

Integrating Character Building into Mathematics and Science Courses in Elementary School

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ABSTRACT

The learning condition in elementary school lately shows that it considers to emphasize the aspect of knowledge and tends to set aside the learning process involving students actively. Teacher's deficiency of knowledge about the importance of character building is caused by less information and socialization of character building. Minister of Education Regulation (PEMERDIKNAS) No. 41 (2007) hints types of character needed to be integrated into school courses. The research is intended to review teacher's effort in choosing and deciding type of character integrated into specific school-courses: Mathematics and science. The result shows that deciding the types of character are found convenient for teachers to be applied in RPP; but in its implementation, it says that most of teachers do not understand about the types of character written in RPP are had to be emphasized in learning process. The learning process of those two courses are still dominated by the teacher, while the core activities in RPP claims that teachers have planned involving students actively through activities of exploration, elaboration and confirmation.

KEYWORDS

Character building, Mathematics and science, elementary school

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Introduction

The application of character building's model in elementary school since the enactment of curriculum 2006 (KTSP) emerged polemics among pedagogues especially elementary school teachers and education stakeholders, related to difficulties in implementing character building through school courses for elementary school teachers. Meanwhile, the education stakeholders look forward that character building must have published the types of character on every lesson plan (RPP) establishment which is a more-detailed elaboration of the annual program (Prota), the semester program (Promes) and syllabus.

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Minister of Education Regulation (PEMERDIKNAS) No. 41 (2007) which is about the standard process states that syllabus as development reference of RPP accommodates identity of school subjects, competency standard (SK), basic competencies (KD), learning materials or topics and character development of students expected. Syllabus development requires to list elements of character building on components provided by noting the types of behavior that should be imparted to students in order to strengthen their characters.

Thus, the research aims to:

- a) Identify how to determine types of character which are further integrated into mathematics and science subjects.
- b) Identify how to choose learning method laden with types of character to be integrated into mathematics and science subjects.
- c) Identify learning's evaluation tools of mathematics and science subjects which integrate types of character.
- d) Observe and supervise the learning's implementation of mathematics and science subjects which integrate types of character as a learning method mathematics and science in elementary school.

Litrature Review

Character Building at School

In the use of colloquial language, the use of 'character' term can be understood as a standard of someone's goodness or badness (Wahyudin, 2013). Then the implication refers to a characteristic that has existed protractedly within someone, although not always so. Koesoema (2007) depicts about character that: "...the term of character is considers the same as personality. Personality is believed as an attribute or characteristic or style or trait of a person that comes from derivatives belong to environment, such as family in childhood and also connatural".

Guidelines of cultural studies development and character of nation (Puslitbang Minister of Education Regulation (PEMERDIKNAS) No. 41 (2007) cultural development and nation's character principally are not included as subject but integrated into courses, self-development and school culture.

In relation to syllabus making, according to Minister of Education Regulation (PEMERDIKNAS) No. 41 (2010), character building or naming the values is clarified in a part of syllabus with providing column to accommodate types of character which are relevant to basic competencies and learning objectives on each subjects. PERMENDIKNAS cites character type that must be well-managed by students of elementary-education stage for low grade, comprising: discipline, persevering, responsible, precision, cooperation, confidence and courage. While elementary-education stage for high grade is: truthful, respect and regard, persevering, responsible, courage, integrity, preserving, honest and nationality.

If this condition is not well maintained immediately, then it will have a bad impact to the purpose of learning character-based mathematics and science which the high mastery of materials is not balanced with the practice of character's actual values, or in other words the low ability of students to socialize in social life that implements the value of mathematics and science.

Therefore, the study of mathematics and science learning process by integrating the values of character are indispensable in order to improve school's learning system.

The application of character's model in elementary school specifically seems to be child-centered, giving immediate experience, providing concepts of various fields of study within one learning process by integrating character building; the learning result can develop in accordance with children interests and needs, meaningful, holistic, flexible and active.

In creating a learning environment that integrates character building into classroom subjects, it requires proper support of pedagogical ability, materials mastering, learning methods mastering, and the availability of learning facilities and the ability to integrate character building into subjects that are applied in the classroom, as the following picture:

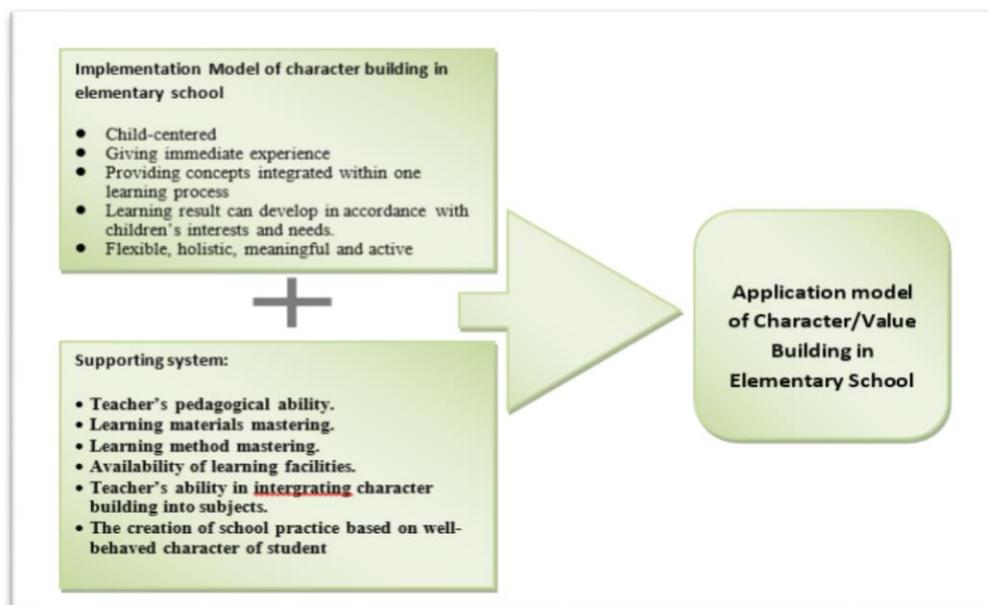


Figure 1. Research Design

Research Method

The research uses descriptive-qualitative approach, a research procedure which produces descriptive data in the form of written and spoken words from people and behavior that is able to be observed (Moleong, 2001). The informant used in the research is school 'X' mathematics and science teachers from grade 1 to VI, consists of twelve persons. Data collecting is done through interviews, documentation study (RPP) and classroom-observation. Primary data are the data collected from learning observation and interview result, while secondary data are RPP arranged by teachers to organize the learning.

In an attempt to integrate character education in teaching and learning process, teachers are required to have pedagogical competence, mastery on the

materials, effective teaching method and ability to integrate character education in their classroom. The school is also necessary to have proper facilities. The following figure illustrates this.

Result and Discussion

The results of research on the Development of Integrated Model of Character Education in Mathematics and Science in Elementary Education are as follows.

Choosing which character values to be integrated in teaching materials

From the subject of the research, which are 12 mathematics and science teachers in elementary level, it is found that (a) almost all teachers (91.5%) states that essentially, they do not found it difficult to design or prepare the lesson plan for the students in all grades; (b) all teachers (100%) have incorporated character values (taken out from character values stated in the Minister of National Education decree No 41 Year 2010) emphasized on in every material in accordance with the competence standard, basic competences and key indicators as well as the objective of the teaching learning process; (c) the choosing of character values in lesson plan is conducted by analyzing the interconnectedness among the competence standard, basic competences and key indicators as well as the objective of the teaching learning process; and (d) teachers will deepen the character values by linking the values in every materials they deliver.

Teaching learning implementation

The analysis of the findings illustrate that (a) there is only one from six teachers (16.6%) who implement character building in the teaching and learning of mathematics; (b) the rest (83.4%) deliver their materials 'as usual', without asserting character building despite the lesson plan stated that there are at least two characters that should be strengthen; and (c) in science teaching and learning process, all teachers (100%) do not assert character building in the teaching and learning process.

The method chosen in teaching mathematics are (a) 66.8% of teachers opt lecturing which is followed by exercise to answer questions; (b) 33,2 % of those chose group work which is followed by group presentation. Meanwhile, in teaching science, (a) half of the respondents (50%) tend to apply a method of lecture and task in which teachers explain the materials in the forms of figure, diagram or chart for the lower grade and (b) the other half (50%) apply a method which involves discussion, demonstration and role-playing.

The formative test conducted by the teachers at the end of the teaching and learning process is intended to evaluate and discover how much the students understand from the materials presented. The evaluation instrument applied by all teachers is a module consisting of a series of questions and problem to be answered and solved. From the minimum requirement of passing mathematics subject, which is 65, the class mean score is 68. Similarly, in science subject, there is also an increase of the mean score of the class, which is 75 (the minimum requirement of passing the subject is 70)

To set a common ground between the researcher and teachers on their perception toward teaching and learning process, this research applies clinical

supervision. Generally, all teachers assert that (a) the integration of character values in teaching materials is not optimally socialized, this is due to the partial socialization from incompetent resource persons; (b) character values have to be incorporated in lesson plan, but it is not necessarily be strengthened in teaching, rather they are what influence students to achieve the objective of the lesson plan; (c) they realize that character building in teaching and learning process will affect positively on students' personality which will engage them to actively participate and improve their score; (d) choosing character values is not only a formality to fulfil requirements in designing lesson plan; and (e) character building will stimulate students to keep learning as they get positive feedbacks from the teachers; this assertion is in line with Wahyudin (2013) who states that teachers build positive learning atmosphere by providing students opportunities to discover, apply their own ideas and use their own strategies to learn. This is conducted to help students gain more understanding independently. For students, the focus of learning should be moved from "being told" to "actively discover".

Conclusion and Recommendation

Conclusion

This is for all mathematics and science teacher of elementary level who are to design lesson plan which incorporates character values. The integration of the values into teaching materials is conducted through a series of analysis starting with identifying annual and semester program. In addition, the lesson plan has to include competence standard and basic competences in which the character values are inserted based on the teaching materials and media. These steps aim at supporting character building in mathematics and science education.

The mathematics and science education in elementary level have not optimally built students' character. One of the factors is that because teaching and learning process is still emphasized on lecturing, whereas in the lesson plan, the method should have involved more exploration and elaboration by the students while the teacher is merely to confirm the validity of the arguments.

The implementation of science education in elementary level has involved students more into the teaching and learning process even though the majority of teachers (83%) still choose demonstration and discussion method in the beginning. The interaction between students and teacher has been conducive since the teachers prepare proper learning props, even they utilize power point slide on human, plant and animal organs to support the teaching and learning process.

Recommendations

a. The implementation of Minister of Education Regulation (PEMERDIKNAS) No. 41 (2007) about teaching is supposed to be considered by school leaders since it is able to encourage and motivate teachers in order to prevent teachers' indecisiveness of themselves.

b. The result of research requires further investigation as most of teachers are still indecisive to character building in which it is responsible to teachers (first to sixth grade), school leaders and all educators.

Disclosure statement

The Authors reported that no competing financial interest.

Notes on contributors

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