taxon, bacteria, microorganism, plants, animal), beneficial and harmful virus (influenza, HIV, hepatitis, ebola, polio, herpes, warts), harmful to animals (chicken, cow, tetelo, rabies,), harmful to plants (TMV, CiLV, tungro,), prevention (polio vaccine, rabies, hepatitis, influenza, smallpox, smallpox, mumps, measles), the definition of AIDS, the cause of AIDS.	
501-750	Virus structure, replication (adhesion, penetration, replication, synthesizing, and budding stages)	(cell, gram +/-), plasma membrane, cytoplasm, ribosome, DNA, granule, capsule, flagus, endospores), way of life (heterotrophic bacteria, autotrophs, aerobes, anaerobes), reproduction (asexual, sexual), habitat, beneficial bacteria (decay, fermentation, nitrogen binders, soil fertilizers, antibiotics), harm (decay, disease in humans, animals, plants), preservation and processing food (sweetening, pasteurization, sterilization), hygiene and health
	Habitat (bacteria, eukaryote, plants, animal/human), classification (taxon, bacteria, microorganism, plants, animal), beneficial and harmful virus (influenza, HIV, hepatitis, ebola, polio, herpes, warts), harmful to animals (chicken, cow, tetelo, rabies,), harmful to plants (TMV, CiLV, tungro,), prevention (polio vaccine, rabies, hepatitis, influenza, smallpox, smallpox, mumps, measles) PLWHA	
751-1000	Virus structure, replication (adhesion, penetration, replication, synthesizing, and budding stages)	(cell, gram +/-), plasma membrane, cytoplasm, ribosome, DNA, granule, capsule, flagus, endospores), way of life (heterotrophic bacteria, autotrophs, aerobes, anaerobes), reproduction (asexual, sexual), habitat, beneficial bacteria (decay, fermentation, nitrogen binders, soil fertilizers, antibiotics), harm (decay, disease in humans, animals, plants), preservation and processing food (sweetening, pasteurization, sterilization), hygiene and health
	Habitat (bacteria, eukaryote, plants, animal/human), classification (taxon, bacteria, microorganism, plants, animal), beneficial and harmful virus (influenza, HIV, hepatitis, ebola, polio, herpes, warts), harmful to animals (chicken, cow, tetelo, rabies,), harmful to plants (TMV, CiLV, tungro,), prevention (polio vaccine, rabies, hepatitis, influenza, smallpox, smallpox, mumps, measles) PLWHA AIDS drugs (NRTIs: HIV inhibitors, HIV NNRTIs, inhibitors of other genes, PI = new viral maturation inhibitors, Fusion = HIV lifecycle binders, THIS = preventing the genetic code)	

## DISCUSSION

The results of the reading speed test on pretest and posttest indicate an increase in reading speed accompanied by an increase in the category of reading speed of students from the slow and average reader category increase to very fast and eloquent reader. The category is a category that is able to obtain essential information in a short time. Every student has the same potential to gain a lot of knowledge in a short period of time. Such sufficient information will be able to improve the conceptual understanding of Biology.

After the learning process with *speed reading* method, students' reading speed increased 98% from slow and average reader to very fast and eloquent reader. With an increase in speed between 500-1000 wpm, students' memory is increasing, which also increases the understanding of the concept of structure, replication, habitat, beneficial or harmful benefits, and prevention of viruses and bacteria.

Speed reading methods are proved to help students in getting the information they want and improve students' reading ability (Marta, 2013; Ratnasari, 2013). Through the scanning stage, students will be empowered to see briefly and thoroughly the content of the reading. In the predicting stage, students will be trained to predict the content of the reading comprehensively. While in the main idea stage, students will be enhanced the ability to find the main idea in each paragraph on a particular reading (Widiatmoko, 2002). The results of this study also prove that higher speed reading skills help students to obtain as much information as possible in a short time as reported by Quinn (2007). This is presumably because the method of speed reading helps students in thinking, innovating, and possessing broad-minded knowledge (Wechsler & Bell, 2006).

## CONCLUSION

According to the result, it can be concluded that speed reading method improves the reading speed and conceptual understanding of students. For further study, it is important to examine speed reading method on other Biology topic and another level of education.

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