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THE INFLUENCE OF CREATIVE PROBLEM SOLVING LEARNING MODEL SUPPORTED WITH REAL OBJECT MEDIA ON THE ABILITY TO SOLVE PROBLEMS RELATED TO SIMPLE SOLVINGS IN THIRD GRADE STUDENTS AT MIN 1 ACEH TENGAH

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Abstract: This research is motivated by the results of observations, that mathematics learning activities in elementary schools still tend to be dominated by teachers with lecturing activities. This is what causes students to become passive and do not understand the material so that it affects low student learning outcomes. This study used a quantitative approach with a pretest-posttest control group design and research subjects of class III MIN 1 Aceh Tengah. The research was conducted using two classes, namely experimental and control. The instruments used are learning tools and test sheets in the form of description questions. To analyze the data, researchers used SPSS 16.0 for windows software. The results showed that (1) the ability of students to solve simple fraction problems using creative problem-solving learning models supported by real object media increased with an average value of 84.00 or > 75% achieving KKM. (2) The ability to solve simple fraction problems using conventional learning models without the support of real object media tends to be low with an average score of 69.18 or <75% which achieves KKM. (3) There is a significant effect on the ability to solve simple fraction problems using the Creative Problem-Solving learning model supported by real object media with Asymp. Sig. (2- tailed) 0.000 < 0.05, tcount > ttable, 7.744 > 2.032.

Keywords: creative problem solving, real objects, simple fractions

INTRODUCTION

Mathematics is one of the most important subjects in the world of education. All students start studying mathematics from elementary school to high school (Ball, 1991; Keller et al., 2001). Mathematics lessons are given in elementary schools to equip students with the experience of thinking about mathematics itself. This is reinforced by the opinion according to Loc et al. (2019) which emphasizes that mathematics can shape the mindset of people who study it into a systematic, logical, critical mathematical mindset with great care.

In mathematics learning material, one of the competencies that requires further thinking is solving simple fraction problems. This is because the problem of simple fractions is very closely related to the daily life of students both at school and at home. For the lower grade level, solving simple fractional arithmetic operations questions requires understanding concepts that are more difficult than other number arithmetic operations (Nemeth et al., 2019).

Based on the results of pre-observations that have been carried out at MIN 1 Aceh Tengah it is known that the competency in solving problems related to simple fractions is still less than the standard value set (KKM). This fact can be seen from the number of students who scored under the Minimum Completeness Criteria (KKM), namely 75. Of the 36 students, only 45% were able to achieve the KKM.

From the pre-observation data it was found that success in the process of learning mathematics is strongly influenced by the role of the teacher (Erdogan et al., 2014; Istikomah & Wahyuni, 2018). The role of the teacher is important because in terms of the selection of learning strategies or models used, it determines the success of the learning process.

Through observation activities in the field, it is known that teachers still use the conventional model with the lecture method. This makes students passive and bored when learning takes place.

Such circumstances will make students less motivated to actively participate in learning. From the conditions previously described, it is necessary to apply an effective and innovative learning model in order to increase motivation so that learning outcomes increase or are better.

According to Arifah & Widjajanti (2018) that the learning model is a plan or a pattern that is used as a guide in planning learning in the classroom. Learning models are designed to have steps (syntax) that aim to make students actively involved in learning. One learning model that is suitable for the results of the pre-observation is Creative Problem Solving (Maulyda et al., 2019; Morphew et al., 2020; Sukoriyanto et al., 2016). This learning model emphasizes problem solving skills. Problem-solving skills in question are skills in terms of thinking about efforts to solve them. In this case students are required to develop their mindset to choose the appropriate strategy or way to solve a simple fraction problem (Liu & Liang, 2020).

According to the stages of the student's mindset, the steps of the Creative Problem Solving model according to Hotimah et al. (2021) consist of clarifying the problem, expressing opinions, evaluating and selecting and implementing it. In addition to using the Creative Problem Solving learning model, it can also be supported by media. With the existence of a media, learning mathematics which is abstract in nature can be concretized in such a way. The existence of media is also able to stimulate students to play an active role during the learning process. In line with this, Mufidah (2021) reveal the importance of learning media, namely.

In the process of teaching and learning the presence of the media has an important meaning. Because in this activity the lack of clarity in the material presented can be helped by presenting the media as an intermediary. The complexity of the material to be conveyed to students can be simplified with the help of the media. From the complexity of students in solving simple fraction problems, the media that is considered appropriate is real objects. This is reinforced by the opinion according to Ibrahim and Syaodih (2003: 119) that real object media are real objects that will provide a very important stimulus for students in learning various things, especially those concerning the development of certain skills (Tarigan & Siregar, 2022).

METHODS

This study uses a quantitative approach with experimental research techniques (Creswell, 2014). Quantitative research is carried out in a systematic, planned and clearly structured manner from the beginning to the creation of the research design. The experimental technique was designed in such a way as to determine the effect of using the Creative Problem Solving learning model supported by real object media on the ability to solve problems related to simple fractions. The research design uses the Pretest-Posttest Control Group Design model involving 2 classes, namely the experiment and control. Here is the design from research.

Table 1. Control Group Design

Subject	*Pre-Test*	*Treatment*	*Post-Test*
E	O_1	X_1	O_2
K	O_3	X_0	O_4

Information:
E : Experimental Group
K : Control Group
O_1 : Experiment Group Pretest
O_2 : Experiment Group Posttest
O_3 : Pretest Control Group
O_4 : Posttest Control Group
X_1 : Treatment
X_0 : No Treatment

According to Sugiyono (2010) population is a generalized area consisting of objects/subjects that have the best quality and certain characteristics set by researchers to study and then draw conclusions. While the sample is part of the number and characteristics possessed by the population. In this study the population was 36, namely the total number of class III at MIN 1 Aceh Tengah. And for the sample because the population is less than 100, it uses calculations with saturated sampling techniques and determines the number of samples, namely all members of the population or 36 students.

The instrument used is a test in the form of 10 number word problems. Before being used, the instrument must be tested for its validity and reliability. Furthermore, for data analysis techniques using descriptive and inferential statistics. Descriptive statistics are presented in the form of frequency distribution tables, graphical diagrams and central tendency. As for the inferential statistics using the normality test, homogeneity test and test the research hypothesis. The first and second hypotheses are based on KKM. While testing the third hypothesis using the t-test on SPSS software version 16.0 for Windows.

RESULT & DISCUSSION

The results of data analysis were performed using SPSS software version 16.0 for Windows. After being analyzed, the following results were obtained.

Hypothesis Testing 1

Data analysis to test the first hypothesis was carried out by comparing it with the Minimum Completeness Criteria (KKM) standard, which was 75. The data being compared was the pretest and posttest values. In this study, testing the first hypothesis was to determine students' ability to solve problems related to simple fractions using the Creative Problem Solving model supported by real object media (experimental class). Based on the results of the analysis it is known that the first hypothesis stated by the researcher is accepted. This is related to the grade III students at Melis Elementary School which are classified as high or achieve KKM scores. The classical average value in the class is 84.00.

Hypothesis Testing 2

The second hypothesis is still being tested using the Minimum Completeness Criteria (KKM) standard. Testing the second hypothesis aims to determine students' ability to solve problems related to simple fractions using conventional models without the support of real object media (control class). From the results of data analysis, it is known that the second hypothesis stated by the researcher is accepted. This is related to the ability of class III students at MIN 1 Aceh Tengah in solving complex problems related to simple fractions is still relatively low. The classical average value in the class is 58.82.

Hypothesis Testing 3

Testing the third hypothesis was carried out to find out whether there was an effect from using the Creative Problem Solving learning model supported by real object media. Testing the third hypothesis using the T-Test with the Independent T-Test using a comparison of tcount and ttable at a significance level of 5% or 0.05. Testing was carried out using SPSS software version 16.0 for Windows. From the data calculated through the T-Test, it was found that Asymp. Sig. (2-tailed) of 0.000. This is when compared with the provisions of the significance level means Asymp. Sig. (2-tailed) is smaller than alpha (α) or 0.000 < 0.05. Referring to the results of tcount compared to ttable at a significance level of 0.05, the result is that tcount > ttable or 7,744 > 2,032.

Based on these calculations, the analysis is that Ha is accepted and Ho is rejected. This means that there is a difference in effect between the use of conventional learning models without the support of real object media and compared to the use of creative problem solving learning models supported by real object media. From the data analysis that has been done, it can be concluded that there is a greater influence on the use of creative problem solving learning models supported by real object media on students' abilities in solving problems related to simple fractions the use of creative problem solving learning models supported by real object media (Adi Widodo et al., 2019; Arsyad, 2011; Powell et al., 2017). From the data analysis that has been done, it can be concluded that there is a greater influence on the use of creative problem-solving learning models supported by real object media on students' abilities to solve problems related to simple fractions (Rahmayani, 2019; Sugiantiningsih & Antara, 2019).

CONCLUSION

From the results of data analysis, data processing, and hypothesis testing, conclusions can then be drawn. It is known that there is a significant influence from the use of creative problem solving learning models supported by real object media on the ability to solve problems related to simple fractions in class III students of MIN 1 Aceh Tengah. This is proven through testing with

the T-Test which has described the results. In the use of the Creative Problem-Solving learning model supported by real object media, it has an influence in terms of increasing students' ability to solve problems related to simple fractions. This is because the Creative Problem-Solving learning model can involve students directly during the learning process. So that makes them more active and can easily understand the material. Under these conditions classical completeness reached ≥ 75%.

REFERENCES

Adi Widodo, S., Turmudi, & Afgani Dahlan, J. (2019). Can Sociomathematical Norms Be Developed with Learning Media? *Journal of Physics: Conference Series*, *1315*(1), 1–7. https://doi.org/10.1088/1742-6596/1315/1/012005

Arifah, P. N., & Widjajanti, D. B. (2018). Mathematics Anxiety: Causes and the Effects on Student's Mathematics Achievement. *5th ICRIEMS Proceedings*, 105–110.

Arsyad, A. (2011). *MediaPembelajaran*. Rajawali Press.

Ball, D. L. (1991). Implementing the NCTM Standards: Hopes and Hurdles. In *Telecommunications as a Tool for Educational Reform*.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.)*. SAGE.

Erdogan, A., Yazlik, D. O., & Erdik, C. (2014). Mathematics Teacher Candidates ' Metaphors about the Concept of " Mathematics ." *International Journal of Education in Mathematics, Science and Technology*, *2*(4), 289–299. https://doi.org/https://doi.org/10.18404/ijemst.55442

Hotimah, H., Ermiana, I., & Rosyidah, A. N. K. (2021). Pengembangan Multimedia Interaktif Berbasis Macromedia Flash Untuk Meningkatkan Kemampuan Komunikasi Matematis. *Progres Pendidikan*, *2*(1), 7–12. https://doi.org/10.29303/prospek.v2i1.57

I. Mufidah Y., A. L. H. & E. (2021). Identifikasi Tantangan Yang Dihadapi Guru Dalam Implementasi Pendidikan Inklusif Di Sekolah Dasar Negeri 1 Gemel Dan Sekolah Dasar Negeri Batututlis. *Renjana Pendidikan Dasar*, *1*(1), 1–9.

Istikomah, E., & Wahyuni, A. (2018). Student's Mathematics Anxiety on the Use of Technology in Mathematics Learning. *Journal of Research and Advances in Mathematics Education*, *3*(2), 69–77. http://journals.ums.ac.id/index.php/jramathedu

Keller, B. A., Hart, E. W., & Martin, W. G. (2001). Illuminating NCTM's Principles and Standards for School Mathematics . *School Science and Mathematics*, *101*(6), 292–304. https://doi.org/10.1111/j.1949-8594.2001.tb17960.x

Liu, Y.-C., & Liang, C. (2020). Neurocognitive Evidence for Different Problem-Solving Processes between Engineering and Liberal Arts Students. *International Journal of Educational Psychology*, *9*(2), 104. https://doi.org/10.17583/ijep.2020.3940

Loc, N. P., Tong, D. H., & Duy, V. K. (2019). Using the information processing theory into teaching mathematics: A case study of "vector" concept. *International Journal of Scientific and Technology Research*, *8*(9), 1612–1616.

Maulyda, M. A., Hidayati, V. R., Rosyidah, A. N. K., & Nurmawanti, I. (2019). Problem-solving ability of primary school teachers based on Polya's method in Mataram City. *PYTHAGORAS: Jurnal Pendidikan Matematika*, *14*(2), 139–149. https://doi.org/https://doi.org/10.21831/pg.v14i2.28686

Morphew, J. W., Gladding, G. E., & Mestre, J. P. (2020). Effect of presentation style and problem-solving attempts on metacognition and learning from solution videos. *Physical Review Physics Education Research*, *16*(1), 10104. https://doi.org/10.1103/PhysRevPhysEducRes.16.010104

Nemeth, L., Werker, K., Arend, J., Vogel, S., & Lipowsky, F. (2019). Interleaved Learning in Elementary School Mathematics: Effects on the Flexible and Adaptive Use of Subtraction Strategies. *Frontiers in Psychology*, *10*(February). https://doi.org/10.3389/fpsyg.2019.00086

Powell, E. M., Frankel, L. A., & Hernandez, D. C. (2017). The mediating role of child self-

regulation of eating in the relationship between parental use of food as a reward and child emotional overeating. *Appetite*, *56*(3), 452–478. https://doi.org/10.1016/j.appet.2017.02.017

Rahmayani, A. (2019). Pengaruh model pembelajaran discovery learning dengan menggunakan media video terhadap hasil belajar siswa. *Jurnal Pendidikan*, *4*(1), 59–62.

Sugiantiningsih, I. A., & Antara, P. A. (2019). Penerapan model pembelajaran talking stick berbantuan media flash card untuk meningkatkan kemampuan berbicara. *Jurnal Ilmiah Pendidikan Profesi Guru*, *2*(3). https://doi.org/10.23887/jippg.v2i3.15728

Sugiyono. (2010). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Alfabeta.

Sukoriyanto, S., Nusantara, T., Subanji, S., & Chandra, T. D. (2016). Students' Errors in Solving the Permutation and Combination Problems Based on Problem Solving Steps of Polya. *International Education Studies*, *9*(2), 11. https://doi.org/10.5539/ies.v9n2p11

Tarigan, J. E., & Siregar, H. T. (2022). Perbaikan Pembelajaran Ipa Dengan Menggunakan Media Konkret Pada Materi Jenis-Jenis Daun Di Kelas Iv Sd Negeri 068007 Medan Tuntungan. *JURNAL CURERE*, *6*(1), 77. https://doi.org/10.36764/jc.v6i1.720