

The Role of Text To Speech Assistive Technology to Improve Reading Ability in E-Learning for ADHD Students

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Abstract: This study aims to determine the role of text to speech assistive technology on the reading ability of ADHD students in learning using e-learning. The ability of ADHD students who have impulsive and hyperactive behavior shows that students who are diagnosed will have difficulty focusing on one thing as a result of coordination functions and emotional responses that affect learning abilities, especially in reading. To improve reading skills, the use of assistive text to speech technology is needed by students during e-learning. The purpose of this study was to determine the role of text to speech assistive technology to improve the reading ability of ADHD students in reading spelling of words, with a clear voice and straightforward word emphasis. The method used in this study is Single Subject Research (SSR) using the ABA technique. Instruments to determine the level of reading ability of ADHD students are observation and documentation. The results showed that the role of text to speech assistive technology to improve reading skills in e-learning for ADHD students made progress in spelling words and with clear vowels and straightforward word emphasis. It can be concluded that the role of text to speech assistive technology to improve reading skills in e-learning for ADHD students is highly recommended to be applied in every e-learning lesson. It can be concluded that the role of text to speech assistive technology to improve reading skills in e-learning for ADHD students is highly recommended to be applied in every e-learning lesson.

Keywords: Assistive Technology; Text To Speech; Reading Ability; E-Learning; ADHD

INTRODUCTION

Article 5 of Law Number 20 of 2003 concerning the National Education System states that citizens who have physical, emotional, mental, intellectual, and/or social disorders are entitled to special education. This regulation stipulates that the rights and obligations of every citizen have the same opportunity to obtain a proper education even though they have abnormalities in themselves. This special education is intended for those who experience physical, emotional, social, mental intellectual limitations that affect the growth and development process that is not appropriate for children their age.

ADHD is a type of child with special needs which stands for Attention Deficit Hyperactivity Disorder. Students with ADHD will have problems with active/hyperactive behavior, impulsive behavior and difficulty focusing/concentrating. In line with the understanding Baihaqi and Sugiarmun (in Adiputra et al., 2018) provide an overview of ADHD students who experience brain dysfunction and result in difficulty in controlling impulsivity, inhibiting behavior and not supporting their attention span. Based on DSM IV, the first characteristic of ADHD is inattention, namely difficulty in paying attention which results in academics such as completing tasks and various social situations. The second is impulsivity or difficulty in holding back the urge. The third is hyperactivity or difficulty controlling movement. Based on the characteristics of ADHD, it greatly affects school academic achievement because it affects the way of learning.

Although ADHD students have difficulties in participating in learning, ADHD students have an average IQ so these ADHD students are not unable to learn well, but inattention, hyperactivity and impulsivity that are not suitable for children their age make ADHD students not ready to learn. But the lack of attention due to difficulties in listening, directing, and paying attention to something that is bad is experienced by ADHD students and results in tasks that are not completed because of difficulties in completing the assigned tasks (Yusri, 2016). As a result of inattention, hyperactivity and impulsivity, these ADHD students will experience reading disorders which result in poor reading skills, this can be seen in the mastery of reading skills, namely reading words and sentences, decoding and reading comprehension (Gray & Climie, 2007).

This greatly affects when distance learning must use e-learning and currently the dependence of the world of education on e-learning is increasingly real. E-Learning is an information and communication technology to enable students to learn wherever and whenever (Hartanto, 2016). This e-learning learning will require students to be active independently at all learning times and be responsible for the implementation of learning taking place using information technology (Chusna, 2019). The current use of information technology with the existence of e-learning is quite effective when used for distance learning, but for ADHD students this learning will make students bored and tired.

When ADHD students understand the existing learning, it will be difficult to read the material displayed on the computer screen during e-learning due to inattention, hyperactivity, and impulsivity, which will experience a lack of focus and result in impaired reading. ADHD students will usually do other things when asked to read the material on the screen during e-learning. Thus, the existing learning process will be meaningless and result in missing the existing lessons and lack of understanding of the material presented.

Reading ability is reading accuracy and understanding of the overall reading content (Tampubolon in Lalily, 2014). Reading activities have a very big influence on any activities at school. This will affect students who do not understand in reading or do not have the ability to read will have difficulty when learning. With the current information technology, teachers can use it to improve reading skills for ADHD students. In terms of reading and understanding the content of reading, ADHD students will have difficulty, but the development of technology is now growing very rapidly with the existence of assistive technology.

This assistive technology is used to assist and train during the learning process (Suwahyo, 2022). There are many assistive technologies that can help ADHD students improve reading skills, one of which is text to speech. Text to speech technology that is able to take words on smartphones, tablets and computers that convert them into audio can also be used to read a file that outputs also in audio form (Filbert et al, 2021). So this can help ADHD students improve reading skills by always hearing the words spoken through audio text to speech students are expected to be able to read word spelling well, clear voice intonation and clear word affirmations.

METHOD

The method used in this study is an experimental research method which means as a quantitative research approach to examine the causal relationship of a treatment (Sukmadinata, 2017). In this experimental research method, one of them uses a single subject or one commonly referred to as Single Subject Research (SSR). With this SSR research approach, it is an experiment conducted on an object that aims to determine the extent of the effect of certain treatments under controlled conditions (Sugiyono, 2015). This study uses a single subject design that performs comparisons between the baseline phases, namely the ABA design. What is meant by these phases are the phase without treatment, the intervention phase with treatment, and the repetition of the baseline phase. The subjects of this study were 2nd

Class ADHD students at the Montesori School. The independent variable in this research is Assistive Text To Speech Technology with the dependent variable in this study is the ability to read in e-learning learning. By collecting data using an observation and documentation system with data analysis techniques, namely condition analysis and analysis between conditions using descriptive statistics.

RESULT AND DISCUSSION

Result(S)

The data displayed is the result of direct observation by researchers for approximately 20 sessions.

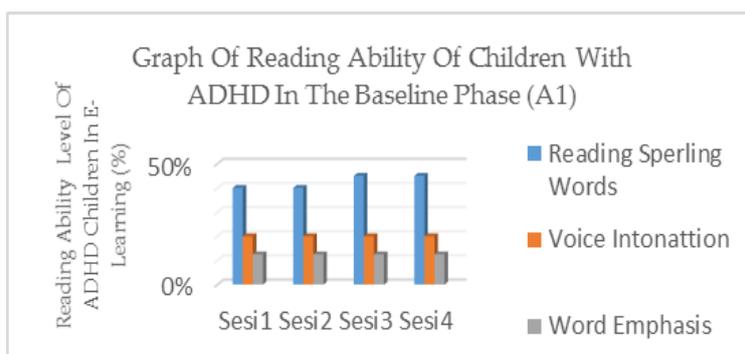


Figure 1. Results of reading ability in ADHD students during e-learning in the baseline phase (A1)

In the baseline phase (A1) the reading ability of ADHD students before being given the intervention can be seen that the ability to read spelling of words is still low with word intonation and word emphasis that has not been straightforward. The researcher gave a test by reading the text given in accordance with the learning materials given from school by giving 4 sessions with 30 minutes each session for ADHD children. Each session is carried out in three material topics with the first explanation to measure the ability to read spelling of words, the second is to read by measuring the intonation of words, and the third is to read to measure the emphasis of words.

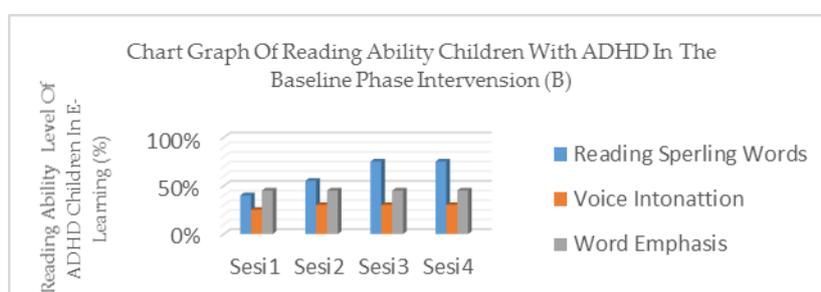


Figure 2. Results of reading ability in ADHD students during e-learning with the application of text to speech assistive technology in the intervention phase (B)

In the intervention phase (B) the reading ability of ADHD students who applied assistive text to speech technology in e-learning was carried out for 12 sessions with each session given 60 minutes showing a stable increase when given treatment or application of the assistive technology. Seen from treatment A1 to B showed improvement and stability. By spelling good words, clear intonation and direct emphasis. In this phase, the researcher provides material that is read by text to speech assistive technology, then the child is taught to read the words that have been spoken on the technology and the child follows it. Researchers dissect the words in

the text of the material into syllables and teach children how to read the syllables according to intonation with the help of technology, namely following the issued speech. After teaching how to read words and syllables, children are asked to read sentences that have been read and keep repeating them with 3 different materials.

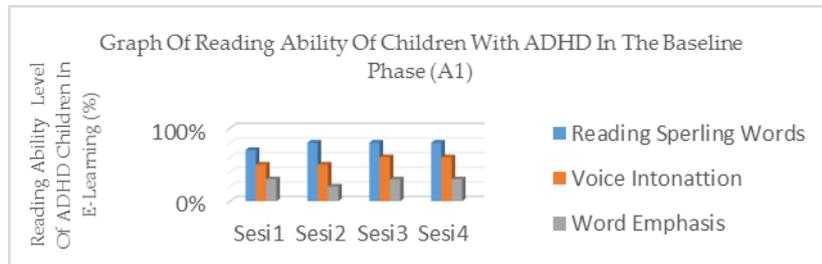


Figure 3. Results of reading ability in ADHD students during e-learning after being given the application of text to speech assistive technology in the baseline phase 2 (A2).

The reading ability of ADHD students after being given treatment with the application of text to speech technology, namely in the baseline phase 2 (A2) in e-learning, the baseline conditions showed that ADHD students remained on the verge of stability at numbers 9 and 10 this was due to children's interest in learning that took place because the technology was very help. In this phase, the researcher conducted another test such as baseline 1 (A1) for 2 sessions with 30 minutes each session and 2 learning sessions during the learning process. By using the same test format and the same implementation procedures, conclusions are drawn from the results of the overall research that has been carried out.

Discussion(s)

The purpose of this study was to determine the role of text to speech assistive technology on reading skills in ADHD children during e-learning which includes reading with spelling, word intonation and word emphasis. As is well known, text to speech assistive technology is very helpful for ADHD students because it gives examples of reading texts and reading readings that students do not understand. Basically, assistive technology is to help students with special needs in doing their tasks by using computer access (Suwahyo et al, 2022). This makes students more interested and helpful in doing any given task and can take part in learning during e-learning that faces gadgets during learning. As is well known, these ADHD students have difficulty in capturing lessons, learning difficulties, and poor reading and thinking skills. When using text-to-speech assistive technology, ADHD students showed increasing reading skills with clearer types of sounds and clearer word emphasis in each session. This shows that in helping students who have difficulty in reading can use assistive technology in the form of spell checking software to support students in evaluating grammar (Smith & Hattingh, 2020). When using text-to-speech assistive technology, ADHD students showed increasing reading skills with clearer types of sounds and clearer word emphasis in each session. This shows that in helping students who have difficulty in reading can use assistive technology in the form of spell checking software to support students in evaluating grammar (Smith & Hattingh, 2020). When using text-to-speech assistive technology, ADHD students showed increasing reading skills with clearer types of sounds and clearer word emphasis in each session. This shows that in helping students who have difficulty in reading can use assistive technology in the form of spell checking software to support students in evaluating grammar (Smith & Hattingh, 2020).

Based on the results of data processing and data analysis, the overall use of this technology has a positive effect on reading ability. This result is shown by the percentage of

reading ability before and after the intervention by applying this technology, it shows that the subject's data acquisition has increased between the initial ability of the two subjects at baseline 1 to the ability of the two subjects after being given the intervention (Baseline 2) with a mean level comparison of 21% and in the second phase baseline 2 experienced an increase in the ability obtained by 49%.

Based on the results of the analysis of the data that has been presented using the ABA design, it can be said that the application of this technology can improve reading skills in ADHD students during e-learning, namely learning during school. Text to speech technology that is able to take words on smartphones, tablets and computers that convert them into audio can also be used to read a file that outputs also in audio form (Filbert et al, 2021). This assistive text to speech technology shows that by combining visual skills, namely looking at the text screen during e-learning learning and auditory listening to readings, it can improve the ability to read with words correctly and increase vocabulary because they often hear words that are stuck in students' memories.

E-learning is a form of learning that uses electronic technology, it is a form of conventional learning as outlined in digital format through internet technology (Mais, 2016). In line with the assistive text to speech technology that is applied to e-learning learning using electronic technology as a form of learning media, it is able to support ADHD students who have inattention, hyperactivity and impulsive behavior resulting in poor reading skills, this can be seen in the mastery of reading skills, namely reading words. as well as sentences, decoding and reading comprehension (Gray & Climie, 2016).

However, the research has its own advantages and disadvantages. In this advantage, the use of text-to-speech assistive technology can be used on any smartphone and is easily accessible and the child's interest is higher because the sound produced attracts attention but the lack of using this technology is when the signal used is not good, it will cause delays when learning takes place, as a result sometimes lessons learned and readings read are sometimes delayed and can leave ADHD students confused.

CONCLUSION

Based on the results of the study, it can be concluded that the role of text to speech assistive technology in improving reading skills in e-learning learning for ADHD students is correctly seen from the type of sound that is issued, the clearer the sound and the clearer the word emphasis can be seen from the results before and after the intervention used according to the procedure. and the child's condition is good. The application of this text to speech assistive technology should continue with assistance because it uses electronic media where students still have not fully mastered the electronic media.

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