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COMMUNICATION MATHEMATICS IN PROBABILITY OF STUDENTS GRADE XI IPA USING PMRI APPROACH

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Abstract

This research aims to knowing the mathematical communication skills of students XI IPA SMAN 1 Penukal Utara on content probability that which developed using PMRI approach. This research is design research that consist of two stages, namely the preliminary study and formative study. The subject of this research is the students XI IPA SMAN 1 Penukal Utara that consist of 32 students. The collection of data on this research using walkthrough, observation, documentation, interview, and questionaire. Potential effects of oral and written communication skills as seen from the results of the field test that resulted in 12.5% of students who are low, its mathematical communication skills 43,75% communication skills students are. 40,63% higher, and 3.13% is very high.

Keywords: Design, PMRI, Probability, verbal communication, writing communication

INTRODUCTION

Mathematics need given to all students as a basis for equip them the ability to think logically, analytical, systematic, critical, creative, and cooperate, s stated in the regulation of the Minister of national education of Indonesia (Permendiknas Nomor 23 tahun 2006). Through mathematics expected the students has the ability: (1) understanding the concept of mathematics, explain the relationship between the concepts and apply a draft or algorithms in a lithe, accurate, efficient, and exact in problem solving, (2) using reasoning patterns properties, compile evidence, or explain the idea and mathematical statements (3) to solve problems that include the ability to understand the issues, design a mathematical model, complete model and interpret the solution obtained, (4) communicates ideas with symbols, tables, diagrams or other media to explain the situation or problem, (5) Having the trait of appreciating usefulness mathematics in life, namely curiosity, attention and interest in learning mathematics, and attitude ductile and confident in solving a problem (Depdiknas, 2006:346).

Capabilities described above, can be viewed by communications, as mentioned by Pugalee (2011:296)

> *When students are given the opportunity to communicate about mathematics, they engage thinking skills and processes that are crucial in developing mathematical literacy. Students who are supported in their speaking, writing, reading, and listening in mathematics classes reap dual benefits: they communicate to learn mathematics and they learn to communicate mathematically.* .

Sabandar, et.al. (2010:911) said mathematical communication skills cannot appear by itself, but needs to be drilled in the learning activities. During learning mathematics is more focused on the aspect of computing which is algorithmic. It is not surprising if the students in General can perform a variety of mathematical calculations, but less satisfactory results regarding its application in daily life Mahmudi (2009:1) said learning mathematics should not only includes a variety of mastery of the mathematical conception, but also associated with his application in real life.

Problems in learning mathematics are also expressed by Ilma (2007:21), she said he low student achievement at the school, which is assumed because the learning material caused less attractive due to the lack of examples which applicated in everyday student life and learning methods are more focused on the teacher. In the implementation of the lesson that teachers are required to use the lesson plan (RPP) that have made by teacher in Musyawarah Guru Mata Pelajaran (MGMP). Unfortunately indeed in learning teacher draft have used as reference in teaching but draft used is the result duplication other school steps that still conventional (Fitriani, dkk., 2010:54).

To solve the problems in a bid for needed reforms in order to increase the quality of education and teaching one of them is to design a device of learning, choose a strategy or means in making and conveying the subject matter. For example, start with a learning situation with students, guiding students to be actively involved in the learning process and are able to help students develop appropriate intellectual level making it more strengthen the understanding of students of the concepts being taught.

This is in line with the opinion of the Kesumawati (2008:134) which states the main principle in the study of mathematics at the moment is to fix and prepare the learning activities that benefit students. The reform seems to be done especially on the creation of mathematical material that is focused on applications of mathematics in everyday life and the use of methods of mathematical learning actively. One approach-oriented experience of everyday students that emphasizes on the meaningfulness of students in learning is PMRI (Pendidikan Matematika Realistik Indonesia).

PMRI is one approach to learning that herding students understand math concepts by constructing its own through prior knowledge related to daily life, by finding the concept itself, then the expected student learning becomes more meaningful (Ilma, 2011:548). Based on research by Ilma (2011), learning by approach pmri can enhance communications mathematical students. Students learn from the absence of matter contextual close to everyday life, then eventually bring up a mathematical concepts. From the contextual of problem given, students develop own mathematical models to mathematics formal. Through matematisasi mathematics, the model was be a model of for knowledge informal and the model for for knowledge formal.

In the discussion groups and classes, students give the arguments and interpret the models created, so arise interaktifitas among students. Thus, students learn to communicate in verbal form. In this research, researchers designing matter about probability in the form of sheets of the activity of students (LAS) using PMRI approach.

Based on the description above the formulation of problems in this research is: *How the effects of potential material opportunities that designed using the approach of mathematical communication ability of PMRI oral and written grade XI IPA?*

Based on the above problems purpose in this research is knowing the effects of potential material opportunities that designed using the approach of mathematical communication ability of PMRI oral and written grade XI IPA.

This research is design research that consist of *preliminary study* and *formative study* Researchers designing matter probability using PMRI approach, that result "Lembar Aktivitas Siswa (LAS)".

The steps that researchers use is like on a flowchart according to Tessmer (in Zulkardi, 2006) below:

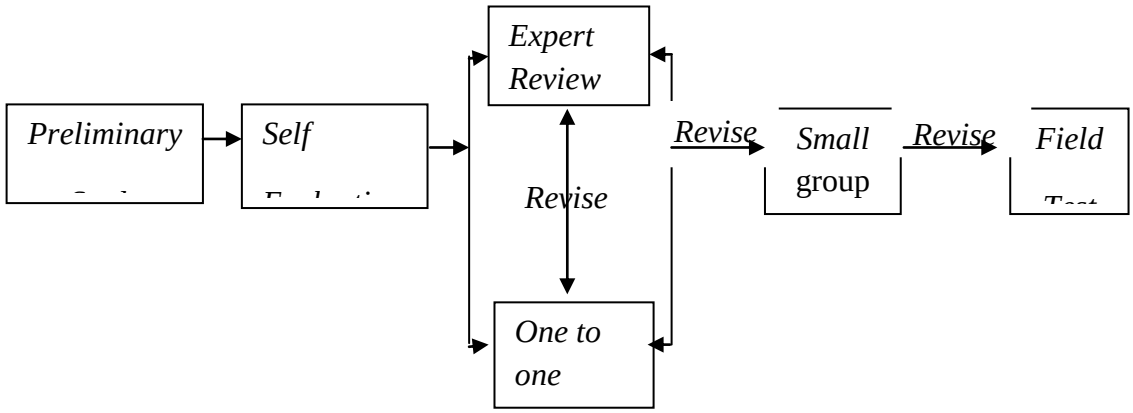

Figure 1. Research Method

MAIN SECTION

In this research, researchers make the material of probability using PMRI approach. Researchers through two stages which is that preliminary study and formative study. Activities performed at the stage of a preliminary study are researchers doing preparation and restyling of the learning materials. Activity that was done on the preparation stage is performs analysis curriculum on any material probability class XI IPA and contacting experts and friend peers to asked willingness be validator. On the stage designed, researchers designing matter probability in LAS performed using PMRI approach based on the purpose of communication that would be achieved.

There are several indicators of communication skills used in this research:

a. Oral Communication: Students exchange opinions with their groups to finish the the LAS, students presented the results of the working group, students ask questions on other groups or opinions in a discussion of class,
b. Written Communication: Students write down the mathematical expressions, symbols or Figures to present their idea, Students write down the answers of the questions contained in the LAS, students record the ideas presented in the form of writing

In formative study, researchers have done *self evaluation, expert review* and *one to one, small group,* based on the revision that have valid and practical of worksheet *field*

*test (*based on the revision that have valid and practical of worksheet*).* Valid seen from advice validator who has committed validation by evaluating matter contained n las based on content, construct, and languages. Which then revision by researchers. practical, relating to material which is designed easy to use by teachers and students.

Observations on field test can be seen on the results of the analysis of mathematical communication ability observation sheet grade XI IPA obtained the following results:

Interval	Frequency	Category
91 – 100	1	Very high
71 – 90	13	High
41 – 70	14	Medium
21 – 40	4	Low
0 – 20	0	Very Low

Table 1. Qualification (modification of giulford in ruseffendi) (2005: 160)

From the table above, there are 12.50% of its mathematical communication skills of students who are low. In the process of learning fourth students were not following learning at a meeting next. There are 43,75% students under its mathematical communication skills. Based on the observations of the researchers, students are less active in the group. From the table also can be known that there are 40,63 percent of students high, the ability of connection and 3,13 % very high. hose numbers clearly visible during class discussion. Based on research observations, mostly students, lacking the confidence to come forward class conveys its results. When asked of the group discussion results gives an advanced, they tend to be bowed and silent, but at the moment they do group discussion, they communicate with each other. After the values are obtained from the results of the calculation, obtained mathematical communication skills that the students of Class XI IPA is said to be moderate, with the average value of 69,375.

According to Rahmat in Hapsari (2010:3) when people feel inferior, he will have difficulty to communicate his ideas to other people, and to avoid talking in public, for fear of other people blame him. Based on the experience of researchers, most of the students do feel inferior or less confident to communicate the idea in public, the cause is as revealed by grace in hapsari above.

CONCLUSION

This research has resulted a product of LAS using PMRI approach which valid and practical, and have effect potential against the ability to communicate mathematical students well verbal and written.

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