

CONSTRUCTIVISM APPROACHES IN EFFORTS TO IMPROVE STUDENTS 'UNDERSTANDING ON THE ROUND NUMBER OPERATIONS

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Abstract

The problem in this study is how the constructivism approach can improve students' understanding of integer operations. The methodology used in this study is the Classroom Action Research Method (CAR) using the Kemis and Mc. Taggart, namely: planning, (planning), the implementation of actions (actions), observation (observation) and reflection (reflection). PTK is used through 2 cycles and 4 actions. The subject of the research was the fourth grade students of SDN 4 Galanggang, Batujajar Subdistrict, West Bandung Regency, the theory used in this study was the theory of Piaget and Brunner. Both theories are very relevant to the constructivism approach used in this study, the constructivism approach is an approach to teaching and learning that positions students as individuals who actively construct their own knowledge through experience from the surrounding environment. With the constructivism approach applied the teacher acts as a facilitator, motivator and mediator for students. Improved understanding and activity of students is shown by changes in scores and changes in the average score of students from the first cycle to the second cycle that is from 71.62 to 83.78. Besides that, an increase in student understanding and activity can also be seen from the average normalized gain of 0.36 for the first cycle to the second cycle. In addition to increased understanding, students also showed a positive response to the constructivism learning approach seen from the results of the questionnaire that most (75.67%) students gave positive responses

Keywords : Constructivism understanding, *integer operations*

Abstrak

Permasalahan dalam penelitian ini adalah bagaimana pendekatan konstruktivisme dapat meningkatkan pemahaman siswa pada operasi bilangan bulat. Metodologi yang digunakan dalam penelitian ini adalah Metode Penelitian Tindakan Kelas (PTK) menggunakan model Kemis and Mc. Taggart yaitu: perencanaan, (*planning*), pelaksanaan tindakan (*action*), observasi (*observation*) dan refleksi (*reflection*). PTK ini digunakan melalui 2 siklus dan 4 tindakan. Subjek penelitian adalah siswa kelas IV SDN 4 Galanggang Kecamatan Batujajar Kabupaten Bandung Barat, teori yang digunakan dalam penelitian ini adalah teori Piaget dan Brunner. Kedua teori tersebut sangat relevan dengan pendekatan konstruktivisme yang digunakan dalam penelitian ini, pendekatan konstruktivisme adalah pendekatan belajar mengajar yang memposisikan siswa sebagai individu yang aktif mengkonstruksi sendiri pengetahuannya melalui pengalaman dari lingkungan sekitar. Dengan pendekatan konstruktivisme yang diterapkan guru berperan sebagai fasilitator, motivator dan mediator bagi siswa. Peningkatan pemahaman dan aktivitas siswa ditunjukkan dengan perubahan skor dan perubahan skor rata-rata siswa dari siklus pertama ke siklus kedua yaitu dari 71,62 ke 83,78. Selain itu peningkatan pemahaman dan aktivitas siswa dapat juga dilihat dari rata-rata gain yang dinormalisasi sebesar 0,36 untuk siklus pertama ke siklus kedua. Selain pemahaman meningkat, siswa juga menunjukkan respon positif terhadap pendekatan pembelajaran konstruktivisme terlihat dari hasil angket yang sebagian besar (75,67%) siswa memberikan respon yang positif.

Kata Kunci: Pemahaman Konstruktivisme, *operasi bilangan bulat*

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INTRODUCTION

As basic science, various subject matter of mathematics must be mastered by students, especially elementary school students. One of the basic materials that must be mastered by elementary school students is the integer operation material that is studied in Class III Elementary School. This material must be mastered by elementary students because it will be useful for daily life. But the reality obtained in the classroom, the results obtained by students after learning integer operations are not optimal. In general, there are still many students who have difficulty in understanding this material. Some difficulties experienced by students in learning integer operations, among others (1) Students do not understand the operations of adding positive and negative integers, (2) Students do not understand the operations of reducing positive and negative integers.

The above problems occur because teachers do not understand the characteristics of students they face. The characteristics of students need to be understood by the teacher so that students succeed in learning. Since elementary school age is an intellectual period, because at this time students are relatively easy to educate, students are mature enough to learn, they begin to want to have new skills according to their level of development. To overcome the above problems, the researcher tries to combine learning of integers by creating mathematical learning activities on the students' researchers using the constructivism approach. The constructivism approach believes that knowledge is composed by a person from experiences gained through his interactions with the environment. So clearly constructivism departs from the idea that to understand something does not have to always start from thoughts that are abstract but can be started from tangible objects through the interaction of students with their environment (Cobb in Windayana, 2004: 11).

Mathematical learning will be more successful if students feel interested in learning, and interest in learning can be obtained through the learning process with a construction approach as an support because because this approach students will be given concrete things in accordance with the stage of development, therefore students can construct knowledge , skills, or experiences that already exist in students so that it will arouse students' interest to learn.

Based on the statements above, the research is designed to investigate how to improve the understanding of elementary school students in grade IV in learning integer concepts and operations through a constructivism approach, on this basis the research takes the title "The Use of the Constructivism Approach in Efforts to Increase Students' Understanding in Operations Integers". It aims to provide concrete things so students can understand and interpret the learning of integers.

METHOD

This research is a cyclic classroom action research using Spiral models: Kemmis and Mc. Taggart (Ruswandi, 2007), because in this model planning uses four components of research including planning, action, observation and reflection in a related spiral system so that it can streamline research and minimize possible errors. Classroom action research conducted by researchers consisted of 2 cycles and each cycle consisted of 2 actions. The instruments used for carrying out each research activity included: questionnaires, observation sheets, interview sheets, student worksheets and evaluation sheets.

Data analysis for hypothesis testing of each activity was carried out by comparing each instrument of activities or student work. The data analysis technique used is qualitative data analysis and quantitative data analysis by finding \bar{x} (calculated average) and gain.

$$\bar{x} = \frac{\sum(fi . xi)}{n}$$

A note :

\bar{x} = Calculate average

n = lots of samples

$\Sigma(fi.xi)$ = the results of the score multiplication with the frequency score in question

RESULTS AND DISCUSSION

Cycle 1

In cycle I, students generally responded well to the learning presented by the teacher. Student responses to learning with the constructivism approach continue to vary. The number of students who gave positive responses was 22 people, many students who gave negative responses were 6 people, while the number of students who gave neutral responses was 9 people.

The level of understanding of students in the first cycle is quite good, this is seen in the initial activity when given a question as an initial conception of students responding and responding, then when assigned to complete student worksheets is quite active as evidenced by the responses from other groups who deliver the results of the discussion. Until the evaluation activities individually, students can answer the questions given.

While the inhibiting factors that arise when learning activities are very clearly remembered in completing worksheets with their groups, it seems that there are groups that ask questions from other groups, thus disturbing other group discussions, the role of researchers to direct students to work with their groups so that other groups are not disturbed.

Student learning achievement results are satisfactory seen from the evaluation results obtained by students the highest value of 100 five people and the lowest value of 40 ten people, the total value is 2650 of the total number of students present 37 people, then the average class is 71.62.

Cycle II

As in previous actions the researcher will analyze the level of student understanding and inhibiting factors in learning. Because researching it on an ongoing basis so that makes it easy for researchers to carry out learning.

Regarding the level of understanding of students in the second cycle is very good as students in group discussions look active by understanding the instructions in the worksheet and exploring the string of the numbers themselves. But there are a few obstacles when students in activities using the number line props, maybe many who like the learning tools that are made, there is one group fighting over each other eventually causing the visual aids to be broken up divided into two parts. With such an incident the researcher quickly anticipates by connecting it and giving direction or warning so that it does not happen again. Based on the results obtained in the evaluation of student learning the results satisfying 14 students got the highest score of 100 and 6 students got the lowest score of 60 six people, the total number of scores was 3100 of the number of students 37 people, then the class average of 83.78. The overall results are very satisfying.

Analysis with \bar{x}

From the two cycles that have been carried out it can be seen the development of students with a maximum number of 100, in integer operations as shown in the graph as follows in figure 1:

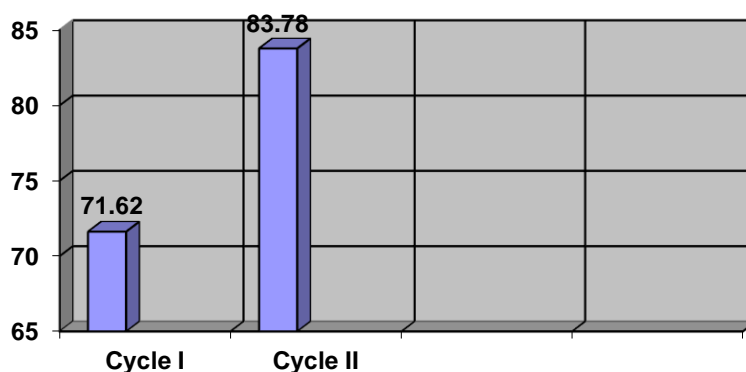


Figure 1. Level of Understanding of Students in a Cycle

In the first cycle, students are not used to it and are still rigid with the teacher's instructions as researchers, so the learning outcomes are not in line with expectations. In the second cycle, by paying attention to the analysis and the results of the reflection conducted, the researcher tries to plan even better actions. These yields result with a significant increase in the second cycle.

Gain Analysis

After testing in cycle, I and cycle II, the following data are obtained on table 1:

Table 1. Evaluation results of cycle i and cycle ii as well gains index

No	Name	Cycle I	Cycle II	g	<g>	Category
1	Ican P	100	100	0	$\frac{0}{0}$	
2	Reza S	80	80	0	0	low
3	Dwi D	80	90	10	0.5	middle
4	Eko B	60	70	10	0.25	low
5	Dickcel	60	60	0	0	low
6	Salsa	100	100	0	$\frac{0}{0}$	
7	Cici	80	100	20	1	high
8	Alni M	60	100	40	1	high
9	Reza N	60	60	0	0	low
10	Dira D	80	100	20	1	high
11	Diva A	50	70	20	0.4	middle
12	Eka P	50	70	20	0.4	middle
13	Kharisma	80	90	10	0.5	middle
14	Dea	60	100	40	1	high
15	Nadiyah	90	100	10	1	high
16	Hema	60	90	30	0.75	high
17	Septia	80	80	0	0	low
18	Igis	80	80	0	0	low
19	Oktavian	100	100	0	$\frac{0}{0}$	
20	Anugrah	60	80	20	0.5	middle
21	Romy	40	60	20	0.3	middle
22	Azis	50	70	20	0.4	middle
23	Zulpan	80	100	20	1	high
24	Vikry	80	90	10	0.5	middle
25	Bayu	80	100	20	1	high
26	Khotama	80	80	0	0	low
27	Pazar	80	60	-20	-1	low
28	Abdel	60	80	20	0.5	middle
29	Andika	80	100	20	1	high
30	Riki	60	80	20	0.5	middle
31	Mario	80	60	-20	-1	low
32	Alfi	40	70	30	0.5	middle
33	Fery	80	100	20	1	high
34	Yusup	70	100	30	1	high
35	Andre	80	60	-20	-1	low
36	Indra	100	100	0	$\frac{0}{0}$	
37	Arya	40	70	30	0.5	middle

Analyzing questionnaires

Based on the results of the questionnaire the author can conclude that the students' response to integer operations using the constructivism approach is very good and the positive response has increased every cycle from the formulation of the problem raised by the researcher students interpret the operation of integers with the constructivism approach to increase students' understanding of integer operations shown by the students' responses to the material provided. Students' understanding of test results increases in learning of integers, then based on the results of the analysis the researchers draw the conclusions of the theory proposed by Bruner in line with the results of the study.

This the use of constructivist approaches in integer operations supported by Bruner's theory, and Piaget's theory of development proved to increase students' understanding of the material to be taught, increased student interest in the learning process is shown by submitting opinions, responding to the proposed knowledge, student understanding in learning the involvement students actively in the learning process of students increases.

CONCLUSION

By using the constructivism approach to understanding students at SDN 4 Galanggang, Batujajar District, West Bandung Regency in integer operations, this can be seen from the way students worked when evaluating. Students are able to work on problems correctly because students have understood integer operations that have been learned using the constructivism approach.

When the learning activities took place, the activities of the teachers and students of SDN 4 Galanggang Kacamatan Batujajar seemed to increase. In presenting learning, the teacher does not overwhelm the child with formulas that make the child confined, but the teacher positions himself as a facilitator, mediator and motivator. Students are more enthusiastic and can interact with their peers, they exchange ideas, cooperation between group members looks better, all members have their respective tasks so that each group can do the worksheets correctly and on time.

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REFERENCES

- Rahmat, et. all. (2004) *Belajar Matematika dengan Orientasi Penemuan dan Pemecahan Masalah Untuk Kelas IVB*. Bandung: PT Sarana Panca Karya.
- Rostika, Deti. (2008). *Pendekatan Volume Bangun Ruang Melalui Pendekatan Konstruktivisme Untuk Sekolah Dasar*. Dalam Jurnal Pendidikan Dasar Nomor 9 April 2008.
- Ruswandi, Hermawan. Mujono dan Suherman, Ayi. (2007). *Metode Penelitian Pendidikan Sekolah Dasar*. Bandung: UPI Press.
- Suyanto. (1997). *Pedoman Pelaksanaan Penelitian Tindakan Kelas*. Jakarta: Sayagatama.
- Suyati, M. Khalid. (2002). *Pelajaran Matematika. Untuk SD kelas IV Semester 2* Jakarta: Erlangga.
- Tim Matematika, (2004). *Cerdas Matematika Untuk Kelas IV SD*. Jakarta: Yudistira.
- Windayana, Husen. Et.all (2005). *Modul Pendidikan Matematika*. Bandung: UPI PRESS.