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Contextual Approach Using Pictures as a Media Increased Result and Motivation of Mathematical Learning

(Mathematical Learning of Fractional Addition by Equalizing the Denominator)

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Abstract—This research aims to understand the result of mathematical learning of Class IV student in elementary school. (1) Discovering the influence of the Contextual Approach to the student's motivation. (2) Discovering whether the Contextual Approach can increase student's motivation by equalizing the denominator for the class IV students. The Research uses descriptive method by using inferential statistical analysis technique. "Descriptive method is a method that focuses to solving current and actual issues. Inferential statistical technique is a statistical method to analyses sample data and creating general inference for the population." (Nisfiannoor, 2009:4). The approach used by the research is the quantitative approach. Quantitative approach is a research approach that uses statistical technique to test hypotheses and research instrument to be used to uncover data in a certain measurement scale, to be able to create a generalized statement for the whole population. (Sudjana and Ibrahim, 2004:8). There

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are several conclusions to be inferred from the result of the research. From the cyclical analysis, the improvement of the learning capacity was successfully implemented in the cycle I, cycle II, or even cycle III. Cycle I experienced an increase in average class scores from 42 to 72. Cycle II also experienced increasing from 72 to 81. While Cycle III experienced increasing from 81 to 83. The increases in scores are due to the improvement in the teacher's teaching method by implementing contextual approach. The approach ultimately increases the students' enjoyment of the learning, leading to an increase in the motivation for learning, therefore increasing the result of the learning itself. If the learning result improves, the quality of the education in the school also improves.

Keywords: Learning, Education, Contextual Approach

I. Introduction

Education is one of the most fundamental needs of mankind, for it was education that will prepare a man to face problems and challenges in his life. Therefore the quality of education is linearly related with humans' quality of life, an increase in the quality of education is an increase in the quality of life. In order to increase the quality of education there is a need for every stakeholder to participate in the quality improvement endeavor, most of all teachers as the educator. Not only as an educator, a teacher has multiple roles in the education process, a teacher must be able to pass on knowledge, facilitate learning, guide, and motivate the student to actualize the potential inherent in each and every student. As a motivator, teacher has to be able to drive the student to learn, to stimulate the students' curiosity and willingness to learn. This role is one of the most important roles a teacher has in order to improve students' learning motivation and capacity.

In order to motivate the student, a teacher has to have a mastery over the methods and models of teaching. The sheer number of students with different condition and capabilities means that there is no one model that is suitable to teach and motivate the entire student, therefore the ability to choose and implement a suitable method is a must for a teacher. However, in practice most teacher still dominate the education process, making the whole process teacher centric as opposed to the student centric ideal that is more suitable to increase the potential of learning in the students. The results are the student gets tired and bored of the whole education process. The

incessant memorizing, and the monotony of the education process severely inhibit the learning capacity of the student, thus lowering their test result.

Regarding said problem, this research tries to find out the appropriate method to increase the learning motivation and result among class IV student in elementary school. According to a latest research, the result of the mathematical learning particularly on the Fractional Addition in class IV student is still below the standard imposed by the government, achieving only 50 on average while the standard is 60. Therefore there is a need to improve the educational quality by special means.

Research Question

- How to increase the result of the mathematical learning process, particularly the Fractional Addition, by equalizing the denominator using picture as a media in the contextual approach in Kapuk Muara Pagi 07 Elementary School, 2014/2015 academic year Kapuk Muara Jakarta Utara?

Research Aim

- To discover the influence of contextual approach to students' learning capacity
- To discover whether the usage of contextual approach can increase students' motivation

II. Research Method

This Research uses descriptive method. "Descriptive method is a method that focuses to solving current and actual issues." (Nisfiannoor, 2009:4)

A. Data Collecting Technique

Data collecting technique used in this research are:

- Learning product test that are used to gather data regarding the result of Class IV mathematical learning process. The tests are an essay question with the answer key and evaluation criteria.
- Observation is used to gather data on the educational activity.

Gathered data will be analyzed descriptively and using percentage technique to uncover the learning pattern in the mathematical learning process. The calculation is as follows:

a. Mathematical Learning Product

Calculated by analyzing the average of the formative test done:

Score = $\frac{Total\ Students\ Score}{Number\ of\ Students} \times 100\%$

b. Students Aptitude

Calculated by averaging the formative test score with the number of the question in the test:

Score = $\frac{Total\ Students\ Score}{Number\ of\ questions} \times 100\%$

B. Analysis technique

The technique used by the researcher is “Inferential statistical technique is a statistical method to analyses sample data and creating general inference for the population.” (Nisfiannoor, 2009:4). The approach used by the research is the quantitative approach. Quantitative approach is a research approach that uses statistical technique to test hypotheses and research instrument to be used to uncover data in a certain measurement scale, to be able to create a generalized statement for the whole population. (Sudjana and Ibrahim, 2004:8).

III. LITERATURE STUDY

A. Learning Result

1) Learning

According to Winkel in Purwanto, learning is a psychological activity that occurs in an active interaction with the environment that results in changes in knowledge, skill, and attitude. Sardiman A.M. further expand on the definition by providing the essential principles of learning: **(1)** Learning is connected to the human potential and attitude**; (2)** Learning need stages and a certain maturity of the student; **(3)** Learning is more effective with intrinsic motivation rather than learning because of fear and stress; **(4)** Learning mostly consist of trial and error, and conditioning; **(5)** students’ learning capacity must be calculated to determine the appropriate learning content; **(6)** there are 3 ways of learning: Tutoring, Contact and experience, Imitating; **(7)** Learning through practice and direct experience is much more effective than memorizing; **(8)** students’ experience influence students’ learning capacity **(9)** Meaningful lesson is easier to absorb than meaningless lesson; **(10)** Information of students conduct, behavior, achievement, and failings can stimulate students motivation; **(11)** Learning process must be as varied as possible in order to stimulate students’ experience and motivation.

2) Learning Product

Learning product is the result of the whole educational process. In order to achieve good result the education process need to be able to sustain a fun and inspired environment for the students. According to Purwanto learning process can be explained etymologically by understanding the word “Learning” and “Product”. Product refers to the output of a given activity or process that cause a functional change in the input. Learning is an activity aimed to create changes in the learning individuals’ attitude. The change in the individuals’ attitude is the learning product. Winkel in Purwanto states that learning product is a change that caused human to alter its behavior. In that context-learning product is the end result of the learning process in line with the ends being attained. Sri Anitah suggested that there are 2 factors that determine the learning product; internal factor (motivation, goals, talent, etc.) and external factor (environment, family, school program, teacher, etc.)

B. Mathematics

Mathematics and Fractions according to experts

According to Johnson and Rising, Mathematics is a mode of thinking, organizing, and logical proofing using a symbolic language that is defined clearly, accurately, and succinctly. Mathematic is a symbolic language that expresses quantitative and spatial relationship that simplifies and makes thinking congenial and convenient as Johnson and Myklebust believes.

Fraction is a number that consist of numerator and denominator that represent a part of the whole. Fraction described how many parts of a certain whole are there in a conversation or in a mathematical exercise. Usually written down as e.g. 3/4, (three – quarter), 1/8 (one – eight).

C. Contextual Teaching and Learning

Contextual Teaching and Learning (CTL) is a holistic education process that aims to make lessons congenial and convenient for student to understand by relating the lessons with students’ experiences. It engages students in meaningful, interactive, and collaborative activities that support them in becoming self-regulated learners. In relating the lessons with real work experience of the students’ there are 7 main component of effective learning that must be kept in mind. Those

components are: **(1)** Constructivism; **(2)** Questioning; **(3)** Inquiry; **(4)** Learning Community; **(5)** Modeling; **(6)** Reflection; and **(7)** Authentic Assessment.

1) Key Concepts

Contextual is one of the key concepts that enable student to learn meaningfully. By learning meaningfully, students are more apt to apply the lessons in their everyday life, therefore achieving the goal of education. There are 9 key context that concern a student**: (1)** Goal Context, what goal is desired?; **(2)** Lessons Context, what lessons is given?; **(3)** Source Context what source is appropriate?; **(4)** Target Context, who is the target recipient?; **(5)** Teacher Context, who is doing the teaching?; **(6)** Method Context, what method is used?; **(7)** Product Context, how will the product measured?; **(8)** Maturity Context, is the recipient ready for the lessons? **(9)** Environment Context, what kind environment is conducive to learning?

As mentioned above, CTL is concerned in engaging students in meaningful, interactive, and collaborative activities that support them in becoming self-regulated learners by relating the lessons into real world context. As such there are 5 characteristics of the approach: **(1)** activating prior knowledge; **(2)** acquiring new knowledge; **(3)** understanding said knowledge; **(4)** applying the knowledge in the appropriate context; **(5)** reflecting upon the knowledge.

2) CTL Indicators

As it mentioned above there are 7 key components in the CTL. Those are:

- Constructivism: constructing knowledge from students' real world personal experience and personal knowledge structure
- Inquiry: Main activity of CTL, the students undertakes the process of Observation, Questioning, Hypothesize, Data Gathering, and Conclusion to uncover new knowledge.
- Questioning: A useful strategy of contextual learning to discover new knowledge and stimulating the students' motivation and understanding

- Learning Community: a community of shared learning, created by grouping together students to encourage communications between them
- Modeling: modeling is enunciating or expressing abstract thought into words. In CTL modeling doesn't have to come from teacher, the students or third party can be actively participating.
- Reflection: reflecting is revisiting prior experience and contemplating them. Its implementation in the CTL is that the teacher provides time for question by students on what did they learn today
- Authentic Assessment: it is a process to collect data relevant to the students learning condition. In CTL the learning condition must be understood by teacher to make sure the students are learning. The focus on the assessment can be on the output or the whole process

D. CTL Forms

There are 5 main forms of CTL. The first is **relating**, in which the teacher relate the content of the lessons into some prior knowledge of the students. Second form is **experiencing**, that is learning by personally experiencing the lessons, through exploration, discovery, and invention. Hands-on activities can involve manipulative, problem-solving activities, and/or laboratories or projects Third form is **applying**, in which the student apply what he knows in a problem solving activities. The teacher can encourage the behavior by giving them realistic and relevant problem. Fourth is **cooperating** in which the students cooperate in a group to solve a given problem, it also encourage the cooperative spirits in the students. Fifth is **transferring**, in which the teacher transfer their knowledge by creating learning experience focused on understanding rather than memorizing.

E. Pros and Cons

Every model always has its advantage and disadvantages, as with the CTL. The advantages of CTL are that the lessons are much more relatable; the students understand the lessons rather than memorizing it; it also encourage critical thinking

and problem solving attitude coupled with the courage to speak up their mind, therefore helping them to increase their interpersonal skill. On the other hand, the CTL approach necessitates a large investment in time and resource to make the model works.

F. CTL Criteria

As a summary, the criteria of a CTL based method are as such: the education process are student centric in which the students actively understand knowledge by working together in a group exercises while relating the knowledge to real world practical experiences. The whole learning processes are founded on prior experiences, in which learning is based on personal initiative, the student become self-regulated learner that learn purely for his own self-satisfaction and wellbeing rather than through fear. As such the knowledge and skills of the students expands according to their own experiences.

G. Picture Media

Etymologically, media is taken from the Latin word "*medium*" that literally means a connector or transmitter. Therefore a picture media is a visual or graphical medium that transmits a certain idea through usage of imagery and words (Sudjana, 2007: 68). Picture media can also be understood as an expression of event or experiences through graphical expression such as lines, words, symbol, or pictures (Azhar Arsyad. 1995: 83). According to Gagne (Arief S. Sadiman, 2007: 6), picture media is among the most widely used media in learning, because its ubiquity and ease of transmitting the idea.

H. Characteristic of Class IV Students in Elementary School

Essentially, elementary school students are the same as any other students. They are polite, friendly, good hearted, and obedient to the teacher. Students are happy to go to school because beside they get to learn science and general knowledge; they also get to learn religious knowledge. Most of the elementary school

graduate goes on to enroll onto higher school. Thanks to teachers motivating students, the students get to enroll into desired school.

IV. **RESEARCH RESULT**

A. Result of Increase in Educational Quality

From the data and the result of the analysis, it was found that there is improvement between learning product cycles, be it between cycle I to cycle II, or cycle Ii and cycle II. The evaluation results from the first cycle shows an improvement, from the average score of 42 pre cycle, to average score 72 in the end of the first cycle. The second cycle experiences the same improvement from 72 to 81 averages. While on the third cycle, the improvement peaks at 81 to 83. The improvements were caused by the usage of CTL with picture media as an improvement to the teaching methods.

Fun and inspired environment of learning can increase students' motivation, in effect increasing the students' learning product. If the increase of the learning product held out, in the long run, the overall quality of the educational process also experience an increase.

The processed data on the increase of learning product in elementary school student class IV is shown in the following graph:

Picture 1

Formative mathematic test result of elementary school class IV Pre Cycle, Cycle I, Cycle II, and Cycle III

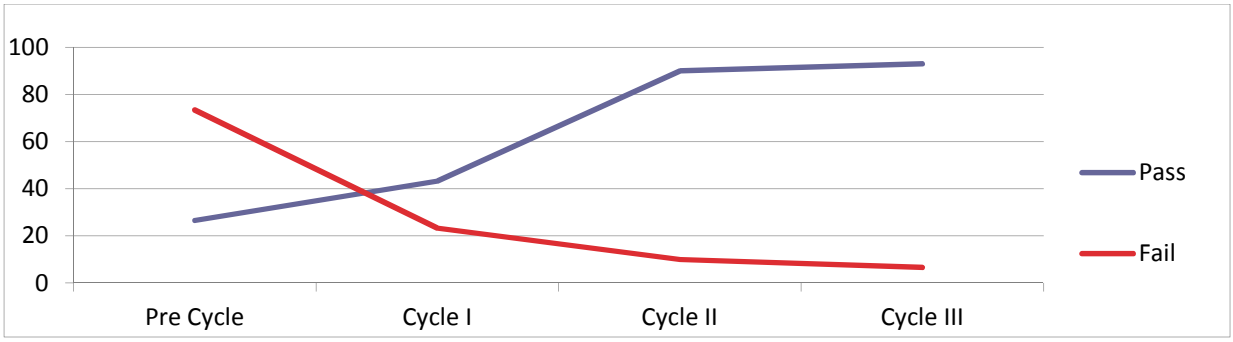

FIGURE1

IV. **CONCLUSION AND REMARK**

A. **Conclusion**

Generally the implementation of the three-improvement cycle is essential in improving the learning process of mathematics, especially on the subject of fractional addition by equalizing the denominator, in the second semester of class IV. Departing from previous problems, which will be solved through reflection and observation by supervisors.

With a good cooperation between teachers, principal, and the tutor, CTL with picture media can and will increase students' enthusiasm, motivation, and learning product of Mathematical Learning of Fractional Addition In Elementary School Class IV by Equalizing the Denominator. As proven by the observation increase in average class scores from 42 to 72 in Cycle I, from 72 to 81 in Cycle II, and 81 to 83 in cycle III.

B. **Remark**

Ultimately it can be mentioned conclusions; there are several points of importance to be done by teachers to improve the learning process:

- A teacher has to be able to stimulate the students to take active role in the learning process.
- A teacher has to be able to choose the appropriate method, media, and model of teaching that is suitable and fun for the lessons at hand.

- A teacher has to be able to provide a wide variety of test and problem in order to evaluate the students' progress.
- A Teacher has to always strive to improve his teaching ability and skill, in designing, implementing, evaluating, and improving a learning process.

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