

Enhancing Adolescent Physical Development Understanding: Evaluating the Impact of Word Search Puzzle Games on Student Mastery

Aly Imron¹, Deffri Anggara², Febrika Dwi Lestari³, Rina Oktavia Simarmata⁴, Pandu Adi Cakranegara⁵

¹ Politeknik Negeri Malang, Indonesia; mrallyimron1234@gmail.com

² Universitas Dehasen Bengkulu, Indonesia; deffri.anggara@unived.ac.id

³ Universitas HKBP Nommensen Medan, Indonesia; febrikadwilestari@uhn.ac.id

⁴ Universitas HKBP Nommensen Medan, Indonesia; rinasimarmata@uhn.ac.id

⁵ Universitas Presiden, Indonesia; pandu.cakranegara@president.ac.id

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ABSTRACT

This study aims to determine the effectiveness of the Word Search Puzzle game on students' mastery of concepts in adolescent physical development material. This type of research is classroom action research which is carried out in 2 cycles. The subjects of this research were 7th-grade students at Junior High School. Each cycle consists of 4 stages: planning, implementation, observation, and reflection. Data collection uses interview techniques, observation sheets, and test instruments. Data was analyzed descriptively and qualitatively. The results of the research show that the word search puzzle learning media is effective in improving students' concept mastery abilities. As the data shows, the test results in cycle I were 71.47, and increased in cycle II by 80.29%. Furthermore, the concept mastery indicators also increased from initial observations, cycle I and cycle II. Thus, there is an increase in students' mastery of concepts from cycle I to cycle II.

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Corresponding Author:

Aly Imron

Politeknik Negeri Malang, Indonesia; mrallyimron1234@gmail.com

1. INTRODUCTION

The learning process involves interactive activities and reciprocal communication between teachers and students in educational settings, with the aim of achieving learning objectives (David, 2014). The instructional value influences the interactions between educators and students. The learning process is considered to be an educational endeavour as it involves purposeful behaviours aimed at reaching predetermined objectives prior to instruction (Fitrianti, 2018; Pea, 2018). During this process, there are interdependent interactions that are integral to one another and contribute to the optimal achievement of student learning outcomes (Nugraha, 2018). The teacher's involvement is crucial in overseeing the process of learning in this encounter.

The teacher plays a crucial role in attaining high-quality and successful education. Teachers have a crucial part in the growth and advancement of their pupils. Hence, they are expected to fulfil their

responsibilities to the best of their abilities (Hidayah, 2014). As per Brow, instructors are responsible for acquiring expertise in their subject matter, creating instructional materials, strategizing, organising daily lessons, and effectively communicating educational information. To ensure the successful and efficient execution of the teaching and learning process, the teacher's role must be supported by educational media. This is mostly attributed to the growing variety and abundance of educational resources that will be provided, taking into account the accelerated progress of science and technology (Makhfudin, 2008). In addition, the implementation of an inappropriate learning system makes the material difficult to understand and cannot be remembered for a long time, so it is necessary to use methods or media that facilitate understanding and support student memory to facilitate the process of storing learning information into long-term memory (Anshorulloh, 2008). The teacher's presence is important in facilitating students so that students can understand the learning material by utilizing various resources.

The teacher's complaint is that there is always a lack of time to achieve learning objectives. In class, the teacher explains more about the learning material. However, this does not need to be done if the teacher uses learning media optimally. With media, learning goals will be more easily achieved optimally with minimal time and effort. With the media, the teacher does not have to explain the subject matter repeatedly, because only once using the media, students will more easily understand the learning and learning material (Wahid, 2018). Apart from that, media will also create two-way interaction so that the learning atmosphere becomes active.

Based on the results of the preliminary study, it was found that the level of student mastery of concepts in adolescent physical development material was still low, as evidenced by student learning outcomes that did not reach the minimum completeness criteria (KKM) set at 75. Furthermore, indicators of concept mastery by students, such as remembering, understanding, and analyzing, were also found. still below the average of 45%. Furthermore, the use of conventional learning methods and media by teachers has also decreased, contributing to students' low mastery of concepts. This condition needs to be a concern for teachers to find a solution so that students' mastery of concepts is in the medium or high category. One effort that teachers can make is the use of word search puzzle games.

Word search puzzles are one kind of educational media that might help pupils retain more information. Word Search Puzzle is an array-based puzzle game that seeks for concealed words, as stated by Sholeh (2018). Meanwhile, Word Search Puzzle is a word search game, a sort of puzzle wherein players mark square or rectangular letters that can be discovered horizontally, vertically, or diagonally. The letters are then delivered at random. (Wahyuni, 2018). Students can learn more about health, sports, and physical education with the help of this medium, and they can also be more active as a result.

Several research investigations have been conducted on the topic of word search puzzles and their effects on memory improvement, vocabulary enhancement, learning achievement, speed reading, and the development of Android-based learning media. These studies include Nurhalifah (2020), Hidayah (2014), Ratnaningsih (2010), Rahmah (2016), Chesy et al. (2018), Sholeh et al. (2018), and Pamungkas (2021). Unlike other studies, this research specifically examines the impact of the Word Search Puzzle game on students' understanding of concepts related to teenage physical development. Conducting this research is crucial for teachers to consider incorporating it into their instructional practices.

2. METHODS

This study employs a method of classroom action research. The study was conducted in a Junior High School classroom, specifically in class 7, with a total of 34 pupils, comprising 14 males and 20 females. The classroom action research was conducted in two cycles, with the possibility of incorporating more cycles if necessary. This classroom action research employs the Kurt Lewin paradigm, comprising four distinct components: (1) Planning, (2) Action, (3) Observation, and (4) Reflection.

This action research was carried out in 2 (two) cycles, namely cycle I and cycle II, with the first research stage being action planning. At this planning stage, it begins with planning the actions to be carried out. The planning starts from identifying the problem, then conducting consultations to find solutions through classroom action research. After finding the problem, then determine the method or strategy that suits the conditions occurring in the field. The next step is to prepare learning tools in the form of a syllabus and learning implementation plan (RPP) using the Word Search Puzzle learning media related to the material, create assessment indicators and validation of tools, instruments and learning media.

Second, implementation of action. At this stage, the planned actions are carried out and the researcher acts as a teacher and observer. Implementation of the learning plan is carried out in accordance with the stages designed in the RPP. Third, observation. This observation action is carried out simultaneously with the implementation of the action. The observation stage involves observing and recording the learning process from the beginning to the end of the lesson according to the design that has been made. The targets that need to be observed in this action are events that are indicators of success or failure as stated in the plan above. And fourth, reflection or evaluation. At this stage, evaluate what has been done. Observation results are analyzed and used to evaluate procedures, processes and results of actions. Reflection is to find out whether what happened was according to the plan, whether there were no deviations or errors in implementing the action, whether the process was as envisioned in the action plan, and whether the results were satisfactory as expected. If it turns out to be unsatisfactory, then there needs to be a redesign to improve, modify and if necessary, a new design will be drawn up if it is not at all satisfactory. Based on the revised design, the next cycle is carried out.

The data collection techniques used in classroom action research are 1) interviews, interviews are conducted with the aim of finding out the teacher's problems or difficulties in teaching and knowing the students' mastery of concepts; 2) test instrument, the test is carried out to determine the implications of the actions that have been taken on students' conceptual knowledge in adolescent physical development material. The student knowledge test was carried out twice, namely: the initial ability test (Pre-test), and the final post-cycle test (Post-test), and the test to determine the increase in student memory was carried out 2 (two) times, namely the test in the cycle I and tests in cycle II; and 3) observation sheet, the observation sheet is used as an observation sheet which is used to measure students' conceptual knowledge on adolescent physical development material during the learning process. This observation sheet is also used as reflection material for the next cycle. Data analysis techniques, the data obtained by researchers in this action research, will be presented descriptively qualitatively and quantitatively. Data was analyzed descriptively and qualitatively.

3. FINDINGS AND DISCUSSION

3.1. Preliminary Data on Student Concept Mastery

After observing the initial conditions before conducting classroom action research. Preliminary observations were used to determine the state of mastery of the concepts of 7th grade junior high school students. Based on the results of observations, students are less able to remember the subject matter during the learning process. The results of the initial observations can be seen in Figure 1.

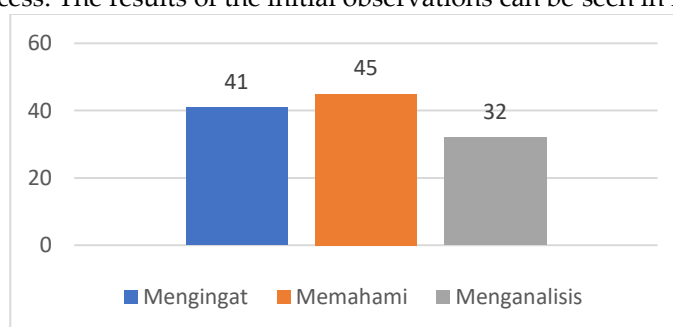


Figure 1. Initial Observation Graph

Based on Figure 1, it is known that the ability to remember is 41%, the ability to understand is 45%, and the ability to analyze is 32%. Thus the percentage of concept mastery is 39.33% on average. Apart from that, the learning process is less than optimal due to the use of conventional learning methods and media, so that students are less motivated to participate in learning.

Conventional learning media is a learning method that focuses on the use of conventional media such as textbooks, blackboards and other conventional teaching aids. Conventional learning can be defined as attitudes and thoughts and acting according to the norms and habits of the heredity learning model. Therefore, conventional learning can also be called the traditional learning concept (Fahrudin et al., 2021; Ramadhani et al., 2023). This method usually involves direct instruction from the teacher and passive acceptance from the student. Conventional learning media tends to be less interactive and flexible in presenting information to students.

On the other hand, conventional learning media still has the most important place in the world of education. This approach emphasizes direct interaction between teachers and students, allowing students to obtain in-depth explanations, ask questions directly to the teacher, and discuss with fellow students. Conventional learning media can also be more easily accessed because it does not require special technology or internet access. With these advantages and disadvantages, it is hoped that interactive and conventional learning media can influence student motivation and learning outcomes, especially in terms of learning (Wulandari et al., 2020).

3.2. Student Pretest and Posttest Score Data

Before applying the word search puzzle media, the researcher conducted a pre-test. The results can be seen in table 1.

Table 1. Pre-test scores

Number of Student	Total Grade Point	Average
34	1800	52,94%

Based on Table 1 it is known that the pre-test scores of students have not reached the predetermined KKTP which is equal to 75%. This is because students have not received the material well, so mastery of the concept is still low to understand the material given by the previous teacher. The data shows an average of 52.94%, this means mastery of the concept is included in the low criteria.

Furthermore, the researcher uses the media word search puzzle at the end of the learning activity. To see the effectiveness of the media, a post-test was carried out as shown in table 2.

Table 2. Post-test scores

Number of Students	Total Grade Point	Average
34	2570	75,58%

Table 2 demonstrates the effectiveness of utilising word search puzzle media in enhancing students' comprehension of concepts. This is evident from the significant increase in the average score of the Post-Test results, which reached 75.58%. This achievement falls inside the high criteria category.

3.3. Analysis of N-Gain Results

The results of the N-Gain analysis show that out of 34 students, there were 15 students who got an N-Gain score > 0.7 with high Gain index criteria, and there were 19 students got an N-Gain score > 0.3 with medium N-gain index criteria. The results of this analysis show that the effectiveness of the word search puzzle media used has medium criteria.

The effectiveness of word search puzzle media is in line with previous research findings, including that it can improve memory (Pamungkas & Ghofur, 2021), learning outcomes (Mujaiyanah, 2020), participation and collaboration (Putri, 2023), and motivation to learn (Yani, 2022). Word Search Puzzle

is a word search game in two categories. Next, this game is a word search game, a type of puzzle that is arranged by finding answers horizontally, vertically and diagonally (Wahyuni, 2018).

3.4. Cycle I Test Results Data

In cycle I, the researcher applied word search puzzle learning media to improve students' mastery of concepts. The data on test results in cycle I regarding students' mastery of concepts in class VII can be seen in Table 3:

Table 3. Cycle I values

Number of Students	Total Grade Point	Average
34	2430	71,47%

Based on Table 5. above, it can be seen that of the 34 students, 6 students had test scores > 80 with the criteria for very good memory, 15 students had scores > 50 with the criteria for good memory and 13 students had test scores < 50 with poor memory criteria. The percentage of success in the learning process in cycle I, namely 71.47%, still did not meet the success indicators as expected by the researchers.

Based on the data in Figure 3, it can be seen that students' enthusiasm for remembering the material is quite good with a percentage of 65%. Students' ability to understand the material provided by the teacher is also quite good, namely 63%, their ability to analyze has also increased to 60% and the average observation results for assessing mastery of cycle concepts has reached 62%. These results show that there has been an increase in students' mastery of concepts, although their achievement still does not meet the indicators of success in the learning process, namely 75%. Therefore, the researcher continued the research in cycle II to determine the effectiveness of the learning process using word search puzzle media in improving students' mastery of concepts, especially in adolescent physical development material.

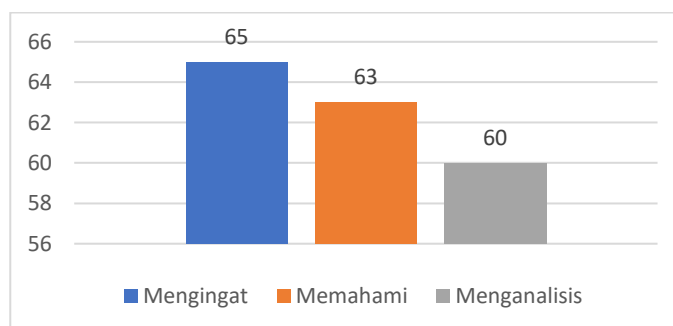


Figure 2. Cycle 1 Observation Graph

3.5. Cycle II Test Results

In cycle II, researchers applied word search puzzle learning media to improve students' mastery of concepts. In this cycle, researchers put more emphasis on making students more serious about learning, using varied methods, and applying rewards and punishments. The test result data in cycle I regarding students' mastery of concepts in class VII can be seen in table 4:

Table 4. Cycle II values

Number of Students	Total Grade Point	Average
34	2730	80,29%

Based on Table 4. it can be seen that student test scores have increased compared to cycle I with a success percentage of 80.29%. Even though there are still some students who score < 80, this achievement already meets the indicators of the success of the learning process with very high criteria. Therefore, the researcher did not continue the research in the next cycle because the indicators of the

success of the learning process had been achieved. In addition to the data from the test results above, the improvement in students' memory can also be seen based on the results of observational assessments of students' mastery of concepts. The data from the observation results of the second cycle assessment regarding mastery of the concept can be seen in Figure 3.

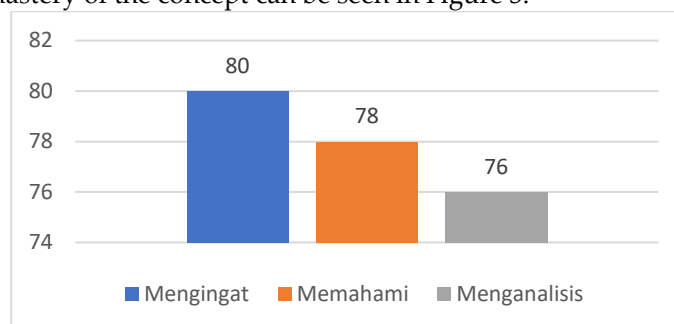


Figure 3. Cycle II Observation Graph

According to Figure 3, it is evident that students who excel in learning the subject matter, with an 80% success rate, also possess a strong ability to comprehend the material provided by the teacher, with a success rate of 78%. In addition, the proficiency to analyse the provided content also improves with a success rate of 76%. The assessment results demonstrate the efficacy of utilising word search puzzle media for enhancing students' comprehension of topics, as evidenced by the attainment of learning process success indicators. These results demonstrate the effectiveness of using word search puzzle media in the learning process to enhance students' understanding of concepts, particularly in the area of adolescent physical development. This effectiveness is evident in both the students' learning outcomes and their active engagement in the learning process. Hence, the utilisation of word search puzzles as an educational tool is suitable for classroom instructional purposes.

The results of this research use previous research, including Nurhalifah (2020), Hidayah (2014) about word search puzzles in improving memory; Ratnaningsih (2010), Rahmah (2016) about word search puzzles in increasing vocabulary; Chesy et al. (2018) about Word Search Puzzle in improving learning achievement; Sholeh et al. (2018) about Speed Reading Competition Using the Word Search Puzzle Game; and Pamungkas (2021) about the development of Android-based word search puzzle learning media.

Games are no longer foreign to everyday life because games are a cheap means of entertainment to relax or do a fun activity (Fahmi, 2016). Educational games are a type of multimedia game that contains a summary of learning materials used to educate and guide students in a fun learning process (Winarni et al., 2019). The visual display, audio and interaction in the game have been proven to make learning easier and provide motivation for students (Fahmi, 2016). One game that strengthens the level of mastery of concepts to a mature level and invites the class to create answers to puzzle clues is word search puzzle (Usman et al., 2021).

A word search puzzle is also called a word search game. Word search puzzle is a game of searching for words in a collection of letters arranged randomly in a box, which is usually square, hidden words can be found horizontally, vertically and diagonally (Garwan & Jusnita, 2020). The advantage of word search puzzles is that they can help students understand concepts and improve students' memory (Usman et al., 2021).

4. CONCLUSION

This research concludes that the word search puzzle learning media is effective in improving students' ability to master concepts based on the results of cycles I and II with indicators of remembering, understanding and analyzing. The limitation of this research is that the word search puzzle is still only a game that is separate from the subject matter. Therefore, this research suggests

further research to examine the development of Android-based word search puzzle media, teaching modules, student worksheets (LKPD), and others.

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