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The Effect of Learning Media Use on Conceptual Understanding Ability in Students with Low Mathematical Ability

Pengaruh Penggunaan Media Pembelajaran Terhadap Kemampuan Pemahaman Konsep pada Siswa Berkemampuan Matematika Rendah

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Abstract

Conceptual understanding is a fundamental skill essential for students in learning mathematics. This study aims to analyze the effect of instructional media on the conceptual understanding of students with low mathematical ability. The subject matter focused on linear equations and inequalities in one variable, utilizing instructional media such as comic-based worksheets, snakes and ladders games, buffalo paper, domino cards, and word puzzles. The population consisted of 233 seventh-grade students at a public junior high school in Bandar Lampung during the first semester of the 2024/2025 academic year, with a sample of 29 students selected through purposive sampling. The research employed a quasi-experimental method with a one-group pretest-posttest design, using the Mid-Semester Examination scores as the pretest. The Wilcoxon test results indicated sig. (2-tailed) = 0.00 < 0.05, showing the use of instructional media has a positive effect on the conceptual understanding of students with low mathematical ability.

***Keywords**: Conceptual Understanding; Instructional Media; Low Mathematical Ability.*

Abstrak

Pemahaman konsep merupakan keterampilan dasar yang penting bagi siswa dalam mempelajari matematika. Penelitian ini bertujuan menganalisis pengaruh penggunaan media pembelajaran terhadap pemahaman konsep siswa dengan kemampuan matematika rendah. Materi yang dikaji adalah persamaan dan pertidaksamaan linear satu variabel, dengan media berupa LKPD komik matematika, permainan ular tangga, kertas buffalo, kartu domino, dan puzzle kata. Populasi penelitian terdiri atas 233 siswa kelas VII di salah satu SMP Negeri Bandar Lampung pada semester gasal 2024/2025, dengan sampel 29 siswa yang dipilih melalui purposive sampling. Penelitian menggunakan metode quasi eksperimen dengan desain one group pretest-posttest, dengan nilai pretest diambil dari Ujian Tengah Semester. Hasil uji Wilcoxon menunjukkan sig.(2-tailed) = 0,00 < 0,05, yang berarti penggunaan media pembelajaran berpengaruh positif terhadap pemahaman konsep siswa berkemampuan matematika rendah.

***Kata Kunci**: Kemampuan Matematika Rendah; Media Pembelajaran; Pemahaman Konsep.*

Introduction

Education has a strategic role in shaping competent individuals and productive societies[1]. Through education, a person acquires the knowledge, skills, and attitudes necessary to face life's challenges[2]. Quality education is also the key in overcoming social problems such as poverty and inequality, so improving the quality is very important[3]. One of the efforts to improve the quality of education is to improve the learning process that takes place in the classroom[4].

An effective and innovative learning process is largely determined by the role of teachers[5]. Teachers are required to be able to create a fun, active, and creative learning atmosphere so that learning can be meaningful[6]. This is especially important in learning mathematics, which has often been considered difficult and boring for most students. Mathematics holds a central role in various disciplines, ranging from technological advancement and scientific development to economic growth[7]. The Ministry of Education, Culture, Research, and Technology has emphasized that the most essential mathematical ability students must master is the ability to understand concepts[8]. Conceptual understanding is crucial for students to recognize the interconnections between ideas, derive meaning from every process, and apply it to solve real-world problems that arise across different fields of life[9]. Without mastery of concepts, mathematics will only be viewed as rigid

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[1] Endang Sih Pujiharti, "Peran Sumber Daya Pendidik Dalam Perspektif Ekonomi Pendidikan," *An-Nahdliyah: Jurnal Manajemen Pendidikan Islam* 1, no. 2 (2022): 35–50, https://ejournal.stainumalang.ac.id/index.php/annahdliyah/article/view/62.

[2] Normina Normina, "Partisipasi Masyarakat Dalam Pendidikan," *ITTIHAD* 14, no. 26 (December 29, 2016), https://doi.org/10.18592/ittihad.v14i26.874.

[3] Eny Kusumawati, "Sosialisasi Kurikulum Merdeka Belajar Untuk Mewujudkan Profil Pelajar Pancasila Di Jenjang Sekolah Dasar Di SD Al-Islam 2 Jamsaren Surakarta," *BERNAS: Jurnal Pengabdian Kepada Masyarakat* 3, no. 4 (October 13, 2022): 886–93, https://doi.org/10.31949/jb.v3i4.3483.

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[5] Minsih Minsih and Aninda Galih D, "Peran Guru Dalam Pengelolaan Kelas," *Profesi Pendidikan Dasar* 1, no. 1 (July 31, 2018): 20, https://doi.org/10.23917/ppd.v1i1.6144.

[6] A Aziz, "Hubungan Antara Kompetensi Guru Dan Kepercayaan Diri Dengan Kemandirian Siswa SMP N 2 Pangkalan Susu," *Jurnal Psychomutiara* 1, no. 1 (2018): 15–29, http://e-journal.sari-mutiara.ac.id/index.php/Psikologi/article/view/130.

[7] Diana Zuschaiya et al., "Pengaruh Kesiapan Belajar Dan Kemampuan Berhitung Terhadap Hasil Belajar Matematika," *JPMI (Jurnal Pembelajaran Matematika Inovatif)* 4, no. 3 (2021): 517–28, https://doi.org/10.22460/jpmi.v4i3.517-528.

[8] Kebudayaan, Riset, dan Teknologi Republik Indonesia Kementerian Pendidikan, "Capaian Pembelajaran Mata Pelajaran Matematika Pada Fase A - Fase E Untuk Jenjang SD, SMP, Dan SMA Pada Kurikulum Merdeka" (Jakarta, 2022), https://kurikulum.kemdikbud.go.id/.

[9] Efrata Gee and Darmawan Harefa, "Analisis Kemampuan Koneksi Dan Pemahaman Konsep Matematis Siswa," *Musamus Journal of Primary Education* 4, no. 1 (October 28, 2021): 1–11, https://doi.org/10.35724/musjpe.v4i1.3475.

numbers and formulas. Therefore, the mathematics learning process needs to be carefully designed so that students can gain a deep understanding of mathematical concepts[10].

According to Murnaka and Dewi, the ability to understand concepts is a basic skill that allows students to understand the important meanings of the material being studied, including symbols, numbers, and causal relationships that underlie a concept[11]. Thahir and Amir define conceptual understanding as the ability to comprehend information and transform it into a more meaningful form[12]. Furthermore, Sari and Yuniati argue that conceptual understanding is an individual's competence in thinking, behaving, and acting, which is reflected in the understanding of definitions, characteristics, the essence and core of the material, as well as the ability to select and use procedures accurately and efficiently[13]. Basic concepts that are taught and deeply understood can provide a strong foundation for logical thinking, developing problem-solving strategies, and expanding knowledge of more complex mathematical topics[14]. The highest achievement of conceptual understanding is evident when students are able to restate a concept more flexibly, whether through their own words or other relevant representations[15]. Thus, the development of strong conceptual understanding enables students to master and further develop mathematical concepts accurately.

The ideal condition in which students are expected to have a good understanding of mathematical concepts does not align with the reality in the field. The 2022 Programme for International Student Assessment (PISA) survey reported that Indonesia's mathematics score was only 366, far below

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[10] Yusuf Safari and Pina Nurhida, "Pentingnya Pemahaman Konsep Dasar Matematika Dalam Pembelajaran Matematika," *Karimah Tauhid* 3, no. 9 (September 9, 2024): 9817–24, https://doi.org/10.30997/karimahtauhid.v3i9.14625.

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[14] Renita Dwijayanti et al., "Analisis Kesulitan Mahasiswa Rumpun Matematika UNNES Dalam Pembuktian Matematis Pada Mata Kuliah Kalkulus Diferensial," *Jurnal Angka* 1, no. 1 (2024): 1–16, http://jurnalilmiah.org/journal/index.php/angka.

[15] Nego Linuhung and Satrio Wicaksono Sudarman, "Pengaruh Pembelajaran Kooperatif Tipe Group Investigation (GI) Terhadap Kemampuan Penalaran Matematis Siswa MTs," *AKSIOMA: Jurnal Program Studi Pendidikan Matematika* 5, no. 1 (June 30, 2016): 52–60, https://doi.org/10.24127/ajpm.v5i1.465.

the average of Organisation for Economic Co-operation and Development (OECD) countries, which was 472[16]. Even more concerning, around 82% of Indonesian students did not reach Level 2, the minimum level that indicates the ability to recognize, understand, and use basic mathematical concepts in simple situations. Furthermore, almost no students were able to reach the advanced level. This fact is reinforced by the results of a preliminary study at a state junior high school in Bandar Lampung City, which also showed that students' conceptual understanding ability was relatively low, with only 31.5% of students able to solve non-routine problems on a given topic. According to one of the mathematics teachers at the school, this occurred because students tend to be reluctant to read and unwilling to make an effort to understand the problems. They often prefer solving routine exercises or following examples directly demonstrated by the teacher. This condition leads to weak conceptual understanding in mathematics and low willingness to solve applied problems that require deeper comprehension[17].

The problem of low conceptual comprehension skills shows the need for solutions that can bridge the gap between material delivery and student understanding. Some of the efforts that can be made include improving the quality of learning interaction between teachers and students, the application of contextual and meaningful learning approaches, the use of formative assessments to map student understanding periodically, and the application of learning strategies that are able to connect concepts with students' real experiences[18, 19]. One of the strategies that is considered effective to realize this is the use of learning media[20].

The use of learning media makes it easier for educators to deliver material to students[21]. In addition, it can help increase students' learning

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[16] OECD, *PISA 2022 Results (Volume I): The State of Learning and Equity in Education*, vol. 1 (Paris: OECD Publishing, 2023), https://doi.org/10.1787/53f23881-en.

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[21] Annisa Mardatillah et al., "Pengaruh Penggunaan Media Pembelajaran Terhadap Hasil Belajar Peserta Didik," *Jurnal Ilmiah Wahana Pendidikan* 9, no. 22 (2023): 98–105, http://jurnal.peneliti.net/index.php/JIWP/article/view/5447.

motivation for more interactive and more active learning in the classroom so that there is feedback to the educator and the student[22]. The learning media used in this study included comic-style math worksheets, snakes and ladders games, colorful buffalo paper teaching aids, domino cards, and math word puzzles. This diversity of media is expected to be able to bridge abstract concepts, such as in the material of one-variable linear equations and inequalities, to be more concrete and easy to understand by students, especially those with low mathematical skills.

Several studies have demonstrated that the use of learning media can positively impact the improvement of students' conceptual understanding. Faoziah and Azka found that comic-based media could increase students' motivation and interest in learning[23]. Meanwhile, Setianingsih showed that game media such as snakes and ladders and dominoes are able to increase student involvement as well as their ability to express and apply concepts[24]. These findings indicate that learning media can create a more enjoyable and meaningful learning environment. Nevertheless, most previous studies tended to focus only on the use of a single medium to improve students' conceptual understanding. This can be seen in Amir's research, which applied picture media to understand the concept of circles; Anita's study, which implemented Uno cards to enhance understanding of fractions; and Pangaribuan's research, which utilized crossword puzzles to foster algebraic concept comprehension[25, 26, 27]. These results are not considered a weakness, as the application of a single medium has proven effective. However, involving multiple media allows

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[22] Edi Kusnadi and Syifa Aulia Azzahra, "Penggunaan Media Pembelajaran Interaktif Berbasis Wordwall Dalam Meningkatkan Motivasi Belajar Peserta Didik Pada Mata Pelajaran PPKn Di MA Al Ikhlash Padakembang Tasikmalaya," *Jurnal Dimensi Pendidikan Dan Pembelajaran* 12, no. 2 (July 30, 2024): 323–39, https://doi.org/10.24269/dpp.v12i2.9526.

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[27] N. S. Pangaribuan, Y. M. Marbun, and Y. O. Purba, "Pengaruh Media Pembelajaran Matematika Teka-Teki Silang Terhadap Pemahaman Konsep Peserta Didik Pada Materi Aljabar Kelas VII SMP Negeri 8 Pematang Siantar," *INNOVATIVE: Journal Of Social Science Research* 4, no. 1 (January 6, 2024): 767–80, https://j-innovative.org/index.php/Innovative/article/view/7948.

students' conceptual understanding to develop more optimally and enables them to grasp the material from various approaches and perspectives.

In light of these facts, this study seeks to implement a variety of learning media specifically aimed at improving the conceptual understanding of students with low mathematical ability. The media involved in this study must be preceded by a preliminary study to ensure their alignment with students' characteristics, as well as with the material on linear equations and inequalities in one variable, which is often considered difficult because it involves variables, coefficients, and constants[28]. Thus, the learning process designed in this study is expected to be more adaptive to students' needs and to help them overcome difficulties in comprehending the material more deeply.

Based on this background, this study was conducted to find out whether the application of learning media has a significant influence on the ability to understand mathematical concepts, especially in students with low mathematical ability in grade VII of one of the State Junior High Schools in Bandar Lampung City. The implementation of learning involving media in this study is expected to make the learning process more in-depth and contextual, as well as serve as an alternative solution to significantly improve students' concept understanding ability.

Method

This study consisted of several research stages as follows:

1. Planning Stage
   a. Identifying the research population by conducting direct observations at the research site.
   b. Conducting interviews with mathematics subject teachers regarding the applied learning process and the students involved in the study.
   c. Developing learning tools along with test instruments to measure students' conceptual understanding ability.
   d. Conducting a feasibility test of the research instruments.
   e. Revising the instruments if necessary.
2. Implementation Stage
   a. Carrying out the learning process using various learning media.
   b. Administering a conceptual understanding test after the implementation of learning with media on the material taught.
   c. Collecting final data on students' conceptual understanding ability.

[28] Dani Hidayat, Uba Umbara, and Evan Farhan Wahyu Puadi, "Pengembangan Desain Didaktis Persamaan Linear Satu Variabel (PLSV) Pada Pembelajaran Matematika MTsN Model Cigugur," *JUMLAHKU: Jurnal Matematika Ilmiah STKIP Muhammadiyah Kuningan* 2, no. 2 (2016): 160–69, https://jurnal.umkuningan.ac.id/index.php/jumlahku/article/view/335.

3. Final Stage
   a. Processing and analyzing the collected data to evaluate the improvement of students' conceptual understanding ability.
   b. Compiling the research report and drawing conclusions based on the results of the data analysis.

This study employed a quantitative approach with a quasi-experimental method, in which the researcher could not control all external variables that might have influenced the implementation of the experiment. The focus of the study was the topic of Linear Equations and Inequalities in One Variable, which, according to the curriculum, is taught at the seventh-grade level of junior high school. Therefore, the research was conducted at one of the State Junior High Schools in Bandar Lampung during the odd semester of the 2024/2025 academic year. Based on preliminary observations at the school, the study population consisted of all seventh-grade students, distributed into eight classes with a total of 233 students. The sample was selected through purposive sampling, as teachers who were willing to collaborate in this study only taught in classes VII-1 and VII-2. Each class consisted of 29 students. A review of students' academic records indicated that learning outcomes in class VII-1 tended to be lower than those in class VII-2. Therefore, class VII-1, consisting of 29 students, was chosen as the research subject because it represented the characteristics of students with low mathematical ability in line with the focus of the study.

The research design used was a one-group pretest–posttest design, which involves only one sample. The pretest was obtained from the Mid-Semester Examination scores, which reflected students' conceptual understanding prior to the use of learning media. Meanwhile, the posttest was obtained from a conceptual understanding test administered after the implementation of learning media, in which all test items were developed by the researcher. This design was adapted from Fraenkel, which is presented in Table 1[29].

Table 1. Research Design

O_1	X	O_2

Source: Fraenkel (2012)

Information from table 1:
X : treatment using learning media
O_1 : test of concept comprehension ability before the application of learning media
O_2 : test of concept comprehension ability after the application of learning media

[29] Jack Fraenkel, Norman Wallen, and Helen Hyun, *How to Design and Evaluate Research in Education*, ed. Sarah Kiefer, Eight (McGraw-Hill Education, 2012).

The study applied the indicators of conceptual understanding, namely: (1) the ability to restate a concept; (2) the ability to classify objects based on their concepts; (3) the ability to present concepts in various forms of mathematical representation; (4) the ability to select and use specific procedures or operations; and (5) the ability to apply concepts in problem solving. These indicators are considered relevant to the characteristics of the material and were therefore used as the basis for developing the research instrument in the form of a conceptual understanding test.

The instrument consisted of seven items in the form of essay questions, complex multiple-choice items, and matching questions. Each item was designed to measure specific indicators; thus, not all indicators were covered in every question, as the items were adjusted to the learning objectives and the limited time available. The test instrument was validated by three experts through content, construct, and language review, and was declared suitable for use. In addition, the reliability test produced a Cronbach's Alpha value of 0.95, indicating that the instrument was highly reliable for use in the study. Data collection was carried out by administering the conceptual understanding test directly to students after the implementation of learning media, while the initial data on students' conceptual understanding (prior to the use of media) were obtained from documentation of their Mid-Semester Examination scores.

The research procedure began with learning activities that applied instructional media. The learning process was conducted over seven meetings in accordance with the allocated time. Each meeting concluded with either a conceptual understanding test or concept-deepening exercises. The tests were administered in the 1st, 2nd, 5th, and 7th meetings, each consisting of one to two questions tailored to the material taught. The remaining meetings focused on concept-deepening exercises conducted in groups or individually, providing students with opportunities to strengthen their understanding through exploration and discussion. In addition, at the end of the learning process, students were asked to complete a reflection sheet as an evaluation of the learning activities.

The data collected from the Midterm Examination scores and posttest results were analyzed through several stages. First, descriptive statistical analysis was conducted to illustrate the distribution of student scores and the condition of students' conceptual understanding before and after the implementation of learning media. Second, a normality test was performed to determine whether the data came from a normally distributed population. Third, if the data were normally distributed, the analysis continued with a homogeneity test and parametric hypothesis testing, whereas if the data were not normally distributed, hypothesis testing was carried out using a nonparametric test to examine the differences in students' conceptual

understanding before and after the use of learning media. Fourth, the results of the analysis served as the basis for drawing conclusions to answer the research objectives.

Results and Discussion

The results of data on students' concept comprehension ability obtained from the Mid-Semester Exam scores as the initial concept comprehension test without learning media and from the posttest scores as the final concept comprehension test with learning media are presented in Table 2.

Table 2. Data on Students' Concept Comprehension Ability

Phase	Number of Students	Min. Score	Max. Score	Std. Deviation	Average
Mid-Semester Exam scores after learning without media	29	10	75	21	30
Posttest scores after learning with the media		8	100	26	67

Source: Researcher Data

Based on Table 2., there is a difference in students' concept understanding abilities after participating in learning using media. In addition, the standard deviation also shows that the spread of students' grades after treatment becomes more diverse. These variations can reflect differences in how students respond to learning using media.

Furthermore, a hypothesis test was carried out to find out whether there was a significant difference in students' concept comprehension ability obtained from the data results between Mid-Semester Exam scores after the implementation of learning without media and posttest scores after the implementation of learning using media. Before that, a normality test was carried out to evaluate whether the sample data came from a normally distributed population or not. The results of the normality test analysis conducted using IBM SPSS Statistics are presented in Table 3.

Table 3. Recapitulation of Normality Test Results

Parameter	Mid-Semester Exam score Data	Posttest Score Data
Sig. Shapiro Wilk	0,001	0,024

Source: Researcher Data

Based on Table 3., a value of sig. $\leq$ 0,05 is obtained, so it is rejected. This suggests that the overall data comes from a population that is not normally distributed. Thus, statistical analysis is further used by nonparametric tests.

The Wilcoxon test is a nonparametric statistical test used as an alternative to analyze data from a single sample in pairs that do not come from a normally distributed population. Therefore, the Wilcoxon test in this case is

used to analyze differences in students' concept comprehension abilities before and after the application of learning media. The Wilcoxon test was performed using IBM SPSS Statistics with the results presented in Table 4.

Table 4. Results of Hypothesis Test of Students' Concept Comprehension Ability

Value of $sig.\ (2-tailed)$	Value Limit $sig.\ (2-tailed)$	Results
0,000	0,05	H_0 rejected

Source: Researcher Data

Based on Table 4., a value of sig. $(2-\text{tailed}) < 0{,}05$ is obtained, so, H_0 rejected. These results show that there is a difference in students' concept understanding abilities obtained from the data results between Mid-Semester Exam scores after the implementation of learning without media and posttest scores after the implementation of learning using media.

The posttest score of students' concept comprehension ability was analyzed to find out the extent of students' progress in achieving concept comprehension indicators after participating in learning using media. The results of these achievements can be seen in Table 5.

Table 5. Results of Analysis of Posttest Indicators of Concept Comprehension Ability

No	Indicator	Posttest for the nth meeting (%)				Average (%)
		1	2	5	7	
1.	Being able to restate a concept	-	-	65	89	77
2.	Able to classify objects based on their concepts	7	38	65	90	66
3.	Able to present concepts in various forms of mathematical representation	-	38	64	89	69
4.	Able to select and use specific procedures or operations	-	56	49	89	66
5.	Able to apply concepts in solving a problem	24	59	47	89	63

Source: Researcher Data

Based on Table 5., the achievement of the indicator of students' concept comprehension ability shows a gradual increase in each meeting. Overall, the average achievement of each indicator was above 60%, which indicates that students have tried to show a good enough ability to understand concepts.

The improvement of conceptual understanding test results after the application of media made a positive contribution to students' ability to understand concepts. The initial condition of students who had low mathematical ability, as well as the results of academic achievements submitted by partner teachers and the results of preliminary studies, gradually developed. Students were encouraged to be more active and exploratory in understanding the material using media. This was evident from

the application of learning media during seven meetings on the material of one-variable linear equations and inequalities. In line with the findings of Shoimah, the use of instructional media has been proven to improve students' mathematical conceptual understanding, as it functions as a tool for concretizing abstract concepts[30].

The first learning meeting was carried out using mathematical comic media packaged in the form of worksheets to introduce the basic concept of one-variable linear equations and inequalities. This learning invited students in groups to observe illustrations and storylines in comics, identify mathematical elements that appeared, and solve problems in worksheets. After the learning process, students took a posttest, and it was found that the achievement of the indicator of students' conceptual understanding ability was still quite low, which was caused by students' adaptation to new material and unfamiliar learning approaches. However, the results of learning reflection showed that 71% of students felt that they were able to retell the content of the comic, complete the worksheet assignments on time, and actively participate in learning from start to finish. This indicated that the use of mathematical comic media had a positive impact on student engagement. In line with the findings of Faoziah and Azka, who discovered that the use of mathematics comics in learning can enhance students' motivation and interest, conceptual understanding, however, requires further practice.

Figure 1. Situation of Learning Media Use in the First Meeting

The second learning meeting was carried out using a mathematical snake and ladder game that was modified to direct students to understand the completion of a one-variable linear equation. Through the game, students were challenged to solve problems according to their pawn positions, both individually and in groups, so that there was collaborative discussion and problem solving. After the learning process, students took a posttest, and the

[30] Retno Nuzilatus Shoimah and Mustika Syafi'aturrosyidah, "Penggunaan Media Pembelajaran Konkrit Untuk Meningkatkan Aktifitas Belajar Dan Pemahaman Konsep Pecahan Mata Pelajaran Matematika Siswa Kelas III MI Ma'arif NU Sukodadi-Lamongan," *MIDA : Jurnal Pendidikan Dasar Islam* 4, no. 2 (July 5, 2021): 1–18, https://e-jurnal.unisda.ac.id/index.php/mida/article/view/4055.

achievement of indicators of their conceptual understanding ability increased compared to the first meeting. The reflection results also showed that 72% of students felt that they were able to repeat the snake and ladder game well, complete assignments on time, and actively participate in learning. This showed that there was an increase in student involvement in the learning process. This finding is supported by Nehe's research, which finds that the use of educational games in mathematics learning can strengthen conceptual understanding in a fun way[31].

Figure 2. Situation of Learning Media Use in the Second Meeting

The third and fourth learning meetings were carried out using props in the form of colorful pieces of buffalo paper that represented elements in equations and inequalities, such as variables, constants, and operation signs. In these meetings, students were invited to solve simple problems by arranging and grouping the cards based on the question instructions and finding solutions. No special posttest was administered in these two meetings, because the learning activities were more focused on exercises as a form of strengthening concepts. This decision was essential, because mathematics instruction with limited practice can cause students to struggle in connecting new concepts with their prior knowledge, resulting in a superficial understanding[32]. Based on the results of the reflection, an average of 76% of students stated that they were able to solve problems using teaching aids correctly and follow the learning from start to finish well. These results showed that student engagement in understanding the material was improving compared to previous meetings.

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[31] Foahonoa Zisokhi Nehe, "Penggunaan Permainan Edukasi Untuk Meningkatkan Minat Belajar Matematika Di SD Harapan Nias," *HAGA : Jurnal Pengabdian Kepada Masyarakat* 2, no. 2 (November 30, 2023): 128–39, https://jurnal.uniraya.ac.id/index.php/HAGA.

[32] Feny Apriani and Sudiansyah Sudiansyah, "Dampak Kurangnya Praktik Dalam Pelajaran Matematika: Pentingnya Latihan Terstruktur Bagi Pemahaman Konsep," *Al Khawarizmi: Jurnal Pendidikan Matematika* 4, no. 1 (July 17, 2024): 40–49, https://doi.org/10.46368/kjpm.v4i1.1856.

Figure 3. Situation of Learning Media Use in the Third Meeting

The fifth learning meeting was carried out using mathematical domino card media, which was specially designed for the material of solving one-variable linear inequalities. Each card contained a pair of questions and answers that included different forms of representation. Students worked in small groups to logically match the cards and construct a sequence of solutions based on their understanding of the concept. After the learning activity, students took a posttest and then filled out a reflection sheet. The results of the posttest showed that the achievement of indicators decreased slightly compared to the previous meeting. This decline was predicted, because students faced the challenge of understanding the resolution of inequalities, which was more complex than that of equations. The results of the students' reflections also showed an average achievement of 70%, slightly lower than the previous meeting, but still demonstrating that most students were able to maintain their active involvement throughout the learning process. These findings are in line with the results of Sudiatmika's research, which shows that a decrease in achievement on more complex material can be considered reasonable as long as student learning outcomes remain in the good category and learning completeness is achieved[33].

Figure 4. Situation of Learning Media Use in the Fifth Meeting

[33] I Ketut Sudiatmika, "Penerapan Model Pembelajaran Problem Based Learning (PBL) Untuk Meningkatkan Hasil Belajar Dan Motivasi Belajar Fisika Siswa Kelas X RPL 2 Semester Genap Di SMK Negeri 1 Negara," *Widyadari* 20, no. 2 (October 27, 2019), https://doi.org/10.5281/zenodo.3517892.

In the sixth and seventh meetings, students learned through the media of mathematical word puzzles, which were pieces of sentences that had to be arranged at the place of completion. This media facilitates students in building meaningful mathematical sentences and connecting the narrative of the problem with the form of equations or inequalities. The sixth meeting was more of an exercise and initial exploration of the structure of complex questions, so that the learning at the seventh meeting was focused on measuring all indicators of concept comprehension ability through posttests. The posttest results showed a fairly high percentage of indicator achievement, with reflection results showing that an average of 77% of students were able to solve problems using puzzles and follow learning well. Sabrina and Sya revealed that well-structured instructional planning can create meaningful learning experiences, thereby enabling students' learning potential to develop more optimally[34]. Thus, this data confirmed that learning efforts designed by involving learning media had succeeded in strengthening student understanding.

Figure 5. Situation of Learning Media Use in the Seventh Meeting

Based on the entire series of meetings that had been held, the implementation of learning by applying media was able to show a tendency to increase learning outcomes in grade VII-1 students. A more active and meaningful learning atmosphere was seen through student involvement in discussions, educational games, and the use of props. The students' enthusiasm also grew along with their involvement in these activities. In line with Sulatra's framework of thinking, participatory and contextual learning experiences allow students to build conceptual understanding through simultaneous emotional and cognitive engagement[35]. Thus, it can be

[34] Naya Sabrina and Mega Febriani Sya, "Konsep Perencanaan Pembelajaran Dan Model Pengembangan Perangkat Desain Pembelajaran," *Karimah Tauhid* 3, no. 4 (April 24, 2024): 5203–11, https://doi.org/https://doi.org/10.30997/karimahtauhid.v3i4.13092.

[35] I Gede Sulatra, "Menumbuhkembangkan Nilai Karakter Melalui Projek Penguatan Profil Pelajar Pancasila Dalam Kurikulum Merdeka Pada Pendidikan Agama Hindu Dan Budi Pekerti Di SMKN 1 Banjit," *Vijnana: Jurnal Hasil Penelitian Multidisiplin* 1, no. 1 (February 28, 2025): 90–107, https://e-journal.samsarainstitute.com/jhpm/article/view/91.

concluded that the use of learning media is able to have a significant influence on the ability to understand concepts in students with low mathematical ability in grade VII of one of the Bandar Lampung State Junior High Schools in the odd semester of the 2024/2025 academic year.

Conclusion

Based on the results of the research and discussion, it was found that students' conceptual understanding ability after learning with media was higher compared to their conceptual understanding ability after learning without media. The results of the Wilcoxon test analysis showed a sig. (2-tailed) value of $0.00 < 0.05$, which indicates a significant difference in students' conceptual understanding before and after the implementation of learning media. Thus, the use of learning media has a positive effect on improving the conceptual understanding ability of low-achieving mathematics students in Grade VII at one of the state junior high schools in Bandar Lampung during the first semester of the 2024/2025 academic year. For other researchers who want to develop further studies, it is recommended to introduce learning media from the beginning so that students have time to adapt to the media used during the research. Given the characteristics of students with low abilities, special attention is required for adaptation to new learning patterns.

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