

## MATHEMATICS LEARNING BASED MATHEMATICAL COMMUNICATION CULTURED AND CHARACTER OF INDONESIA

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### Abstract

Communication is an activity that cannot be separated from human life and character of the local culture. Through communication one can express ideas and thoughts. Through communication human socialize each other in accordance with the character of the culture, as well as receive and make learning, develop the cultured character and many more activities conducted through communication. Education of culture and national character can be implemented through a learning process at school which is integrated in every lesson. Thus, in the process of mathematics learning can also be used to develop the mathematical communication which is cultured and have national character. But the problem is how to teach mathematics to develop the culture and have Indonesian national character.

**Keywords:** Mathematics communication character cultured Indonesia

### 1. Introduction

Character education cannot be taught only by words or just a theory, but the character and culture are studied with real-life examples that can be modeled. For example, over the years students were given religious instruction and moral education of Pancasila, but what students seen in the real life contradict with the theory both of these subjects, then both of these subjects are "just a theory" that cannot used as a way of life.

Character as a moral built on a variety of virtues which in turn only has meaning when it is based on the values prevailed in the culture. Indonesian national character is a character owned by Indonesian citizens based on actions which are valued as a virtue prevailed in the society and the nation of Indonesia. In the Kemendiknas (2010) is said that education of culture and national character are *developmental*, while the teaching materials are *mastery* as well as a competency. The difference in the nature of the two material groups requires the different treatment in the educational

process. Educational material that is *developmental* requires a long and mutually reinforcement of learning process between learning activities and other learning activities. For example, when doing the exam "*cheating*" are seems to become a culture of almost all pupils and students.

Dewi (2013) declared the results of a survey from 12 junior high school teachers in Medan, there were 83.3% of teachers said students are lazy, 66.7% of teachers said the students' interest in learning are less, 91.7% of teachers said students do not respect, and undisciplined, and 41.7% of teachers said students are not creative. In line with the results of the survey, the current objective conditions, many students who are not honest in exams like seeing the friends' answer and work together when taking the exam, students prefer to ask their friends before thinking themselves. From these data are needed a learning model based mathematical communication which have character and culture of Indonesia.



The question to be answered in this paper is how the steps (syntax) of mathematics learning based mathematics communication cultured and character of Indonesia?

## 2. Material and Method

Communication is an activity that cannot be separated from human life and character of the local culture. Through communication one can express ideas and thoughts, can socialize with each other in accordance with the character of the culture, as well as receive and make learning, and many more activities conducted through communication to develop the cultured character. Instead there are many problems that can be appeared due to a communication error. Besides that it can be used to share ideas and information, through communication people can reflect his understanding of something. In mathematics,

of students to formulate concepts and strategies, (2) the asset of success for students of the approach and completion in the exploration and investigation of mathematics, and (3) a forum for students to communicate with friends to obtain information, share thoughts and discoveries, assess and sharpen ideas to convince others.

Communication process is essentially the process of delivering a feeling or thought by the communicator to communicant. The feelings can be a conviction, certainty, concerns, etc. arising from the heart. While the minds can be ideas, information, opinions and other emerging from his mind. When examined understanding of communication that has been given, then the communication in mathematics can be defined as the process of delivering a message that contains the mathematical material. While the parties involved in communication in the

communication is a need to be noticed. When a student is challenged to think and reason mathematically and ask them to communicate either orally or in writing, means they are challenged to learn to gain a more clear and convincing understanding.

The learning activities in school is a form of communication between lecturers and students or between students and other students. The importance of communication in mathematics as described in the following opinion: "Communication makes mathematics thinking observable and therefore facilitates further development of the thought. It encourages students to reflect on their own knowledge and their own ways of solving problems" (NCTM: 2000). Furthermore, Greenes dan Schulman (1996) said the mathematic communication is (1) the central strength

classroom are lecturer and students. The means used to convey the message can be done verbally or in writing. The effects that can be obtained from communication in the mathematics is the students mathematics understanding.

Character is nature, behavior, moral, or personality that is formed from the internalization of various virtues which are believed and used as a basis for perspective, think, behave, and act. Virtue consists of a number of values, morals, and norms, such as honest, courageous, act trustworthy, and respectful to others. Students' interactions with others grow the community character and national character. Therefore, the development of national character can only be done through the development of individual character of students. However, because humans live in a particular social and cultural environment, the development of the individual person's character can only be done in a concerned social and cultural



environment. That is, the development of culture and national character can only be done in an educational process that does not release students from the social environment, culture, and national culture.

This following table describes the linkages between values and value descriptions of culture and national character education.

Table 1: Value and Value Description of Culture and National Character Education

Value	Description
1. Religious	Attitudes and behaviors are obedient in carrying out the teachings of their religion, tolerant of the practice of other religion, and live in harmony with other religions.
2. Honest	Belavior based on an attempt to make himself as someone who is always trustworthy in word, act, and work.
3. Tolerance	Attitudes and actions that respect the differences of religion, race, ethnicity, opinions, attitudes, and actions of others who are different from themselves.
4. Discipline	Action which shows an orderly and obedient behavior on various rules and regulations.
5. Hard Work	Behaviors that indicate an earnest effort to overcome various barriers to learning and assignments, as well as completing the task as well as possible
6. Creative	Thinking and doing something to generate new method or result from something that has been owned.
7. Independent	Attitudes and behaviors that are not easy to depend on others in completing tasks.
8. Democratic	Way of thinking, being, and acting the same rights and obligations judging himself and others.
9. Curiosity	Attitudes and actions are always working to find more depth and breadth from things he had learned, seen, and heard.
10. Spirit of Nationality	How to think, act, and sound that puts the interests of the nation and the state above those of himself and his group.
11. Love of Country	Way of thinking, being, and doing that show the loyalty, caring, and high appreciation of the language, the physical environment, social, cultural, economic, and political nation.
12. Appreciate the Achievement	Attitudes and actions that encourage him to produce something useful for society, and acknowledging, and respecting other people's success.
13. Friendly/ Communicative	Actions that demonstrate a sense of love to talk, hang out, and work together with others.
14. Love Peace	Attitudes, words, and actions that make other people feel happy and safe over her presence



Value	Description
15. Love to Read	Habits take time to read the various readings that give virtue to him.
16. Care Environment	Attitudes and actions that strives to prevent damage to the surrounding natural environment, and to develop measures to improve the environmental damage that has occurred.
17. Social Care	Attitudes and actions always wanted to help other people and communities in need.
18. Responsibility	Attitudes and behavior of a person to carry out the duties and obligations, he should do, to self, society, environment (natural, social and cultural), country and God Almighty

### Research Methodology

This paper is a portion from research development. Development method used was adapted from Plomp (1997), namely: the initial assessment stage, design stage, realization / construction stage, evaluation and revision stage, and the implementation stage. So in this paper is still in a limited trial.

The subjects were the students in Grade VIII in junior high school. The selection of junior high school students as research subjects based on a consideration of the level of cognitive development of junior high school students who are still at the stage of transition from childhood towards adult. In addition, during junior high school, either physical or psychological growth is at the stage of puberty which requires the formation of character and culture.

### 3. Result and Discussion

From the analysis result of the objective conditions in mathematics learning and the needs of junior high school students in Medan to improve the mathematical communication characteristic and culture of Indonesia, then designed an alternative learning mathematics based Mathematical Communication and Character Cultured Indonesia, then designed an alternative mathematics learning based mathematical communication character and cultured.

Generally, the purposes of this learning model are that the students can construct their own understanding can communicate ideas clearly, can reflect an understanding of knowledge, can respect for others, can respect the culture and be the human being who is objective and open to the give input. Steps (syntax) from mathematics learning model based Mathematical Communication and Character Culture Indonesia can be described as follows.

1. *Introduction / Motivating Students.* In this stage the teacher motivate students by giving the real problem that exist in the Indonesian region that can be solved with mathematics. This is done so that the students are interested in learning mathematics and love the culture of Indonesia.
2. *Presenting the material and give a problem to be solved.* This stage aim to enable students to construct their own knowledge and working hard to resolve the problem.
3. *Asking students to work in groups.* The characters which are expected at this stage is that students can communicate their mathematical ideas to friends, work together and help each other, and respect the opinions of others. At the time, the interactive will be formed between students and other students and between teachers and students.
4. *Asking students to make a clear presentation from the results of*



*discussion.* When students are given the opportunity to express their understanding in front of the class means students are given the opportunity to communicate their mathematical ideas clearly. In addition, when students are already practicing some technical of confidence and for other students (the audience) it will be a reflection on the understanding that they have.

5. *Motivating other students to ask questions or give opinions.* This stage is expected that students want to share their opinions, dare to give arguments for their understanding, and to reflect on their understanding.

6. *Guiding students to take conclusions.* At this stage the teacher asks students to infer what they have gained from Table 2: The Trial Result about the

the learning. The characters which are expected is that students can take their own conclusions so that students can become independent.

7. *Asking students to give value to the group.* At this stage students are trained to become an objective, honest, and does not distinguish or choose a friend.

8. *Informing the assessment results.* At this stage the students practice to be open and ready to accept the risk.

9. *Giving award.* At this stage the teacher gives a real example to the students to appreciate other's academic abilities.

The trial result which is carried out in the mathematics learning based mathematics communication which have character and culture of Indonesia can be seen in Table 2 below.

Response of Students of Learning

Description	Satisfied	Unsatisfied
Opinions of students to the components of teaching and learning activities		
a. Learning atmosphere in the classroom	33 people = 97,1%	1 person = 2,9%
b. Activity sheets were used	32 people = 94,1%	2 people = 5,9%
c. Tasks were given	33 people = 97,1%	1 person = 2,9%
d. Cooperation in groups	28 people = 82,4%	6 people = 17,6%
e. Class presentation	32 people = 94,1%	2 people = 5,9%
f. Giving value to fellow groups	29 people = 85,3%	5 people = 14,7%
g. Mathematics communication training activities	29 people = 85,3%	5 people = 14,7%
h. Overall teaching and learning activities	33 people = 85,3%	1 person = 14,7%

Open suggestion that was given by the students due to the learning process is suggested for even more groups can present their work. It shows that the students have dared to communicate what they think

#### 4. Conclusion

Junior high school students have ranged in age from 12 – 15 years which is a teenager age who is looking for identity and began to break away from the family. To "escort" them from negative norms then they need to be equipped with an education



that is communicative, have character and culture of Indonesia. One way of "debriefing" of communication, culture and character of Indonesia which can be given in the learning of mathematics. Learning steps that can be used are: a) Opening / Motivating students, b) Presenting the material and give the problem, c) Asking students to work in groups, d) Asking students to make a class presentation, e) Motivating other students to ask questions or give opinions, f) Guiding students to take conclusions, g) Asking students to give value to the group, h) Informing the assessment results, and i) Giving award.

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