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Development of Aljabar Materials Based On React Strategy To Increase Material Thinking About Metafora Students Moral Crisis

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ABSTRACT: Juvenile delinquency and moral crisis faced by students will certainly have an impact on the learning process. They will be left behind and lack the motivation and confidence in learning, one of them on the subjects of mathematics. One attempt to overcome them is with developing algebra teaching materials based on the REACT strategy to enhance students' metaphorical thinking ability. The research method uses research and development type formative research. The subject of this study is class VII in one of junior high school in Cianjur, Indonesia. Based on the results of research and discussion can be summed up some things as follows: (1) teaching materials that have been compiled good quality although still need to be refined again. (2) The students' metaphorical thinking ability through the use of the teaching materials is enhancing. (3) The student's response to this teaching material is very positive.

KEYWORDS: *React Strategy , Algebra, Teaching and Learning Materials, Metaphorical Thingking, Moral Crisis*

I. INTRODUCTION

Juvenile delinquency often exists primarily for education ranging from elementary school, junior high school and even high school. Juvenile delinquency is often caused by a moral crisis. One of juvenile delinquency is brawl. The thing that worries, this brawl occurs in junior high school in Cianjur 23/03/2017 (pojokpajar.com, 2017). The problem of moral crisis occurs as a result of several factors, namely family factors, peer group, school life and wider community including mass media and law enforcers. However, the determinants of the moral crisis are individual factors of perverted daily behavior, such as disobeying regulations, disrespect for the elderly, smoking and others (Sutisna, 2015).

Moral crisis is often found in children from economically disadvantaged families, divorced parents or children who are entrusted to relatives because their parents work abroad so that children get less attention from their parents. Based on the observations and interviews of teachers and students in one of the junior high schools in Cianjur revealed that 65% of students come from economically disadvantaged families and have divorced parents or abandoned by parents to work abroad so they are entrusted to their grandmother and less attention. Problems of the students' moral crisis will affect the learning process. They lack the motivation and confidence in learning, one of them on learning mathematics.

Mathematics is often regarded as a difficult subject and less desirable by students. Various facilities in learning mathematics such as textbooks are needed by students. This becomes a difficulty for students who come from poor families in the economy. They will feel burdened with various support facilities that they do not have because of economic limitations. In addition, interest, confidence and perseverance are required in these subjects. For children who get less attention from parents it is difficult to obtain because there is no motivation and support to learn math. Therefore, the mathematical value of the students in one of the junior high schools in Cianjur is low, including the material of algebra.

The average daily student re-examination score on Algebra material in this Junior High is only 5 students who fall into the high category, the rest (42 Students) fall into the low category. Student difficulties are caused by algebra that includes abstract material and difficult to understand by various students, especially this junior high school students in Cianjur who have problems prone to moral crisis. Though the material of algebra is very important in everyday life. In general, junior high school students are still not able to model a real situation into the algebra. Thus, junior high school students still think that the problem of algebra is a problem that cannot be modeled concretely. This is due to the lack of students' metaphorical thinking and low student self-confidence.

According to Alhaddad (2012) metaphorical thinking are used in understanding the abstract to be concrete. A low student's metaphorical thinking will lead to poor math skills. Metaphorical thinking helps students to connect a problem with something easier. With metaphorical thinking, you shift your frame of reference and make a connection between the problem and something else (Michalko, 2012). Through metaphorical thinking, divergent meanings become unified into the underlying patterns that constitute our conceptual understanding of reality (Pugh et al, 1992)

Student self-confidence is also low due to lack of motivation so should be developed their confidence, especially confidence in learning math. Teachers must choose a learning approach that accommodates students' confident development to be more motivated and like mathematics so that the optimal learning achievement of mathematic (Martyanti, 2013). One of learning approach that can be used is with the REACT (relating, experiencing, applying, cooperating and transferring) strategy.

Learning process based on REACT strategy has positive effect on students' attitudes and increase their success (Özbay and Kayaoğlu, 2015). REACT strategy is based on contextual learning methods. The REACT strategies are designed to help learners build new skills and knowledge regardless of their starting point. *Relating*: Learning in the context of life experience; *Experiencing*: Learning in the context of exploration, discovery, and invention; APPLYING:Learning by using new concepts and information in a useful context; *Cooperating*: Learning in the context of sharing, responding, and communicating with others; *Transferring*: Learning in the context of existing knowledge (CORD, 1999 [updated 2016])

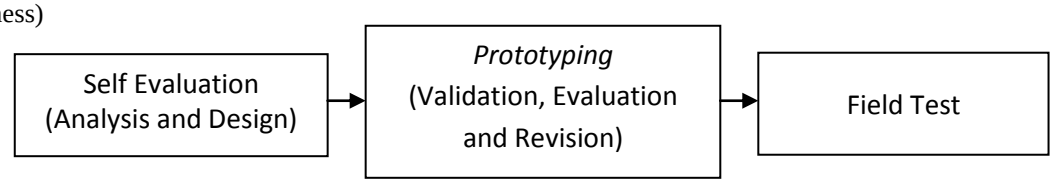
According to Arifin, Kartono, and Sutarto (2014) REACT strategy can improve the mathematical ability of junior high school students because students identify a problem and provide a simple explanation where the explanation will encourage students to issue their ideas (relating), ideas can be used to build the basic skills of students (experiencing), students are able to make a good conclusion, students can do it in groups by discussing (cooperating), students are expected to provide further explanation and set the strategy and tactics in applying the concept being studied (applying and transferring).

Efforts to overcome the above problems especially to students who are vulnerable to moral crisis through developing algebra teaching and learning materials based on REACT strategy.

II. RESEARCH METHODS

This study uses the method of development research type formative research. This research tries to develop teaching materials on algebra material based on REACT strategy to enhance metaphorical thinking ability and have good effect on every learning. Subjects in this study class 7 in one junior high school in Cianjur, Indonesia.

Teaching materials development procedure in this research consists of 3 stages: Self Evaluation, Prototyping (validation, evaluation and revision), Field Test (Nizarwati, 2009). *Self Evaluation*, This stage includes: 1) Analysis, Researchers analyze students, curriculum and exam materials. 2) Design, researchers compile algebraic teaching materials based on REACT strategies to improve metaphorical thinking skills. *Prototyping* (Validation, Evaluation and Revision), researchers made the first prototype, then validated by experts, the results of expert validation and evaluation were used as the basis for revision and the prototype was made. *Field test*, at this stage the second prototype was tried out to students who were the subject of the research (the product tested in the field test was a product that had met the standards of validity, practicality and effectiveness)



III. INDENTATIONS AND EQUATIONS(11 BOLD)

A. SELF EVALUATION

Mathematics teaching materials on Algebra are developed based on the competency standards of graduates as regulated by the Regulation of the Minister of Education and Culture No. 20 of 2016 on the Competency Standards of Primary and Secondary Education graduates as follows:

After adjusting to the graduate competency standards then adjusted to the level of secondary school education which includes the basic competencies of algebra material based on aspects of attitudes, knowledge and skills. Furthermore, it is adjusted to the characteristics of the REACT Strategy. Algebra teaching and learning materials developed consisted of three chapters, namely algebraic expression, linear equations and inequalities in one variable, the system of linear equations in two variables.

Table 1. Competency of SMP (Junior High School) / MTs / SMPL Graduates

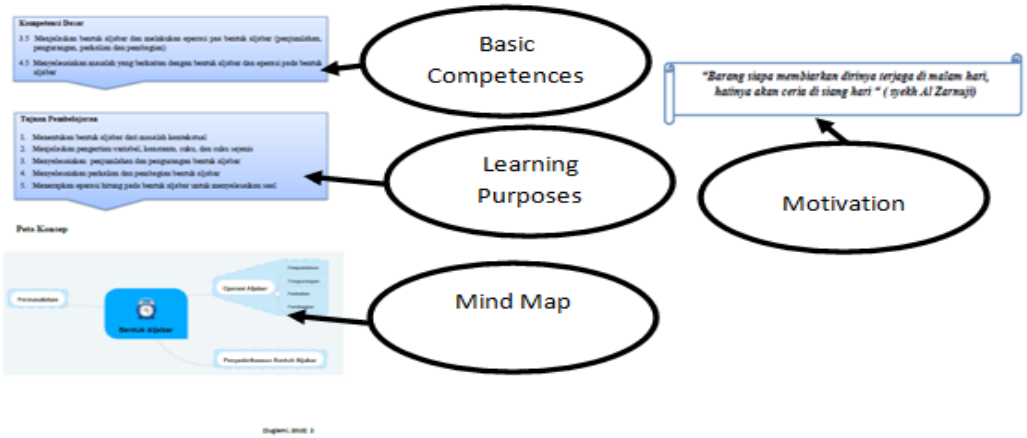
Attitude	Knowledge	Skills
Have behaviors that reflect attitudes: 1. believe and fear God, 2. character, honest, and caring, 3. responsible, 4. true learners throughout life, and 5. physically and mentally healthy in accordance with the development of children in the family, school, community and the surrounding natural environment, nation, country and regional region.	Have factual, conceptual, procedural, and metacognitive knowledge at a simple technical and specific level with respect to: 1. science, 2. technology, 3. art, and 4. culture. Ability to link the above knowledge in the context of self, family, school, community and the surrounding natural environment, nation, state, and regional area.	Having thinking and acting skills: 1.creative, 2.productive, 3.critical, 4.independent, 5.collaborative, and 6. communicative through a scientific approach in accordance with what is learned in educational units and other sources independently

B. PROTOTYPING

The teaching and learning materials are based on the competence of graduates and basic competencies (see Figure 3). Then validated by experts. Validation of teaching and learning materials that have been produced based on the assessment of linguists and mathematics.

Figure 2.

Figure 3



Assessment using a assessment instrument from BNSP (National Board of Education Standards) modified. There are 5 aspects of the assessment of teaching materials and learning tailored to the characteristics of learning materials REACT Strategy Algebra (see figure 3), which provides students with insight on how to solve daily problems about Algebra material. Experts have assessed teaching and learning materials and provided notes for teaching and learning materials improvements before they are used in learning. Expert validation results from various aspects are presented as follows:

Table 2 Validation of teaching and learning materials from Content Feasibility Aspect, final score from expert 1 with score of 87,5 which entered in very good category and expert 2 with score 75 that enter good category. It can be concluded that from content feasibility aspect, it is feasible to be used.

Table 2. Content Feasibility

Assessment Indicators	Expert Validation Results	
	Expert 1	**Expert 2**
A. Conforminty of material with basic competencies and core competencies	4	3
B. Accuracy of material	3	3
C. Supporting learning material	3	3
D. Material Upgrades	4	3
Final Score	87,5	75
Final Score Category	Very Good	Good

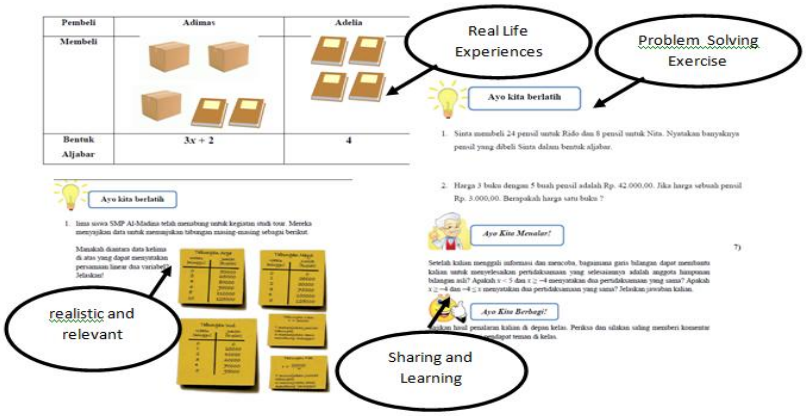


Figure 4

Whereas expert judgment from strategic aspect that is adjusted with REACT is as follows.

Table 3. REACT Strategy Aspects

Assessment Indicators	Expert Validation Results	
	Expert 1	**Expert 2**
A. Context is associated with real-life experiences	4	4
B. The existence of activities that encourage students in solving problems	4	3
C. There are exercises to place the rythmic and relevant concepts	4	3
D. Directs student learning in the context of sharing, responding and communicating with other learners.	3	3
E. Direct learning by using knowledge in a new context	4	3
Final Score	95	80
Final Score Category	Very Good	Very Good

It can be concluded that from the aspect of REACT Strategy, this instructional material is in accordance with REACT strategy that involve learners and deserve to be given. While the expert judgment of the aspects of language used module teaching materials that is as follows.

Table 4. Language Aspects

Assessment Indicators	Expert Validation Results	
	Expert 1	Expert 1
A. Straightforward	4	3
B. Communicative	4	3
C. Dialogic and Interactive	3	4
D. Conformity with the level of development of learners	4	3
E. Guidance and Integration of thought flow	3	3
F. Use of terms, Symbols, or icons	3	3
Final Score	87.5	79.16
Final Score Category	Very Good	Very Good

Overall of the four aspects of the assessment of linguists and mathematicians there is a note from mathematicians that "add more challenging questions for learners". While from the language experts that is "add more supporting data". Experts' notes are then followed up by providing additional challenging questions and adding more supporting data.

C. FIELD TEST

After the teaching materials are judged worthy by the expert is then used in classroom learning. Before the learning,t he students are given a test (pretest). Pretest is given to know students' metaphorical thinking ability. Learning activities using instructional materials that have been prepared are held approximately 4 meetings in the classroom. After the learning is done, the students are given test (posttest) again to know the Enhancementof students' metaphorical thinking ability. Then analyzed the improvement of students' metaphorical thinking ability based on pretest and posttest using gain index, presented as follows:

Table 6. The Result of Enhanching Metaphorical Thinking Ability

Enhancement Category	Number of Students	Percentage
High	25	81 %
Medium	4	13 %
Low	2	6 %

Only 2 students from 31 students or 6% fall into the low category in the improvement of metaphorical thinking ability. While almost 25 students or 81% enter into high category, thus the use of teaching materials can help students in mastering algebra learning materials. The students 'responses to teaching materials that are expected to increase students' self-confidence are presented as follows.

Table 7. Student Response to Teaching Materials (Books)

Statement	Strongly Agree	Strongly Agree	Agree Neutral	Disagree	Strongly Disagree
The teaching materials (Books) helped me make it easier in my frame of mind to solve the problem	27 %	73 %	0 %	0 %	0 %
Exercise on the teaching materials (Books) helped me in learning algebra	10 %	77 %	0 %	13 %	0 %
The exercises in teaching materials (Books) are confusing	10 %	27 %	0 %	59 %	4 %
The questions given in the teaching materials (Books) helped me to understand the algebra material	27 %	73 %	0 %	0 %	0 %
Positive words in Teaching Materials (Books) motivated me in learning	27 %	63 %	0 %	10 %	0 %

Based on the results of a questionnaire filled by students shows that all students give positive responses to the use of teaching materials.

The real impact that teachers have experienced when teaching using teaching materials that have been developed with the team, in the management of the class becomes easier because the discussion material presented makes students actively involved in learning and learning materials are relevant to the learning objectives.

Based on the final value data can be interpreted that the teaching materials developed effectively for students, as evidenced by the increase in learning outcomes. A mean score of 85 and 87% of students have earned a complete score over the Minimum Criterion. From the results of this study that learning materials can increase student value. At the time of utilization of teaching materials, teachers can more freely develop their own assessment sheet contained in the teaching materials in accordance with the needs and can be monitored student development during learning by using the teaching materials.

IV. CONCLUSION

Based on the results of research and discussion can be summarized some things as follows: 1) teaching materials that have been compiled good quality although still need to be refined again. 2) The students' metaphorical thinking ability through the use of the teaching materials is enhancing. 3) The student's response to this teaching material is very positive.

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