Advances in Social Science, Education and Humanities Research, volume 287
1st International Conference on Education and Social Science Research (ICESRE 2018)

GEOMETRY MODULE WITH CTL APPROACH FOR ELEMENTARY SCHOOL LEARNING

1st Nury Yuniasih
Elementary Teacher Education Program
Universitas Kanjuruhan Malang
Malang, Indonesia
nuryyuniasih@unikama.ac.id

2nd Dyah Tri Wahyuningtyas
Elementary Teacher Education Program
Universitas Kanjuruhan Malang
Malang, Indonesia
dyahtriwahyu@unikama.ac.id

***Abstract*—Geometry learning in elementary school, especially in class IV three-dimensional material requires appropriate teaching materials to teach concept understanding. Based on this, this study aims to describe the effectiveness of using modules based on the CTL approach in geometry learning. This research is a qualitative research with a narrative approach. The study was carried out involving 5 elementary schools in Malang City, data collection techniques used in this study were documentation and questionnaires. The data obtained were analyzed through data reduction, data presentation, and verification. The results showed that the use of the module based on the CTL approach on geometry learning gained learning outcomes with an average of 83.5 above the KKM score and the average response of students was 3.32 or 83%. Students easily understood the language used, found the concept independently , and motivated to learn because of the interesting modules. Based on these results it can be concluded that CTL-based modules are suitable for use in geometry learning.**

Keywords—Geometry Module, CTL Approach, Elementary School

I. INTRODUCTION

In accordance with the 2013 curriculum revision in 2016 states that theapproach learningin primary schools uses thematic-integrated, except for Mathematics and Sports and Health Physical Education (PJOK) as stand-alone subjects for grades IV, V, and VI [1]. This policy can help students understand deeper mathematical concepts without having to relate to other subjects. In addition, students' ability to understand mathematical material can be measured well. The subject matter of mathematics learned in elementary school consists of numbers, algebra, measurement, and geometry [2].

Van Hiele argued that learning geometry in elementary school includes two-dimensional objects and three-dimensional objects, two-dimensional objects for class III and three-dimensional objects for class IV. there are 5 stages of understanding geometry, namely: the introduction stage of analysis, sorting, deduction, and accuracy [3]. The initial stage of cognitive development in understanding geometry is the introduction stage, at this stage the child has not been able to mention the properties of geometric structures which he recognizes the properties of the geometrical structures he knows. So if we ask questions such as "whether in a rectangle, the opposite sides are the same length?". Therefore, it is very important to involve objects around students to introduce geometry material.

The three main elements of geometry learning according to Van Hiele are time, learning materials and compiler methods which, if managed in an integrated manner, can result in an increase in children's thinking ability to a stage higher than the previous stage [3]. One way to teach geometry material in elementary schools is to integrate these three things. Learning time has been provided, learning material has also been determined by the method used. Currently in elementary school teachers use student books and teacher books as learning guidelines. There are several disadvantages to using the book, namely less contextual learning. Theuse of instructional materials in the presentation of mathematical concepts that are less than optimal causes students difficulty in understanding the material, especially in geometrical material namely two-dimensional objects and three-dimensional objects [4].

One way to increase students' understanding of geometrical material is by using modules. Module is one form of independent teaching material that is packaged systematically and contextually [5]. CTL-based modules are independent teaching materials in which there are contextual examples of three-dimensional objects such as pencil-shaped boxes of blocks etc. The CTL approach creates conditions for students to learn through experiencing activities and not just memorizing [6]. The focus of this research is to describe the effectiveness of using modules based on the CTL approach in geometry learning.

II. METHODS

This study uses qualitative research with a narrative approach. Narrative research is a research design on the lives of individuals as information to be retold by researchers in the narrative chronology [7]. The subjects of this study were grade 4 students at Puwodadi 1 Elementary School in Malang, Sukun 1 Elementary School in Malang, Bandungrejosari 3 Malang Elementary School, Bareng 5 Elementary School in Malang, and Kedungkandang 1 Elementary School in Malang. In qualitative research key instruments are researchers [8]. Data collection techniques used in this study are documentation and questionnaires. Instruments used Learning outcomes document is data obtained from students' grades

after working on evaluation questions in the module. Student response questionnaire is data taken from the results of giving questionnaires to students. The data obtained were analyzed through the following stages:

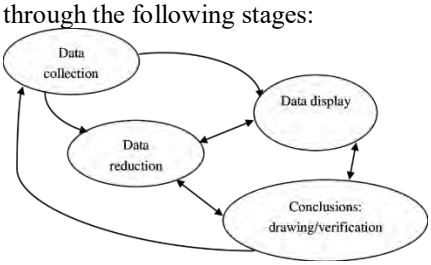

Fig 1. Model of Qualitative Data Analysis Miles and Huberman

This study used Miles Huberman qualitative data analysis [9] with the following steps:

1) data reduction
   At this stage researchers conducted a sharpening, categorizing, analysis direct, dispose of unnecessary, and organize data in such a way that the final conclusions can be verified.
2) data presentation
   At this stage researchers are involved in the presentation of data that has been collected previously. Researchers compile in narrative text, the researcher focuses on the results of the reduction of data on student learning outcomes and student response questionnaires.
3) verification
   At this stage is the result of interpretation of data reduction.

III. Results and Discussion

A. Results

The results of the study showed that the use of CTL-based modules in geometry learning had an impact on student learning outcomes, along with student learning outcomes from 5 elementary schools in Malang:

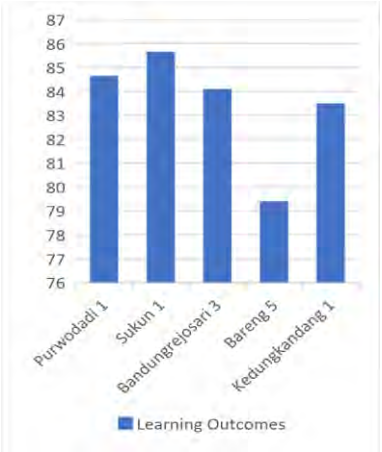

Fig. 2. Geometry Learning Results After Using CTL-based Modules

Fig. 2 shows that each primary school learning outcomes above the KKM value is 75. Purwodadi 1 average value obtained 84.65; Breadfruit 1 average score of 85.67; Bandungrejosari 3 the average score obtained was 84.1; Together with 5 average values obtained 79.4; Kedungkandang 1 average value obtained 83.5. The use of CTL-based modules on geometry learning improves learning outcomes proventhe average value of overall learning outcomes is 83.5 above the minimum completeness criteria.

Geometry learning using CTL-based modules also received good responses from students. Student responses were obtained by giving the questionnaire and the results:

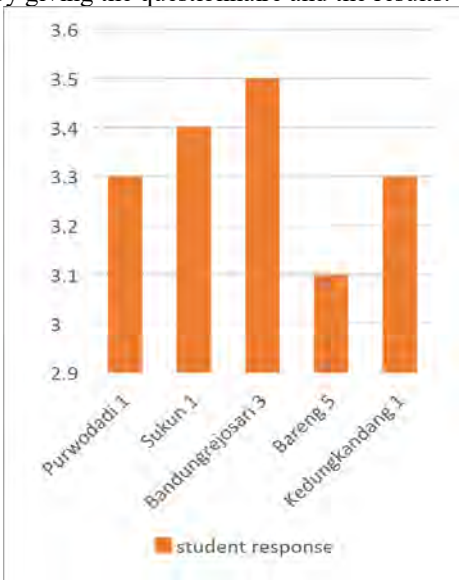

Fig 3. Response of Students After Using CTL-based Modules

Fig 3 shows students' responses after using CTL-based modules. Purwodadi 1 student response was 3.3 or 82.5%; Breadfruit 1 student response is 3.4 or 85%; Bandungrejosari 3 student response of 3.5 or 87.5% or; Together with 5 student responses of 3.1 or 77.5%; Kedungkandang 1 student response is 3.3 or 82.5%. The overall student response rate of 3.32 or 83% is in the good category. The results of the study that show students' responses in using CTL-based modules are easier to understand because students easily understand the language used, find concepts independently, and are motivated to learn because of the interesting modules. The following student response results show the effectiveness of CTL-based modules on class IV geometry learning:

1) Students have no difficulty understanding the information, instructions, commands, and symbols in the module.
2) Students are motivated to study the material of three-dimensional object concepts
3) The students' curiosity increases when they follow the learning activities in the module which contains the problems
4) Students can find out whether their answers are right or wrong
5) Students feel free to interact with their learning environment
6) Students are happy with the CTL-based module display
7) Students do not experiencing difficulties in understanding the language used

So that the results of this study have an impact on student learning outcomes that have exceeded the minimum completeness criteria and students respond well to the use of CTL-based modules.

B. Discussion

CTL-based modules make it easier for Grade IV students to understand the concept of three-dimensional objects. The module makes students more independent. An interesting module can increase student motivation in learning material. As stated by Retnasari [10] also suggests that contextual approaches are significantly better than conventional approaches in increasing student learning motivation. Based on the results of student response data the CTL-based module is also interesting to facilitate students in learning concepts. This is in line withopinion Suryaningsih's [11] revealing that the benefits of the module are: (a) Increasing student motivation [12] [13], because every time they do a lesson task that is clearly limited and in accordance with their abilities, (b) After an evaluation, teachers and students know correctly, in the module where students have succeeded and in the part of the module where they have not succeeded, (c) the learning material is divided more evenly in one semester, (d) Education is more efficient, because the learning material is arranged according to the academic level .

All learning outcomes of grade IV students above KKM after using CTL-based modules on learning the concept of three-dimensional objects. The module helps students to improve their learning outcomes. This was reinforced by the research of Amir and Kusuma [14] which stated that contextual problem-based learning tools developed were of good quality. This can be seen from the implementation of good categorized learning, student activities in good category, positive categorical response to students 'metacognition, mastery of classical students' metacognition learning outcomes achieved. Like the opinions of previous researchers Wahyuningtyas [15] The use of emodules with CTL attracts good responses from students and can improve students' understanding of two-dimensional objects.

IV. CONCLUSION

The results showed that the use of a module based on the CTL approach on geometry learning gained learning outcomes with an average of 83.5 above the KKM score and the average student response was 3.32 or 83%. This proved that students easily understood the language used. find concepts independently, and be motivated to learn because of the interesting modules. Based on these results it can be concluded that CTL-based modules are effectively used in geometry learning. It is suggested to other researchers to develop a module as a tool to improve students' understanding, thanks to the Ministry of Research, Technology and Higher Education who have funded this research.

REFERENCES

[1] dan K. R. I. Menteri Pendidikan, “No Title,” vol. 2025, 2016.

[2] Depdiknas, *Peraturan Menteri Pendidikan Nasional Republik Indonesia (Permendikbud) Nomor 22 Tahun 2006 Tentang Standar Isi Sekolah*. Jakarta, 2006.

[3] Ismail, *Kapita Selekta Pembelajaran Matematika*. Universitas Terbuka, 1998.

[4] and E. B. I. D. T. Wahyuningtyas, N. Yuniasih, “Dengan Pendekatan Contekstual Teaching And Learning,” vol. 8285, pp. 30–38, 2018.

[5] D. Caprioara, “Problem Solving- Purpose and Means of Learning Mathematics in School,” *Procedia-Soc. Behav, Sci*, vol. 191, pp. 1859–1864, 2015.

[6] & S. A. G. Nurhadi., *Pembelajaran Kontekstual*. Surabaya: PT JePe Press Media Utama, 2009.

[7] C..Ressman, *Narrative methods for the human sciences*. Thousand Oaks, CA: Sage, 2008.

[8] Creswell, *Research Design, Pendekatan Metode Kualitatif, Kuantitatif, dan Campuran*. Yogyakarta: Pustaka Belajar, 2016.

[9] dan S. J. Miles, M. B., Huberman, A. M., *Qualitative Data Analysis, A Methods Sourcebook*, 3rd ed. USA: Sage Publications, 2014.

[10] and J. R. Retnasari, Maulana, “Pengaruh Pendekatan Kontekstual Tehadap Kemampuan Koneksi Matematis Dan Motivasi Belajar Siswa Sekolah Dasar Kelas IV Pada Materi Bilangan Bulat,” *J. Pena Ilm*, vol. 1, 2016.

[11] Suryaningsih, *Media Cetak Modul Sebagai Media Pembelajaran Mandiri*. Jakarta: Salemba Empat, 2010.

[12] and N. Z. I. Novianty, O. Sulistina, “Efektivitas Penerapan Modul Materi Analisis Elektrokimia Berbasis Inkuiri Terbimbing Terhadap Hasil Belajar Dan Persepsi Siswa Kelas XI Semester 1 Kompetensi Keahlian Kimia Analisis Smkn 7 Malang,” *jurnal-online.um.ac.id*, no. 1, 2013.

[13] K. T. Aritonang, “Minat Dan Motivasi Dalam Meningkatkan Hasil Belajar Sswa,” *J. Pendidik, Penabur*, vol. 7, no. 10, pp. 11–21, 2008.

[14] and M. D. K. M. F. Amir., “Pengembangan Perangkat Pembelajaran Berbasis Masalah Kontekstual Untuk Meningkatkan Kemampuan Metakognisi Siswa Sekolah Dasar,” *J. Medives*, vol. 2, no. 1, pp. 117–128, 2018.

[15] and E. B. I. D. T. Wahyuningtyas., N. Yuniasih., “Two-Dimensional Figure E-Modul with Contextual Teaching and Learning (CTL) Approach,” vol. 7, pp. 276–278, 2018.