



Assessment of Mathematic Text Book Grade XII Science Based on Mediated Learning Experience and Rigorous Mathematical Thinking in Curriculum 2013

Ika Kurniasari

Department of Mathematics, Faculty of Mathematics and Natural Sciences, The State University of Surabaya

ABSTRACT

The aim of this research is to assess of mathematic text book grade XII science based on mediated learning experience and rigorous mathematical thinking in curriculum 2013. Method of this research use development research. The subjects are four mathematics teacher from different school and the object is the text book. The result consist of two aspects, for the first aspects is feasibility content and the second is performance the book. The feasibility contents have four dimension; spiritual dimension and attitude/social dimension have 1 score, knowledge dimension and softskill dimension have 6 score. The performance of book have four categories: the technique of performance has 6 score; the support of contents performance has 7 score; the learning performance has 6 score and the completeness performance has 5 score.

Key Word: assessment of text book, Mediated Learning Experience, Rigorous Mathematical Thinking, Curriculum 2013

INTRODUCTION

Developing text book grade XII science is needed, because the government does not have the book for that grade. Developing it based on Rigorous Mathematical Thinking (RMT) and description text book instrument in curriculum 2013. Level RMT based on level in cognitive function. There any three level in cognitive fuction on RMT. Description in students book instrument have two catagories such as feasibility contents and performance components.

Psychological equipments mathematics utilization emphasize in learning process engage with intervention of Rigorous Mathematical Learning (RMT). RMT theory based on previous theory such learning theory. For learning theory could be used sociocultural Vygotsky and Mediated Learning Experience (MLE). Kinard (2008) defines RMT as mental operation for: To get knowledge in pattern and relation; Applied the utilization and scheme obtainable cultural for describe of knowledge, correlation, abstract representation to make understanding and definition, Transformation and generalization to shows the conceptualization and understanding for coheren, logic and ideas. Planning use ideas for problem solving facility and decreasing new knowledge in contex and human activities. To check critics, analysis, and structur monitoring, operation,

process RMT for understanding itself and intrinsic integrity. From all of the definition, we are chose that all of the process and utilization its finally get RMT.

Developing curriculum 2013 one of step continuing from curriculum based competence 2004 and KTSP 2006. The different Curriculum 2013 with other in process standart. In process standart consist of spiritual dimension, attitude/social dimension, knowledge dimension and skill dimension.

Development text books with curriculum 2013 use instrument from BSNP. From that instrument consist of feasibility contents and performance component. For feasibility contents have four aspects such as: spiritual dimension, social dimension, knowledge dimension, skill dimension. For performance component have four aspects such as: performance techniques, supporting performance techniques, learning performance, completeness of performance.

METHODS

Method of this research use development research. This paper give the information about the final text book for grade XII science assess. The subjects are

four mathematics teachers from different school and the object is the text book.

dan peluruhan, Topic four is induksi matematika, Topic five is Dimensi tiga, topic six is konsep jumlah Riemann, topic seven is teorema fundamental kalkulus. For this paper explain one topic, the topic is matrix. Not all aspect in RMT could be combined with curriculum 2013 for matrix matter. For the example in feasibility contents only knowledge and skill dimension. For a while, spiritual and social dimension we can find. For completely, it shows in Table 1.

RESULT AND EXPLANATION

In the text book of mathematics grade XII science consist of four main topics. Thats main topics are Topic one is matrix, Topic two is deret geometri tak hingga, Topic three is Bunga Majemuk, pertumbuhan

Table 1. Analysis Students' Book Based on RMT and Curriculum 2013


Figure of Students' Book for Matrix Topics	Level kognitif Function on RMT	Categories for Text Books in curriculum 2013
<p style="text-align: center;">BAB I MATRIKS</p>  <p>Blaise Pascal (1623-1662) lahir di Perancis. Bersama Piere Fermat, ia diberi penghargaan karena teori probabilitas. Namanya diabadikan pada susunan bilangan yang membentuk segitiga yaitu Segitiga Pascal.</p> $ \begin{array}{ccccccc} & & & & 1 & & & \\ & & & & 1 & & 1 & \\ & & & 1 & 2 & 1 & & \\ & & 1 & 3 & 3 & 1 & & \\ & 1 & 4 & 6 & 4 & 1 & & \end{array} $		<p>Suitable with support presentation technique item number 23, description about giving a motivation to starting chapter.</p>
<p>Setelah mempelajari materi ini kalian diharapkan mampu</p> <p>2.1 Menghayati perilaku disiplin, sikap kerjasama, sikap kritis dan cermat dalam bekerja menyelesaikan masalah kontekstual</p> <p>2.2 Memiliki dan menunjukkan rasa ingin tahu, motivasi internal, rasa senang dan tertarik dan percaya diri dalam melakukan kegiatan belajar ataupun memecahkan masalah nyata.</p> <p>3.1 Menganalisis konsep, nilai determinan dan sifat operasi matriks serta menerapkannya dalam menentukan invers matriks dan dalam memecahkan masalah.</p> <p>4.1 Menyajikan dan menyelesaikan model matematika dalam bentuk persamaan matriks dari suatu masalah nyata yang berkaitan dengan persamaan linear</p>		<p>Suitable with feasibility contents</p> <p>a. Knowledge Dimension</p> <p>b. Skill Dimension</p> <p>That figures shows the aim for learning process.</p>
<p>Cek Pemahaman</p> <p>1. Tentukan matriks X yang memenuhi kesamaan di bawah ini.</p> $ \begin{bmatrix} 1 & 2 & -3 \\ 2 & 1 & 1 \end{bmatrix} + X = \begin{bmatrix} 5 & 1 & 8 \\ -6 & 0 & 5 \end{bmatrix} $ <p>2. $A = \begin{bmatrix} -1 & 0 \\ 2 & 3 \end{bmatrix}$; $B = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$</p> <p>Hitung AB dan BA</p> <p>3. Diketahui $A = \begin{bmatrix} 1 & 2 \\ 3 & 0 \end{bmatrix}$, tentukan A^2, A^3 dan A^4</p>	<p>Level 1: Using more than one information, Symbol-problem code.</p> <p>Level 2: Decision conservation, Space measuring dan spatial relation, accuracy</p>	<p>Suitable with feasibility contents knowledge Dimension item no. 5, 6, 7, 8 and 11.</p> <p>Suitable with presentation components about Learning presentation aspect item no. 28 and 29.</p>

Table 1. Analysis Students' Book Based on RMT and Curriculum 2013

Figure of Students' Book for Matrix Topics	Level kognitif Function on RMT	Categories for Text Books in curriculum 2013
<p>1. Determinan Matriks</p> <p>Berapakah determinan matriks berordo 1×1?</p> <p>Determinan matriks berordo 1×1 sama dengan elemen dari matriks tersebut. Jika</p> <p>$A = [a]$ sebarang matriks ordo 1×1, maka $\det(A) = a$</p> <p>Mencoba</p> <p>Berapakah determinan dari matriks berordo 1×1 di bawah ini?</p> <p>a. $\det[5]$ b. $\det[4]$ c. $\det\left[\frac{5}{2}\right]$ d. $\det[-2]$ e. $\det[1]$</p> <p>Amati matriks $A = \begin{bmatrix} 5 & 6 \\ 3 & 4 \end{bmatrix}$ berordo 2×2. Nilai perkalian elemen-elemen pada diagonal utama pada matriks A dikurangi perkalian elemen-elemen pada diagonal yang</p>	<p>Level 1: Using more than one information, Symbol-problem code.</p> <p>Level 2: Decision conservation, Space measuring dan spatial relation, accuracy.</p> <p>Level 3: Articulation event of logic mathematic, Definition of problem, Thinking inductive-deductive mathematics, Thinking analog mathematics.</p>	<p>Suitable with feasibility contents with aspect Knowledge Dimension item no. 5, 6, 7, 8, 9, 10, 11, 12, and 13. For aspect skill dimension item no. 16, 17 and 18.</p> <p>Suitable with presentation components with aspect presentation techniques item no 19, 20, and 21. For aspect learning presentation item no. 28, 29, 30, and 31.</p>

From the four validator assess, we have the result each aspect from BSNP instrument text book. The result shows in Tabel 2. In general, the assessment for the text book have 3.5 for feasibility contents and 6 score for performance components. It means that the text book must be improve in contents and on going to make the text book good in performance component.

The spiritual and social/attitude dimension have one score because in that book does not have activities to

improve it component. The knowledge dimension have six score because there are clearly to explain the contents. The softskill dimension have six score too because there are many problem can students solve it.

In general for performance components is good. In completeness performance it must have acknowledgement, contents list, references, index, the margin, the size of paper.

Table 2. Assessment about Text Book Mathematics Grade XII

Aspect	Criteria	Validator				Mean Criteria	Mean Aspect
		1	2	3	4		
Feasibility Contents	Spiritual Dimension	1	1	1	1	3.5	
	Social Dimension	1	1	1	1		
	Knowledge Dimension	5	7	6	6		
	Softskill Dimension	6	7	5	6		
Performance components	technique of performance	6	6	5	7	6	
	support of contents performance	7	7	7	7		
	learning performance	7	6	6	5		
	completeness performance	5	5	5	5		

CONCLUSION

The result of this paper is consist of two aspects, for the first aspects is feasibility content and the second is performance the book. The feasibility contents have four dimension; spiritual dimension and attitude spiritual have 1 score, knowledge dimension and softskill dimension have 6 score. The performance of book have four categories: the technique of performance has 6 score; the

support of contents performance has 7 score; the learning performance has 6 score and the completeness performance has 5 score.

BIBLIOGRAPHY

Budiarto, Manoy, Kurniasari. 2013. *Rigorous Mathematical Thinking dalam Pembelajaran*

Geometri. Laporan Penelitian Unggulan Perguruan Tinggi. Unesa: Tidak dipublikasikan.

BSNP 2014. *Instrumen Penilaian Buku Teks Pelajaran Tahun 2014 01 Kelompok Peminatan MIPA*. <http://bsnp-indonesia.org/id/?p=1340>.

Kinard, J. T., & Kozulin, A. 2008. *Rigorous Mathematical Thinking : Conceptual Formation in the Mathematics Classroom*. New York : Cambridge University Press.