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RESEARCH ARTICLE

The Realistic of Mathematic Educational Approach to Enhancing Ability Mathematical Connections

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ABSTRACT

The aim of this study was to look at improving students' ability mathematical connection. Improve ability mathematical connection by developing Realistic Mathematics (RME) learning tools. This research is research and development, the results of this product are RPP, student activity sheets, teacher book guidelines, and student books. Development of learning tools based on a realistic approach developed using the 4-D development model from Thiagarajan. This research was conducted in grade VIII Junior High School 2 Candi. The results of this study indicate: learning devices that are developed are valid, both in content validity and construction validity, there is an increase in ability mathematical connection of students using learning developed devices, and learning devices developed meet the criteria effectively, seen from: a) students' mathematical connection abilities are met , b) the ideal time of student activity is fulfilled, c) the teacher's performance in managing the class is fulfilled and d) the student's positive response.

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1. INTRODUCTION.

Mathematical subjects consist of interrelated concepts. This is not only between concepts in mathematics, but mathematics is also related to other disciplines, and mathematics is related to real life (Afandi, 2018; Trisnawati, 2018). This is supported by the NCTM (2000) statement, "Mathematics is not a collection of separate strands or standards, even though it is partitioned and presented in this manner". Based on the statement, it can be said that mathematics is not a separate set of topics, although in reality it is partitioned and taught separately. The ability mathematical connection as an aspect of mathematical skills that students need to develop (Fonna, 2019; Fonna, 2018, Indarasati, *et al*, 2019). This is contained in the curriculum 2013 mathematics learning objectives (Depdikbud, 2014) “The ability to connect mathematics is very important to be developed in the process of learning mathematics”. This is supported by the statement of NCTM (2000) "Mathematical connections are used to help students develop a tendency to use connections in solving mathematical problems, rather than seeing mathematics as a disconnected collection and separate concepts and skills". Correspondingly, Rohendi & Dulpaja (2013) "The ability mathematical connection is needed by students, especially in solving problems that require a relationship between mathematical concepts to other concepts in mathematics and other scientific disciplines or in real life.

The ability mathematical connection of students in various schools in Indonesia is still relatively low and moderate. This is based on several research results which say that students' ability - mathematical connection are low and students still have difficulty in connecting mathematical concepts (Suminanto & Kartono, 2015; Warih, 2016; Latif & Akib, 2016; Siregar & Surya, 2017; Saputra, 2019, Rohimah, 2019). This is also supported by the results of the PISA survey which shows that mathematics achievement in Indonesia at the junior and senior high school level is always fixed on low numbers and Indonesia is ranked 64th out of 72 countries with a score of 386 (OECD, 2018). PISA data shows that the emphasis on mathematics learning especially in Indonesia is more on basic skills, but there is little emphasis on applying mathematics to the context of everyday life, communicating automatically, and thinking automatically (OECD, 2018).

From the problems of the low mathematical connections above, it can be seen that students cannot make mathematical connections on their own. This is in accordance with the opinion of Sawyer (2008) saying that: Students are not automatically able to connect mathematical concepts because they are very influential in implementing effective learning from teachers to form students able to demonstrate ability to make connections between mathematical knowledge of scientific disciplines other as well as real-life mathematical knowledge. Thus the ability mathematical connection is very necessary to be trained on students.

Based on these statements, mathematics learning in the classroom emphasizes a link between mathematical concepts of student experience in their daily lives and it is very necessary to re-apply the students' knowledge to mathematical concepts in real

life. The approach to learning mathematics that directs the mathematical knowledge of everyday students and applies mathematics to their daily lives is realistic mathematics educational approach. So, it can be said that mathematics learning basically trains students 'logical reasoning by increasing students' ability mathematical connection. Therefore, the realistic mathematical educational approach is appropriate to train students' the ability mathematical connection.

The description above the learning approach that can be applied to train students' ability mathematical connection namely realistic mathematics educational approach. Realistic mathematics educational approach is appropriate and appropriate for students because it uses contextual problems as the starting point of learning. According to Freudenthal that mathematics should not be conveyed to students as a tool (tool) that is ready to be used, but a form of activity constructing on mathematical concepts (Wijaya, 2012; Nurhadi, 2019; Qurohman, 2018).

Realistic Mathematics Education translated as Realistic Mathematics Education (RME), is an approach to learning mathematics developed by a group of mathematicians from Utrecht University in the Netherlands (Van den Heuvel-panhuizen & Drijvers, 2014). This approach is based on Freudenthal's assumption "mathematics is a human activity" (Van den Heuvel-panhuizen & Drijvers, 2014). This approach characterizes mathematical activity as an activity of solving problems, finding problems and organizing the subject matter (Trisnawati, 2018). The main activity, is organizing or mathematical. This approach emphasizes student activity and not as passivity. The mathematical activity in question is the activity of rediscovering mathematical ideas and concepts by exploring the real world under the guidance of the teacher as a facilitator. Mention Gravemeijer (1994) formulates three RME principles:

1. Guided Reinvention and Progressive
2. Didactical phenomenology
3. Self-developed models

Based on expert opinion above, the RME Approach (Realistic Mathematics Educations) is a teaching approach that starts from real things for students (reality), or real problems in the student environment and focuses on re-creation with characteristics: (1) Using problems contextually, (2) Using models, (3) Using student contributions, (4) Interactive and (5) intertwinment.

The following are steps in realistic mathematics learning (Soedjadi, 2007):

1. Understand contextual problems
2. Resolve contextual problems
3. Compare and discuss answers
4. Summarize

The ability mathematical connection is an ability that must be possessed by students in the field of mathematics (Masitoh, 2018). This is in line with the statement of NCTM (2000), "The standard problem solving process, proof and reasoning, connection, communication, and representation, highlights how to obtain and use knowledge content. Although in reality students do not realize the importance of a mathematical connection so they still see that for each concept in mathematics it is not related to other mathematical concepts".

Mathematical connection is the connection of mathematics to mathematics itself, the connection of mathematics to other fields of study, and mathematical connections to its applications, as well as mathematical connections to real problems around students through mathematical modeling (Goos et al, 2007). According to Coxford (1995) “ability mathematical connection is the ability to connect conceptual and procedural knowledge, use mathematics on other topics, use mathematics in life activities, use connections between topics in mathematics”.

Mathematical connections are the ability of students to: (1) recognize equal representation with the same topic, (2) relate procedures in one representation to procedures in equal representation, and (3) use and appreciate the relationship between mathematics and other disciplines (Ida & Sinaga, 2014)

NCTM (2000) describes the standard process of ability mathematical connection in teaching as follows:

a. Recognize and use connections between mathematical ideas.
b. Understand how mathematical ideas are interrelated and form relationships with each other so as to produce a comprehensive relationship
c. Identify and apply mathematical ideas in contexts outside mathematics.

Based on the problems described, the objectives of this study are; 1) To develop learning tools based on realistic mathematical approaches to improve ability mathematical connection; 2) To analyze the improvement of the ability of Mathematical Connections students to use Realistic based learning tools that have been developed.

2. RESEARCH METHOD

This type of research is Development research. The development model used is a 4-D (Four-D Model) model developed by Thiagarajan, et.al (1974) consisting of four stages, namely defining, designing, developing, and disseminating.

The research was conducted in class VIII of SMP Negeri 2 Candi Sidoarjo, class VIII was selected by random sampling. The class chosen is VIII B with the number of students 30. Based on the research objectives, the device is said to be effective if it meets three criteria, namely valid, practical, and effective and the realistic mathematical educational approach is said to improve students’ ability mathematical connection if it is greater or equal to 80% of students obtain value above the Minimum Completion Criteria (KKM).

Learning tools are developed in the form of Learning Implementation Plans (RPP), Teacher Handbook (BPG), Student Worksheets (LKS) and research instruments in the form of the Test Ability Mathematical Connection (TKKM). Device development was carried out using the 4-D development model from Thiagarajan which included four stages: designing, designing, developing, and disseminating.

The instruments used in this study include instruments to assess the validity of learning devices and the effectiveness of learning devices. The instruments used were teacher activity observation sheets, student activity observation sheets, student response questionnaires and tests.

Learning devices are said to be valid if they meet the criteria for content validity and construct validity. Content validity is carried out by 3 validators by assigning grades 1 to 4 in each assessment column that cover the following aspects: 1) Format, 2) Content, 3)

Language, and 4) Illustrations. Furthermore, the overall expert assessment is calculated on average to obtain the content validity assessment criteria as follows:

Table 1. Criteria for validity of learning devices

No	Kevalidan	Criteria
1	1 ≤ V < 2	Invalid
2	2 ≤ V < 3	Less Valid
3	3 ≤ V < 4	Enough Valid
4	4 ≤ V < 5	Valid
5	V = 5	Very Valid

Realistic mathematics learning devices fulfill content validity if the validator evaluates on average all learning devices meet valid or very valid criteria. If it does not meet these criteria, it needs to be revised again. And so on to obtain learning devices that fulfill content validity. then construct validity tests ability mathematical connection. Before being used for trials in the field, the test items for mathematical connection ability were tested outside the research subjects to measure validity and reliability. To measure the validity of an item you can use the product moment correlation formula (Arikunto, 2013) below.

$$rxy = \frac{\frac{\sum xy-(\sum x)(\sum y)}{N}}{\sqrt{\left(\frac{\sum x^2-(\sum x)^2}{N}\right)\left(\frac{\sum y^2-(\sum y)^2}{N}\right)}}$$

Information:
rxy: correlation coefficients variables x and y
Σxy: total multiplication between x and y
x: item x score obtained
y: total score
N: number of subjects

Then, to calculate the reliability coefficient of test items Alpha-Cronbach (Arikunto, 2013) is used as follows:

$$r_{11}=\left(\frac{n}{n-1}\right)\left(1-\frac{\sum \sigma_i^2}{\sigma_t^2}\right)$$

Information:

r_{11} = Instrument reliability
n = Number of items
$\sum \sigma_i^2$ = Amount of item / item variance
σ_t^2 = Total variance

The effectiveness of learning devices is reviewed based on: 1) Students' mathematical connection ability is fulfilled, which is more or equal to 80% of students who follow the learning score of 70. 2) Activities of teachers meet the criteria of good. 3) Activities of students meet active criteria. 4) At least 80% of students give a positive response to the components of the device being developed and learning activities.

Data on the results of ability mathematical connection were obtained from the pretest and posttest which were then analyzed using the Gain formula to find out whether realistic mathematics learning can improve ability mathematical connection. Following this the N-Gain formula used is:

$$\text{N-Gain} = \frac{\text{Posttest Score} - \text{pretest score}}{\text{Maksimum Score} - \text{pretest score}}$$

Table 2. N-Gain Value Criteria

N-Gain Value	Criteria
N-Gain ≥ 0,70	High
0,30 ≤ N-Gain < 0,70	Medium
N-Gain ≤ 0,30	Low

3. RESULTS AND DISCUSSION

3.1 Results

a. Description of Learning Device Development Stage

Development of learning devices using the 4-D development model from Thiagarajan with the following details:

1. Description of the defining stage
   Based on the results of observations and analysis of learning devices in the Sidoarjo State Middle School 2, shows that so far the teacher does not have a learning device that can improve ability mathematical connection. From these problems it is necessary to develop learning tools based on realistic mathematical approaches. By developing learning tools based on realistic mathematical approaches, students will be trained to relate their prior knowledge in resolving the given contextual problems. Thus students' mathematical connection abilities can be improved. Learning tools developed in the form of RPP, LKS, and TKKM for Prism material.
2. Description of the designing stage
   To measure students' mathematical connection ability to achieve learning goals, an assessment tool was developed in the form of a test of ability mathematical connection in prism material. Students 'mathematical connection ability tests consist of 2, namely Pretest and Posttest Learning tools consist of: Lesson Plans (RPP), Student Worksheets (LKS), and tests of students' ability mathematical connection. Furthermore, the results of the format selection in this study were adjusted to the 2013 curriculum. The format for the RPP was adjusted to the Permendikbud number 22 (2016) concerning standards for the process of primary and secondary education.
3. Description of the developing stage
   At this stage evaluation of learning devices that have been designed (Initial Draft). Formative evaluation is done in 2 stages, namely: 1) evaluation by experts and practitioners, and 2) field trials. The results of evaluations by experts and practitioners in the form of content validity assessment indicate that all learning devices meet valid criteria, with average content validity (RPP, LKS, and TKKM) being 4.5. All test items for connection ability meet valid criteria with a calculated r value = 0.901 (very high). Field trials or trial I was conducted to see the effectiveness of learning devices. In experiment I, learning devices have met effective criteria, so there is no need to conduct trial II.

b. Description of the Test Result

Criteria and valid learning devices based on the validator's assessment are fulfilled, because all validators assess the learning device developed can be used with "little revision" or "without revision". The results of the classical mathematical connection ability test show the total number of students who meet the minimum completeness criteria (KKM) reaches 85% of the total 30 students. So that it meets the effectiveness criteria. Furthermore,

the effectiveness criteria based on student activities show active with an average observer rating of 3.5. The average percentage of teacher activity shows the categories performed well, and student responses show a positive category with an average of 92.15%. Thus it can be concluded that effective learning devices seen from teacher activities and student activities meet criteria, positive student responses and ability mathematical connection are achieved. So that overall learning tools based on realistic mathematical approaches that are oriented to learning developed have met the criteria of valid, practical and effective.

c. Improved Student The Ability Mathematical Connection

Increased ability mathematical connection increased from the average in the posttest results of mathematical connection abilities. The average ability mathematical connection of students at the pretest is 65.80, increasing to 82.15. Based on this, an increase in the average score of students' mathematical connection abilities is 16.35. Then based on the calculation of N-Gain the students' ability mathematical connection at the pretest and posttest increased from 0.38 to 0.71. The increase in students' ability mathematical connection was also seen to increase in each indicator, including indicators of mathematical ideas with an average of 0.86, on mathematical indicators with other fields of science with an average of 0.75, and mathematics in everyday life with average of 0.89. Based on this, the ability mathematical connection of students using learning tools developed based on a realistic approach can be improved as expected with the percentage of 85% of the posttest scores of students who get greater scores than KKM.

3.2 Discussion

The results showed that the learning process based on realistic mathematical approaches developed met the criteria of valid, practical, and effective. After learning tools that are valid, practical, and effective are produced, the next goal is a learning device developed that can improve students' ability mathematical connection.

The Ability Mathematical connections are one of the abilities students must possess to solve problems. According to NCTM (2000), the connection of mathematics is a very important part that must be emphasized at every level of education. In line with what is said by Hafiz et al (2016) that the ability to connect mathematics is one of the mathematical abilities that must be developed in learning mathematics in school. When students do not apply the concept of experience that they have had before, they will find it difficult to remember certain material and they will remember too many separate concepts while mathematics contains many principles. Mathematical connection is the relationship between the topic of mathematics itself, the relationship between mathematics and other scientific disciplines, and the relation of mathematics to the real world or in everyday life.

The purpose of developing learning devices in this study by using this realistic mathematical approach is to improve students' ability mathematical connection. To see the increase in ability mathematical connection in students, it will be seen based on the value of the students' pretest and posttest mathematical connection abilities. In accordance with the data analysis description of the results of the study, it was found that less than 60% of students who obtained pretest scores below the standard set of minimum completeness criteria were determined. Mathematical connection ability of low students is influenced by several factors, among others, in solving mathematical problems in the form of contextual problems students are not accustomed, problems given by students from teachers are not much different from the examples previously taught, and students learn by memorizing mathematical ideas in solve math problems, so students are not familiar with the non-routine questions given. Based on this, it becomes an effect for students having difficulty in connecting mathematical ideas themselves, mathematics with other fields of science, and mathematics with everyday life.

As said Hafiz et al (2016) that the low ability mathematical connection of students in learning mathematics is caused by several factors, one of which is because students are not able to associate mathematical ideas that have been taught and new mathematical ideas taught. This phenomenon occurs because often students memorize mathematical ideas without trying to interpret the ideas contained in the problem given. Learning is said to be meaningful if the information learned by students is prepared in the appropriate cognitive structure so that students have strong memories and transfer of learning is easily achieved. Therefore, to improve ability mathematical connection a learning device is needed that is able to link mathematical ideas and meaningful learning to occur. This is consistent with realistic mathematical characteristics that use student contributions so that it emphasizes meaningful learning. By using contributions students can construct their own knowledge that they already have with their new knowledge in solving mathematical problems. The results of this study indicate that students' ability mathematical connection increase with realistic mathematical learning tools. The increase can be seen from the posttest results of the ability mathematical connection obtained by students. In accordance with the N-Gain calculation to see an increase in students' ability mathematical connection, an increase in the pre-test to post-test value with a n-gaint value of 0.71 was interpreted as in the "medium" category. Students' ability mathematical connection also increases seen in each indicator of ability mathematical connection which consists of indicators of mathematical connections between mathematical topics, connections between mathematical topics and other fields of science and connections between mathematics and everyday life. The ability mathematical connection increases because realistic mathematics learning tools applied in learning have met valid, practical, and effective criteria. With realistic mathematical learning devices students will be accustomed to solving non-routine mathematical problems, problems that are given close in the daily lives of students, with that students will not feel bored in the learning process. This realistic mathematical learning tool will also train students to solve problems by finding procedures from ideas found by students. then students will be directed in linking mathematical ideas learned before in solving problems, with this the learning process will take place more meaningfully.

The learning process of mathematics by using realistic mathematical approaches can improve students' ability mathematical connection. This is because learning scenarios using realistic mathematical approaches are designed to contain contextual realistic problems close to the lives of students, so the process of solving problems done by students goes well and activates students to rediscover the concept of learning through mathematical modeling activities. the learning process by using realistic mathematical approaches with student contributions makes students more active, produce and provide meaningful learning experiences through the formation of interrelated concepts so as to improve students' ability mathematical connection.

4. CONCLUSION

Based on the results of the description and analysis of data in this study, then presented some conclusions as follows: 1) Approach to realistic mathematics learning by developing learning devices meet valid criteria. The average value of total validity of RPP, LKS and Test Ability Mathematics Connection (TKKM) is 4.5. 2) Increasing the ability of mathematical connections of students using learning devices based on the realistic mathematical approach that has been developed is seen at the pretest of 0.38 while in the posttest is 0.71 which means the "medium" category. 3) Learning tools based on realistic mathematical approaches developed meet the effective criteria. Effective criteria are reviewed from: (a) The ability mathematical connection of students in the class meets the criteria above the KKM with a percentage of 85%; (b) Student activities in all aspects observed meet active criteria; (c) Teacher activities in managing learning are in the well-implemented category and (d) Students' positive responses reach 92.15% of the components of the device and learning activities.

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REFERENCES

Afandi, A. (2018). Difference of learning mathematics between open question model and conventional model. *Malikussaleh Journal of Mathematics Learning (MJML)*, *1*(1), 13-18.

Arikunto, S. (2013). Dasar-Dasar Evaluasi Pendidikan. Jakarta: PT. Bumi Aksara.

Coxford, A.F. 1995. "The Case for Connections", dalam Connecting Mathematics Across the Curriculum. Editor: House, P.A. dan Coxford, A.F. Reston, Virginia: NCTM

Depdikbud. (2014). Permendikbud No. 58 Thn. 2014 tentang Kurikulum 2013 Sekolah Menengah Pertama/Madrasah Tsanawiyah. Jakarta: Depdikbud.

Fonna, M., & Mursalin, M. (2019). Using of Wingeom Software in Geometry Learning to Improving the of Mathematical Representation Ability. *Malikussaleh Journal of Mathematics Learning (MJML)*, *1*(2).

Fonna, M., & Mursalin, M. (2018). Role of Self-Efficacy Toward Students' Achievement in Mathematical Multiple Representation Ability (MMRA). *Jurnal Ilmiah Peuradeun*, *6*(1), 31-40.

Gravemeijer, K. (1994). Developing Realistic Mathematics Education. Utrecht: Freudenthal Institute.

Hafiz, M, dkk. 2016. Concept Mapping Learning Strategy to Enhance Students' Mathematical Connection Ability. Mathematics, Science, and Computer Science Education (MSCEIS 2016) AIP Conf.

Indarasati, N. A., Abadi, A., & Lukito, A. (2019). Enhancing Students' Creative Thinking through Inquiry-Based Learning Integrating Mathematical Tools. *International Journal of Trends in Mathematics Education Research*, *2*(2), 91-95.

Ida, K., & Sinaga, M. (2014). Enhancing Mathematical Problem Solving and Mathematical Connection Through the Us of Dynamic Software Autograph in Cooperative Learning Think-Pair-Share. Journal SAINSAB. Vol. 17, 2014, pp 51-71.

Latif, S., & Akib, I. (2016). Mathematical Connection Ability In Solving Mathematics Problem Based on Initial Abilities of Students at SMPN 10 Bulukumba. Jurnal Daya Matematis, Volume 4 No. 2.

Masitoh, L. F., & Fitriyani, H. (2018). Improving students' mathematics self-efficacy through problem based learning. *Malikussaleh Journal of Mathematics Learning (MJML)*, *1*(1), 26-30.

Nurhadi, M., Hizqiyah, I. Y. N., & Saraswati, A. (2019). Application of The Problem Based Learning Method Trought Authentic Assessment Approach to Improving the Habits of Mind. *International Journal of Trends in Mathematics Education Research*, *2*(2), 68-71.

National Council Of Teachers Of Mathematics (NCTM). (2000). Principles And Standards Schools Mathematics. Reston, VA:NCTM.

OECD. (2018). PISA 2015 Results in Focus. New York: Columbia University.

Permendikbud. (2016). Permendikbud Nomor 22 Tahun 2016 Tentang Standar Proses Pendidikan Dan Menengah. Jakarta: Depdikbud.

Qurohman, M. T. (2018). Think to Talk Write Learning Mathematics Tool Hands on Activity. *International Journal of Trends in Mathematics Education Research*, *1*(3).

Rohimah, S. M., & Prabawanto, S. (2019). Student's Difficulty Identification in Completing the Problem of Equation and Trigonometry Identities. *International Journal of Trends in Mathematics Education Research*, *2*(1), 34-36.

Rohendi, D., & Dulpaja. (2013). Connected Mathematics Project (CMP) Model Based on Presentation Media on the Mathematical Connection Ability of Junior High School Student. Journal of Educational and Practice, 4 (4), 17-22.

Sawyer, A. (2008). Making Connection: Promomting Connectedness in Early Mathematics Education. Annual Conference of the Mathematics Education Research, 429-435.

Saputra, N. N., & Sukmawati, R. (2019). The Implementation of 2013 Curriculum in Mathematics Learning at SMA Muhammadiyah 3 Tangerang. *International Journal of Trends in Mathematics Education Research*, *2*(1), 43-46.

Siregar, Nenta Dumalia dan Edy Surya. 2017. Analysis of Students' Junior High School Mathematical Connection Ability. International Journal of Sciences: Basic and Applied Research (IJSBAR). ISSN 230-74531)

Soedjadi, R. (2007). Inti Dasar-Dasar Pendidikan Matematika Realistik Indonesia. Jurnal Pendidikan Matematika, Volume I, No. 2.

Suminanto, & Kartono. (2015). Analysis of Mathematical Connection Ability in linear Equation with One variable Based on Connectivity Theory. International Journal of Educational and Research, 3(4).

Thiagarajan, S., Semmel, D. S & Semmel, M. I. (1974). Instructional Development for Training Teachers of Expectional Children. Minneapolis, Minnesota: Leadership Training Institute/Special Education, University of Minnesota.

Trisnawati, T., Pratiwi, R., & Waziana, W. (2018). The effect of realistic mathematics education on student's mathematical communication ability. *Malikussaleh Journal of Mathematics Learning (MJML)*, *1*(1), 31-35.

Warih, P. D., Parta, I. N., & Rahardjo, S. (2016). Analisis Kemampuan Koneksi Matematika Siswa Kelas VIII pada Materi Teorema Phytagoras. Konferensi Nasional Penelitian matematika dan Pembelajarannya (KNKMP I). Surakarta: Universitas Muhammadiyah Surakarta.

Wijaya, A. (2012). Pendidikan Matematika Realisitik: Suatu Alternatif Pendekatan Pembelajaran Matematika. Yogyakarta: Grahana Ilmu.

Van den Heuvel-Panhuizen, M., & Drijvers, P. (2014). Realistic Mathematics Education. In Encyclopedia of Mathematics education. Springer Science + Business Media Dordrecht.