
DOES PICTURE WORD BOARD GAME ACTIVITY IMPROVING READING INTERVENTION FOR STUDENTS WITH DOWN SYNDROME?

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ABSTRACT

Down Syndrome students are special needs students with cognitive problems, including reading barrier. This is a challenge for teachers to teach students with Down Syndrome at inclusive school to read words. One of them is through the picture-word board games. This study aims to determine whether the picture-word board games improve reading words ability in students with Down Syndrome. The research methodology used was pre-experimental design with two participants students with Down Syndrome at MTs. Ar Roihan Lawang Malang. The pretest and posttest used ten matching questions between words and pictures to read. The results showed that there was an increasing in reading words ability in students with Down Syndrome ($n=2$) through a board game by $\text{sig}=0.041$ ($\text{sig}<0.05$) SPSS analysis. It is concluded that picture-words board games increase students with DS for reading. Suggestion for further researchers is to examine the short memory of students with Down Syndrome using board games.

Keywords: Picture-word board games, reading words ability, students with Down Syndrome

A. INTRODUCTION

Down syndrome students are children who have genetic disorders due to excess chromosomes that cause children to have physical and mental deviations. Chromosome number 21 of the children do not consist of 2 chromosomes as it should but they have three chromosomes which causes the child to decrease physical deviations (Kaler & Hussain, 2020). Down syndrome is a cause of mental retardation, then the children got retardation in speech language. This mental retardation is caused by the presence of a central nervous system and it is called dyslexia in speech therapy or reading barrier (Laws et al., 2016). Therefore, this condition (reading barrier for students with Down Syndrome) is a challenge to be solved by teachers in inclusive madrasah.

One of the problems with children with Down Syndrome (DS) is they require special understanding learning and it can be digested by students with Down syndrome because of their cognitive constraints. Cognitive is a thinking process, the child's ability to connect, assess and consider an event (Lubis, 2019). Through this cognitive ability, children are seen as creature who are actively building knowledge about the world. There is a need for linguistic intervention to improve cognitive abilities for students with DS so they can read properly (Lemons et al., 2018) by contextual learning and playing games. Direct object learning can also be a useful alternative learning for students with DS (Almendra & Elvas, 2020).

The method of learning for students with DS is adjusted to the level of classification of their mental retardation. Previous research stated that they can use the picture word card to increase the vocabulary of students with DS (Rahayu et al., 2018). Previous research also said that the color card method can be used to treat cognitive abilities in students with DS (Kusumawati, 2013). Another previous study used kinesthetic games that connected sensory and motor skills in students with DS as therapy (Chuang et al., 2017). Meanwhile in this research will use combination

between card, picture, and motion to increase reading vocabularies students with DS in Ar-Roihan Inclusive Madrasah.

Madrasah Tsanawiyah Ar-Roihan is an inclusive madrasah located in sub-district Lawang, district of Malang, East Java Province. This madrasah accommodates several inclusion children with different criteria. There are students with Down Syndrome, cerebral palsy, ADHD, autism, deafness, slow learners, and so on. As an inclusive madrasah, MTs Ar-Roihan also provides facilities and infrastructure as well as special inclusive tutors for students with special needs. The curriculum used is a modified curriculum, in which there are also assessments and educational teaching aids for students with special needs.

There are two students with Down Syndrome and of course they still can not reading vocabulary properly yet. This is a challenge for teacher to make the condition of two students better. This study will examine efectiveness of picture-words board games, a combine of teaching media based on previous study. Therefore, the research problem for this study: does picture-words board games activity improving reading intervention for students with down syndrome? The purpose of this study is to find out whether the board game method using picture-word cards can improve the ability of students with Down Syndrome to remember and read vocabularies properly. The hypothesis in this study: (H1) there is an increase in memorizing and reading vocabularies in students with DS through picture-word cards board games, (H0) there is no increase in memorizing and reading vocabularies in students with DS through picture-word cards board games.

B. LITERATURE REVIEW

Reading and its relationship with Down Syndrome Students

Language and speaking are difficult areas for stdents with Down Syndrome. How to express the language of expression is still an obstacle in communicating for children with this barrier. Most of students with DS have poor articulation in speaking. It also affects their intelligence caused

by weak phonology (Roepke et al., 2020). Most students with DS are also slow in speaking, even though they have grown up still their communication is difficult to understand.

Among the three linguistic components: 1). Content (vocabulary), 2). Form (phonology, morphology, and syntax), and, 3). Use (pragmatic), students with DS have their strengths and weaknesses in certain components. In content, for example, students with DS understand more receptive vocabulary than expressive vocabulary, so students with DS find it difficult to communicate their intentions, which sometimes makes them moody or even tantrums. Meanwhile, in the form component, students with DS also get weakness. Finally, the use component is also still a constraint and depends on the individual of students with DS (Smith et al., 2020).

The phonological patterns produced by students with DS have similarities, they are: 1). The resulting consonant is a single consonant, 2). The final consonant is removed, 3). Fricative and africative stop consonants, 4). Sharply spoken words seem to have been omitted (Diez-Itza et al., 2021). These conditions also complicate reading in addition to intelligence factors. Speech therapy is also carried out so that students with DS are able to pronounce words correctly.

Based on previous study, this research is not only an intervention for reading, but also a therapy for phonological acuity in students with DS. Students with DS who use picture card board games, apart from being introduced to reading, they will also learn to pronounce phonology correctly.

Reading Intervention for Students with Down Syndrome

Reading for students with DS requires continuous effort. Interventions learning to read in students with DS must also pay attention to the elements of language therapy and psychology. In previous research reveals that knowledge about the effects of these interventions and identifies general characteristics specific to effective or ineffective interventions, produce variable significant effects with respect to various

characteristics including the age of the target group, intervention approach, dose, and implementer (Smith et al., 2020).

In the condition of students with DS, several treatments were carried out as reading interventions, including: 1). Letter-sound correspondence, 2). Reading code with words with high frequency, 3). Phonological awareness (Lemons et al., 2017). In this study, Lemons et al revealed that the reading intervention could positively improve reading in three children as a subject experiment. While the other two children still have limited in learning.

Other studies have conducted an experimental to explore the effectiveness of a phonics-based approach to reading instruction for students with DS. They have conducted a randomized control experiment to evaluate the efficacy of reading and language interventions involving 57 students with DS between the ages of 5 and 10 years (Burgoyne et al., 2012). The intervention includes: 1). Reading instructions targeting phonics, phonological awareness, sight words learning, and reading linked texts and 2). Language instruction that targets the oral and written use of new vocabulary words. After 20 weeks of intervention, children in the treatment group outperformed children in the control group in terms of reading word size, letter sound knowledge, phoneme blending, and teaching expressive vocabulary.

The difference in previous studies to this research is that the intervention will be carried out based on visuals using images, in addition to phonological awareness and sight words. Time taken for two weeks with the hours specified for studying.

Reading Strategy for Students with Down Syndrome

Learning that involves short-term memory must be conducted for students with DS because cognitive problems are the main obstacle for them. Research evidence shows that reading therapy also improves short-term memory function (Laws, 2010). Appropriate reading interventions also affect the speech and language conditions of students with DS.

The strategies used in the reading intervention also varied. One of them is a game that involves body-kinesthetic. Sensory motor needs to be used in learning strategies for students with DS because it can motivate them to be more confident in facing learning challenges (Chuang et al., 2017).

In addition, the strategy of using colored cards turned out to attract the attention of DS students (Kusumawati, 2013) to increase their cognitive ability. Another research using picture and word cards can also increase the vocabulary of students with DS (Rahayu et al., 2018). Through this picture card, students with DS can also learn to pronounce words, read, and then remember the vocabularies.

Therefore, this research attempted to combine sensor-motor strategies with picture-word cards. The strategy is given through board games by matching words and pictures pasted on the board. Students with DS can work cognitively by remembering words and pictures and also engage to read the words that have been typed.

C. METHODOLOGY

This study used a pre-experimental design, a study with one group that will be tested pretest and posttest without comparison or control group (Sugiyono, 2015). One shot case study is used in this study by one time frame design (Jaedun, 2011). This research activity provides a pre-test before being given treatment, after being given treatment then the participants given a post-test (Arikunto, 2010).

The setting of this research was conducted at Madrasah Tsanawiyah Terpadu Ar Roihan, Jl. Major Abdullah number 248 Lawang, Regency of Malang, East Java Province. Participants were 2 students with special conditions of Down Syndrome. Participants were recommended by a special mentor teacher at MTs. Ar-Roihan Lawang.

The pretest and posttest consisted of ten questions to match between the picture on the board game and the scrambled word cards. Then, participants choose word cards to match with pictures. The score is

taken from the number of words correctly installed in the picture which is then read correctly. The treatment given is how many pictures and writings are the same as those on the board game.

This study took two weeks for experimental times. After participants given treatment, the researcher used post-test for final score. The data were analysed by SPSS through non-parametric test because of the limited participants ($n=2$) (Wahyono, 2013).

D. RESULT AND DISCUSSION

The board game experiment was carried out on two students with DS in MTs. Ar-Roihan Lawang with a special mentor teacher. They were both diagnosed with Down Syndrome since birth and have received speech and language therapy.

Table 1. Experiment Participants

No	Name	Sex	Age	Grade	Classification Barrier
1.	Ariel	Male	17	IX	Pervasive student
2.	Hero	Male	14	VII	Intermittent

The pretest was conducted by shuffling the word cards, then participants were asked to match them with the pictures provided on the board game. In a pretest trial conducted on August 14, 2021 on two students with DS. In this pretest, students with DS experiment by taking a word card, placing it in the pocket of the board game and then reading the card.



Figure 1. Picture-words cards

After the pretest, participants used board games by giving pictures written with words underneath. Treatment of this board game had done twice so that students with DS were able to absorb words and read them correctly. The pictures that were installed on the cards and their writings were used as learning objects so that learning would be easier for students with DS (Almendra & Elvas, 2020).

The picture and word board game contains a board that was given a pocket of 10 places. On the face of the pocket was given a picture that would be guessed by students with DS through pieces of words that were given randomly. Then the students with DS matched the writing with the picture and read the words to be inserted in the pocket of board game.



Figure 2. Picture-Words Board Games Activity

The posttest then be held on August 21, 2021. At the time of the posttest, students were still accompanied and guided by a special supervising teacher because basically these two students with DS still need support from their teachers. Especially Ariel which was classified as pervasive students (need intense support).

Table 2. Pretest and Posttest Score

No	Words	Pretest		Posttest	
		Ariel	Hero	Ariel	Hero
1	Recite Quran	0	1	0	1
2	Sweep	1	0	1	1
3	Water	0	0	1	0
4	Pray	0	0	1	1
5	Sleep	0	0	0	1
6	Take a bath	0	0	1	1
7	Eat	1	0	1	1
8	Drink	0	0	1	0
9	Cook	0	1	1	1
10	Ablution	1	0	1	0
Total		3	2	8	7

Based on these data, it can be seen that there was an increase in reading down syndrome students through word and picture board games. In the second pretest, students with DS had a total score of 5 and the posttest had a total score of 15. The analysis of the data was taken from SPSS and got the following summary:

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The categories defined by pretest = 0 and 1 occur with probabilities 0.5 and 0.5.	One-Sample Binomial Test	.041 ¹	Reject the null hypothesis.
2	The categories defined by Posttest = 0 and 1 occur with probabilities 0.5 and 0.5.	One-Sample Binomial Test	.041 ¹	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

¹Exact significance is displayed for this test.

Based on SPSS analysis, it showed that $sig = 0.041$ ($sig < 0.05$), then hypothesis 0 (H_0) is rejected and hypothesis 1 is accepted. This indicates that there was an increase in memory and reading in students with Down syndrome through picture-words card board games.

In this experiment, it can be seen that images and visuals are still of interest to students with DS. This supports the previous research of Rahayu et al which stated that picture cards could improve the cognitive understanding of students with DS (Rahayu et al., 2018). In addition, physically kinesthetically, students with Down syndrome were also active when inserting word cards into pictures in the board game. This also supported previous research that active sensorimotor supports the learning of students with DS (Chuang et al., 2017).

Based on the results it was confirmed that students with DS can improve reading and memorizing words through picture-words card board games.

E. CONCLUSION

The conclusion of this study showed that word and picture board games were able significantly to improve reading skills in 2 students with Down Syndrome who were participants in this experiment. This experiment improved word understanding and reading in 2 participants so that board games media can be: 1). Fun learning media for students with DS, 2). Become a bridge for students with DS who have difficulty in reading words, 3). Improve vocabulary for students with DS. Further more, the picture-words board games could be an enjoyable teaching aid for students with DS in memorizing and reading vocabularies.

Suggestions for the next researcher is to reveal the relationship between short memorized down syndrome students through picture-words board games.

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