

THE APPLICATION OF CTL TO IMPROVE STUDENTS' UNDERSTANDING CONCEPT ABILITY BY MATFLASH GRAPHIC MEDIA ASSISTANCE

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ABSTRACT

This analysis aims to know the improvement of students' concept understanding ability in integers of addition and subtraction the contextual learning model using math-flash graphic media. The kind of this analysis is Class Action. The subject of this analysis is 41 students VII Grade and the object of this analysis is learning activity in the addition and subtraction operation of integers. The instrument using to get the data is a test and observation sheet. The last data analysis result of cycle II is gotten an improvement, many students who have understood the Translational aspect is as big as 85,4%, the aspect of Interpretation is improved as big as 82,9% and the Extrapolation is improved as big as 80,48%.

Keyword : Contextual Approach, Concept Understanding, Math-flash Media Graphic.

1. PRELIMINARY

One of standart competence wanting to reach in mathematic learning in Junior High School as stated by Education National Standart Instance (2006) is the students have ability in doing the arithmetic operation of integer and fraction. The achievement of this competence is one of success indicator of mathematic learning in Junior High School. Many efforts had done by the goverment that students' mathematic ability in Indonesia is still very low. The difficulties of learning mathematic is caused by the special character of Mathematic which has abstract object. The Mathematic learning nowadays is showed in students' abilituy in finishing the mathematic question. Individually, many students is less-understanding of mathematic concept which is essentially ia an deductive axiomatic and starting from abstract things. Relating with the teaching learning process that's emphasized in reasoning arrangement, critical attitude development, logic and the skill of applying mathematic, thus the students must have the ability of understanding mathematic concept as a main requirement.

Based on diagnostic test the researcher given to 41 students of VII Grade Junior High School in addition and subtraction integer operation there were some difficulties experienced by the students, one of them is the students haven't understood about the definition of integer itself, characteristics of general principle from addition and subtraction of integer that caused the error in enumerating and subtracting positive and negative integer, negative by negative and positive by positive. From the result that can be described how weak are the students' understanding in addition and subtraction of integer material operation. It's absolutely influenced to the low students' learning result. The low of students' ability is caused of less-understanding of integer arithmetic concept is backgrounded by students' mathematic learning factors which are less-variation or there is no media used in delivering the mathematic concepts to Junior High School students', that have abstract level, in this level the usage of media in learning is very helpful to help the students in understanding the material delivered, as stated by Sadiman (2017:17) media has usage as following :

- (1) To clarify the presentation so that it's not too verbalistic; (2) To overcome the space limitation, place and sense power; (3) The truly usage of the media and varied to overcome the students' passive; (4) With the unique in every students and the environment and different experience, while the curriculum and material education is certain same to every students, so the teacher experienced the difficulties much, it can be overcome by the media usage.

The error in delivering by the teacher is fatal to the students in facing the next problem that's still related to the concept and at last causes a less-intention for the students to learn mathematic. Generally, the teacher using konventional method (explaining and doing exercise) that does not give an attractiveness for students. Supporting with the material which is regarded difficult, this learning is often stuck in a bored condition and does not give a students' chance to study comfortably.

One of alternative so that mathematic learning can be delivered concretely is by contextual learning. Contextual learning is a learning concept that helps the teacher to relate the learning material with the real world condition and support the students in making the knowledge they have with the application in their daily life. The research result of Akmal (2012) The principles found in CTL learning make the students more active in finding and digging as much as possible information they have already experienced. Therefore, contextual learning prioritizes to the knowledge and experience or real world learning, high level thinking, students' central, active and critical students, solving the problem, the students' learn nicely, joyfull and quantum learning. According to Sariningsih (2014) Achievement of students' mathematic concept understanding ability which the learning using the approach contextual in better than conventional. Based on that case so the researcher applicate a learning model called learning model by contextual approach using mathflash graphic media. Remembering the Junior High School students' mental development most is in transition period from concrete fase to the formal operation fase thus the media can be used to train the students to be able thinking abstractly, namely the media that can improve the students' attention for the ideas or concepts. Therefore, the suitable learning method is mathflash graphic method. By mathflash graphic media the teacher can presentate mathematic concepts in concrete form to clarify the learning. As Aristo (2003:9) stated, graphic media is used to catch the attention, clarify the learning and illustrate a fact or concept which is forgettable and able to show in concrete form thus there will be much things to remember by the students so in learning occurs memorizing process, meanwhile in studying mathematic is more need understanding than memorizing.

2. CONTEXTUAL LEARNING

Contextual learning is a learning concept that helps the teacher to relate the learning material she/he taught to students' real world condition and to support the students in making a relation between the knowledge they have with the application in their daily life. Therefore, the conceptual learning prioritizes to the real world learning, high level learning, students central, student's active, critical, creative, and solving the problem, joyfull quantum learning, and using many learning source.

The research result of Northwest Regional Education Laboratories (Depdiknas, 2002) reports that CTL can create the meaningfulness of learning experience and improve the students' academic achievement. Owens (2001) also stated that contextual teaching practically promises the students' attractiveness improvement from any background

and improve students' participation and support the students actively in giving chance for them to construct the knowledge and apply the knowledge they have in order to improve mathematics problem solving in the daily life. Besides that, Owens (2001) also stated that contextual teaching practically promises the students' attractiveness improvement from any background and improve students' participation and support the students actively in giving chance for them to apply knowledge understanding, connect and apply the knowledge they get in finishing the challenge of problem they face. Some characters of contextual learning according to Kunandar (2011:303) are:

- a. There is a cooperation between both side
- b. Emphasizing the importance of problem solving
- c. Supporting one each other
- d. Pleased
- e. Studying intensively
- f. Integrated learning
- g. Using many sources
- h. Students' active
- i. Sharing thematically
- j. Students' are critical, teacher's creative
- k. Students' working result report

According to Zahorik (in Kunandar, 2011:306) there are five elements that must be attained in contextual learning demonstration, they are:

1. *Activating knowledge*
2. *Acquiring knowledge* by learning a whole first and then attend the detail.
3. *Understanding knowledge*, namely by arranging:
 - 1) Hypothesis
 - 2) Doing sharing to other people to get respond (*validation*)
 - 3) The concept is revised and developed.
4. Demonstrating the knowledge and experience (*applying knowledge*)
5. Doing reflection (*reflecting knowledge*) to the knowledge development strategy.

3. MATFLASH GRAPHIC MEDIA

Mathflash graphic media is classified of computer basic media. Mathflash graphic media is also used to catch the attention, clarifying the learning presentation, and illustrate a fact or concept which is forgettable if it is explained by verbal explanation only.

Mathflash graphic media that used in this research is number line diagram with picture. The animation in this media will move based on the addition and subtraction rule. The animation is made by Adobe Photoshop software and performed in Power Point form. The rule used in determining result of addition and subtraction integer operation by mathflash graphic media is as follow:

1. Starting in 0 position to the right side.
2. Walking ahead to state positive number and walking behind to state negative number.
3. Staying only to state zero (0).
4. Continues direction to state the addition operation (+).
5. Back direction to state subtraction operation (-)

Example:

Please count, $3 + 2 = \dots$

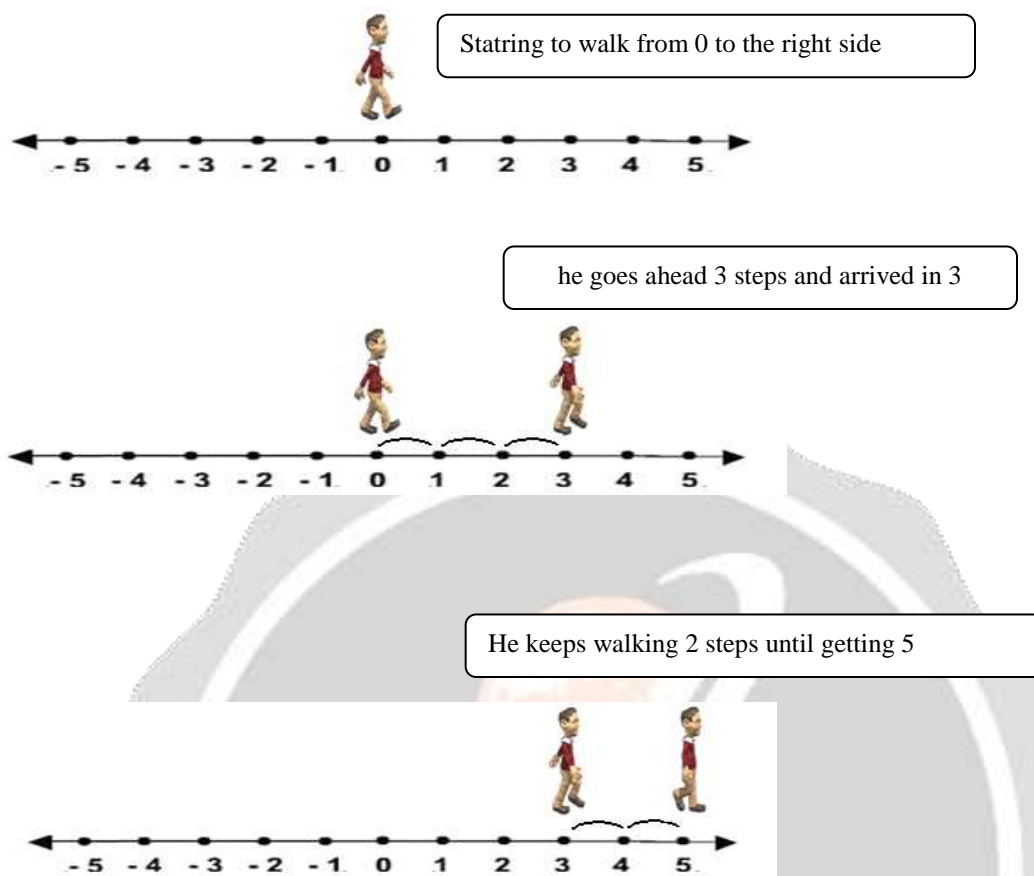


Fig-1 : The Addition Operation of Two Positive Number by Graphic Media

4. RESEARCH METHOD

This research is an Action Class Research. The action done to improve the students' concept understanding ability in doing the addition and subtraction of integer.

This research is done in Junior High School. The subject of this research is VII Grade consists of 41 students. The object of this research is learning process in addition and subtraction of integer by using the contextual application by using mathflash graphic media. The instrument used to get the data was test and observation sheet. The test used to know the improvement of students' ability in every aspect of concept understanding in addition and subtraction of integer and observation sheet was used to see the learning process and students' activity when the learning model of contextual approach is applied, namely the translational, interpretation, and extrapolation.

The indicator of this research is formulated after the researcher did the diagnostic, presenting on the table below:

Table-1 : Work Indicator

Work Indicator	Pre		Post	
	Percentage	Category	Percentage	Category
1. Students' percentage who's able to translate the question.	47,6%	very bad	80%	good

	Pre		Post	
2. Students' percentage who's able to interpretate the question (Interpretation)	33%	very bad	80%	good
3. Students' percentage who's able to extrapolate the question (Extrapolation)	54%	bad	80%	good

Work indicator is used to see the changing of pre-ability with the post-ability (before and after the action).

5. RESEARCH RESULT

Based on the achievement result in the beginning diagnostic test and understanding concept of diagnostic test in cycle I, it's gotten data as the table below:

Tab-2 : The Description of Students' Coccept Understanding Ability that Refers to Every Aspect of Cycle I.

Aspects	Pre		Cycle I Achievement		Target	
	%	Category	%	Category	%	Category
Students' percentage who's able to translate the question.	47,6%	Very bad	56,1%	Very bad	80%	Good
Students' percentage who's able to interpretate the question (Interpretation)	33%	Very bad	54%	Very bad	80%	Good
Students' percentage who's able to extrapolate the question (Extrapolation)	54%	Very bad	56,1%	Very bad	80%	Good

Based on the result of diagnostic test concept understanding I for cycle I, if it is seemed from first result of diagnostic test in work indicator that students' ability who could to translate the question (*translation*) is in 47,6% (very bad) but after learning with contextual approach by mathflash graphic media was done, the students who's able to translate theis in 56,1% (very bad). Thereby with the students who werw able to interpretated the question is in 33% (very bad), after the learning was done is in 54% (very bad) also. Thereby with the students who were able to extrapolate the question is in 54% (very bad), after the learning method was done is in 56,1% (very bad) also.

So we can conclude that the application of contextual approach with mathflash graphic media to improve students' mathematic concept understanding ability, there were an improvement in any aspect, but the improvement had not reached the last target that's hoped namely in 80% (good) in any aspect.

Based on the achievement gotten in the pre-diagnostic test, test and diagnostic concept understanding in cycle II, was gotten data in the table below:

Tab-3 : The Level Description of Students' Concept Understanding Concept aims in Every Aspect in Cycle II

Aspet	Pre		Cycle I Achievement		Target	
	%	Category	%	Category	%	Category
Students' percentage who's able to translate the question.	47,6%	Very bad	85,4%	Good	80%	Good
Students' percentage who's able to interpretate the question (Interpretation)	33%	Very bad	82,9%	Good	80%	Good
Students' percentage who's able to extrapolate the question (Extrapolation)	54%	Very bad	80,48%	Good	80%	Good

Based on the diagnostic test concept understanding II for cycle II in attachment 23 page 167, if it's seemed from the pre-diagnostic test that the percentage of students who were able to translate the question is in 47,6% (very bad), after the revision was done of cycle II the students who were able to translate the question is in 85,4% (good). Thereby with the students who were able to interpretate the question is in 33% (very bad), after the revision was done of cycle II the students' who were able to interpretate the question is in 82,9% (good). Thereby with the students who were able to predict the question is in 54% (very bad), after the revision was done in cycle II the students who were able to predict the question is in 80,48% (good).

Based on the data analysis result, we can conclude that the students ability in uderstanding concept have an improvement as the target expected namly 80% (good)

Tab-4 : Teacher's Observation Ability Result in Cycle I and II

No	Evaluated Aspect	Contextual Component	Cycle I Mean	Cycle II Mean
1.	Opening the learning	-	2,75	3,25
2.	Delivering learning goal	-	2,5	3
3.	Reminding requirement material	-	2,75	3
4.	Motivating the students to studey spiritly	Constructivism	2,5	3
5.	Rising the contextual problem related with the material	Inquiry	2,5	3
6.	Showing the material and guiding students to finishing the material	Inquiry	2,25	3
7.	Giving a chance to ask if there is unclear material	Asking	2	3,25
8.	Make a discussion group	Studying community	3	3,5

9.	Giving LAS and the information about LAS content	Studying community	3	3
10.	Reminding so that the students can discuss with other friend in a group for doing LAS	Studying community	3	3
11.	Asking one of groups to presentate the discussion result	Model	2,75	3
12.	Conclude the knowledge gotten from the learning and give the task or evaluation	Reflection	2,5	3
13.	Doing evaluation to the evaluation given and discussion result report	Real evaluation	2,25	2,5
14.	Closing the learning and say greeting	-	2,75	3,5

Based on the learning implementation observation result was gotten that learning implementation had an improvement from cycle I to cycle II. Learning implementation based on observation result to the teacher in cycle I is as big as 62,5 (enough) improve in cycle II become 76,78 (good). The improvement occurred in any aspect, except the aspect in giving LAS and giving information about the LAS content, and order so that the students can discuss with another friend in a group to do LAS that haven't improvement. Thereby, we can conclude that learning implementation that's done by the teacher in applying learning with contextual approach with math flash graphic media can improve students' concept understanding. While students' activity observation result in cycle I and II, can be seen in the table below:

Tab-5 : The Result of Students' Activity Observation in Cycle I and II

No	Students' activity	Contextual components	Cycle I Mean	Cycle II Mean
1.	Listening for the material	Asking, modeling	2,75	3,25
2.	Discussing about the material	Constructivism, Inquiry, Asking, Studying Community	2	3
3.	Writing the explanation about the material	Asking	2,75	3,5
4.	Making conjecture, arranging the argument, formulating the definition and generalization	Constructivism, studying material, and reflection	2	3
5.	Reading and explaining a presentation of group discussion	Constructivism, Inquiry, Asking, Studying Community, and authentic evaluation	2,5	3
6.	Making a question about the material that's achieve	Asking, reflection	2,5	3

From the table of learning implementation result based on the observation for the students, there are improvement from cycle I to cycle II, in the cycle I is as big as 60,4 (less) and than improve in cycle II as big as 78,12 (good)

The learning implementation improvement that's done by the teacher, improving the students' activeness and the students' enthusiastic to attaining the lesson that's delivered by the teacher more. While in the students' activity, the approachment between group members have an improvement from cycle I. It can be seen from the students' enthusiastic in doing LAS has been good, the students' ability in understanding the concept improves because the the students amount in understanding the question are increase, the enthusistic of the students to ask is getting better and condusive. Question and answer that's show in the discussion and presentation had been satisfying, the students are also more spirit in delivering the opinion, idea, in the discussion or presentation.

Based on reseach result and theoritical review above, it is prove dthat the learning with contextual approachment with mathflash graphic media can be improve the students' mathematic concept understanding ability in addition and subtraction of integer. The basic study theory related to contextual learning in this research are:

1. Piaget Theory stated that there are two process occure in children's development and grown namely (1) assimilation process, relating and matching new information with what she/he have known by changing if needed. (2) accomodation process, the children arrange and rebuild or change what she/he have known before so the new information can be related better. In contextuan learning implementation , the Piaget Theory becomes an important part to understand. Because, by understanding Piaget Theory, so ateacher can consider students' development ability, because children's mindset is different with adult's mind set.
2. Contrctivism Theory be a main basic of contextual learning. It is because of in contextual learning the students construct their knowledge actively. In constructivism, knowledge is not a set of facts, conepts, or the rule to remember or take. But must construct that knowledge and give the meaning with real experience (Trianto, 2009:28). The Constructive Theory is an important part that must be understood in contextual learning, because in contextual learning the students construct their own wxperience actively not as a process where the teacher's arguments are moved to the students.
3. Bruner Theory is the most important theory. It's caused by with the children's ability, they will try to show or organized its ideas structure in reaching a balance in their mind. It is in step with the essential of contextual learning, namely the students' participate in finding and informing the complex information actively to other situation (Trianto, 2009: 38)

As the reference, the researcher compare this research to the relevant research before:

1. The research by Sundari (2009). She concluded that, after contextual learning with mathflash graphic media was done, infact, it got more effective learning result to the students. In other words, this learning makes the students as the subject and initiative in learning activity..
2. Nanang (2009) did an experiment study about contextual learning in VIII Grade of Junior High School Garut Regency, the research result showed that understanding ability, problem solvingmathematic strategy arranged the students who get the contextual approach, and the students who got the learning with contextual approach colaboration and metacognitive is better than the students with conventional learning. Beside that, there is coleration between understanding ability, mathematical problem solving ability and strategy to manage the students, and based on the observation result and the students' performance evaluation based on CTL in good category.

Related research finding above, the researcher conclude that the research result before is a learning that implementated contextual learning with graphic media had better learning result than before. Generally, the implementation of contextual learning with graphic media can be an alternative to improve students' learning result through mathematic concept understanding ability. The related finding research strengthen the research that by implementating contextual learning with graphic media can improve students' mathematic concept understanding in addition and subtraction of integer in VIII Grade of Junior High School Garut Regency. Based on the comparison research before with the done research, showed that the steps in contextual learningwith graphic media is an important tool that influences the student' mathematic concept understanding.

6. CONCLUTION

The conclusions of this research are:

1. The implementation of contextual approach with mathflash graphic media can improve students' mathematical concept aunderstanding ability in addition and subtraction integer operation in VII Junior High School.
2. The learning management that held contextual learning model with mathflash graphic media in addition and subtraction of integer in VII Grade of Junior High School has been good..

7. SUGGESTION

The suggestion can be submitted from this research are:

1. Especially to the Junior High School mathematic teachers, who want to improve the students' mathematic understanding in addition and subtraction of integer mainmateria, can implementate contextual approach learning material with mathflash graphic media.
2. To the next researcher, so that this research is made a consideration to applicate contextual approach in mathematic learning with main material and other research subject that can be developed to the next research.

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