Implementation Of Textbook That Integrates KKNI 6 Task Improving Student Mathematical Communication Ability.

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Abstract. The purposes of this study were: first to determine the mathematical communication ability differences between students who learned with textbook that integrates 6 task KKNI and students who learned without using textbooks that integrated 6 task KKNI; second to describe the interaction between the application of textbook integrates 6 task KKNI with students’ mathematics prior knowledge. This study is semi-experimental research. DIK class D-Mat 2019 and the class F-MAT DIK 2019 were randomly selected as consecutively the control class and the experimental class. The instrument used for this study took place, namely mathematical communication ability test and observation sheet. Data was analyzed using ANOVA analysis and ANACOVA. The results showed that, the first class of students communication skills mathematical experiment better than the students who are in the control class. Second, there is no interaction between the application of integrated textbook 6 KKNI task and beginning math ability of students to students mathematical communication.

1. Introduction

The government has made some efforts to improve the quality of mathematics education in Indonesia. One of them by change the curriculum. Along with the development of science and competition in the world of work today, college graduates are required to have a profile of graduates with his knowledge. Therefore, a curriculum is needed in which there are courses that provide core skills that will be achieved.

In an effort to qualify the college graduates in Indonesian, the government has issued papers No.2012 years about the Indonesian National Qualifications Framework (KKNI) [7], Permendikbud No. 73 2012 [8] years about the Learning Outcomes In accordance with Level KKNI and UU PT No. 12 2012 [10] years article 29 about the Competence of graduates is determined by referring to the KKNI. KKNI a qualifications framework that pair, equalizes, integrate, education and training and work experience in order to award the recognition of the competence of work in accordance with the position of labor in various sectors, and produce graduates who are qualified and productive in accordance with the work competency standards both nationally and internationally with learning outcomes (learning outcomes).

In the application of mathematics curriculum in the Department KKNI Faculty of Science, University of Medan institute against Rector University of Medan No. 065 / UN33 / Kep / 2016 [9]. The demands of the 6 (six) task KKNI applied curriculum in mathematics, namely; (1) Task Routine
TR), (2) Critical Book Review (CBR), (3) Journal Review (JR), (4) Mini Research (MR), (5) Idea Engineering (RI), (6) Project (PR). Efforts to improve the quality of education continues to be done both conventional and innovative. However, the quality of education has yet to show the maximum results as expected. It can be seen from the List of Participants and Final Value on TA. 2018/2019 primarily on a set course and logic. Thus, to achieve maximum results in the execution of tasks such KKNI, researchers designed an integrated textbook 6 KKNI duties and is expected textbooks can help students in the execution of tasks KKNI, and is also expected to improve the ability of the student mathematical communication. Availability of learning tools is one factor that can support the learning process. Textbooks have an important role in the learning process, which is the reference used by faculty and students.

According Mulyasa (2006: 96) [2] argues that the teaching material is one part of teaching resources that can mean anything that contains a message of learning, both special and general nature that can be exploited for the sake of learning. This illustrates the notion that teaching materials should be designed and written in accordance with the rules of learning, which is adapted learning materials are prepared based on the learning needs, there is an evaluation, as well as the teaching material of interest to be studied by students.

Meanwhile, according to Iskandarwassid and Dadang Sunendar (2011: 171) [3] reveals that the teaching material is a set of information that must be absorbed learners through fun learning. This suggests that in the preparation of teaching materials is expected that students really feel the benefits of teaching materials or materials that after he learned them. Yana Ward (2010: 29) [11] adds that the teaching material is a medium to achieve the desire or goal to be achieved by learners. Meanwhile, according to Opara and Oguzor (2011: 66) [5] revealed that instructional materials are the audio-visual materials (software / hardware) the which can be used as alternative channels of communication in the teaching-learning process.

Textbooks are designed not only to help students in doing or completing 6 KKNI task alone. However, textbooks are expected to improve student mathematical communication. Because of the importance of the mathematical communication skills, an educator must understand mathematical communication and to know aspects or indicators of mathematical communication, resulting in the implementation of mathematics learning should be designed as possible for the purpose of developing a mathematical communication capability can be achieved.

Peressini and Bassett (in NCTM, 1996: 63) [6] argues that the mathematical communication, the level of ability of students' understanding of math concepts and applications can be more easily understood. This means that with the communication of mathematics teachers can better understand students' ability to interpret and express their understanding of mathematical concepts and processes. while mathematical communication ability indicator of students in the learning of mathematics by NCTM (2000), 1) [4] Ability express mathematical ideas through oral, written, and visually demonstrate and Illustrate 2) The ability to understand, interpret, and evaluate mathematical ideas both orally and other visual forms; 3) The ability to use terms, notations of Mathematics and its structures to present ideas, describe the relationships and models of the situation.

Familiarize students with the use of existing measures on indicators for learning mathematical understanding, is expected to help students to overcome difficulties in studying mathematics, especially in the subject of the set and logic. Thus, when students are faced with a problem, they can do problem-solving skills to choose and develop its response through mathematical good communication skills.
2. Material and Methods
This research is advanced, which in previous studies has been carried out research on the development of integrated textbook 6 KKNI task. In this study, an experimental research with this type of research is quasi experiment (quasi experimental), for the class used previously formed. The research was conducted at the Department of Mathematics Faculty of Science University of medan, with research samples that grade student DIK-F 2019 with a number of students were 51 people as an experimental class and class-D DIK 2019 with the number of students as many as 49 people as classroom control.[1]

| No. | Formulation of the problem | Hypothesis | Data | Test Equipment | Statistic test |
|-----|----------------------------|------------|------|----------------|---------------|
| 1   | Is there a difference between a student mathematical communication skills by learning with an integrated textbook 6 KKNI task with students whose learning without textbooks integrated 6 KKNI task? | There are differences between student mathematical communication skills by learning with an integrated textbook 6 KKNI task with students whose learning without textbooks integrated 6 task KKNI | Mathematical communication skills before and after implementation of an integrated textbook 6 task KKNI | Mathematical communication ability test | ANACOVA |
| 2   | Whether there were interactions between the application of integrated textbook 6 KKNI task with early mathematical ability of students to student mathematical communication | There is no interaction between the application of integrated textbook 6 KKNI task with early ability math students to the student mathematical communication | KTAM, KTBM, KSAM, KSBM, CRAMPS, KRBM | Pretest mathematical communication ability test | 2-way ANOVA |

Information:

KTAM : Group of students who have a high initial capability is taught using books 6 integrated teaching assignments KKNI to measure mathematical communication skills
KTBM : Group of students who have a high initial capability is taught without books 6 integrated teaching assignments KKNI to measure mathematical communication skills
KSAM : Group of students who have prior knowledge being taught using books 6 integrated teaching assignments KKNI to measure mathematical communication skills
KSBM : Group of students who have prior knowledge being taught without books 6 integrated teaching assignments KKNI to measure mathematical communication skills
CRAMPS : Group of students who had lower initial ability taught using an integrated textbook 6 KKNI task to measure the ability of mathematical communications
KRBM : Group of students who had lower initial ability taught without books 6 integrated teaching assignments KKNI to measure mathematical communication skills.
Research procedure

Preliminary study Problem Identification, Formulation Problems, Literature, etc.

Preparation of Research Instruments, Test

classroom Control

Selection of Research Subjects
class Experiment

Learning without textbooks integrated 6 task KKNI

Test post

Observation

Learning by using the integrated 6 task textbook KKNI

Data analysis

Data

finding

Conclusions & Recommendations

Figure 1
Stages Research Workflow
3. Result and Discussion

3.1 Level Mathematical Communications Capabilities College student

3.1.1 Test Results Communication Early Mathematical Ability College student

In quantitative terms, the level of initial capability mathematical communication can be seen in Table 2 below:

| No. | interval Value | Total students | Percentage | Category Penilain |
|-----|----------------|----------------|------------|-------------------|
| 1   | 0 ≤ SKKM <69   | 32             | 65.31%     | Less              |
| 2   | ≤ 70 SKKM <79  | 14             | 28.57%     | Enough            |
| 3   | ≤ 80 SKKM <89  | 3              | 6.12%      | Well              |
| 4   | 90 ≤ SKKM <100 | 0              | 0%         | Very good         |

From Table 2 above shows that the assessment category of "less" there are 32 students, for the category of "enough" there are 14 students, for the "good" category, there are 3 students and for the category "very good" there are 0 students. Meanwhile the results of initial mathematical communication ability of students in the experimental class is as follows:

| No. | interval Value | Total students | Percentage | Category Penilain |
|-----|----------------|----------------|------------|-------------------|
| 1   | 0 ≤ SKKM <69   | 29             | 56.87%     | Less              |
| 2   | ≤ 70 SKKM <79  | 18             | 35.29%     | Enough            |
| 3   | ≤ 80 SKKM <89  | 4              | 7.84%      | Well              |
| 4   | 90 ≤ SKKM <100 | 0              | 0%         | Very good         |

From Table 3 above shows that, in the assessment category of "less" there are 29 students, for the category of "enough" there are 18 students, for the "good" category, there are 4 students and for the category "very good" there are 0 students.

3.1.2 Test Results End of Communications of Mathematical Ability College student

In quantitative terms, the level of the ability of mathematical communications end can be seen in Table 4 below:

| No. | interval Value | Total students | Percentage | Category Penilain |
|-----|----------------|----------------|------------|-------------------|
| 1   | 0 ≤ SKKM <69   | 20             | 40.82%     | Less              |
| 2   | ≤ 70 SKKM <79  | 17             | 34.69%     | Enough            |
| 3   | ≤ 80 SKKM <89  | 11             | 22.45%     | Well              |
| 4   | 90 ≤ SKKM <100 | 1              | 2.04%      | Very good         |

From the above description shows that, in the assessment category of "less" there are 17 students, for the category of "enough" there are 18 students, for the "good" category there were 11 students and for the category "very good" is 1 student.

| No. | interval Value | Total students | Percentage | Category Penilain |
|-----|----------------|----------------|------------|-------------------|
| 1   | 0 ≤ SKKM <69   | 3              | 5.89%      | Less              |
| 2   | ≤ 70 SKKM <79  | 10             | 19.60%     | Enough            |
| 3   | ≤ 80 SKKM <89  | 20             | 39.22%     | Well              |
| 4   | 90 ≤ SKKM <100 | 18             | 35.29%     | Very good         |
Classical mathematical communication ability level end of the experimental class is obtained by 94.11%. When viewed from the level of mathematical ability in the classroom communication end control of only 59.18%. It can be concluded, that the ability of students to the stated problem aspects of everyday life into mathematical symbols or language of the experimental class is higher than the control class.

Thus it can be seen that the number of students who received the answer either category criteria, the more the experimental class than the control class. Therefore it can be concluded that the process of completion of the answers of students in the experimental class is better than the control class in solving mathematical communication ability test.

### 3.2 Analysis of inferential statistics (ANACOVA) Mathematical Communications Capabilities

Inferential analysis test results to student mathematical communication ability to test the hypothesis: mathematical communication skills among students in the experimental class with students in the control class. Statistically still need to use the test significant difference by using statistical test ANACOVA, after counting and meet the test of normality, homogeneity, linear regression model, independency test and test the equality of two regression models we can conclude in table 6 below:

| No. | Research hypothesis                                                                 | result examination |
|-----|--------------------------------------------------------------------------------------|--------------------|
| 1   | There is a positive effect (significance) the results of the initial test (pretest) mathematical communication ability of students to the final test results (post-test) students to the experimental class and control class | Rejected           |
| 2   | The results of the initial test (pretest) mathematical communication ability of students to the final test results (post-test) students to have control class linear regression model. | Be accepted        |
| 3   | The regression model group and the experimental class regression model group control class is not the same or differ significantly for mathematical communication skills | Rejected           |
| 4   | The regression model group and the experimental class regression model group control class is not the same or differ significantly for mathematical communication skills. | Be accepted        |
| 5   | There are significant differences between mathematical communication skills of students who are subject to treatment in the experimental class and the students in the control class | Rejected           |
3.3 Results and Analysis of Interaction between the Application of Integrated Textbook 6 Task KKNI with Student Initial Capability (High, Medium, Low) on the Mathematical Communication Students

To understand the interaction between learning makes no prior knowledge of students on student mathematical communication skills, used ANOVA two lanes. Summary ANOVA two-track interaction between the application of the textbooks used by students' mathematical ability early on student mathematical communication skills can be seen in Table 7 below:

Table 7. Summary of ANOVA Two-Line Test Calculation Integrated Textbook Intraksi between 6 Task KKNI Ability Students Early on Mathematical Communication Ability Students

| Tests of Between-Subjects Effects |  |  |  |  |
|----------------------------------|---|---|---|---|
| Source                           | Type III Sum of Squares | Df | mean Square | F   | Sig.  |
| corrected Model                  | 1393.096a                | 5  | 278 619     | 36 621 | .000 |
| Intercept                        | 20898.891                | 1  | 20898.891   | 2,747  | .000 |
| Textbooks                        | 892 138                  | 1  | 892 138     | 117 260 | .000 |
| KAM_Komunikasi                   | 154 957                  | 2  | 77 479      | 10 184  | .000 |
| Buku_Ajar * KAM_Komunikasi      | 1,252                    | 2  | .626        | .082  | .921 |
| Error                            | 958 632                  | 126 | 7608       |       |      |
| Total                            | 31872.000                | 132 |            |       |      |
| corrected Total                  | 2351.727                 | 131 |            |       |      |
| a. R Squared = .592 (Adjusted R Squared = .576) | | | |   |

Based on Table 7 will described about hypothesis testing as follows:

\( H_0 : \alpha \beta_f = 0 \) Singnifikan there is no interaction between the application of integrated textbook 6 KKNI task with early mathematical ability of students (high, medium, low) on the ability of the student mathematical communication.

4. Conclusions

We would like to thank Dr. Kustoro Budiarta, ME, as Chairman and the entire staff LPPM Unimed Unimed LPPM employee who has given us the opportunity to carry out research activities through internal research grants (KDBK). And we also say Thank you for Ma’am University of Medan Science Faculty Dr. Fauziyah Harahap, M.Si., who contributed to this study. And do not forget we say to all those who have contributed suggestions to build up this research can be conducted properly and smoothly. Thankyou speech is also not forget we extend to students Dik-D-2019 and F 2019 DIK student Prodi Mathematics Education who have been willing to participate and help in this study.

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