How are students' higher order thinking skills (HOTS) in mathematical problem solving viewed from the ability to understand mathematical concepts

by Prosiding 13

Submission date: 30-Dec-2022 10:15AM (UTC+0700)
Submission ID: 1987390043
File name: iewed_from_the_ability_to_un-derstand_mathematical_con-cepts.pdf (334.5K)
Word count: 4269
Character count: 23164

How Are Students' Higher Order Thinking Skills (HOTS) in Mathematical Problem Solving Viewed From the Ability to Understand Mathematical Concepts?

Ika Putri Lenawati[1, b)], Wasilatul Murtafiah[2, a)], Sanusi[3, c)]

[1,2,3]*Mathematics Education Department, Faculty of Teacher Training and Education, Universitas PGRI Madiun, Jalan Setiabudi No. 85 Madiun Indonesia*

[a)] *Corresponding author:* wasila.mathedu@unipma.ac.id
[b)]ikalenawati075@gmail.com
[c)]sanusi.mathedu@unipma.ac.id

Abstract. The process of learning mathematics requires Higher Order Thinking Skills (HOTS) to solve various mathematical problems. The HOTS of each student is different, one of which is influenced by students' understanding of mathematical concepts. This study aims to determine the students' HOTS in solving mathematical problems on the flat shape material based on the ability to understand students' mathematical concepts. This type of research is qualitative research. Data collection techniques were carried out by test and interview methods. The subjects in this study were three fourth grade students at SD Islam Terpadu Adzkia Indonesia consisting of one student with high concept understanding ability, one student with moderate concept understanding ability, and one student with low concept understanding ability. The data validity technique uses a time triangulation technique. Technical data analysis uses data reduction, data presentation, and conclusions. The results of this study indicate that the HOTS of students with high conceptual understanding abilities have the ability of HOTS indicators in the aspects of (a) analyzing, (b) evaluating, (c) and creating. Students with moderate concept understanding ability have the ability of HOTS indicator in the aspects of (a) analyzing, and (b) evaluating. Students with low concept understanding ability do not have the ability of HOTS indicator.

INTRODUCTION

The rapid development of science and technology encourages humans to have the ability to think logically, critically, systematically, creatively, and reason well. One of the subjects that can equip students in developing these abilities is mathematics. The 2013 curriculum system in mathematics subjects is expected to not only equip students with the ability to use calculations or algorithms in working on problems or tests only, but also able to involve the ability to reason, think critically and logically in solving contextual problems it aims to improve students' math learning achievement [1][2]. Considering the importance of achievement in learning mathematics, but according to Ramlah et al., that at this time there are still many achievements in learning mathematics in schools ranging from elementary, high school and vocational school levels that are still low [3]. One of the contributing factors to students' low math learning achievement is due to high-level thinking skills or Higher Order Thinking Skill (HOTS) [4][5].

One indication of the success of human resources is in the field of education, where students have skills in thinking at a high level, because the main focus in learning in the 21st century is aimed at developing and improving higher-order thinking skills or HOTS students [6][7]. The development of HOTS in learning is one form of implementing the 2013 curriculum, so that learning activities and evaluations carried out are expected to be oriented to HOTS [8]. HOTS involves a variety of thinking activities consisting of analyzing, evaluating, and creating conditions or situations in the process of solving mathematical problems [9][10].

Kurniati et al., based on the results of the PISA survey in 2012 showed that Indonesia is slightly different from Peru which is located at the bottom ranking, so this shows the skills of students in analyzing, evaluating, creating, and logic and reasoning are very lacking or HOTS Indonesian students belong to the low category [11]. Usmaedi [12] also said that the current state of students' thinking skills, it was found that learning at the elementary school level showed

a lack of students' thinking skills or was in the Lower Order Thinking Skill (LOTS) area [13]. The low HOTS skills of students of course also affect the low learning achievement of mathematics.

Facts related to the low HOTS of students are also experienced by students in Adzkia Integrated Islamic Elementary School. Students are still less able to solve complex problems that require critical, creative, and logical thinking skills. Based on the results of observations with class IV math teachers, information was obtained that each student's HOTS in solving a problem has different abilities. The results of interviews conducted on some students also showed that students' HOTS were influenced by an understanding of concepts. Understanding concepts in the scope of mathematics is a process of observation of cognition in absorbing an understanding theory that will be understood, then show the ability in dealing with other situations [14]. Understanding a concept is an essential part of the teaching and learning process, and solving problems, both in the learning stage itself and in contextual problems or related to real activities, so that the skill of understanding a concept becomes the foundation for thinking in solving a problem [15][16].

To overcome the problems that occur, in this article the researcher intends to conduct an assessment related to the HOTS of students at the elementary school level in solving mathematical problems in terms of high, medium, and low concept understanding abilities. The HOTS indicator used refers to Anderson & Krathwohl [17][1]. It includes skills in analyzing, evaluating, and creating. This research is expected to be an insight or reference for teachers and educators to know the importance of HOTS students in solving mathematical problems, so that teachers can apply learning models and strategies that support HOTS students in learning mathematics.

METHOD

Research Type and Subject

This research includes a type of qualitative research with a descriptive approach. The subjects of this study were three students of grade IV of Adzkia Integrated Islamic Elementary School located in Slaji Hamlet, RT.27 RW. 09 Karangagung, Randualas, Kare, Madiun Regency, East Java, Indonesia. The research subjects consist of one student capable of high concept understanding, one student capable of medium concept understanding, and one student capable of low concept understanding.

Data Collection and Analysis

The research subjects consisting of students with high, medium, and low concept understanding skills based on the results of the concept understanding ability test, and strengthened by the consideration of the math teacher who teaches the class. As for the category of achievement of the ability to understand concepts according to Arikunto [18], presented in Table 1 as follows.

Table 1 Category of Ability to Understand Mathematical Concepts

Grouping Criteria	Category
$80 \leq$ Scores < 100	Hight
$60 \leq$ Scores < 80	Medium
$0 \leq$ Scores < 60	Low

Study subjects were asked to complete a problem-solving test aimed at measuring students' HOTS on flat wake material. The following error-solving test instruments at one of the test stages given to students, are presented as follows:

A village called Suka Makmur has 3 rectangular mango orchards that are each managed by Mr. Andi, Mr. Budi, and Mr. Doni. Mr Andi has a mango garden with a length of 26 meters and the circumference is 88 meters. Mr. Budi has a mango garden with a length of 27 meters and a width of 17 meters. While Mr. Doni has a mango garden with an area of 20 m2. Based on this information, answer the following questions:

a. *What is the width of Mr. Andi's mango garden?*
b. *Between Mr. Andi's garden and Mr. Budi's garden, whose garden is the largest??*
c. *Determine the possibility of going around Doni's mango garden!*

Students who have completed the problem-solving test, then proceed with the interview. This problem-solving test is in the form of 2 description questions given to students to measure the extent to which the HOTS level is possessed

in solving a problem in terms of the ability to understand mathematical concepts. The following are the HOTS indicators used by researchers, in line with Krathwohl's opinion [19] [20], in Table 2 as follows.

Table 2. Indicators *HOTS*

No.	Aspect	Descriptors	Indicators
1.	*Analyzing* / C4	Breaking material into parts and determining how the parts are connected between the parts.	Students are able to diagnose a problem. Students are able to analyze the information in the problem so that it can show the relationship between existing patterns or relationships.
2.	*Evaluating* / C5	Making considerations based on criteria or standards.	Students are able to consider a decision based on suitable criteria or clear standards.
3.	*Creating* / C6	Putting elements together to form a coherent or functional whole. Or rearrange elements into new patterns or structures.	Students are able to combine elements or parts into new structures.

Interviews in this study used this type of semi-structured interview. The interview guidelines are compiled by the researchers themselves, with reference to the HOTS indicator. Interviews are needed to dig up more in-depth information about students' HOTS that can be known through the results of problem-solving tests. The existence of these data can help to obtain complete information to analyse the results.

RESULT AND DISCUSSION

Students with High Concept Understanding Ability

1. Analyzing (C4)

Translation:

Is known: garden length Mr. Andi = 26

around the garden Mr. Andi = 88

$$k = 2x(p + l)$$
$$88 = 2x(26 + l)$$
$$l = \left(\frac{88}{2}\right) - 26$$
$$l = 44 - 26$$
$$l = 18m$$

so the width of the garden is 18m

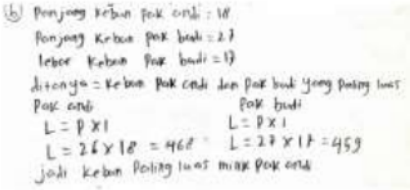
Figure 1 Students with High Concept Understanding Ability Analyzing (C4)

The results of problem solving tests and interviews show the first step that students take is to understand the problems presented by reading and understanding the problem first. Then students write and reveal by mentioning various information on the problem that is what is known, but students do not write what is asked, but students are able to explain exactly when interviewing each question precisely and use their own sentences to make it easier to understand. Students are able to understand and identify problems well. This shows that students have the ability to analyze the HOTS indicator aspect (C4) that is able to diagnose a problem.

The next stage of work, students try to connect any information that has been previously obtained. Students are able to write and explain the steps in analyzing the relationship between concepts in solving flat shapes

correctly. In the aspect of analyzing (C4) students can break down the material into its parts and determine which parts are connected into an overall goal. In line with Trianggono [21] that students with good concept understanding skills will make it easier for someone to relate the concept to other concepts and everyday events. Students have the ability to analyze HOTS indicators (C4), which are able to analyze information in questions, so they can show the relationship between existing patterns or relationships.

2. Evaluate (C5)



Translation:

In known: Garden length Mr. Andi = 18 m
Garden length Mr. Budi = 6 m
Garden width Mr. Budi = 17 m
whose garden is the largest ?
Mr. Andi
$L = pxl$
$L = 26x18$
$L = 468$
Mr. Budi
$L = pxl$
$L = 27x17$
$L = 459$
so the most extensive garden owned by Mr. Andi

Figure 2 High Concept Understanding Ability Students Evaluate (C5)

The results of problem-solving tests and interviews show that students do planning or consideration in advance. Students can perform calculations according to formulas or strategies that have been prepared before and obtain the final results correctly. Students are able to make decisions based on clear criteria or standards. This indicates that students have the ability to evaluate the HOTS indicator (C5) aspect of being able to consider a decision based on suitable criteria or clear standards. In line with O'Connell's view in [22] that with the ability to understand concepts, students will find it easier to solve a problem, because students will be able to relate and solve these problems armed with concepts that they already understand.

3. Creative (C6)

Translation:

Known: Garden area Mr. Doni = $20m^2$
Asked: around the garden
Solution:

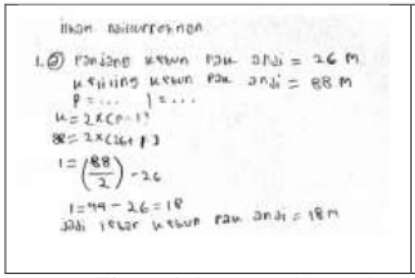
$$L = pXl$$
$$20 = pXl$$
$$factor\ of\ 20\ (1,2,4,5,10,20)$$
$$k = 2Xp + l$$
$$k = 2 \times (20 + 1) = 42$$
$$k = 2x(10 + 2) = 24$$
$$k = 2x(15 + 4) = 38$$

Figure 3. Students with High Concept Understanding Ability to be Creative (C6)

The results of problem solving tests and interviews showed that students were able to write and explain problem solving by developing and describing ideas or ideas in detail, so that the right answers were obtained. Students are able to create solutions by arranging elements together to form a new structure well. This shows that students have the ability of the HOTS indicator of the creative aspect (C6) which is able to combine elements or parts into new structures. According to Trianggono [21] shows that someone who has a good understanding of concepts, is able to generate varied ideas. Widyastuti & Pujiastuti [23] means that students who have a good level of conceptual understanding will be trained and able to develop and improve logical thinking skills to be able to solve contextual problems.

Students With Medium Concept Understanding Ability

1. Analyze (C4)



Translation:
In Known Garden length Mr. Andi = 26 m
around the garden Mr. Andi = 88
asked width?

$$k = 2x(p + l)$$
$$88 = 2x(26 + l)$$
$$l = \left(\frac{88}{2}\right) - 26$$
$$l = 44 - 26 = 18$$

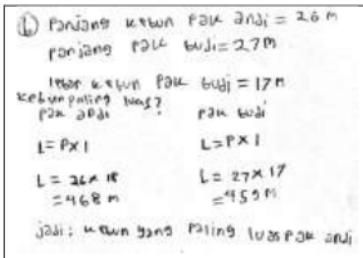
So, the width of the garden Mr. Andi=18 cm

Figure 4. Students with Medium Concept Understanding Ability Analyzing (C4)

The results of the problem-solving tests and interviews showed that the first step taken by students was to understand the problems presented by reading the questions first. Then students write and express by mentioning various information on the questions, namely what is known and asked about each question correctly. Students are able to understand and identify problems well. This shows that students have the ability to analyze the HOTS indicator (C4), which is able to diagnose a problem.

The next stage of workmanship, students strive to connect any information that has been obtained before. Students are able to write down and explain the steps in analyzing the relationships between concepts in the completion of flat wakes appropriately. In the aspect of analyzing (C4) students can break down the material into its parts and determine which parts are connected into an overall goal. Students have the ability to analyze the HOTS indicator aspect (C4) which is able to analyze information in the problem so that it can show the interrelationships between existing patterns or relationships. Strong concept knowledge will provide ease in improving students' mathematical procedural knowledge [24].

2. Evaluate (C5)



Translation:
In known: Garden length Mr. Andi = 18 m
Garden length Mr. Budi = 6 m
Garden width Mr. Budi = 17 m
Whose garden is the largest?
Mr. Andi

$$L = pxl$$
$$L = 26x18$$
$$L = 468$$

Mr. Budi

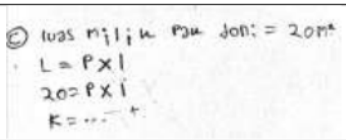
$$L = pxl$$
$$L = 27x17$$
$$L = 459$$

So the most extensive garden owned by Mr. Andi

Figure 5. Students with Medium Concept Understanding Ability Evaluate (C5)

The results of the problem-solving tests and interviews showed that the students did some planning or consideration beforehand. Students can perform calculations according to formulas or strategies that have been prepared previously and obtain the final results correctly. Students are able to make judgments based on criteria. This shows that students have the HOTS indicator ability in evaluating aspects (C5), namely being able to consider a decision based on suitable criteria or clear standards [25]. The high ability of students to understand mathematical concepts is related to the high ability of students to solve mathematical problems [26][5].

3. Creative (C6)



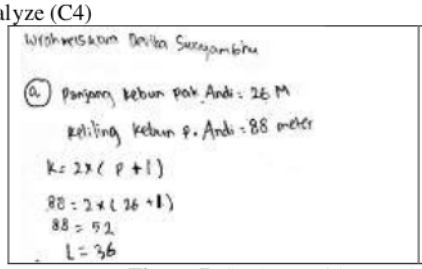
Translation:
In Known Garden area Mr. Doni = $20m^2$
$L = p\ x\ l$
$20 = p\ x\ l$
$k = \cdots..$

Figure 6. Students with Medium Concept Understanding Ability Creative (C6)

The results of problem solving tests and interviews showed that students were not able to write and explain problem solving by developing and describing ideas or ideas in detail, so that incorrect answers were obtained. Students are not able to create solutions by arranging elements together to form a new structure properly. This shows that students do not have the ability of the HOTS indicator in the creative aspect (C6).

Students with Low Concept Understanding Ability

1. Analyze (C4)



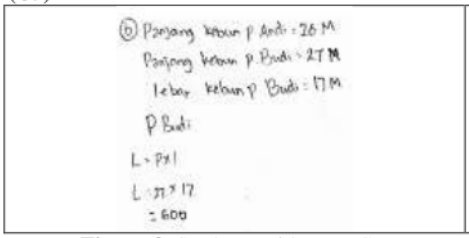
Translation:
In known: Garden length Mr. Andi = 18 m
around the garden Mr. Andi = 88
$k = 2x(p + l)$
$88 = 2x(26 + l)$
$88 = 52$
$l = 36$

Figure 7. Students with Low Concept Understanding Ability Analyze (C4)

The results of problem solving tests and interviews show that the first step that students take is to understand the problems presented by reading and understanding the problem first. Then students write and express by mentioning various information on the problem, namely what is known and asked from each question. Students are able to understand and identify problems well. This shows that students have the ability to analyze the HOTS indicator aspect (C4) that is able to diagnose a problem. According to Novitasari [27] The existence of a concept can diagnose the presence of objects around, namely by understanding the characteristics of each object.

The next stage of work, students do not connect any information that has been obtained previously. Students are not able to write and explain the steps in analyzing the relationship between concepts in the completion of flat shapes correctly, so that in the aspect of analyzing (C4) students cannot break down the material into its parts and determine which parts are connected into an overall goal. Students do not have the ability to analyze aspects of HOTS indicators (C4). In line with Wahyuni & Prihatiningtyas [28] that if students do not have the ability to understand concepts well then they will find it difficult to connect between mathematical topics.

2. Evaluate (C5)



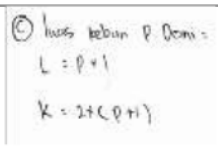
Translation:
In known: Garden length Mr. Andi = 18 m
Garden length Mr. Budi = 27 m
Garden width Mr. Budi = 17 m
Mr. Budi
$L = pxl$
$L = 27x17$
$L = 600$

Figure 8. Students with Low Concept Understanding Ability Evaluate (C5)

The results of problem-solving tests and interviews show that students do not do planning or consideration in advance. Students cannot perform calculations according to formulas or strategies that have been prepared

before to obtain the final result appropriately. Students are unable to make considerations based on criteria. This indicates that students do not have the ability of the HOTS indicator to evaluate (C5). Hutagalung research who found that there was a causality relationship between the low understanding of students' mathematical concepts and the low student achievement [29].

3. Creative (C6)



Translation:
Garden area Mr. Doni =
$L = p \; x \; l$
$k = 2 \; x \; (p + l)$

Figure 9. Students with Low Concept Understanding Ability Creative (C6)

Problem-solving test results and interviews show that students are unable to write down and explain problem-solving steps by developing and outlining ideas or ideas in detail. Students are unable to create solutions by arranging elements simultaneously to form new structures properly. This indicates that students do not have the ability to indicator the creative aspect (C6). Understanding the concept of students in solving a problem has different abilities. Herawati et al., also said that there were differences in the ability to understand mathematical concepts between students in the high and medium and high and low groups [30].

CONCLUSION

Students with high concept understanding skills have the ability in the aspect of analyzing (C4) which includes the ability to diagnose a problem and the ability to analyze information in the problem so as to show the relationship between existing patterns or relationships, aspects of evaluating (C5) which includes the ability to consider a decision based on suitable criteria or clear standards, and aspects of creating (C6) which includes the ability to combine elements or parts into a new structure.

Students with medium conceptual understanding skills have abilities in analyzing aspects (C4) which include the ability to diagnose a problem and the ability to analyze information in questions so that they can show the relationship between existing patterns or relationships and evaluating aspects (C5) which include the ability to consider a problem. Decisions based on suitable criteria or clear standards, and creative aspects.

Students with low concept understanding ability do not have the ability to analyze (C4), evaluate (C5), and create (C6). This research is expected to be a reference and further study to describe the *Higher Order Thinking Skill* (HOTS) of students in solving mathematical problems in terms of the ability to understand mathematical concepts and be able to contribute in the form of insight into students' HOTS, especially in solving problems on the subject of flat shapes.

ACKNOWLEDGMENTS

In the completion of this study, the author received a lot of support from various parties. The author expressed his gratitude to Mrs. Aviv Herawati, S.Pd., Head of Integrated Islamic Elementary School Adzkia Kare who has given research permission. Lecturer of mathematics education department in Universitas PGRI Madiun who has provided guidance and direction, as well as students of grade IV Integrated Islamic Elementary School Adzkia who have helped the completion of this research. Hopefully in this research can be useful for all parties.

REFERENCES

[1] Le LK. Teacher-Efficacy for using HOTS Pedagogy in the Classroom. 2013.
[2] Hammond M. Learning through practice: models, traditions, orientation and approaches. vol. 15. 2011. https://doi.org/10.1080/13664530.2011.608521.
[3] Ramlah, Firmansyah D, Zubair H. Pengaruh Gaya Belajar Dan Keaktifan Siswa Terhadap Prestasi Belajar Matematika (Survey pada SMP Negeri di Kecamatan Klari Kabupaten Karawang). J Ilm Solusi 2014.
[4] Murtafiah W, Suwarno, Lestari NDS. Exploring the types of a material presentation by teachers in mathematics learning during the COVID-19 pandemic. J Phys Conf Ser 2020;1663:1–8.

https://doi.org/10.1088/1742-6596/1663/1/012043.
[5] Yee MH, Jailani MY, Widad O, Razali H, Tee TK, Mohaffyza MM. The Effectiveness of Higher Order Thinking Skills for Generating Idea among Technical Students. Recent Adv Educ Technol 2015:113–8.
[6] Arifin Z, Retnawati H. Analisis Instrumen Pengukur Higher Order Thinking Skills (HOTS) Matematika Siswa SMA. Semin Nas Mat Dan Pendidik Mat Uny 2015.
[7] Husamah, Fatmawati D, Setyawan D. OIDDE learning model: Improving higher order thinking skills of biology teacher candidates. Int J Instr 2018;11:249–64. https://doi.org/10.12973/iji.2018.11217a.
[8] Badjeber R, Purwaningrum JP. Pengembangan Higher Order Thinking Skills Dalam Pembelajaran Matematika Di SMP 2018;1:36–43.
[9] Wangge M, Lusyana E. Higher Order Thinking Skill (HOTS) Mathematics Untuk Mendukung Pembentukan Karakter Siswa. Pros Semin Nas 2016.
[10] Sa'dijah C, Murtafiah W, Anwar L, Nurhakiki R, Tejo E, Cahyowati D. Teaching Higher-Order Thinking Skills in Mathematics Classrooms: Gender Differences. J Math Educ 2021;12:159–80. https://doi.org/http://doi.org/10.22342/jme.12.1.13087.159-180.
[11] Kurniati D, Harimukti R, Jamil NA. Kemampuan berpikir tingkat tinggi siswa SMP di Kabupaten Jember dalam menyelesaikan soal berstandar PISA. J Penelit Dan Eval Pendidik 2016. https://doi.org/10.21831/pep.v20i2.8058.
[12] Usmaedi U. Menggagas Pembelajaran HOTS Pada Anak Usia Sekolah Dasar. J Pendidik Sekol Dasar 2017. https://doi.org/10.30870/jpsd.v3i1.1040.
[13] Hasnida N, Ghazali C, Hassan N, Rabi NM. Confirmatory factor analysis of the teaching strategy for HOTs and LOTs Inventory in the Malaysian context 2018;8:83–94.
[14] Luritawaty IP. Pembelajaran Take and Give dalam Upaya Mengembangkan Kemampuan Pemahaman Konsep Matematis. Mosharafa J Pendidik Mat 2018. https://doi.org/10.31980/mosharafa.v7i2.27.
[15] Yunita A. Pengaruh Metode Stratagem Melalui Pembelajaran Kooperatif terhadap Pemahaman Konsep Matematis Siswa Kelas VIII SMP Negeri 20 Padang. Ta'dib 2016. https://doi.org/10.31958/jt.v17i1.254.
[16] Walkington C, Sherman M, Petrosino A. "Playing the game" of story problems: Coordinating situation-based reasoning with algebraic representation. J Math Behav 2012;31:174–95. https://doi.org/10.1016/j.jmathb.2011.12.009.
[17] Mandini GW, Hartono H. Analisis kemampuan menyelesaikan soal HOTS model TIMSS dan kepercayaan diri siswa sekolah menengah pertama. Pythagoras J Pendidik Mat 2018. https://doi.org/10.21831/pg.v13i2.21234.
[18] Effendi KNS. Pemahaman Konsep Siswa Kelas VIII pada Materi Kubus dan Balok. Symmetry Pas J Res Math Learn Educ 2017. https://doi.org/10.23969/symmetry.v2i2.552.
[19] Anderson LW, Krathwohl DR (Eds.). A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives. Complete e. New York: Longman; 2001.
[20] Afifah MN, Septiarini FN, Afifah FH. Analisis Higher Order Thinking Skills Siswa SMP Ditinjau Dari Perbedaan Gender. EDU-MAT J Pendidik Mat 2019. https://doi.org/10.20527/edumat.v7i2.7102.
[21] Trianggono MM. Analisis Kausalitas Pemahaman Konsep Dengan Kemampuan Berpikir Kreatif Siswa Pada Pemecahan Masalah Fisika. J Pendidik Fis Dan Keilmuan 2017. https://doi.org/10.25273/jpfk.v3i1.874.
[22] Fatqurhohman F. Pemahaman Konsep Matematika Siswa dalam Menyelesaikan Masalah Bangun Datar. JIPM (Jurnal Ilm Pendidik Mat 2016. https://doi.org/10.25273/jipm.v4i2.847.
[23] Widyastuti NS, Pujiastuti P. Pengaruh Pendidikan Matematika Realistik Indonesia (PMRI) terhadap Pemahaman Konsep dan Berpikir Logis Siswa. J Prima Edukasia 2014. https://doi.org/10.21831/jpe.v2i2.2718.
[24] Hutagalung R. Peningkatan kemampuan pemahaman konsep matematis siswa melalui pembelajaran guided discovery berbasis budaya toba di smp negeri 1tukka. J Math Educ Sci 2017.
[25] Murtafiah W, Sa'dijah C, Chandra TD, Susiswo S. Decision making of the Winner of the National Student Creativity Program in Designing ICT-based Learning Media. TEM J 2019;8:1039–45. https://doi.org/10.18421/TEM83-49.
[26] Suraji S, Maimunah M, Saragih S. Analisis Kemampuan Pemahaman Konsep Matematis dan Kemampuan Pemecahan Masalah Matematis Siswa SMP pada Materi Sistem Persamaan Linear Dua Variabel (SPLDV). Suska J Math Educ 2018. https://doi.org/10.24014/sjme.v4i1.5057.
[27] Novitasari D. Pengaruh Penggunaan Multimedia Interaktif terhadap Kemampuan Pemahaman Konsep Matematis Siswa. FIBONACCI J Pendidik Mat Dan Mat 2016. https://doi.org/10.24853/fbc.2.2.8-18.
[28] Wahyuni, R., Prihatiningtyas NC. Kemampuan Pemahaman Konsep Matematika terhadap Kemampuan

Koneksi Matematika Siswa pada Materi Perbandingan. Variabel 2020;3(2):66–72.
[29] Jeheman AA, Gunur B, Jelatu S. Pengaruh Pendekatan Matematika Realistik terhadap Pemahaman Konsep Matematika Siswa. Mosharafa J Pendidik Mat 2019. https://doi.org/10.31980/mosharafa.v8i2.454.
[30] Herawati ODP, Siroj R, Basir D. Pengaruh Pembelajaran Problem Posing terhadap Kemampuan Pemahaman Konsep Matematika Siswa Kelas XI IPA SMA Negeri 6 Palembang. J Pendidik Mat 2013. https://doi.org/10.22342/jpm.4.1.312.

How are students' higher order thinking skills (HOTS) in mathematical problem solving viewed from the ability to understand mathematical con-cepts

ORIGINALITY REPORT

9%	7%	7%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

3%

★ download.atlantis-press.com

Internet Source

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		