

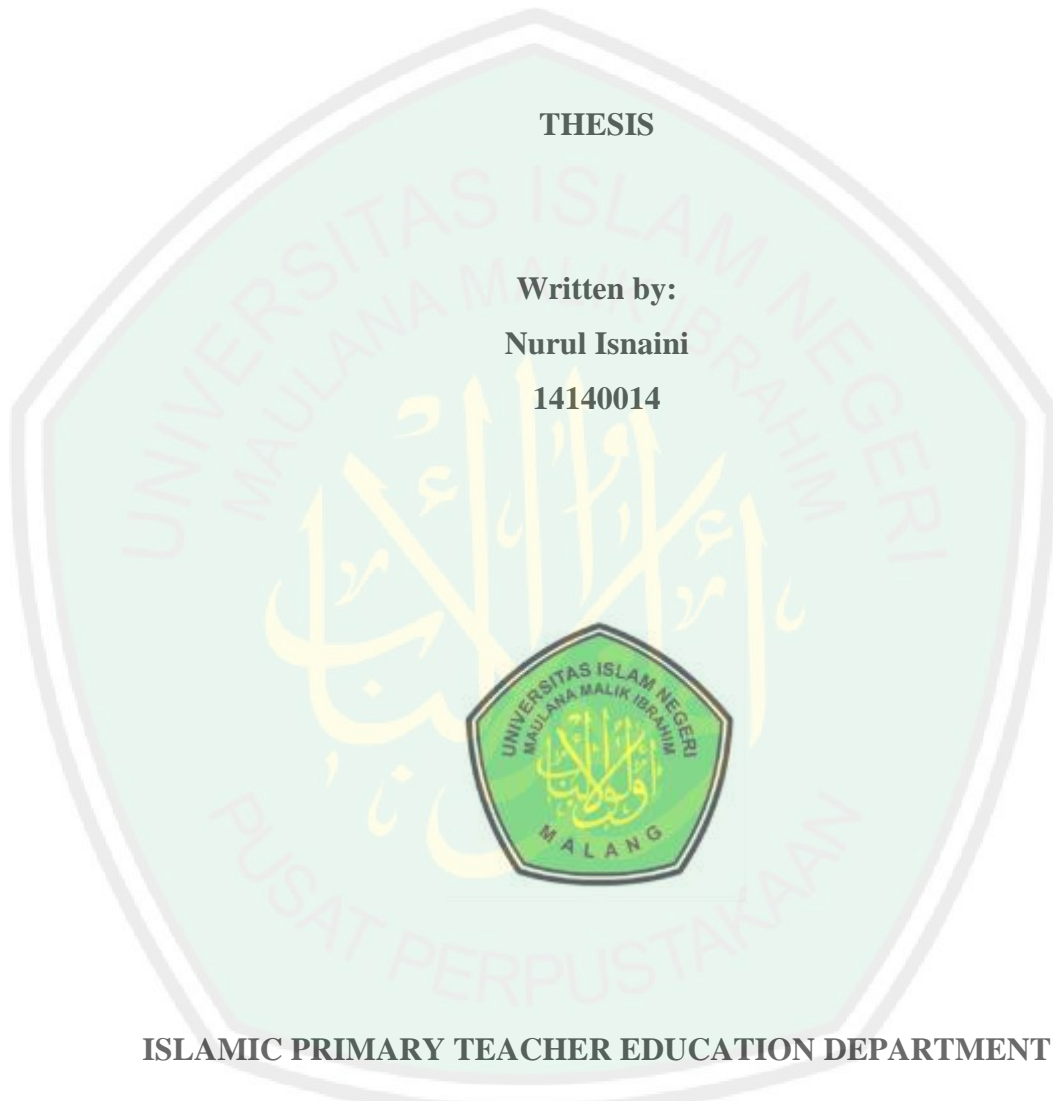
**THE DEVELOPMENT OF LEARNING MEDIA BASED ON RODA
PUTAR GAME ON MATHEMATIC SUBJECTS OF SOLID FIGURE
MATERIAL FOR 5th GRADE OF SDN PURWANTORO 4 MALANG**

THESIS

Written by:

Nurul Isnaini

14140014



**ISLAMIC PRIMARY TEACHER EDUCATION DEPARTMENT
TARBIYAH AND TEACHING TRAINING FACULTY
STATE ISLAMIC UNIVERSITY OF MAULANA MALIK IBRAHIM
MALANG**

October, 2018

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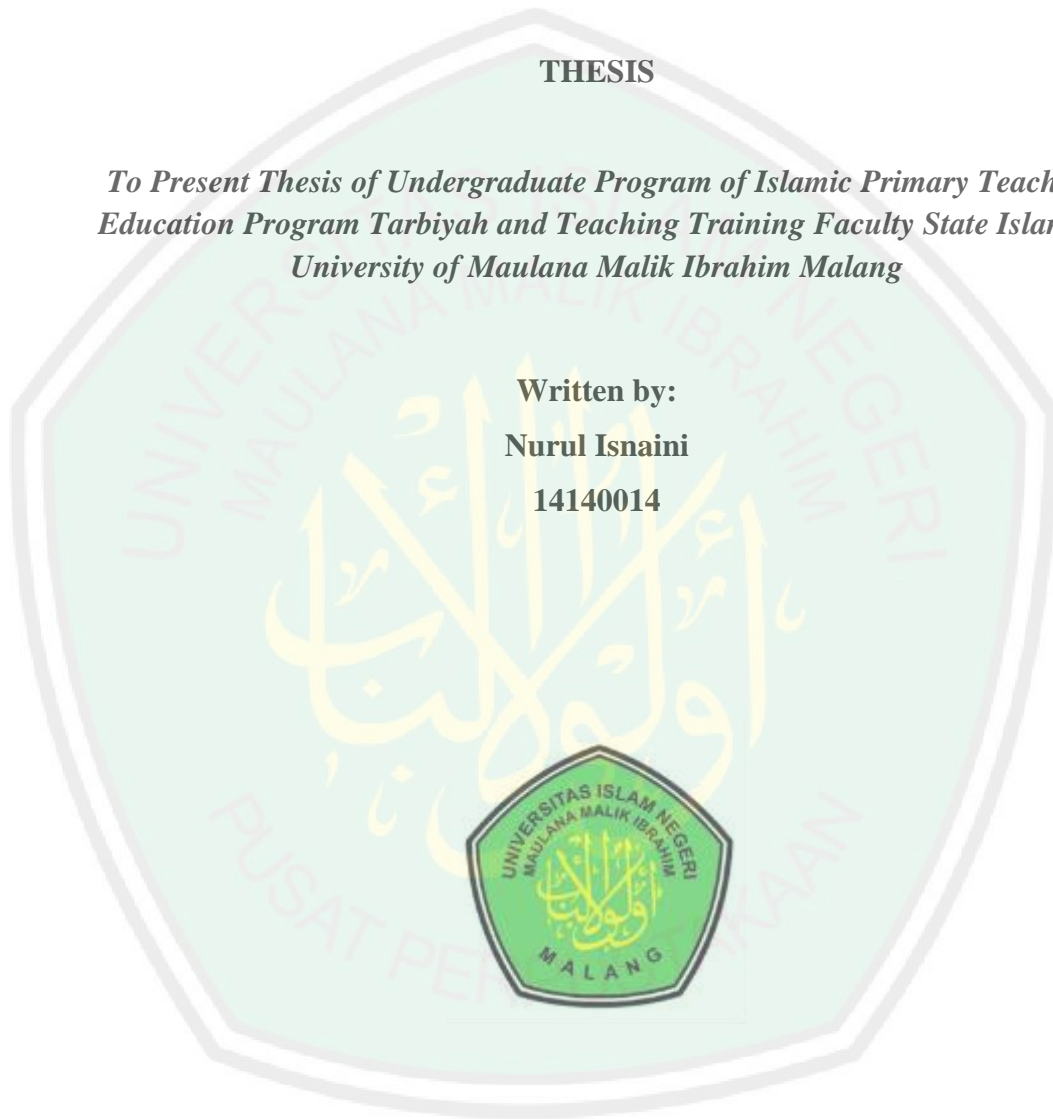
THESIS

*To Present Thesis of Undergraduate Program of Islamic Primary Teacher
Education Program Tarbiyah and Teaching Training Faculty State Islamic
University of Maulana Malik Ibrahim Malang*

Written by:

Nurul Isnaini

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TARBIYAH AND TEACHING TRAINING FACULTY
STATE ISLAMIC UNIVERSITY OF MAULANA MALIK IBRAHIM
MALANG**

APPROVAL SHEET

**THE DEVELOPMENT OF LEARNING MEDIA BASED ON RODA
PUTAR GAME ON MATHEMATIC SUBJECTS OF SOLID FIGURE
MATERIAL FOR 5th GRADE OF SDN PURWANTORO 4 MALANG**

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**THE DEVELOPMENT OF LEARNING MEDIA BASED ON RODA
PUTAR GAME ON MATHEMATIC SUBJECTS OF SOLID FIGURE
MATERIAL FOR 5th GRADE OF SDN PURWANTORO 4 MALANG**

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The Board of Examiners

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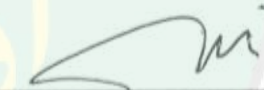
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DEDICATION

Thanks to Allah because of all blessing and guidance. Shalawat and salam always bless to our prophet Muhammad SAW because of him we get the brilliant religion.

Alhamdulillah rabbi 'alamin

This thesis is dedicated to my beloved parents,

(Mr Tekat and Mrs Supiani)

Thanks you for always giving me compassion, advice, spirit and prayer.

This thesis also dedicated to my beloved husband,

Sampras Adi Pradipta

who already help, pray, give motivation and loved me.

To my young sister **Septia Wahyu Triani** and my big family who has been support in my life.

Not forget to my big family of International Class Program Islamic Primary Teacher Education Department 2014 who already help and always support in the completion of this thesis, I would like to say thank you for everything.

MOTTO

وَلَا تَهِنُوا وَلَا تَحْزَنُوا وَأَنْتُمْ الْأَعْلَوْنَ إِنْ كُنْتُمْ مُؤْمِنِينَ ﴿١٣٩﴾

Janganlah kamu bersikap lemah, dan janganlah (pula) kamu bersedih hati, padahal kamulah orang-orang yang paling tinggi (derajatnya), jika kamu orang-orang yang beriman. (QS. Ali Imran : 139)



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Lecturer Tarbiyah And Teaching Training Faculty

State Islamic University of Maulana Malik Ibrahim Malang

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Matter : Thesis of Nurul Isnaini

Malang, October 5th 2018

Appendixes : 4 (four) Exemplar

Dear,

Dean of Tarbiyah And Teaching Training Faculty
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At Malang

Assalamualaikum Wr. Wb

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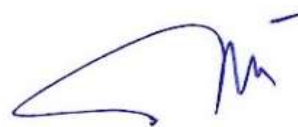
Program : Islamic Primary Teacher Education Department

Title of thesis : The Development of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang

As the advisor, I considered that this thesis is qualified to be proposed in the examination.

Wassalamualaikum Wr. Wb

Advisor



Dr. Alfiana Yuli Efiyanti, MA
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CERTIFICATE OF THESIS AUTHORSIP

I certify that this thesis is originally written by Nurul Isnaini, student of Islamic Primary Teacher Education Department (PGMI) the requirement for degree of Sarjana Pendidikan (S.Pd). This research writing does not incorporate any material previously written or published by another person, except those which are indicated in the notes, quotation, and bibliography. Therefore, I am the only person who is responsible for the thesis if there is any objection or claim from others.

Malang, October 2018
Author,



Nurul Isnaini
NIM.14140014

PREFACE

Alhamdulillah Praise Allah SWT writer who has give a mercy, taufiq and guidance, so that writer can finish this thesis with the title "*The Development of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang*" Sholawat and greetings may express to our Prophet Muhammad saw. who has been guiding people towards the path of truth and goodness.

Many of those who helped in completing this thesis. To the authors would like to thank and appreciation as much as possible with the words *jazakumullahu Ahsanul Jaza'* inparticular to:

1. Prof. Dr. Abdul Haris, M.Ag as Rector State Islamic University of Maulana Malik Ibrahim Malang
2. Dr. H. Agus Maimun, M.Pd. as Dean of Tarbiyah And Teaching Training Faculty
3. Ahmad Sholeh. M.Ag. as Chairman of Islamic Primary Teacher Education Department
4. Dr. Alfiana Yuli Efiyanti, MA as supervisor who gave guidance, suggestions, criticisms, and corrections in the thesis.
5. Dra.Hj. Ulfah Khamidah,M.Pd as head master of SDN Purwantoro 4 Malang and all teacher especially Mrs Sri Idha Suprapti S.Pd as homeroom teacher of 5th grade, Head of TU and all educators in particular who have taken the time to provide information in the study.

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7. Beloved husband Sampras Adi Pradipta who always provide support, loved me, and prayer so that a witness boost in the study.
8. big family of International Class Program Islamic Primary Teacher Education Department 2014 who already help and always support in the completion of this thesis
9. All parties were unable to mention who have helped the completion of this thesis.

Finally the author expect this thesis may be benefit author and readers.

Wassalamu'alaikum Wr Wb

Malang, October 2018
Author,

Nurul Isnaini

TRANSLATION GUIDELINES OF ARAB LATIN

Translation of Arab Latin in this thesis utilize the translation guidelines based on the agreement and decision together between Ministry of Religion and Ministry of Education and Culture of Republic of Indonesia No. 158, 1987 and No. 0543b/U/1987. That is could explained as follow:

A. Letter

ا	=	A	ز	=	Z	ق	=	Q
ب	=	B	س	=	S	ك	=	K
ت	=	T	ش	=	Sy	ل	=	L
ث	=	Ts	ص	=	Sh	م	=	M
ج	=	J	ض	=	Dl	ن	=	N
ح	=	H	ط	=	Th	و	=	W
خ	=	Kh	ظ	=	Zh	ه	=	H
د	=	D	ع	=	'	ء	=	,
ذ	=	Dz	غ	=	Gh	ي	=	Y
ر	=	R	ف	=	F			

B. Long Vocal

Vocal (a) long = â

Vocal (i) long = î

Vocal (u) long = û

C. Diphthong Vocal

أو = Aw

أي = Ay

أو = û

أي = î

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ABSTRAK

Isnaini, Nurul. 2018. *Pengembangan Media Pembelajaran Berbasis Permainan Roda Putar Pada Mata Pelajaran Matematika Materi Bangun Ruang Kelas 5 SDN Purwantoro 4 Malang*. Skripsi, Jurusan Pendidikan Guru Madrasah Ibtidaiyah, Fakultas Ilmu Tarbiyah Dan Keguruan, Universitas Islam Negeri Maulana Malik Ibrahim Malang. Pembimbing : Dr. Alfiana Yuli Efiyanti, MA

Kata Kunci : Media Pembelajaran, Permainan Roda Putar, Matematika, Bangun Ruang

Dalam proses belajar mengajar guru perlu melakukan upaya untuk meningkatkan prestasi siswa. Salah satu cara yang dapat dilakukan oleh guru untuk memotivasi peserta didik dalam pengajaran matematika yaitu dengan menggunakan media pembelajaran. Pengembangan media pembelajaran berbasis roda putar dilakukan berdasarkan kebutuhan siswa dan guru dalam proses pembelajaran. Peserta didik membutuhkan pembelajaran yang menyenangkan berupa game serta media yang tahan lama dan dapat digunakan secara berulang.

Tujuan penelitian ini yaitu : 1) Untuk memproduksi media pembelajaran berbasis permainan roda putar pada mata pelajaran matematika materi bangun ruang pada siswa kelas 5 SD/MI, 2) Untuk mengetahui keefektifan media pembelajaran Berbasis permainan roda putar, (3) Untuk mengetahui perbedaan pemahaman materi bangun ruang antara sebelum dan setelah menggunakan media pembelajaran berbasis permainan roda putar.

Rancangan pengembangan media yang digunakan oleh peneliti adalah model pengembangan borg & gall yang memuat 10 tahapan, mengingat keterbatasan waktu dan keterbatasan biaya, maka peneliti menyederhanakan menjadi 8 tahap sebagai berikut: 1) pengamatan dan pengumpulan informasi, 2) perencanaan, 3) pengembangan produk awal, 4) uji coba awal oleh validasi ahli, 5) revisi produk 6) uji lapangan, 7) revisi akhir, 8) Disiminasi dan implementasi.

Hasil validasi dari ahli materi atau isi memperoleh prosentase 84%, dari ahli desain memperoleh presentase 93%, penilaian ahli pembelajaran matematika memperoleh 93%, dan hasil angket tingkat kemenarikan media pembelajaran oleh siswa mendapat prosentase 94,7%. Hasil uji coba lapangan sebelum dan sesudah penerapan media pembelajaran mengalami peningkatan rata - rata dari uji pre test memperoleh rata – rata 62,6 dan meningkat saat uji post test yaitu 81,9. Begitu pula hasil yang ditunjukkan dari perhitungannya uji t dimana $t_{hitung} (8,818) > t_{tabel} (2,069)$ berarti H_0 **ditolak** dan H_a **diterima**, yang artinya hasil belajar siswa dengan menggunakan media pembelajaran berbasis permainan roda putar pada mata pelajaran matematika materi bangun ruang meningkat, dari pada hasil belajar siswa yang tidak menggunakan media pembelajaran.

ABSTRACT

Isnaini, Nurul. 2018. *The Development of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwanto 4 Malang*. Skripsi, Islamic Primary Teacher Education Department, Tarbiyah And Teaching Training Faculty, Maulana Malik Ibrahim State Islamic University Malang. Advisor : Dr. Alfiana Yuli Efiyanti, MA

Keyword : Learning Media, Roda Putar Game, Mathematic, Solid Figure

In teaching and learning process, teacher need to make an effort to improve students achievement. One of the ways that can be done by teacher to motivate the students in teaching of Mathematic subject is using the learning media. The Development of Learning Media Based on Roda Putar Game done by the level neednees of student and teacher in learning process. The students need learning that fun in the form of games and media are durable and can be used for repeatedly.

The purpose of this research are 1) To produce Learning Media Based on Roda Putar Game on mathematic subject of solid figure material for students 5th grade SD/MI, 2) To know the effectiveness of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material, and (3) To know the difference of comprehension about solid figure malerials between before after the students use learning media based on roda putar game.

The design of development media used by researcher is development model based on borg & gall there are 10 stages, Given the limited time and the cost of belonging to a researcher researchis divided into 8 steps, which are: 1) Research And Information Collecting, 2) planning, 3) development format of the preliminary product, 4) preliminary test by expert validator, 5) product revision I, 6) field trials, 7) final product revision, 8) Dissemination and implementation.

Results Validation from content expert earn percentage 84%, Results Validation from media expert earn percentage 93%, result from mathematic learning expert earn percentag93%, questionnaire result of feasibility level by student earn percentage 94,7%. Field trial results before and after the application of the learning media obtain an increase in the average grade from pre test get average 62,6 and increase in post test is 81,9. Also the result showed from count t test that $t_{\text{count}} (8,818) > t_{\text{table}} (2,069)$ that means H_0 **rejected** and H_a **accepted**, It was concluded that The results of student learning by using Learning Media Based on roda putar game on Mathematic Subjects of Solid Figure Material increased, from the results of a study that does not use the learning media.

مستخلص البحث

الاثنين, نورول. تطوير وسائل التعليمية لعب عجله ألعاب المواد الرياضية الفضاء ويك في الفصل الخمسه المدرسة الابتدائية البوروانتورو الاربعه مالانج. البحث الجامعي. قسم تربية المعلمين للمدرسة الابتدائي. كلية علو التربية والتعليم. جامعة مولانا مالك إبراهيم الإسلامية الحكومية مالانج المشرف : الدكتو الفينا يولي افينتي الماجستير

الكلمة المفتاحية : وسائل التعليمية, لعب عجله ألعاب, الرياضيات , والاستيقاظ الفضاء

في عمليه التعليم والمتعلم المعلمين بحاجه إلى بذل جهد لتحسين تحصيل الطلاب. واحده من الطرق التي يمكن ان يقوم بها المعلم لتحفيز المتعلمين في تدريس الرياضيات باستخدام وسائل الاعلام من التعليم. تطوير وسائل التعليمية لعب عجله ألعاب المواد القيام به علي أساس احتياجات الطلاب والمعلمين في عمليه التعلم. الطلاب في حاجه إلى متعه التعلم شكل اللعبة وكذلك وسائل الاعلام هي دائمة ويمكن استخدامها مرارا وتكرارا. والغرض من هذا البحث هو (١) لإنتاج وسائل الاعلام التعليمية القائمة علي اللعبة عجله دواره لتحسين الفهم علي مواضيع المواد الرياضية يستيقظ مكعب الفضاء والحزم في الصف الخامس من المدرسة الابتدائية, (٢) لمعرفة فعاليه وسائل التعليمية لعب عجله ألعاب المواد (٣) لمعرفة الفرق الفهم بين قبل وبعد الاستخدام وسائل التعليمية لعب عجله ألعاب المواد الرياضية الفضاء ويك.

تصميم تطوير وسائل التعليمية لعب عجله ألعاب المواد الرياضية الفضاء ويك هو نموذج تطوير برج وغال يحتوي علي ١. مراحل. نظرا للقيود المفروضة علي الوقت والتكلفة القيود , ثم يبسط الباحثون إلى ٨ مراحل هو (١) مراقبه وجمع المعلومات (٢) التخطيط (٣) تطوير المنتجات الاوليه , (٤) الاختبار الاولي من قبل خبراء التحقق من صحة (٥) مراجعه المنتج (٦) اختبار الحقل (٧) المراجعة النهائية (٨) تنفيذ.

نتائج التحقق من المواد هو ٤٨% , نتائج التحقق من صحة خبراء التصميم ٣٩% , نتائج تقييم الخبراء لتعلم الرياضيات ٣٩% , والآن علي مستوي النتائج المثيرة للاهتمام وسائل التعليمية من الطلاب ٤٩,٧% . نتائج التجارب الميدانية بين قبل وبعد استخدام وسائل الاعلام التعليمية تشهد زيادة في متوسط من اختبار ما قبل اختبار ٢٦,٦ وزيادة عندما اختبار آخر اختبار ١٨,٩ . المثل , أشارت نتائجه من حساب اختبار ت. ت عدد (٨,٨١٨) < ت الجدول (٢,٩٦٠) يعني نتائج تعلم الطلاب باستخدام تطوير وسائل التعليمية لعب عجله ألعاب المواد الرياضية الفضاء ويك زيادة , من نتائج التعلم من الطلاب الذين لم يستخدموا تطوير وسائل التعليمية لعب عجله ألعاب المواد الرياضية الفضاء ويك.

CHAPTER I

INTRODUCTION

A. Background

Education is something that can not be detached from the human, since humans are born until the end of his life. As has been said by Syaikh ‘Abdul Fattah Abu Ghuddah rahimahullah in his book *Qimah az-Zaman ‘inda al-‘Ulama*

اطلبوا العلم من المهد الى اللحد

It means: “Seek the science from the cradle to the grave”

Education is a conscious effort undertaken by the family, society, and government through guidance, teaching, and practice that takes place in schools lifelong, to prepare learners in order to play a role in various environments well life in the future.¹ So it can be concluded that education is everything a conscious effort through various processes that take place in schools and outside schools lifelong for the future.

There are an awful lot of the science that we have learned during our live, Mathematics is one of the subjects studied by students at elementary school. Mathematics is the science of logic about the shape, arrangement, quantity, and concepts that relate to one another with the number of the lot which is divided into three areas, namely, algebra, analysis and geometry.²

Mathematics is an exact science related to logic, by mastering the math

¹ Redja Mudiarto, *Pengantar Pendidikan* (Jakarta: Raja Grafindo, 2002), hlm. 11

² Erman Suherman, dkk, *Strategi Pengajaran Matematika Kontemporer* (Bandung: UPI Press, 2003), hlm.19.

people will be able to learn to set his thoughts and while learning to add his brilliance.³

On the mathematics curriculum of elementary school, the goal of learning mathematics in elementary school is in order that students are skilled in using a variety of mathematical concepts in life. These concepts are divided into three large groups:

- b. Planting the basic concept that is a new concept of learning math, when the students had never studied the concept. In the activities of this basic concept, media or props are expected to be used to help the student mindset capabilities.
- c. Understanding the concept, is advanced learning from the planting concept, the aim of enabling students to better understand a mathematical concepts.
- d. Coaching skills are advanced learning of the concept of planting and understanding the concept. Learning coaching skills aims in order to make students more skilled in using a variety of mathematical concepts.⁴

So it can be concluded that the purpose of mathematics is guiding students to apply and understand mathematical concepts, so that students are more skilled in using a variety of mathematical concepts in the daily life.

³ Moch. Masykur Ag dan Abdul Halim Fathani, *Mathematical Intelligence* (Jogjakarta: Ar-Ruzz Media, 2007), hlm. 43

⁴ Heruman, *Model Pembelajaran Matematika di Sekolah Dasar* (Bandung: PT.Rosda Karya, 2008), hlm. 2

Additionally, Cockroft cited by Mulyono Abdurrahman suggested five reasons why maths lessons need to be learned especially in elementary school students, because math is (1) always used in every terms of life, (2) all fields of study require appropriate math skills, (3) is communication media a powerful, concise, and clear (4) can be used to present information in a variety of ways, (5) improve the ability of logical thinking, accuracy, and lack of awareness, and (6) give satisfaction against the attempt to solve problems that challenge.⁵

The success of the learning system will be influenced by several components that shaped them. Including teachers, students, the means, devices and media that are available as well as the environmental factors.⁶ Teachers as essential components are expected to devise a series of learning process by choosing the methods and appropriate learning strategies. Mulyono Abdurrahman explain that better teaching and learning activities where teachers have provision for an understanding the problems of learning and the use of appropriate learning strategies.⁷ Therefore, the process of learning plans and media used to help the student mindset capabilities be important to be noticed by a teacher to achieve the learning goal.

Learning media is a tool that can stimulate learners to the occurrence of the learning process. Learning media includes hardware that can deliver messages and software containing a message. The media are not just tools or

⁵ Mulyono Abdurrahman, *Pendidikan Bagi Anak Berkesulitan Belajar* (Jakarta: Rineka Cipta, 2003), hlm. 253

⁶ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008), hlm.15

⁷ Mulyono Abdurrahman, *Pendidikan Bagi Anak Berkesulitan Belajar* (Jakarta: Rineka Cipta,2003), hlm. 254

materials, but also anything else that lets students acquire knowledge.⁸ Usage the right learning media, can facilitate teachers in presented and explain material as well as the making the learning process more meaningful. Thus the learning process can be implemented with either and achievement the goal of learning

On this research, research carried out at SDN Purwantoro 4 Malang. The author chose that location as a place for research, because :

1. The availability of facilities of learning media is very simple that makes students less active to participating in the learning process.
2. Not all teachers using media in learning process so sometimes the students are less excited and difficulty to understanding the material. as for that problem needs to be examined to achieve alternative solution.

Based the results of observation and interview researchers with the homeroom teacher 5th grade at SDN Purwantoro 4 Malang especially on mathematics subject of solid figure material, teachers have been strive to improve student learning outcomes, efforts are being made⁹ :

1. Teachers have implemented several methods in learning process, like ceramah, dril, demonstrations.
2. The teacher has done a remedial for students who has low result under minimum criteria of mastery learning is 68.

⁸ Wina Sanjaya, *Perencanaan dan Desain Sistem Pembelajaran* (Jakarta: Kencana Prenada Media Group, 2008), hlm. 205

⁹ Observasi dan wawancara dengan Ibu Sri Idha Suprapti S.Pd guru kelas V SDN Purwantoro 4 Malang, tanggal 16 April 2018 Pukul 09.00 WIB

3. The teacher has done a approach to the students who have difficulties in learning.

Although teachers have strives to improve the learning process, However the results of learning math students still belongs to low. Based on the observations found the following phenomena:

1. From a total of 31 students only 10 students (33.3%) who are active in the learning activities in the class.
2. When done the exam, some student still get skor under minimum criteria of mastery learning is 68.
3. Most of the student From a total of 31 students can not finish the homework. This is apparent when corrected just 17 students or 54,8% that can finish the homework correctly.

Based on the above phenomenons is need for actions to stimulate the students to be more active in learning activities as well as improve student learning outcomes. Because that the researchers in this study develop a learning media based on roda putar game. This medium has a concept of learning while playing. So that it can attract attention, fostering the interest and motivation of learning, and can improve understanding of students.

Learning media based on roda putar game is learning media that developed for a mathematic subject of solid figure material focused on volume of cube and cuboids and nets of cube and cuboids to increase the motivation of students and counting skills because there are the question box to measure understanding of students against material. Instruction

question created on learning media based on roda putar game that has a needle pointer, When the needle pointer stopped the students should be able to complete that problem in question box. Based on the background of the problem, then to be able to assist students in learning to obtain maximum learning result, so the researchers do research with developing media and choose title “The Development of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade at SDN Purwantoro 4 Malang”

B. Statements of the Problem

Based on the background that has been presented above can be taken the formulation of the problem as follows:

1. How does the need assessment students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade at SDN Purwantoro 4 Malang ?
2. How the process of development Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade ?
3. How the effectiveness of Learning Media Based on Roda Putar Game on Mathematic Subjects of Learning Solid Figure Material for 5th Grade at SDN Purwantoro 4 Malang ?

C. Objectives of Developing

This development research aims to:

1. Explain the result of need assessment students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade at SDN Purwantoro 4 Malang.
2. Explain the process of development Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade.
3. Explain the effectiveness of Learning Media Based on Roda Putar Game on Mathematic Subjects of Learning Solid Figure Material for 5th Grade at SDN Purwantoro 4 Malang.

D. Benefits of Development

1. Theoretically
 - a. The results of this research can be used as material for further study
 - b. The results of this research can be used as reference material to teacher to innovate in developing media in the learning process
 - c. The results of this research can serve as a practical step in the development of educational mathematic.
2. Practically

Learning media based on Roda Putar Game is expected to be an alternative source of learning for students of 5th grade elementary school or Madrasah Ibtidaiyah. Learning media based on Roda Putar Game help teachers can easily in teaching, facilitate students to

understanding the material in learning process. The expected benefits in the development of the learning media Based on Roda Putar Game on Mathematic Subjects of Learning Solid Figure Material specifically to obtain :

a. For Students

With the learning media Based on Roda Putar Game can increase motivation and learning outcomes students as well as facilitate students in reaching learning objectives.

b. For School Institutions and Teacher

As consideration of school and teacher to keep implementing the learning by utilizing the learning media based on Roda Putar Game. Expected by having this media can simplify and clarify the delivery of learning activities so that the material can be done properly and effectively.

c. For researchers

with the research in the school directly, researchers gain experience and insights from theories that have been studied as well as add new science obtained through this research.

E. Development Assumption

Assuming of this a media development are :

1. Learning Media Based on Roda Putar Game will grow interest in students because this learning media use game concept in a group.

2. The Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade of SD/MI can be used to deepen understanding.
3. Provide meaningful knowledge to learners with unique and innovative media so that the material can be recorded with a good memory.

F. Scope Limitations of Developing

The limitations of this media development are:

1. The learning media based on Roda Putar Game contains only mathematic subject focus on solid figure material for 5th grade SD/MI only.
2. The learning media based on Roda Putar Game limited to an assessment of the lecturers supervisor, media expert, content expert, homeroom teacher, and trial by students of 5th grade at SDN Purwantoro 4 Malang.
3. Describe the eligibility rate of products that has been created and can measure the ability of the students before and after using the product.

G. Product Specifications

The resulting product of the form a set of learning media *roda putar* game modified accordance with the material, in detail its specifications:

1. This products of learning media based on Roda Putar Game on mathematic subject on solid figure material for 5th grade in SD/MI.
2. This media is used by teacher in the learning process to evaluate student understanding.

3. Learning media based on Roda Putar Game that developed is learning media with games concept such as roulette game or play board games, the role of Learning media based on Roda Putar Game are :
 - a. Students divided into 6 groups
 - b. Advanced Group representatives do suit to finding a Group that will be first play.
 - c. The winner group must rotate the circle board and finish the questions in the group, with a time of 1 min
 - d. If the circle board stop in the smiling picture then the group can play again, If the circle board stop in the sad picture so must replace with another group, group with smiling picture has twist opportunity
 - e. If successful answer will be given a star as a gift
 - f. The winner group is the group that can collect the most star reward
4. Learning media based on roda putar game can be used student for reviewed the material has been studied so indirectly, student expected to be given the material that has been studied or meaningful learning.
5. Learning media based on roda putar game made of plywood-circular the paired on a rectangular Board with fitted question box, net of cube and net of cuboids, Packed with an exciting display and staining according to the characteristics of the child so that it can attract the attention of students.

H. Originality of the Research

On this research development, there are some earlier research yang that has relevance in the form thesis or journal, among other things:

1. Ersya Yunniartien in the year 2017, with the title "*Penggunaan Media Roda Pintar Untuk Meningkatkan Hasil Belajar Matematika Materi Keliling Dan Luas Segitiga Kelas IV SDN 1 Dasan Tereng Tahun Ajaran 2017/2018*". From this research States that with the *media roda pintar* can improve the results of learning math students fourth grade Dasan 1 Elementary School Tereng School Year 2017/2018. Increased student learner outcomes is said to be successfully because an increase in percentage of student learning outcomes in classical cycles I until the cycle II as much as 41,66%.¹⁰
2. Nur Afni in the year 2013, with the title "*Penerapan Strategi Roda Putar Pemecah Masalah Untuk Meningkatkan Hasil Belajar Matematika Siswa Kelas IV Sekolah Dasar Negeri 012 Naumbai Kecamatan Kampar Kabupaten Kampar*" After the carried out research Note an increase in student learning outcomes before treatment, cycle I, and cycle II. before treatment student learning outcomes just 42,86% or 9 student which has been completed, on cycle I student which has been completed increased to 15 student or 71,43%. On cycle II student which has been completed reach 20 student or with the percentage of

¹⁰ Ersya Yunniartien, *Penggunaan Media Roda Pintar Untuk Meningkatkan Hasil Belajar Matematika Materi Keliling Dan Luas Segitiga Kelas IV SDN 1 Dasan Tereng Tahun Ajaran 2017/2018* (Mataram: Pendidikan Guru Sekolah Dasar Universitas Mataram, 2017), hlm. 1

95,24%. the conclusion that implementation *Roda Putar* The Strategy Problem Solver can improve student learning outcomes on Mathematical subjects students fourth grade Naumbai 012 elementary.¹¹

3. Amaliyah in the year 2015, with the title “*Keefektivan Permainan Roda Iqra’ Untuk Meningkatkan Keterampilan Membaca Bahasa Arab Siswa Kelas VII di Mts Ath-Thahiriyah Banjarnegara Tahun Ajaran 2014/2015*” from the results of research on the exsperiment class, rincreased to 80,8. It can be concluded that learning with the use of learning roda iqra’ game effective way to improve reading skills in Arabic. .¹²
4. Nefa Ainurrohmah in the year 2017, with the title “*Peningkatan Keterampilan Menulis Deskripsi Melalui Metode Field Trip Berbantuan Media Roda Putar Kelas IV Sd 1 Pasuruhan Lor Kudus*” the results of this research percentage of student learning an increase on cycle I to cycle II from 65,84% increased to 84,62%, the basic teaching skills of teacher in managing learning process in cycle I get percentage 83,33 % and increased on cycle II becomes 85,57% and learning activities of students on a cycle I is 73.31% increased in cycle II becomes 83.09%. It can be concluded that application of field trip method using the roda

¹¹ Nur Afni, *Penerapan Strategi Roda Putar Pemecah Masalah Untuk Meningkatkan Hasil Belajar Matematika Siswa Kelas IV Sekolah Dasar Negeri 012 Naumbai Kecamatan Kampar Kabupaten Kampar* (Pekan Baru: Pendidikan Guru Madrasah Ibtidaiyah. Universitas Islam Negeri Sultan Syarif Kasim Riau Pekanbaru,2013), hlm. 1

¹²Amaliyah, *Keefektivan Permainan Roda Iqra’ Untuk Meningkatkan Keterampilan Membaca Bahasa Arab Siswa Kelas VII di Mts Ath-Thahiriyah Banjarnegara Tahun Ajaran 2014/2015* (Semarang: Pendidikan Bahasa Arab Universitas Semarang, 2015), hlm. 1

putar media can increased the writing skills of description essay, teaching skills of teacher, and student activities.¹³

5. Rinawati, in the year 2015, with the title “*Meningkatkan Kemampuan Berhitung Melalui Media Roda Putar Pada Anak Kelompok B Tk Dharma Wanita Gandong Kecamatan Bandung Kabupaten Tulungagung Tahun Pelajaran 2014/201*” on treatment cycle III comprehensiveness of study until 84.21%. The results after the treatment cycle III exceeds 75% thus the hypothesis the treatment, accepted. It can be concluded that roda putar media Can increased Count Ability on TK Dharma Wanita Gandong Tulungagung.¹⁴

To make it easier to understand the originality of research above then included a table of differences, similarities, and originality of the research in the table below:

Table 1.1
Originality of Research

No	The Name of The Researcher. The title. Form (Thesis/Theses/journal/etc.). Publisher and years of research.	Equation	Difference	Originality of research
1.	Ersa Yunnartien, <i>Penggunaan Media Roda</i>	1. Media that used is <i>roda pintar</i>	1. The previous research use material about	Based on the characteristics of Mathematics

¹³ Nefa Ainurrohmah, *Peningkatan Keterampilan Menulis Deskripsi Melalui Metode Field Trip Berbantuan Media Roda Putar Kelas IV Sd 1 Pasuruhan Lor Kudus*, (Kudus: Universitas Muria Kudus, 2017), hlm. 1.

¹⁴ Rinawati, *Meningkatkan Kemampuan Berhitung Melalui Media Roda Putar Pada Anak Kelompok B Tk Dharma Wanita Gandong Kecamatan Bandung Kabupaten Tulungagung Tahun Pelajaran 2014/201*, (Kediri: Universitas Nusantara Kediri, 2015), hlm. 1.

	<p><i>Pintar Untuk Meningkatkan Hasil Belajar Matematika Materi Keliling Dan Luas Segitiga Kelas IV SDN 1 Dasan Tereng Tahun Ajaran 2017/2018.</i> Thesis. Mataram: Pendidikan Guru Sekolah Dasar Universitas Mataram. 2017.</p>	<p>or <i>roda putar</i> 2. To improve student learning outcomes 3. Mathematic subjects</p>	<p>circumference and area of Triangles, while research now take material about solid figure of cube and cuboids . 2. The previous research conducting research on 4th grade of elementary school while research now conducting research on 5th grade elementary school</p>	<p>subjects, This research will attempt to create media products in the form of <i>roda putar</i> game pada solid figure of cube and cuboids 5th grade elementary school that is expected to increase the effectiveness of learning so that students are motivated and interested in learning.</p>
2.	<p>Nur Afni, <i>Penerapan Strategi Roda Putar Pemecah Masalah Untuk Meningkatkan Hasil Belajar Matematika Siswa Kelas IV Sekolah Dasar Negeri 012 Naumbai Kecamatan Kampar Kabupaten Kampar.</i> Thesis. Pekanbaru: Pendidikan Guru Madrasah Ibtidaiyah. Universitas Islam Negeri Sultan Syarif Kasim Riau Pekanbaru. 2013.</p>	<p>1. Media that used is <i>roda pintar</i> or <i>roda putar</i>. 2. To improve student learning outcomes</p>	<p>1. The previous research conducting research on 4th grade of elementary school while research now conducting research on 5th grade elementary school 2. The previous research use quantitative research types, while research now use R&D research types.</p>	
3.	<p>Amaliyah, <i>Keefektivan Permainan Roda Iqra' Untuk Meningkatkan</i></p>	<p>1. Media that used is <i>roda pintar</i> or <i>roda</i></p>	<p>1. The previous research To increase Reading while the research now To increase</p>	

	<p><i>Keterampilan Membaca Bahasa Arab Siswa Kelas VII di Mts Ath-Thahiriyah Banjarnegara Tahun Ajaran 2014/2015.</i> Thesis. Semarang: Pendidikan Bahasa Arab Universitas Semarang. 2015.</p>	<p><i>putar</i></p>	<p>the effectiveness of student learning. 2. The previous research on Arabic subject while the research now on mathematic subject 3. The previous research conducting research on 7th grade of junior high school while research now conducting research on 5th grade elementary school</p>	
4.	<p>Nefa Ainurrohmah. <i>Peningkatan Keterampilan Menulis Deskripsi Melalui Metode Field Trip Berbantuan Media Roda Putar Kelas IV Sd 1 Pasuruhan Lor Kudus.</i> Thesis. Kudus: Universitas Muria Kudus. 2017.</p>	<p>1. Media that used is <i>roda pintar</i> or <i>roda putar</i></p>	<p>1. The previous research To increase writing ability while the research now To increase the effectiveness of student learning. 2. The previous research conducting research on 4th grade of elementary school while research now conducting research on 5th grade elementary school</p>	
5.	<p>Rinawati. <i>Meningkatkan Kemampuan Berhitung Melalui Media Roda Putar Pada Anak Kelompok B Tk Dharma Wanita Gandong Kecamatan Bandung Kabupaten</i></p>	<p>1. Media that used is <i>roda pintar</i> or <i>roda putar</i></p>	<p>1. The previous research To increase count ability while the research now To increase the effectiveness of student learning. 2. The previous research conducting research</p>	

	<p><i>Tulungagung Tahun Pelajaran 2014/201. Thesis. Kediri: Universitas Nusantara Kediri. 2015.</i></p>		<p>Kindergarten while research now conducting research on 5th grade elementary school.</p> <p>3. The previous research use qualitative research types, while research now use R&D research types.</p>	
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I. Definition of Terms

1. Media development is a process to raise the quality of a concept for passing information in the process of teaching and learning effectively.
2. Learning media is a component of learning resources or physical probe containing instructional material that carry messages or information aims contains teaching purposes.
3. Learning media based on *roda pintar* game is a form of the game with solve the question randomly match that has been designated by the needle in *roda putar* game.
4. Mathematics is the science of logic about the shape, arrangement, quantity, and concepts that relate to one another.
5. Solid figure material is one material of mathematic subject to account the volume or area of solid figure.

J. Systematic Writing

Systematics of the writing on this research are as follows:

CHAPTER I : In this chapter discuss about the description of introduction consisting of background, statements of the problem, objectives of developing, benefits of development, development assumption, scope limitations of developing, product specifications, originality of the research, definition of terms and systematic writing

CHAPTER II : In this chapter discuss about Literature Review there are development learning media, learning media, learning media based on roda putar game, mathematics, and solid figure material.

CHAPTER III : In this chapter discuss about research methodology consisting of type of research, development model, development procedure, and, Prosedur Pengembangan, Product Trials, and Research Procedure.

CHAPTER IV : In this chapter discuss about research data are : (1) The Result of needness level students against learning media based on roda putar game, (2) development process of learning media based on roda putar game, and 3) The effectiveness of learning media based on roda putar game.

CHAPTER V : In this chapter discuss about research analysis that has three discussion subject i.e.: Analyst The Level Needness Students Against Learning Media, Analyst of Development Process, Analyst The effectiveness of Learning Media.

CHAPTER IV : In this chapter discuss about Conclusions and suggestions.

Bibliography : contains a list of books that used as a source of reverensi arranged by name of the author, year of publication, title of the book, City publishers and Publisher the sorted alphabetically. Bibliography serve to

gives directions for the readers who want to continue studies or to do repeated checking against the paper.

And the last is appendix that contains of documents required the author or reader to supports development of media in the learning process.



CHAPTER II

LIERATURE RIVIEW

A. Development of Learning Media

According to Kamus Besar Bahasa Indonesia, development is a process, a way, deed of develop.¹⁵ And more described in Kamus Umum Bahasa Indonesia the work of WJS Poerwadarminta, that development is the Act of making increased, turn out perfect (thoughts, knowledge and so on).¹⁶

Development of the general meaning is growing, changes slowly (evolusi), and change by step. Development is process of translating or specification design into physical form. Or with other meanings the development means the process of making learning materials.¹⁷

Development activities include the following stages: planning, implementation, and evaluation followed by a refinement of activities so that the acquired good forms. To do the learning media development activities required procedure development. The development procedure is the procedural steps that must be taken by the developer in order to get to the product specified. Media development procedure includes several stages, namely the planning or preparation of media design, media production, and media evaluation.

¹⁵Departemen Pendidikan Nasional, *Kamus Besar Bahasa Indonesia*.(Jakarta: Balai Pustaka, 1989), hlm. 414

¹⁶ Poerwadarminta. W.J.S, *Kamus Umum Bahasa Indonesia*. (Jakarta : Balai Pustaka, 2002), hlm. 473

¹⁷ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Kencana Prenadamedia Group, 2010), hlm. 197

Learning media according to Aqib defined as everything that can be used to transmit a message, stimulate the mind, feelings, attentions, and the willingness of students so as to encourage the learning process. forms of media are used to increases the learning experience in order to become more concrete. Teaching with the media not just use words (verbal symbols).¹⁸

While Hamalik States that media education is the tool, methods and techniques that used in order to better streamline communication and interaction between teachers and students in the process of study and learning in schools.¹⁹

So it can be concluded that the development of the learning media is a series of processes or activities that is done to produce a product in the form of learning media based on existing development theories and the theory of development that is used is a theory of the development of learning.

B. Learning Media

1. Understanding the learning Media

Media derived from the Latin is the plural form of medium which means something that located in the middle between two parties or a tool.²⁰

¹⁸ Aqib, Zainal, *Profesionalisme Guru Dalam Pembelajaran*, (Surabaya : Insan Cendekia, 2002)

¹⁹ Hamalik, *Media Pendidikan*. (Bandung : Sinar Baru, 1994), Hlm. 12

²⁰ Basyaruddin Usman dan Asnawir, *Media Pembelajaran*, (Jakarta: Ciputat Pers, 2002) hlm. 11.

Rossi and Breidle (1966), suggests that the learning media is all the tools and materials that can be used for educational purposes, such as radio, television, books, newspapers, magazines, atc.²¹ However the media not only in the form of tools or materials, but other things that enables students to gain knowledge.

Gerlach and Ely (1980) said: “A medium, conceived is any person, material or event that establishes condition which enable the learner to acquire knowledge, skill and attitude”.²²

2. The functions of the learning Media

In general, learning media has multiple functions, there are :

a. Capture an object or certain events

The important events or rare objects can be memorialized with photos, film or recorded through video or audio and can be used when needed

b. Manipulate condition events, or specific object

Through the learning media teachers can present a lesson that is abstract being concrete making easy to understood and can eliminate verbalisme. Suppose, to presented learning materials about the circulatory system in humans, can be served through the film.

c. Increase spirit and the learning motivation of students

²¹ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008). hlm. 204

²² Ibid., hlm. 205

Usage the learning media can increase the learning motivation of students so attention students towards the learning material can be increased.

d. Have a practical value

The practical value of owned that is as follows:

- a. The media can overcome the limitations of the student experience.
- b. Media can transcend the boundaries of the classroom. This is mainly to present a difficult to understand learning materials directly by learners.
- c. The media can allow the occurrence of direct interaction between the participants with the environment.
- d. The media can produce uniformity of observation.
- e. The media can instill the basic concept of the true, real, and proper.
- f. Media can stir up motivation and stimulate learners to learn properly.
- g. Media can stir up new interest and desire.
- h. The media can control the speed of student learning.
- i. The media can provide a thorough experience of things concrete to abstract.²³

3. The Benefits Of Learning Media

²³ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008). hlm. 207-210.

The benefits of learning media in the learning process are:

- a. Teaching it would be more attracted the attention of students, so it can be increases the learning motivation of students.
 - b. Teaching materials will more clearly its meaning so that it can be better understood by the students, and allows students to domination of learning goal better.
 - c. Methods of teaching will be more varied, not merely verbal communication through the utterance of words by teacher, bored and teachers did not depleted of energy, especially when teachers teach to every hour lesson.
 - d. Students doing more learning activities, because not just listen the explanation from teacher, but also other activities such as observing, perform, demonstrate and others.²⁴
4. The Classification of the Learning Media

Learning Media can be classified into several classifications depending on the angle of view:

- a. Views of nature, the media can be classified as follows:
 - 1) Auditif Media, is media that only be heard or media that only have elements of a sound, like radio and sound recorded sound.
 - 2) Visual media is media that only be seen, do not contain elements of sound. That is included in this medium is film

²⁴ Nana Sudjana dan Ahmad Rivai, *Media Pengajaran* (Bandung: CV Sinar Baru, 1991), hlm. 2.

slides, photos, transparency, pictures and various forms of printed materials such as media graphic.

3) Audiovisual media is types of media that contain elements of sound also contain elements of a picture that can be seen, as video footage, any size movie, *slide sounds, etc.* Media capabilities are considered better and more interesting, because it contains two elements the type of the first medium and second medium.

b. Views of the scope of capabilities, the media can be classified as follows:

1) Media that have power coverage the spacious and simultaneously, like radio and television. Through this medium students can learn things or the actual events simultaneously without having to use special room.

2) Media that have coverage limited by time and space as the movie slides, film, video, and more.

c. Views of techniques adopted, the media can be classified as follows:

1) A projected media, like slide movie, strip movie, transparansitransparency, etc. Media types that require a special projection tool, like *film projector* to project films, *slide projector* to project a movie slide, *Over Head Projector (OHP)* to project transparency. Without the

support This kind of projection tools, then this kind of media will not work anything.

- 2) Media that is not projected, like the picture, photos, painting, radio, etc.²⁵

5. The Characteristics Of The Learning Media

There are characteristics of the learning media:

a. Media Graphics (Visual Silence)

In the learning process, print and graphics media the media is the most widely and most often used. This media includes categories of non visual media projection yang berfungsi untuk menyalurkan pesan from the giver to the receiver of a message (from teacher to student). In a simple graphical media can be defined as media containing a message poured in the form of writings, the letters, pictures, and symbols that containing the meaning. Graphic media including visual media silent. Various graphic media is pictures or photos, diagrams, charts, poster, graphic print and books.

b. Media Projection

Projection media is media that can be used with the help of the projector. Different with the Media graphics, This media should be use the electronic tools to display the information or message. Therefore, media ini dapat digunakan apabila tersedia

²⁵ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008). hlm. 211-212.

fasilitas yang dibutuhkan. however, as with media graphics, media that belongs on the projection media group alike rely on visual stimuli. Some media types of projection that often used, thereslide movie, Over Head Transparansi, Opaque Projector, Microsofis, video. That kind of projection media now rarely used after inception the computer that can project a message better and more variable with the help of other projection tool.

c. Media Audio

Media audio is media or materials containing messages in the form of auditif (the vocal cords or record voice) that can stimulate the mind and feelings of the listeners Thus the learning process occur.

d. Computer Media

Computer is types of media virtual can provide a rapid response against the results of study that conducted by students. More than it, Computer has the capability of saving and manipulate information according to needs. Computer technology at this time used as a learning tool for multimedia that allows students to create a design, engineering a concept and science.²⁶

6. The principles of selection and use of Media

a. The principles selection of Media

²⁶ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008), hlm. 213-218.

In order to make the learning media really used for learning, there are a principles that must be considered in the selection of media:

- 1) The selection of the media must appropriate with the purpose to be achieved. Whether the goal is cognitive, affective, or psychomotor. It should be understood there is nothing media that can be used are suitable for all purposes. Each media has a certain characteristics, that must be made as material considerations in its use.
- 2) The selection of the media should be based on a clear concept. It means the selection of the media not based on the pleasure a teacher or just a distraction and amusement, rather it should be an integral part in overall process of learning to increase the effectiveness and efficiency of student learning.
- 3) The selection of the media should be adapted to the characteristics of the students. There a media that are suitable for a group of students, But not suitable for other students.
- 4) The selection of the media must match with the learning styles of students as well as style and ability of teachers. Therefore, teachers need to understand the characteristics serta usage procedures the selected media.

- 5) The selection of the media must comply with the environmental conditions, facilities and the time available for learning needs.

b. The principles usage of learning Media

To make the learning media really used for learning, There are some principles It should be noted in the use of media:

- 1) Learning media that will use by teacher must be in accordance and directed to attain purpose of learning.
- 2) Learning media that will use must be in accordance with the learning material.
- 3) Learning media that will use must be in accordance with the interest, necessity, and conditions of students.
- 4) Learning media that will use must noticed the effectiveness and efficiency.
- 5) Learning media that will use must be in accordance with the ability of teachers in operating.²⁷

C. Learning Media Based on Roda Putar Game

1. Understanding Learning Media Based on Roda Putar Game

According to Indonesia Dictionary “Roda” is a round item (wound and usually barred).²⁸ Used to run a vehicle. The term of

²⁷ Wina Sanjaya, *Perencanaan dan Desain System Pembelajaran* (Jakarta: kencana, 2008), hlm. 224-227.

²⁸ W. J. S. Poerwadarminta, *Kamus Umum Bahasa Indonesia* (Jakarta: Balai Pustaka ,2003), hlm. 829.

“roda” also often used for circular objects other spinning like a waterwheel. While the word “Putar” According to Indonesia Dictionary has definition: turning movement, spinning, cyclic, change direction, turn and rounds.²⁹ So it can be concluded that “roda putar” is a circle or round goods could move forward and backward, in other words the rotating circle.

Paul Ginnis explains that the strategy of *Roda Putar* is a strategy game with a challenging, that encourages students to participate in solving of problem or question on *roda putar*.³⁰

Learning Media Based on Roda Putar Game is a teaching tool in learning process with the game concept like *roulette* game or Swivel board game. students play with rotate *roda putar* and answer the questions correctly Accordingly the question which has been appointed by the needle in *roda putar* to get the score of each question they answer correctly.

It can be concluded that media *roda putar* is a media game form circle that is divided into several sectors. In its use, This media can be attract the attention, the interest and motivation of learning, make students more active, Interactive, increases the understanding, as well as the learning process can take place in fun and and optimal.

2. The Benefits of Learning Media Based on Roda Putar Game

²⁹ Ibid., hlm. 976.

³⁰ Paul Ginnis, *Trik dan Taktik Mengajar* (Jakarta: PT Indexs, 2008), hlm. 190.

a. Advantages

Khairu ahmadi in his book explains some advantages Learning Media *Roda Putar*, as follows:

- 1) Students are involved in learning activities so that his knowledge really merging with either.
- 2) Train students to collaborate.
- 3) Train student's understanding in resolving various problem, so triggering increasing student learning outcomes ³¹

While in this study there are other advantages as follows:

- 1) Encourages students to be active in the learning process because the student is involved directly in the activities.
- 2) This activity is to train your memory retention and speed of thought.
- 3) train students to cooperate in one group.
- 4) Can be exam preparation which is very nice.
- 5) Packed with an exciting display and staining according to the characteristics of the child so that it can attract the attention of students.
- 6) Provide feedback directly, so the learning process takes place effectively and efficiently.

b. Disadvantages

³¹ Iif Khoiru Ahmadi, *Strategi Pembelajaran Sekolah Terpadu* (Jakarta: Prestasi Pustaka Publisher, 2011), hlm. 56.

- 1) For students who are lazy the purpose of these strategies is difficult to achieved.
 - 2) Need the settings for quite a long time.
3. Steps of learning Media *Roda Putar*

As for the steps of learning media *roda putar* game on this research there are:

- a. Students divided into 6 groups
- b. Advanced Group representatives do suit to finding a Group that will be first play.
- c. The winner group must rotate the cirle board and finish the questions in the group, with a time of 1 min
- d. If the circle board stop in the smiling picture then the group can play again, If the circle board stop in the sad picture so must replace with another group, group with smiling picture has twist opportunity
- e. If successful answer will be given a star as a gift
- f. The winner group is the group that can collect the most star reward

D. Mathematics

1. The Nature Of Mathematics

Many people consider mathematics as arithmetic or counting, but between them there is a significant difference. According to

Jhonson and Myklebust as quoted Abdurrahman, mathematics is the symbolic the function of practice to express quantitative relationships and space whereas theoretical function to ease thinking.³²

Experts define the mathematical sense differently However in principle have the same meaning. According to Suwanggih based on the origin of the word is taken from the literature of Greece is *matematike* , mathematical means of knowledge acquired with the thought (reason).³³

While According To Prof. Dr. Ani Hakim Nasution, Math experts from Institut Pertanian Bogor mention that mathematics is the science of struktur, order, and relationships which includes basic calculation, measurement and depiction of the shape of the object. This the science involves of logic and quantitative calculation and also has increased the degree of an idealization and abstraction subject.³⁴

2. Mathematics Learning in Elementary School

Mathematics Learning taught at each level of education, termasuk di sekolah dasar, but at the elementary school level the material provided is still the basic material. This is because age of

³² Mulyono Abdurrahman, *Pendidikan Bagi Anak Yang Berkesulitan Belajar* (Jakarta: Rineka Cipta, 1999), hlm. 252.

³³ Suwanggih, Erna dan Tiurlina, *Model Pembelajaran Matematika* (Bandung: UPI Press, 2006), hlm. 3.

³⁴ Catur Supatmono, *Matematika Asyik: Asyik Mengajarnya, Asyik Belajarnya* (Jakarta: PT Gramedia Widiasarana Indonesia Kompas Gramedia Building, 2009), hlm. 7-8

child at elementary school, the average of 7 to 11 years, the age at this stages as said bu Piaget that the child are still at the stage of concrete operations mean children are able to think concrete or acording the fact.

Dienes Ruseffendi expose that each concept or principle in mathematics are presented in the form of concrete will be well understood.that means If the objects in the form of the game will be very useful When dimaipulasi with the corre dalam pengajaran matematika.³⁵

3. The Purpose of Mathematics Learning in Elementary School

The purpose of matematika Learning at elementary school is gives emphasis on structuring of reason and establishment the attitude of students. The goal generally is giving emphasis on skills in application of mathematics in daily activity as well as to helping the learning of more science.³⁶

On the curriculum of elementary school mathematics, the goal of learning mathematics in elementary school is in order that students are skilled in using a variety of mathematical concepts in life. These concepts are divided into three large groups:

- a. Planting the basic concept that is a new concept of learning math, when the students had never studied the concept. In the

³⁵ Ruseffendi, *Pengantar Kepada Guru Membantu Guru Mengembangkan Kompetensinya Dalam Pengajaran Matematika Untuk Meningkatkan CBSA* (Bandung: Tarsito, 1995), hlm. 25.

³⁶ Erman Suherman, dkk., *Strategi Pembelajaran Matematika Kontemporer* (Bandung: UPI Press, 2003), hlm. 19.

activities of this basic concept, media or props are expected to be used to help the student mindset capabilities.

- b. Understanding the concept, is Advanced Learning from the planting concept, the aim of enabling students to better understand a mathematical concepts.
- c. Coaching skills are advanced learning of the concept of planting and understanding the concept. Learning coaching skills aims in order to make students more skilled in using a variety of mathematical concepts.³⁷

While according to DEPDIKNAS, the purpose of the mathematics learning in elementary school classified into general purpose and special purpose. general purpose of the mathematics learning in elementary school, as follows:

- a. Conduct the calculations of sum, Subtraction, Multiplication, Division
- b. along with mixed operation, belong Rational Numbers.
- c. Determine the nature and the elements variously Plane Figure and solid figure, belong to angles, Circumference, area, and volume.
- d. Determine the nature of symmetry, congruen and coordinate system.

³⁷ Heruman, *Model Pembelajaran Matematika di Sekolah Dasar* (Bandung: PT.Remaja Rosda Karya, 2008), hlm. 2.

- e. Using the measurement: unit, equality between the units, and valuation of measurement.
- f. Define and interpret simple data like the highest size, the lowest size, average, modus, collect and present.
- g. Solve the problem, do the reasoning and communicating ideas in mathematics.

special purpose of the mathematics learning in elementary school, as follows:

- a. Understand mathematical concepts, explain the relation between concepts and apply the concepts or algorithm..
- b. Using reasoning patterns in nature, doing mathematical manipulations in generalities, compile proof or explaining the idea and the mathematical statement.
- c. To solve problems that include the ability to understand the problems, designing a mathematical model, complete model and interpret the acquired solutions.
- d. Communicating ideas with symbol, table, diagram or other media to explain the circumstances or issues.
- e. Have traits appreciate usage Mathematics in daily activity.³⁸

E. Solid Figure Material

1. Understanding of Solid Figure

³⁸ Ahmad Susanto, *Teori Belajar & Pembelajaran Di Sekolah Dasar* (Jakarta: Kencana Prenada Media Group, 2013), hlm. 190.

According to sri subarinah solid figure is solid geometry dimension 3 with boundaries shaped flat areas or fields.³⁹

While Sumanto, dkk say that solid figure have certain properties, are have side, edge, and vertex. side is a part of solid figure that limit between inside and outside. Edge is line encounter between the two sides of solid figure. Vertex is shoppe of solid figure.⁴⁰

From some of the opinions above it can be concluded that solid figure is geometry solid of three dimensions that have side, edge and vertex.

2. Identify sections of solid figure

a. Side

The field side or side is solid figure is side that connect limit between inside and outside. Side of solid figure can form field flat or curved.⁴¹

b. Edge

Edges are adalah lines that formed by intersection of two sides that meet. Edge in solid figure can form a straight line or curved lines. Edge that located in one area and do not intersect

³⁹ Sri Subarinah, *Inovasi Pembelajaran Matematika SD*. (Jakarta: Depdiknas, 2006), hlm 36

⁴⁰ Sumanto, dkk, *BSE Gemar Matematika 5*. (Jakarta: Pusat Perbukuan Depdiknas, 2008), hlm 149

⁴¹ Endah Budi Rahayu dkk, *Contextual Theching And Learning Matematika*. (Jakarta: Pusat Perbukuan Departemen Pendidikan Nasional, 2008), hal 220

are called edge Parallel. Edge that intersect but are not located in same area called Intercross Line.⁴²

c. Vertex

Vertex is shoppe of solid figure, that connect 3 or more of edge on solid figure.⁴³

d. Side Diagonal

Side diagonal is line segment that connect two vertex located the different edge on one side.⁴⁴

e. Diagonal Space

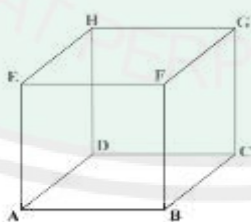
Diagonal Space is line area connect two vertex located on top side and base.⁴⁵

f. Diagonal Plane

Diagonal Plane is field that limited by two Side Diagonal that confronted.⁴⁶

3. Description of Cube and Cuboid

a. Cube



Pictures 2.1 Cube

⁴² Endah Budi Rahayu dkk, *Contextual Theching And Learning Matematika*. (Jakarta: Pusat Perbukuan Departemen Pendidikan Nasional, 2008), hal 220

⁴³ Ibid., hlm 220

⁴⁴ Ibid., hlm 220

⁴⁵ Ibid., hlm 220

⁴⁶ Ibid., hlm 220

Heruman argues that the cube is part of the Prism. The cube has special characteristic there is has the same side.⁴⁷

Soenarjo argues that the cube is right Prism special. All sides in the form of square or rectilinear in the same.⁴⁸

1) The natures of cube as follows:

a) 6 side

On pictures 2.1: (ABCD, ABEF, ADEH, BCFG, CDGH, EFGH)

b) 12 edge

On pictures 2.1 : base edge : AB, BC, CD, AD.

Top edge : EF, FG, GH, EH.

Upright edge : AE, BF, CG, DH.

c) 8 vertex

On pictures 2.1 : A with G, B with H, C with E, D with F.

d) 12 side diagonal

On pictures 2.1 : AC and BD, EG and FH, AF and BE, CH and DG, BG and CF, AH and DE.

e) 4 diagonal space

On pictures 2.1 : AG and CE, BH and DF.

f) 6 diagonal plane

⁴⁷ Heruman, *Model Pembelajaran Matematika di Sekolah Dasar*. (Bandung: PT Remaja Rosdakarya, 2008), hlm 110

⁴⁸ Soenarjo, *Matematika 5*. (Jakarta: Departemen Pendidikan Nasional, 2008), hlm 233

On pictures 2.1 : ABGH, ACGE, ADGF, BCHE,
BDHF, DAN CDEF.

2) Formula of Cube

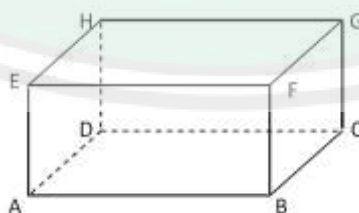
- Area of cube surface : $6 \times S^2$
- Perimeter of cube : $12 \times S$
- Volume of cube : luas alas x tinggi = $S^2 \times S$

3) Nets of Cube



Pictures 2.2 Nets of Cube

b. Cuboid



Pictures 2.3 Cuboid

According to Soenarjo cuboid is upright prism square also called rightprism.⁴⁹

1) The natures of cube as follows:

a) 6 side

On pictures 2.3 : ABCD, EFGH, BCFG, ADEH, ABEF, CDGH

b) 12 edge

On pictures 2.3 : (AB, EF, CD, GH) (BC, AD, EH, FG) (AE, BF, CG, DH).

c) 8 vertex

On pictures 2.3 : A, B, C, D, E, F, G, H.

d) 12 side diagonal

On pictures 2.3 : (AC, BD, EG, FH) (AF, BE, DG, CH) (AH, DE, BG, CF), dimana $AC \neq AF \neq AH$

e) 4 diagonal speace

On pictures 2.3 : AG, BH, CE, DF

f) 6 diagonal plane

On pictures 2.3 : ACGE dan BDHF, AFGD dan BEHC, BGHA dan DFED.

2) Formula of Cube

- Area of cuboid surface : $2 \times \{(p \times l) + (p \times t) + (l \times t)\}$
- Volume of cuboid : $(p \times l \times t)$

⁴⁹ Soenarjo, *Matematika 5*. (Jakarta: Departemen Pendidikan Nasional, 2008), hlm 233

3) Nets of Cuboid



Pictures 2.4 Nets of Cuboid

CHAPTER III

RESEARCH METHOD

H. Type of Research

The type of this research is Research and Development. Research and Development is a process or series of steps in order to develop a new products or refine existing products in order to be accounted for.⁵⁰ Research conducted included in this type of Education Research and Development (R&D). According to a statement Borg &Gall “R&D is a process used to develop and validate educational products”.⁵¹

According to Nana Syaodih Sukmadinata *R&D* is a process or steps to develop a product that already exists, that can be accountable.⁵² Products that will be developed is a Learning Media Based on Roda Putar Game on Mathematic Subject Of Solid Figure Material for 5th Grade SD/MI.

I. Development Model

Development of learning media in this study refers to the type of development according to Borg & Gall (1983). These models are descriptive by following these general steps to produce a product. According to Borg & Gall (1983) steps of research and development are as follows⁵³:

⁵⁰ Trianto, *Pengantar Penelitian Pendidikan bagi Pengembangan Profesi Pendidikan & Tenaga Kependidikan* (Jakarta: Kencana Prenada Media, 2010), hlm. 206.

⁵¹ Zainal Arifin, *Penelitian Pendidikan Metode dan Paradigma Baru* (Bandung: PT Remaja Rosdakarya, 2011), hlm. 127.

⁵² Nana Syaodih Sukmadinata, *Metode Penelitian Pendidikan* (Bandung: PT Remaja Rosdakarya, 2007), hlm. 164.

⁵³ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Prenada Media, 2015), hlm. 292.

1. Research and Information Collecting

Includes a literature review, observation or observation class and the preparation of the preliminary report.

2. Planning

Include activities which are: formulating ability, formulating a specific purpose, to determine the sequence of materials and test small skal.

3. Development Format of Preliminary Product

The purpose is the development format of preliminary product or first draft which includes the preparation of learning materials, and evaluation tools handbook.

4. Preliminary Test

This test is performed for the format program developed whether in accordance with a special purpose. The results of the analysis of these early trials became the input to perform preliminary product revisions.

5. Product Revisions

Product revisions, which is carried out on the basis of this initial trial results to gain information and input to make improvements repairs in accordance with input obtained at the time of trial.

6. Field Trials

Products that was revised based on the results of the initial test, then tested again to subject larger try again.

7. Product Revisions

The revision of the product based on the results of field trials.

8. Field Test

After the revised product, if the developers want products that are more feasible and adequate field test is required.

9. Final Product Revisions

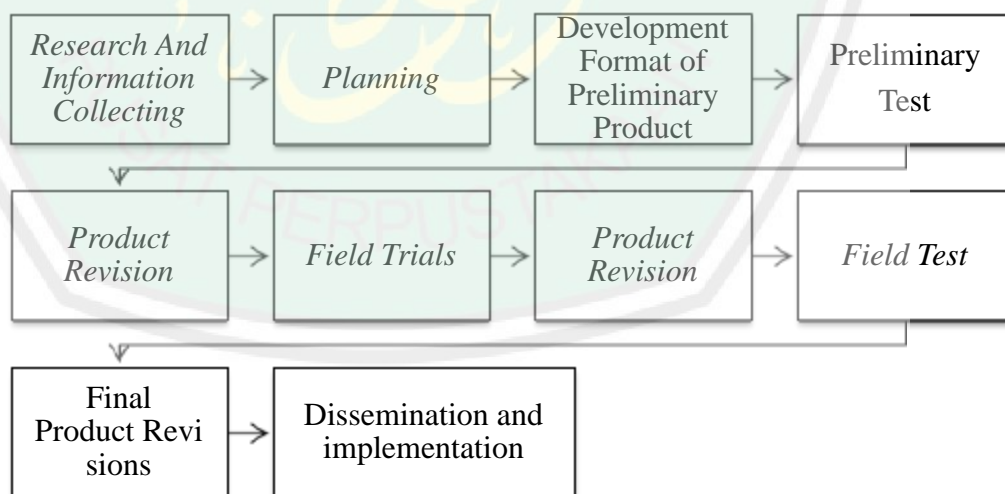
Revision of this product be the size that the product really is said to be valid because it has gone through a series of tests gradually.

10. Dissemination and Implementation

Delivering the results of development (process, procedures, program or product) to the users through a forum and professional meeting or write a journal title, or in the form of a book or handbook.

Based on the steps and development of Borg & Gall above, can be described as follows:

Picture 3.1
Development Model Borg and Gall



However, to simplify research and development, the researchers divided some procedures that became 8 main steps, namely: 1) Research

And Information Collecting, 2) planning, 3) the development format of the preliminary product, 4) preliminary test by expert validator, 5) product revision I, 6) field trials, 7) final product revision, 8) Dissemination and implementation.

J. Development Procedure

Research procedures that are used in the development of researcher is adapted from the development measures developed Borg & Gall, its applications appropriated to the needs of researchers. Given the limited time and the cost of belonging to a researcher, outline the measures of research and development that have been put forward earlier, simplified according to needs of research.

Taking major steps Borg & Gall, procedure learning materials development researchis divided into 8 steps, which are: 1) Research And Information Collecting, 2) planning, 3) development format of the preliminary product, 4) preliminary test by expert validator, 5) product revision, 6) field trials, 7) final product revision, 8) Dissemination and implementation. Learning media development procedures include:

1. Research And Information Collecting

Includes a literature review, observation or observation class and the preparation of the preliminary report.⁵⁴

a. A study of the Literature

⁵⁴ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Prenada Media, 2015), hlm. 292.

This stage done by collecting the theories associated with the development of learning media based on Roda Putar Game on mathematic subject of solid figure material for 5th grade SD/MI. This stage aims to figure out a general overview about development will be carried out. Based on the study of the literature will note the characteristic form of learning media based on Roda Putar Game.

b. Field Study

This stage researchers did some stage analysis, there are:

- 1) Researchers analyzed the learning media to an existing at school. Based on these stage obtained information that teachers rarely use learning media as supporting the learning process.
- 2) Researchers analyzed the characteristics of students with regard to the characteristics, capabilities and experiences of students, both as a group and as individuals.
- 3) Researchers analyzed the level of needness students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade SD/MI.
- 4) Researchers analyze material with the aim to determine the content of the material in the learning media on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade SD/MI.

2. Planning

At this stage the researchers planning the material that will be arranged in the Learning Media Based on Roda Putar Game on Mathematic Subject of Solid Figure Material for 5th Grade SD/MI, steps undertaken include:

a. Analysis of Curriculum

Curriculum that will be used is curriculum 2013 on mathematic subject especially solid figure material. Analysis of curriculum aims to analysis core competencies, basic competencies and indicators.

b. Analysis Materials of Learning Media

The material of learning media based on Roda Putar Game on Mathematic Subject is solid figure material especially on :

- 1) volume of cube.
- 2) cuboids also.
- 3) nets of cube.
- 4) nets of cuboids.

3. Development Format of the Preliminary Product

The purpose is the development format of preliminary product or first draft which includes the preparation of learning materials, and evaluation tools handbook.⁵⁵

Product development through several steps, including:

a. Determine the title

⁵⁵ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Prenada Media, 2015), hlm. 292

Learning media developed titled Learning Media Based on Roda Putar Game on Mathematic Subject of Solid Figure Material for 5th Grade SD Purwanto 4 Malang.

b. Materials and Evaluation Page

As for a series of process from development product stage as follows:

- 1) Prepare the material relating to the topics that will be discussed
- 2) Conduct structuring of content and the structure of the material content with manner determine the groove of learning media in accordance with the framework learning media that has been designed.
- 3) Create learning media design accordance with mathematic subject of solid figure material especially volume of cube and cuboids and nets of cube and cuboids.
- 4) Make the learning evaluation for students.

4. Preliminary Test By Expert Validator

This test is performed for the format program developed whether in accordance with a special purpose. The results of the analysis of these early trials became the input to perform preliminary product revisions.⁵⁶

At this stage of the product development the product format early results validated by:

- a. The validation test by experts of the material or content

⁵⁶ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Prenada Media, 2015), hlm. 292

b. The validation test by experts of the design media

5. Product Revision

Product revisions, which is carried out on the basis of this initial trial results to gain information and input to make improvements repairs in accordance with input obtained at the time of trial.⁵⁷

In this case Product revisions done based on comments, suggestions and the results of assessment from expert validator of content expert and media expert before the product field trials to students and experts validator of the mathematic learning.

6. Field Trials

Field trials in this research is applied at a school with a total of 31 students and experts validator of the mathematic learning. Field trials are required to assess the feasibility of the learning media. Aims this stage to know that learning media is really feasible to use in learning process.

7. Final Product Revision

Revision of this product be the size that the product really is said to be valid because it has gone through a series of tests gradually.⁵⁸ At this stage, revision product is done after the product is applied to students.

Field trials and quantitative data that has already been obtained, then the researchers did a revision of the last product.

8. Dissemination and Implementation

⁵⁷ Ibid., 292

⁵⁸ Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan* (Jakarta: Prenada Media, 2015), hlm. 292

This desiminasi stage takes place when there is no revision again, and then reported the results of development for later printing.

K. Trials

Product trial aims to find out whether the product that made decent used or not and to what extent the product is made can reach target.⁵⁹

1. Design Trials

A test was conducted to find out the level of validity and effectiveness of the product. Products in the form of learning media based on Roda Putar Game was tested level interestness, validity and their effectiveness through several stages:

a. The Stage of Expert Validation

The result of expert validation the already acquired by providing comments and suggestions, are then used to find out the feasibility of the learning media. In this stage of expert validation conducted by :

- 1) Validation of content expert by Mr Ahmad Makki Hasan, M.Pd.
- 2) Validation of media expert by Mrs Churidatul Ulfia A M.Pd.
- 3) Validation of learning expert by Mrs Sri Idha Suprapti S.Pd

b. The Stage of Field Trials

This stage aims to find out the interestness and the effectiveness of learning media based on Roda Putar Game.

⁵⁹ Zainal Arifin, *Penelitian Pendidikan Metode dan Paradigma Baru* (Bandung: Remaja Rosdakarya, 2011), hlm. 132.

Researchers conducted in 5th grade SDN Purwantoro 4 Malang totaled 31 students.

2. Trial Subject

Feasibility test subjects or validator on this research is determined based on the following criteria:

a. Expert content on mathematic subject of solid figure material

Lecturer who is expert in the mathematic subject is mathematics lecturer in Islamic Primary Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang.

b. Expert of media design

Expert of media design as a validator media design learning is Lecturer in learning media at Islamic Primary Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang.

c. Experts Learning

Expert learning validator is a master class with minimal education is Undergraduate (S-1) and had teaching experience.

Expert the selected learning is master class 5th SDN Purwantoro 4 Malang.

d. The subject target test

The subject of target testing product learning media based on Roda Putar Game is students 5th grade of SDN Purwantoro 4 Malang totals 31 students.

L. Types of Data

Data is defined as information or materials that can be relied upon real studies (analysis or conclusion).⁶⁰ Types of data collected in the stage of this trial results will be grouped into two, namely:

1. Qualitative Data

Qualitative data obtained from the assessment results criticism, comments and suggestions of the experts validator to learning media based on Roda Putar Game. While the field trials, the qualitative data get from data when students answers to the activity of the students.

2. Quantitative Data.

Quantitative data are obtained from the results of scoring percentage the form questionnaire or validation assessment sheet from expert content material, expert media and an expert learner on mathematic subject, and student learning outcomes

M. Data Collection Instruments

Instruments used in data collection are Interview, questionnaire and Pre-test dan Post-test. The following is an explanation:

1. Interview

Interview aims to find existing problems and should be examined, and to know things from a deeper respondents. The interview was carried out verbally in face to face meetings individually. In this

⁶⁰ Wahidmurni, *Cara Mudah Menulis Proposal dan Laporan Penelitian Lapangan: Pendekatan Kualitatif dan Kuantitatif* (Skripsi, Thesis, dan Disertasi) (Malang: UM Press, 2008), hlm. 41

interview conducted by researchers to Mrs Sri Idha Suprapti S.Pd as homeroom teacher 5TH grade SDN Purwantoro 4 Malang.

2. Questionnaire

The questionnaire is a number of written questions to obtain information from the respondent of naturally.⁶¹ Question form is used to obtain data more complete data about the validation content, media expert and learning expert, as well as the opinions of the students about learning media based on Roda Putar Game.

As for the questionnaire form needed to analyze and used to revise the learning media are as follows:

- a. Research questionnaire to trial the level needness of learning media.
- b. Research questionnaire to expert content material of learning media.
- c. Research questionnaire or responses expert media of learning media.
- d. Research questionnaire or responses learning expert
- e. Research questionnaire to trial the interestness of learning media for 5th grade SDN Purwantoro 4 Malang.

Question form has two kinds, there are :

- a. Open Question

⁶¹ Trianto, *Pengantar Penelitian bagi Pengembangan Profesi Pendidikan & Tenaga Kependidikan* (Jakarta: Kencana Prenada Media, 2010), hlm. 265

Open question used to obtain qualitative data, the form of instruments to obtain suggestions and comments from the validator expert.

b. Closed Question

Closed question used to obtain quantitative data, the instruments data form of the questionnaire is scale with 5 alternative answers, as follows:

- 1) Score 1, when very not right, very not appropriate, very not clear, very not interesting, very not easy.
- 2) Score 2, when less right, less appropriate, less clear, less interesting, less easy.
- 3) Score 3, when enough right, enough appropriate, enough clear, enough interesting, enough easy.
- 4) Score 4, when right, appropriate, clear, interesting, easy.
- 5) Score 5, very right, very appropriate, very clear, very interesting, very easy

3. Pre-test dan Post-test

Collecting data test is pre-test and post-test for the students to know the comparative effectiveness of learning between before and after using the learning media based on Roda Putar Game on Mathematic Subject of Solid Figure Material. The question of pre-test and post-test consists of 10 multiple choice question

N. Data Analysis Techniques

Researchers collect data that has obtain for later analyzed. Data analysis techniques used in the development of this research there are two kinds, the first is qualitative data analysis technique which is the verbal data is in the form of notes, comments, criticisms and suggestions of expert material and expert media. The second is quantitative data analysis technique which is used to measure the results data from the questionnaire and test (pre test and post test). Data analysis questionnaire according to Arikunto to measure questionare there are two kinds, measure data per-item and measure data overall.⁶²

1. Measure data per-item

$$P = \frac{X}{X_1} \times 100\%$$

Description

P	: Percent
X	: Answer for 1 item
X ₁	: Ideal answer for 1 item
100%	: Konstanta

2. Measure data overall

$$P = \frac{\sum X}{\sum X_1} \times 100\%$$

Description

P	: Percent
X	: Respondents answer
X ₁	: Respondents ideal answer
100%	: Konstanta

⁶² Arikunto, S. *Dasar-dasar Evaluasi Pendidikan* (Jakarta: Bumi Aksara, 2012), hlm. 216

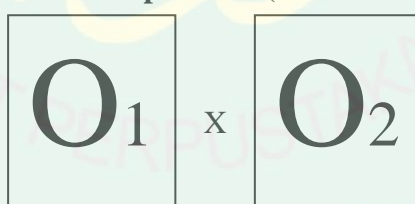
The results obtained from the calculation of the percentage then determined the level of eligibility products learning media used the qualification who have the criteria as follows:⁶³

Table 3.1
Qualification Eligibility Levels Based on Percentage

Percentage (%)	Qualification	Eligibility Criteria
$84\% < \text{skor} \leq 100\%$	Very valid	No revision
$68\% < \text{skor} \leq 84\%$	Valid	No revision
$52\% < \text{skor} \leq 68\%$	Quite valid	Need revision
$36\% < \text{skor} \leq 52\%$	Less valid	Revision
$20\% < \text{skor} \leq 36\%$	Very less valid	The revised total

The analysis of data used to set degree of comparison of student learning outcomes. In field trials test data using the development product (*before-after*). The use of design experiment (*before-after*) its meant to know the effectiveness of development product. As for the design experiment *before-after* as follows:⁶⁴

Pictures 3.2
Desain Eksperimen (Before-After)



Description:

X = Learning to use the learning media *roda putar* game.

O1 = Tes before treatment learning media *roda putar* game.

⁶³ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (Bandung: CV Alfabeta, 2008), hlm. 93.

⁶⁴ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (Bandung: CV Alfabeta, 2008), hlm. 135.

O2 = Tes after treatment learning media *roda putar* game

The comparison rate to calculate using the formula t-test. As for the formula that is used with a level of significance 0,05% is:⁶⁵

$$t = \frac{d}{\sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n(n-1)}}$$

Description:

t = t-test

D = Different ($X_2 - X_1$)

d^2 = Variation

N = The sum of samples

⁶⁵ Subana dkk, *Statistika Pendidikan* (Bandung: Pustaka Setia, 2005), hlm. 131.

CHAPTER IV

RESULT OF RESEARCH

Data that will be presented is a pure research through a process of analysis results. These the results of the analysis data and percentage results accordance with R&D research methods.

A. The Result of Need Assessment Students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material For 5th Grade at SDN Purwantoro 4 Malang

To determine a product's design then the researcher should know the need assessment students against learning media based on Roda Putar Game on Mathematic Subjects of Solid Figure Material, i.e. :

1. Observation and Interview

The results of observation and interview has been done in 5th Grade at SDN Purwantoro 4 Malang on Mathematic Subjects of Solid Figure Material previously have also been using the learning media in the form of box former of toothpaste and box former of soap, but the media is less help in learning process because it can be used only disposable and students tend to get bored and still low active. After Learning Media Based on Roda Putar Game shown to students, they are more excited to finish answer the question because it contained the games challenge them to competed answer the question They are also more interested in finding a variety of nets of cube and cuboids because the learning

media very flexible to be transformed into a variety of nets of cube and cuboids.

Mrs Sri Idha Suprapti S.Pd as homeroom teacher in 5th grade SDN Purwanto 4 Malang saying that Learning Media Based on Roda Putar Game attractive appearance so that it can attract the attention of students, with the game concept are applied students are more excited to learn answer the question, they are challenged to solve the question exactly and quickly than other friends, from the previous they felt hard to solve the problem especially on mathematic subject now they look faster and no difficulty in finding a variety of nets of cube and cuboids because previous to determine a variety of nets of cube and cuboids they have to think and imagine but with Learning Media Based on Roda Putar Game can provide a concrete example that can be changed to a variety of nets of cube and cuboids.

2. Questionnaire

The results of the collection data are taken from the 31 respondents (Students 5th Grade of SDN Purwanto 4 Malang) as follows :

Table 4.1
Questionnaire Result the Need Assessment Students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material

No	Soal	Hasil Responden	ΣX	ΣXI	HU%	Ket
1	Apakah kalian lebih senang belajar menggunakan media pembelajaran berbasis permainan roda putar?	5,5,5,4,5,3,4 ,5,4,5,5,5,4, 5,5,5,5,5,5,4 ,5,4,4,5,5,4, 4,5,5,5,5	144	155	92,9%	Sangat Valid
2	Apakah media pembelajaran berbasis	5,4,4,5,5,5,5, ,5,4,5,4,4,5,	144	155	92,9%	Sangat Valid

	permainan roda putar memudahkan kalian untuk memahami materi bangun ruang?	5,5,5,5,5,5,4 ,5,4,4,5,5,5, 5,4,5,4,4				
3	Apakah pembelajaran berbasis permainan roda putar memudahkan kalian untuk menemukan macam – macam jaring – jarring balok dan kubus?	5,5,4,5,5,5,5, ,3,4,5,3,4,4, 5,2,3,5,5,5,5, ,4,5,4,4,4,5, 5,5,5,4,5	137	155	88.4%	Sangat Valid
4	Apakah soal pada media pembelajaran berbasis permainan roda putar menarik untuk dikerjakan?	5,5,5,5,5,5,5, ,5,5,5,5,5,5, 5,5,5,4,5,4,5, ,5,5,5,5,5,5, 5,5,5,5,5	153	155	98,7%	Sangat Valid
5	Apakah media pembelajaran berupa permainan roda putar mudah dipahami?	4,5,5,5,4,5,5, ,5,5,5,5,5,4, 4,5,5,5,5,5,5, ,5,5,5,5,5,5, 4,5,4,5,5	149	155	96,1%	Sangat Valid
JUMLAH (Σ)			727	775	93,8%	Sangat Valid

From the calculation of the data above, so we can input a percentage

formula :

$$P = \frac{\sum X}{\sum X_1} \times 100\%$$

Description

P : Percent

X : Respondents answer

X_1 : Respondents ideal answer

100% : Konstanta

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

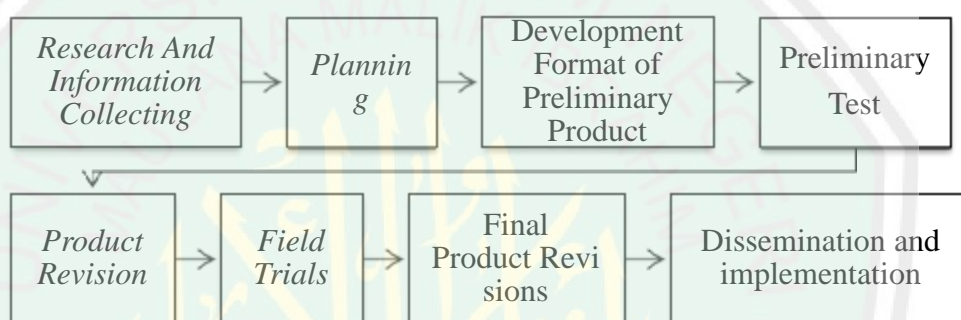
$$P = \frac{727}{775} \times 100\%$$

$$P = 93,8 \% \text{ (Very Interesting)}$$

B. Development Process of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material 5th Grade of SDN Purwantoro 4 Malang

Process of Developing Learning Media Based on development model by Borg and Gall there are ten stages, the researchers adapted into 8 stages :

Picture 4.1
Process of Developing Learning Media Based on Roda Putar Game



1. Research And Information Collecting

The result of observation class the preliminary report are:

- a. Learning media to an existing at school is little. Teachers rarely use learning media as supporting the learning process.
- b. From a total of 31 students only 10 students (33.3%) who are active in the learning activities in the class.
- c. When done the exam, some student still get skor under dibawah minimum criteria of mastery learning i.e. 68.
- d. Most of the student From a total of 31 students can not finish the homework. This is apparent when corrected just 17 students or 54,8% that can finish the homework correctly.

2. Planning

At this stage the researchers planning the material that will be arranged in the Learning Media Based on Roda Putar Game on Mathematic Subject of Solid Figure Material for 5th Grade SD/MI, steps undertaken include:

a. Analysis of Curriculum

Curriculum that will be used is curriculum 2013 on mathematic subject especially solid figure material. Analysis of curriculum aims to analysis core competencies, basic competencies and indicators. The curriculum as follows:

Table 4.2
KI, KD, and Indicator
Math Subjects of Solid Figure Material

Core Competencies	Basic Competencies	Indicators
1. Receive, run, and appreciate the religious teachings that are adhered to.	3.5 Explain and define the volume of solid with use unit volume with root three and cube three.	3.5.1 find and determine volume cube.
2. Demonstrate behaviors of honest, discipline, responsibility, polite, caring, confident, and in interacting with family, friends, teachers and neighboring sewrta love of the fatherland	3.6 explain and define the net of solid figure.	3.5.2 Determine root three and cube three. 3.5.3 find and determine volume cuboids. 3.5.4 determine volume of solid figure irregular.
3. understand the factual and conceptual knowledge by way of observing and ask yourself, based on curiosity about himself, God's		3.6.1 Explain and define the net of cube. 3.6.2 Explain and define the net of cuboids.

<p>creation and its activities, as well as objects that she had met at home, at school, and a play area.</p> <p>4. Present the factual knowledge and konsepptual in respect of the clear language, sistematis, logical, critical and aesthetic, in a movement that reflects a healthy child, and in the actions that reflect the behavior of children playing and noble character.</p>		
--	--	--

b. Analysis Materials of Learning Media

The material of learning media based on Roda Putar Game on Mathematic Subject is solid figure material especially on :

- 1) volume of cube.
- 2) cuboids also.
- 3) nets of cube.
- 4) nets of cuboids.

3. Development Format of The Preliminary Product

At this stage, doing developing the product roda putar game as learning media on mathematic subjects of solid figure. roda putar game as learning media is learning media with games concept such as *roulette game* or play board games. In developing the material, researchers

conduct consultations with homeroom 5th grade and some people who are competent in the field of mathematics. The following are the components contained in the Roda Putar Game as learning media on Mathematic Subjects of Solid Figure Material :

Pictures 4.2
Product of Learning Media Based on Roda Putar Game on
Mathematic Subjects of Solid Figure Material

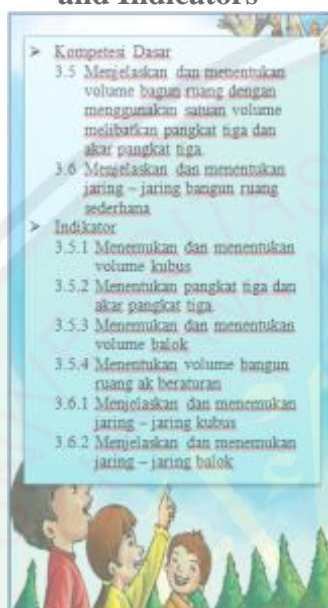


a. Instructions

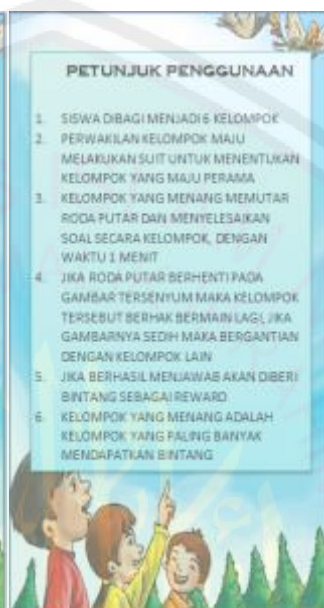
Instructions located on the top left, There are 3 sections and 3 function i.e. 1) first page to know core competencies and indicators from roda putar game as learning media, 2) second page to know the ways and rules of the game on roda putar game as learning

media, 3) last page to know the identities of developer media. The following describes in detail :

Picture 4.3
Core Competencies
and Indicators



Pictures 4.4
Instructions



Pictures 4.5
Developer's Profile



b. Circle Board

Circle board developed based on *roulette* game. Made from plywood circular with a diameter 26 cm divided into 8 sectors, inside there is a code question there are 2 question about volume of cube, 2 question about volume of cuboids , 2 question about nets of cube and 2 question about nets of cuboids.

On roda putar game as learning media, the function of circle board is to appoint one of the questions that have to be taken of students to do. The way the game is to rotate the circle board and wait until circle board stops and the appoints one of the question that has to be done by each group.

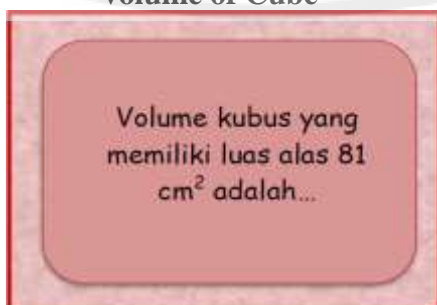
**Pictures 4.6
Circle Board**



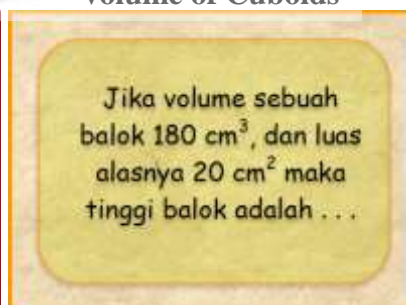
c. Questions Card

questions card on learning media based on roda putar game
 There are two kinds, first yellow card is question about volume of cuboids and red card is question about volume of cube. Each card has size 8 cm x 6 cm. red cards amounted 25 sheets and yellow amounted 25 sheets.

**Pictures 4.7
Red Card Question
volume of Cube**



**Pictures 4.8
Yellow Card Question
volume of Cuboids**



d. The Nets of Cube and Nets of Cuboids

On the Mathematic subject solid figure material 5th grade divided into 2 types, the first are volume of cube and cuboids and the second are nets of cube and cuboids. The game on roda putar game as learning media to volume of cube and cuboids shaped a question presented on question card. While the nets of cube and cuboids presented on plywood pieces which already formed that must be compiled.

The nets of cube has size 5 cm x 5 cm that there are 6 pieces. If compiled this plywood will form a cube with sides of length 5 cm. while the nets of cuboids has size 3cm x 5cm are 2 pieces, size 5cm x 2cm are 2 pieces and size 3cm x 2cm are 2 pieces, If compiled this plywood will form a cuboids with a length 5 cm, width 2 cm and high 3 cm. This nets given the adhesive so that later it can be compiled and glued on the nets board.

e. Star Reward

Picture 4.9
Star Reward

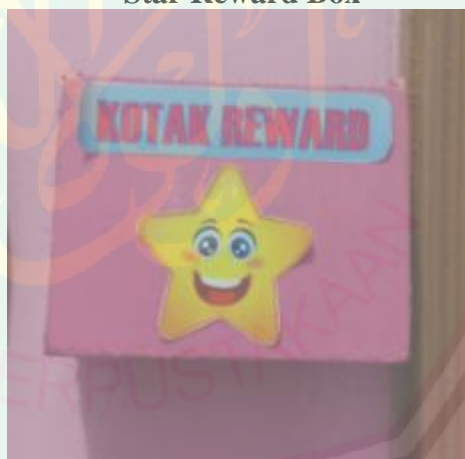


Star reward is reward that given to the group that successfully complete the question or compile the nets properly. As the name star reward shaped star. Each successful group will get 1 star reward. The winner Group is a group that collect the most star reward.

f. Box of question

Box of question made from plywood. There are 5 pieces the function are to put star reward, put question volume cube, put question volume cuboids, put nets plywood of cube and put nets plywood of cuboids.

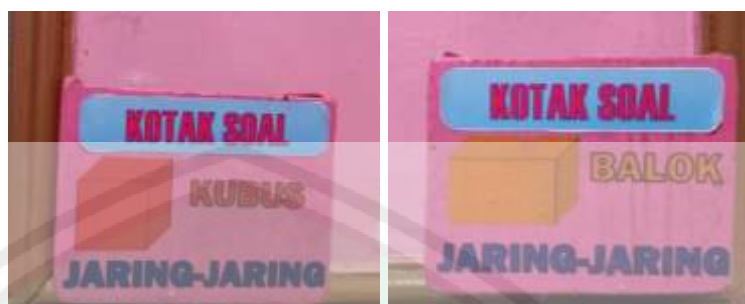
Picture 4.10
Star Reward Box



Pictures 4.11
Question Box Volume of Cube and Cuboids



Pictures 4.12
Question Box Nets of Cube and Cuboids



g. The Nets Board

The nets board is located under the circle board. The nets board made from fabric adhesive. The function of nets board to gluing plywood nets of cube and cuboids that has been compiled so the students know the pattern variation nets of cube and cuboids.

Pictures 4.13
Nets Board



4. Preliminary Test By Expert Validator
 - a. Test Result Data of Content Experts

Test result of content experts aim to find out the feasibility rate roda putar game as learning media fits the criteria. In this case test content expert to find out the feasibility rate in terms of language, and an indicator is in compliance with the material in 5th grade of elementary school math subjects. In the Test material expert researchers pinpointed Mrs Churidatul Ulfia A M.Pd. as a mathematics lecturer in Islamic Primary Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang. Following the assessment results of content Expert:

1) Qualitative Data of Content Experts

the qualitative data collected from the suggestions and comments that appear in the note of the repair from content expert math subject in an open statement is in the appendix table, the following is displayed:

Table 4.3
Qualitative Data of Contant Expert

Critique	Suggestion
Soal sudah sesuai dengan standart di kelas 5 SD	Harus lebih cermat dalam menentutakn bobot soal antara c1,c2 dan c3

2) Quantitative Data of Content Experts

Table 4.4
Quantitative Data of Content Experts

No	Butir Pertanyaan	X	Xi	HU%	Keterangan
1.	Kesesuaian materi yang disajikan dengan KI-KD	4	5	80%	Valid
2.	Kesesuaian materi yang disajikan dengan Indikator	4	5	80%	Valid
3.	Materi yang disajikan pada media pembelajaran sesuai dengan tujuan pembelajaran matematika.	4	5	80%	Valid
4.	Kualitas tes dan penilaian	4	5	80%	Valid
5.	Kesesuaian materi dengan tingkatan siswa kelas 5	4	5	80%	Valid
6.	Bahasa yang digunakan dalam menyajikan materi	4	5	80%	Valid
7.	Pemberian latihan untuk pemahaman konsep	5	5	100%	Sangat Valid
8.	Sistematika penyajian materi	4	5	80%	Valid
9.	Tingkatan kemenarikan media pembelajaran roda putar dapat menarik minat belajar siswa	4	5	80%	Valid
10.	Kejelasan sajian media pembelajaran pada mata pelajaran matematika materi bangun ruang	5	5	100%	Sangat Valid
Jumlah		42	50	84%	Sangat Valid

Description

X : Answers of the respondents in one item questions

Xi : Skor ideal in one item questions

HU: Results of the validation tests in the form of percent (%)

Based on the presented content expert validation result on the table above shows the percentage 84%. This shows that the product of learning media based on Roda Putar Game is feasible to be tested without revision.

b. Test Results Data of Design Media Expert

Media experts test aims to find out the feasibility display of learning media design according to criteria. In the Test media expert researchers pointed Mr Ahmad Makki Hasan, M.Pd as a lecturer in learning media at Islamic Primary Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang. to test the display of roda putar game as learning media as a whole in terms of the display of pictures, the size of the writing and layout material. Following the results of assessment of the media Expert :

1) Qualitative Data of Design Media Expert

The qualitative data collected from the suggestions and comments that appear in the note of the repair from media expert in an open statement is in the appendix table, the following is displayed

Table 4.5
Qualitative Data of Design Media Expert

Critique	Suggestion
1. Penyusunan antara gambar dan tulisan pada kotak soal komposisinya kurang tepat	1. Gunakan font yang tidak berbuntut pada tulisan papan jaring – jaring.
2. Tulisan jaring – jaring pada	2. Gunakan font yang lebih

papan jaring – jaring tidak terlihat jelas dari posisi belakang	bulat agar terlihat jelas dari segala posisi duduk siswa 3. Beri identitas pengembang pada media pembelajaran 4. Penyusunan gambar dan kotak soal buat lebih rapi
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2) Data Quantitative Of Media Expert

Table 4.6
Quantitative Data of Design Media Expert

No	Butir Pertanyaan	X	Xi	HU%	Keterangan
1.	Kemenarikan desain media pembelajaran roda putar.	3	5	60%	Cukup Valid
2.	Kesesuaian warna, yang digunakan dalam media pembelajaran roda putar.	3	5	60%	Cukup Valid
3.	Media pembelajaran roda putar dapat tahan lama.	3	5	60%	Cukup Valid
4.	Keamanan bahan yang digunakan dalam pengembangan media pembelajaran roda putar.	2	5	40%	Cukup Valid
5.	Petunjuk penggunaan media pembelajaran roda putar mudah dipahami oleh siswa dan guru.	2	5	40%	Cukup Valid
6.	Kesesuaian materi dalam media pembelajaran roda putar.	3	5	60%	Cukup Valid
7.	Kemudahan sistem pengoperasian Media pembelajaran roda putar.	2	5	40%	Cukup Valid

8.	Keefektifan media pembelajaran roda putar dalam kegiatan pembelajaran.	2	5	40%	Cukup Valid
9.	Media pembelajaran roda putar dapat menarik minat belajar siswa.	3	5	60%	Cukup Valid
Jumlah		23	45	51%	Less Valid

Description

X : Answers of the respondents in one item questions

Xi : Skor ideal in one item questions

HU: Results of the validation tests in the form of percent (%)

Based on data from validator of media experts , media have been made eligible for revision in accordance with tested advice, the need for revision of the product so that it meets the eligibility standard media design.

3) Qualitative Data of Design Media Expert After Revision

After doing a revision product, researchers test the learning media to media design expert to find out the media need for revision or already meet the feasibility standard that will be displayed as follows:

Table 4.7
Qualitative Data of Design Media Expert After Revision

Critique	Suggestion
1. The Font on the title of the media has been very clearly	Overall it is been a nice and interesting
2. On the question box more interesting and proportionate	

3. Fonts on the nets board has been more clearly	
--	--

4) Quantitative Data Media Expert After Revision

Table 4.8
Quantitative Data of Design Media Expert After Revision

No	Butir Pertanyaan	X	Xi	HU%	Keterangan
1.	Kemenarikan desain media pembelajaran roda putar.	5	5	100%	Sangat Valid
2.	Kesesuaian warna, yang digunakan dalam media pembelajaran roda putar.	4	5	80%	Valid
3.	Media pembelajaran roda putar dapat tahan lama.	5	5	100%	Sangat Valid
4.	Keamanan bahan yang digunakan dalam pengembangan media pembelajaran roda putar.	4	5	80%	Valid
5.	Petunjuk penggunaan media pembelajaran roda putar mudah dipahami oleh siswa dan guru.	5	5	100%	Sangat Valid
6.	Kesesuaian materi dalam media pembelajaran roda putar.	5	5	100%	Sangat Valid
7.	Kemudahan sistem pengoprasian Media pembelajaran roda putar.	5	5	100%	Sangat Valid
8.	Keefektifan media pembelajaran roda putar dalam kegiatan pembelajaran.	4	5	80%	Valid
9.	Media pembelajaran roda putar dapat menarik minat belajar siswa.	5	5	100%	Sangat Valid
Jumlah		42	45	93%	Sangat Valid

Description

X : Answers of the respondents in one item questions

Xi : Skor ideal in one item questions

HU: Results of the validation tests in the form of percent (%)

The feasibility level of Roda putar game as learning media is :

$$P = \frac{42}{45} \times 100\% = 93\% \text{ (Sangat Layak / Very Worthy)}$$

The assessment results from media design experts after revisi earn a percentage 93%, If matched with the table of feasibility criteria, then it shows that the results is on a very feasible qualification. So the media used is very feasible and not need the revision.

5. Product Revision

From the Preliminary Test By content expert and media design expert validator there are some section that must done revision before field trials to students and learning expert and then be final product after learning media meet the feasible level from all sector. the details of the revision of the product is based on the advice of experts as follow :

**Table 4.9
Revision Product**

No .	Revision	Product before Revisi	Product after Revisi
1.	The arrangement of pictures and words less proportionate		

2.	Font on nets board must no tail and bulbous (bulat)		
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6. Field Trials

Field trials in this research is applied at a school with a total of 31 students and experts validator of the mathematic learning Aims to know that learning media is really feasible to use in learning process

a. Test Result of feasibility product to students

To know feasibility product of learning media, measure the learning media based on Roda Putar Game for 5th grade at SDN Purwanto 4 Malang with questionnaire that give to students.

From the results of the collection of research data are taken from the 31 respondents (5th grade SDN Purwanto 4 Malang) found the following data:

Table 4.10
Test Result of Feasibility Product to Student

No	Soal	Hasil Responden	ΣX	ΣXI	HU%	Ket
1	Apakah kalian senang belajar menggunakan media pembelajaran roda putar?	5,5,5,4,5,5,4, ,5,4,5,5,5,4, 5,5,5,5,5,5,4, ,5,4,4,5,5,5, 4,5,5,5,5	147	155	94,8%	Sangat Valid
2	Apakah media pembelajaran roda	5,4,4,5,5,5,5, ,5,4,5,4,4,5,	142	155	91,6%	Sangat Valid

	putar dapat memberikan semangat belajar kalian?	5,5,5,5,5,5,4 ,5,4,4,5,5,3, 5,4,5,4,4				
3	Apakah media pembelajaran roda putar mudah digunakan saat pembelajaran?	5,5,4,5,5,5,5 ,3,4,5,3,4,4, 5,2,3,5,5,3,5 ,4,5,4,4,4,5, 5,5,5,4,5	135	155	87%	Sangat Valid
4	Apakah media pembelajaran roda putar menarik untuk mempelajari matematika materi bangun ruang?	5,5,5,5,5,5,5 ,5,5,5,5,5,5, 5,5,5,4,5,5,5 ,5,5,5,5,5,5, 5,5,5,5,5	154	155	99%	Sangat Valid
5	Apakah media pembelajaran roda putar dapat memudahkan kalian dalam memahami materi bangun ruang?	4,5,5,5,5,5,5 ,5,5,5,5,5,5, 5,5,5,5,5,5,5 ,5,5,5,5,5,5, 4,5,5,5,5	153	155	98,7%	Sangat Valid
6	Apakah petunjuk penggunaan yang tersedia dalam media pembelajaran mudah dipahami berupa permainan?	4,5,5,4,5,5,5 ,5,5,5,5,5,5, 3,5,4,5,5,5,5 ,5,5,5,5,5,5, 5,5,5,5,5	150	155	96,8%	Sangat Valid
JUMLAH (Σ)			881	930	94,7%	Sangat Valid

From the calculation of the data above, so we can input a percentage formula :

$$P = \frac{\sum X}{\sum X_1} \times 100\%$$

Description

- P : Percent
X : Respondents answer
X₁ : Respondents ideal answer
100% : Konstanta

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

$$P = \frac{881}{930} \times 100\%$$

$$P = 94,7 \% \text{ (Very worth it)}$$

b. Test Result Data of Learning Expert

learning Expert test aims to find out if the roda putar game as learning media appropriate and feasible to use in teaching and learning. The researcher pointed Mrs Sri Idha Suprapti S.Pd as the mathematic teacher also homeroom 5th grade SDN Purwantoro 4 Malang. Following the assessment results from learning Expert:

1) Qualitative Data of Learning Expert

Qualitative data in the form of comments and suggestions will be presented as follows:

Table 4.11
Qualitative Data of Learning Experts

Critique	Suggestion
Bagus dan dapat menarik minat peserta didik	Membantu guru dikelas

2) Quantitative Data of Learning Experts

Table 4.12
Data Quantitative of Learning Expert

No	Butir Pertanyaan	X	Xi	HU%	Keterangan
1.	Relevansi media pembelajaran roda putar dengan kurikulum yang	5	5	100%	Sangat Valid

	berlaku				
2.	Media pembelajaran roda putar tepat digunakan dalam pembelajaran matematika materi volume dan jaring – jaring bangun ruang.	5	5	100%	Sangat Valid
3.	Kesesuaian media pembelajaran roda putar dengan KI-KD	5	5	100%	Sangat Valid
4.	Kesesuaian media pembelajaran roda putar dengan materi	4	5	80%	Valid
5.	Kesesuaian media pembelajaran roda putar dengan tujuan pembelajaran	5	5	100%	Sangat Valid
6.	Bahasa pada petunjuk penggunaan dalam media pembelajaran roda putar mudah dipahami	4	5	80%	Valid
7.	Media pembelajaran roda putar dapat menarik minat belajar siswa	5	5	100%	Sangat Valid
8.	Media pembelajaran rooda putar praktis digunakan dalam kegiatan pembelajaran	4	5	80%	Valid
9.	Kejelasan sajian media pembelajaran pada mata pelajaran matematika materi bangun ruang	5	5	100%	Sangat Valid
Jumlah		42	45	93%	Sangat Valid

Description

X : Answers of the respondents in one item questions

Xi : Skor ideal in one item questions

HU: Results of the validation tests in the form of percent (%)

The feasibility level of Roda putar game as learning media

is :

$$P = \frac{42}{45} \times 100\% = 93\% \text{ (Sangat Layak / Very Worthy)}$$

Based on data from the validator learning expert, roda putar game as learning media is feasible for tested without revision.

7. Final Product Revision

Final product revision is done if the result of field trial from students and mathematic learning expert no valid and need revision, but the product can said final product if the product not need revision.

In this reaserch, the percentage of learning media based on Roda Putar Game on Mathematic Subject of Solid Figure Material after applied to students 5th grade and mathematic learning expert at SDN Purwantoro 4 Malang, earn 94,7 % (Very Interesting) from student and 93% from mathematic learning expert. This shows that the product of learning media based on Roda Putar Game on Mathematic Subject of Solid Figure Material is very valid mean very worth it and no need revision.

8. Dissemination And implementation

This desiminasi stage takes place when there is no revision again, and then reported the results of development for later printing.

C. The effectiveness of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material

To know the effectiveness of learning media based on Roda Putar Game on Mathematic Subjects of Solid Figure Material 5th Grade SD Purwanto 4 Malang, received from pre test and post test skors. Compare before and after applied the product of learning media based on Roda Putar Game on Mathematic Subjects of Solid Figure Material . The subject of research are all students of 5th Grade SDN Purwanto 4 Malang totally 31 students. Data obtained from the results of pre test and post test are as follows :

Table 4.13
Skors of Pre Test and Post Test Mathematic Subject 5th Grade SDN Purwanto 4 Malang

NO	NAME	NILAI		d ($x_2 - x_1$)	d ²	NILAI MAX
		Pre Test (x_1)	Post Test (x_2)			
1.	A.A	60	80	20	400	100
2.	A.N.P	90	100	10	200	100
3.	A.R.R	40	70	30	600	100
4.	A.W.U	40	70	30	600	100
5.	D.Y.A.P	50	80	30	600	100
6.	D.E.I	50	70	20	400	100
7.	D.P.S	90	90	0	0	100
8.	E.M.R.F	60	70	10	100	100
9.	F.H	80	90	10	100	100
10.	G.Z.R	80	80	0	0	100
11.	H.A	50	80	30	600	100
12.	H.R.H	40	70	30	600	100
13.	I.N.A	70	100	30	600	100
14.	J.A.F	60	70	10	100	100
15.	M.E.S.G	80	80	0	0	100
16.	M.A.N.S	60	90	30	600	100
17.	M.A.T.D.S	50	60	10	100	100

18.	M.A.P	60	80	20	400	100
19.	M.F.S	60	90	30	600	100
20.	N.H	30	70	40	1600	100
21.	N.A	90	100	10	100	100
22.	N.N.D	50	70	20	400	100
23.	N.A	30	60	30	600	100
24.	R.A.S	100	100	0	0	100
25.	R.F.F	100	100	0	0	100
26.	R.P.A	70	90	20	400	100
27.	R.I.F	80	90	10	100	100
28.	R.F.S	60	80	20	400	100
29.	S.A.A	30	60	30	600	100
30.	S.A	60	100	40	1600	100
31.	R.S.W	70	100	30	600	100
JUMLAH		1940	2540	600	16200	3100
RATA – RATA		62,6	81,9	19,4	522,6	100

Based on the value of the pre test and post test can be analyzed the significance of use Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material before and after the implementation.

1. Analysis Pre – Test and Post - Test

After field trials, based on the results pre -test and pos test that given to students 5th grade SDN Purwantoro 4 Malang. Analysis of the improvement of Student Learning Outcomes aiming to know the magnitude of the percentage an increase in the Student Learning Outcomes.

From the calculation of the data above, so we can input a percentage

formula :

$$P = \frac{\sum X}{\sum X_1} \times 100\%$$

Description

P	: Percent
X	: Respondents answer
X ₁	: Respondents ideal answer
100%	: Konstanta

Before the product applied earn prosentage as follow :

$$\sum x = 1940$$

$$\sum x_i = 3100$$

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

$$P = \frac{1940}{3100} \times 100\%$$

$$P = 62,6 \%$$

After this product applied the result is increasing, according to the results of the post – test as follow:

$$\sum x = 2540$$

$$\sum x_i = 3100$$

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

$$P = \frac{2540}{3100} \times 100\%$$

$$P = 81,94 \%$$

From the above analysis showed that the product Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material able to improve learning achievements students 5th grade SDN Purwantoro 4 Malang on mathematic subject, initially the result of pre-test earn a percentage 62.58% increased to 81.94%. percentage of

increased, reaching 19.41% it is very motivating researchers to develop this product become better.

2. t - Test Analysis

Value data pre – test and post test further analyzed through t test.

This analysis technique is used to know There is influence or no influence on the research objects between the understanding of students before and after using the media that was developed.

Step 1. make the H_a and H_o in the form of a sentence

H_a : The results of student learning by using roda putar game as learning media on Mathematic Subjects of Solid Figure Material increased, from the results of a study that does not use the learning media.

H_o : The results of student learning by using roda putar game as learning media on Mathematic Subjects of Solid Figure Material no increase, from the results of a study that does not use the learning media.

Step 2. Determining The t-test Criteria

If $|t_{count}| > t_{table}$ or value significance < 0.05 , H_o **rejected** and

H_a **accepted.**

If $|t_{count}| < t_{table}$ or value significance > 0.05 , maka H_o **accepted** and

H_a **rejected.**

Step 3. Calculation

Having regard to the table 4.14, Here are the results of pre – test and post – test with t-test formula:

$$t = \frac{d}{\sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n(n-1)}}$$

Description : t = t-test

d = Different ($X_2 - X_1$)

d^2 = Variation

n = The sum of samples

Obtained :

$$t = \frac{d}{\sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n(n-1)}}$$

$$t = \frac{19,4}{\sqrt{\frac{16200 - \frac{(600)^2}{31}}{31(31-1)}}$$

$$t = \frac{19,4}{\sqrt{\frac{16200 - 11613}{930}}}$$

$$t = \frac{19,4}{\sqrt{\frac{4587}{930}}}$$

$$t = \frac{19,4}{\sqrt{4,93}}$$

$$t = \frac{19,4}{2,2}$$

$$t = 8,818$$

So obtained t_{count} 8,818

Step 4. Compare t_{count} and t_{table}

If $-t_{\text{table}} < t_{\text{count}} < t_{\text{table}}$ so do not different significantly.

Whereas if $t_{\text{count}} > t_{\text{table}}$ atau $t_{\text{count}} < -t_{\text{table}}$ so there is a significant difference.

$$\begin{aligned} \text{Degree of freedom (df)} &= n - k \\ &= 31 - 1 = 30 \end{aligned}$$

$$\text{Probabilita } (\alpha) = 0,05$$

$$t_{\text{table}} = 2,042$$

Note :

$$t_{\text{count}} = 8,818$$

$$t_{\text{table}} = 2,042$$

Then $t_{\text{count}} > t_{\text{table}}$

$$t_{\text{count}} (8,818) > t_{\text{table}} (2,042)$$

Step 5. Conclusion

The results of the calculation shows that t_{count} higher than t_{table} , so H_0 **rejected** and H_a **accepted**, there is a significant difference between the student achievement before and after using the learning media roda putar game. It can be concluded that The results of student learning by using roda putar game as learning media on Mathematic Subjects of Solid Figure Material increased, from the results of a study that does not use the learning media.

next, from the mean is known X_2 greater than X_1 ($81,9 > 62,6$) It also shows that post test better than pre test. It shows that the media learning to increase student learning outcomes.



CHAPTER V

DISCUSSION

A. Analysis the Need Assessment Students of Learning Media Based on Roda Putar Game

The product development process, starting from the stage of pre – development, the stage of product development, field test and validation phase as well as the revision obtained roda putar game as learning media. roda putar game as learning media is learning media with games concept such as *roulette game* or play board games developed with a focus on mathematic subjects of solid figure. Basically learning media development based on the needs of students.

The result of observation , questionnaire and interview with Mrs Sri Idha Suprapti S.Pd as homeroom teacher 5th grade V SDN Purwantoro 4 Malang i.e. :

1. Game attractive appearance so that it can attract the attention of students,
2. with the game concept are applied students are more excited to learn answer the question
3. students are challenged to solve the question exactly and quickly
4. students look faster and no difficulty in finding a variety of nets of cube and cuboids
5. Questionnaire Result the Need Assessment Students of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material earn percentage 93,8% it's mean very interesting and very need.

B. Analysis of Development Process

Quality learning media must go through various stages of feasibility test. The results obtained from the calculation of the percentage then determined the level of eligibility products learning media used the qualification who have the criteria as follows⁶⁶ :

Table 5.1
Qualification Eligibility Levels Based on Percentage

Percentage (%)	Qualification	Eligibility Criteria
$84\% < \text{skor} \leq 100\%$	Very valid	No revision
$68\% < \text{skor} \leq 84\%$	Valid	No revision
$52\% < \text{skor} \leq 68\%$	Quite valid	Need revision
$36\% < \text{skor} \leq 52\%$	Less valid	Revision
$20\% < \text{skor} \leq 36\%$	Very less valid	The revised total

The following discussion of assessment feasibility and validity levels of roda putar game as learning media :

1. The Feasibility Rate of Contents

Validation of content/material learning media conducted by mathematic competent lecturers she is Mrs Ulfia Churidatul A. M.Pd currently serves as lecturer at Islamic Primary Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang.

⁶⁶ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (Bandung: CV Alfabeta, 2008), hlm. 93.

Based on the results of assessments that are already described in table 4.5 the results validation of content experts mathematic subject on roda putar gameas learning media in detail as follows:

- a. The suitability of the content that is presented with KI-KD earn a percentage 80%. This shows that the content in the form of questions on the roda putar game as learning media is right with the KI-KD and not out of curriculum 2013.
- b. The suitability of the content presented with Indicator earn a percentage 80%. It is shows that the content is right in accordance with the applicable indicators.
- c. the content on the learning media accordance with the purpose of mathematics learning earn a percentage 80%. This shows that the content is right with the aim of learning mathematics and not out of the purpose of mathematics learning..
- d. The quality of the tests and assessment earn a percentage 80%. This shows that the quality of the tests and assessment is right applied on learning media.
- e. The suitability of the content with the level of the students 5th grade earn a percentage 80%. This shows that the content is appropriate to the characteristics of the students 5th grade.
- f. The language used in the contents earn a percentage 80%. This shows that the language used in the learning media is right.

- g. Granting of exercises for understanding the concept earn a percentage 100%. This shows that the Granting of exercises for roda putar game as learning media is very right to understanding the concept for students.
- h. Systematic presentation of content earn a percentage 80%. This shows that the Systematic presentation of content is right so coherently and easy to understand.
- i. Interesting level of roda putar game as learning media can the learning interest of students earn a percentage 80%. This shows that the roda putar game as learning media is right can the learning interest of students.
- j. The clarity of the presence of roda putar game as learning media on math subject solid figure material earn a percentage 100%. This shows that the clarity of the presence of roda putar game as learning media on math subject solid figure material is very clear.

Overall the assessment results of content expert shows a percentage of 84% which means it is on a very valid qualification and does not need revision. So the content/material on roda putar game as learning media is very feasible to be used in the learning process.

2. The Feasibility Rate of Media

Test of learning media design conducted by media design competent lecturers. He is Mr Ahmad Makki Hasan, M.Pd currently serves as learning media lecturer at Islamic Primary

Teacher Education Department of Maulana Malik Ibrahim State Islamic University Malang.

Based on the assessments results of that are already described in table 4.7 roda putar game as learning media earn a percentage 51% which means it should be revised and the percentage of assessment results after revision earn a percentage 93% is described in table 4.9. There are the assessment result design of media expert on end product after a revision :

- a. Interesting daesign roda putar game as learning media earn a percentage 100%. This shows that the media design at roda putar game as learning media very interesting.
- b. Appropriateness of colour, which is used in roda putar game as learning media earn a percentage 80%. This shows that the the colors chosen are appropriate in roda putar game as learning media.
- c. Roda putar game as learning media be durable earn a percentage 100%. This shows that the roda putar game as learning media is very durable.
- d. The safety of ingredients used in the development of roda putar game as learning media earn a percentage 80%. This shows that the ingredients used in the development of media is right and safety.
- e. Usage instructions roda putar game as learning media easily understood by students and teacher earn a percentage 100%. This

shows that the usage instructions roda putar game as learning media is very easy to understand.

- f. The suitability content of roda putar game as learning media earn a percentage 100%. This shows that the the design of material that displayed on the media is right.
- g. Ease of system use roda putar game as learning media earn a percentage 100%. This shows that the system esed of roda putar game as learning media is very easy.
- h. Effectiveness roda putar game as learning media in learning activities earn a percentage 80%. This shows that the learning media appropriate for the effectiveness of learning activities.
- i. Roda putar game as learning media can interest the learning of students earn a percentage 100%. This shows that the design of roda putar game as learning media is very interest interest of students.

Overall the assessment results of madia expert after revision earn a percentage 93% which means it is on a very valid qualifications and do not need revision. So the media design on roda putar game as learning media is very feasible to be used in the learning process

3. Feasibility Level of learning process

Not just assesment from content expert and media design expert, also conducted validation test with mathematic learning expert doing by mathematic teacher in school. In this case the assessment result

conducted Mrs Sri Idha Suprapti S.Pd as mathematic teacher and homeroom 5th SDN Purwanto 4 Malang.

The result of validation by mathematic learning expert based on table 4.11 will be presented as follows :

- a. The relevance of the roda putar game as learning media with the applicable curricula earn a percentage 100%. This shows that the roda putar game as learning media is very relevant with curriculum applies i.e. curriculum 2013.
- b. roda putar game as learning media right to used on math subject solid figure material earn a percentage 100%. This shows that the roda putar game as learning media is very right to used on math subject solid figure material.
- c. The suitability of roda putar game as learning media with KI-KD earn a percentage 100%. This shows that the roda putar game as learning media is very suitable with KI-KD
- d. The suitability of roda putar game as learning media with content earn a percentage 80%. This shows that the roda putar game as learning media is suitable with content.
- e. The suitability of roda putar game as learning media with the purpose of learning earn a percentage 100%. This shows that the roda putar game as learning media is very suitable with the purpose of learning.

- f. The language in usage instructions on roda putar game as learning media easy to understand earn a percentage 80%. This shows that the language in usage instructions is right and easy to understand.
- g. roda putar game as learning media can interest the students for learning earn a percentage 100%. This shows that the roda putar game as learning media is very interest the students for learning
- h. roda putar game as learning media practical use in learning activities earn a percentage 80%. This shows that the roda putar game as learning media is right and practical use in learning activities.
- i. The clarity of the presence roda putar game as learning media on math subject solid figure material earn a percentage 100%. This shows that the roda putar game as learning media is very clear of the presence contant on math subject solid figure material.

Overall the assessment results of mathematic learning expert shows earn a prosentasi 93% which means it is on a very valid qualifications and do not need revision. So roda putar game as learning media is very feasible to be used in the learning process.

C. Analysis the Effectiveness of Learning Media

The effectiveness of Learning Media based on Roda Putar Game measure with pre – test and post – test skors that implemented to 31 students 5th Grade at SDN Purwantoro 4 Malang and analyzed with t test.

Before the learning media applied each student done pre - test to measure understanding students against solid figure material on mathematic subject. And then done post – test after roda putar game as learning media applied.

From the result of pre – test and post – test that has been described in table 4.14 indicates that there is an increase in average value. On pre – test result the students get average 62,6 increased to 81,9 on post – test result. So there is a significant difference of the use of learning media that has been developed.

significant difference also proven on results of calculation t test explain that $t_{count} > t_{table}$. t_{count} earn 8,818 with significant degrees of hypothesis test 0,05 and t_{table} earn 2,069. The results of the calculation shows that t_{count} higher than t_{table} , so H_0 **rejected** and H_a **accepted**, there is a significant difference between the student achievement before and after using the learning media roda putar game. It can be concluded that The results of student learning by using roda putar game as learning media on Mathematic Subjects of Solid Figure Material increased, from the results of a study that does not use the learning media.

CHAPTER VI

CLOSING

A. Conclusion

Based on the process of the development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwanto 4 Malang, the conclusion can be drawn as follows :

1. The development of roda putar game as learning media required by the students 5th Grade of SDN Purwanto 4 Malang on mathematic subjects of solid figure material because the media developed it is a game that can attract the interest of student learning, durable, can be used repeatedly and form of exercise matter to add to the understanding of the concept in accordance with the needs of the students. It is known from interviews with teachers and some students. This also showed from questionnaire the needness level against learning media based on roda putar game earn presentantage 93,8 % that mean the students very need against the product of learning media based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade.
2. Validity of learning media based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade by content expert, media design expert, learning mathemating expert and interesting assessment from 31 student as respondent earn presentage as follow :

- a. Validity from content expert earn prosentage 84% that mean the learning madia based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade very valid and no revision
 - b. Presentage assessment from design media earn 93% that mean the learning madia based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade very valid and no revision
 - c. From learning mathematic earn prosentage 93% that mean the learning madia based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade very valid and no revision
 - d. Quisionnare result from 31 student as respondent to measure interesting rate of learning madia based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th earn prosentage 94,7% that mean the learning madia based on Roda Putar Game on Mathematic Subject of Solid Figure Materials for 5th grade very valid and very interesting
3. The effectiveness of the use of Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material seen from the results average between pre – test and post – test which increased from 62,6 be 81,9 It is also apparent from the results of the count t test that indicates that $t_{\text{count}} (8,818) > t_{\text{table}} (2,069)$ that means H_0 **rejected** and H_a **accepted**, It was concluded that The results of student learning by using learning media based on roda putar game on Mathematic Subjects of

Solid Figure Material increased, from the results of a study that does not use the learning media.

B. Suggestions

Learning Media Based on Roda Putar Game on Mathematic Subjects of Solid Figure Material expected can be support in learning process on mathematic subject 5th grade SD/MI . There are some suggestions relating with the development of Learning Media Based on Roda Putar. As for the suggestions are as follows :

1. Learning Media Based on Roda Putar Game to 5th grade SD/MI that was developed has been proven it can improve student learning outcomes. This learning media is based on game to reviuw about Solid Figure Material so its utilization need to be material explanation by the teacher in advance.
2. For teacher, these learning media can be used properly by the teacher because it was through the process of research. Teachers can also develop learning Media be more creative.
3. These learning Media products only on the solid figure material therefor need for further development with other materials relating to the mathematics subjects.

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APPENDIX 1
RESEARCH LICENSE



KEMENTERIAN AGAMA REPUBLIK INDONESIA
UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG
FAKULTAS ILMU TARBIYAH DAN KEGURUAN

Jalan Gajayana 50, Telepon (0341) 552398 Faximile (0341) 552398 Malang
[http:// fitk.uin-malang.ac.id](http://fitk.uin-malang.ac.id). email : fitk@uin_malang.ac.id

Nomor : 1704 /Un.03.1/TL.00.1/05/2018
Sifat : Penting
Lampiran : -
Hal : Izin Penelitian

30 Mei 2018

Kepada
Yth. Kepala SDN Purwantoro 4 Malang
di
Malang

Assalamu'alaikum Wr. Wb.

Dengan hormat, dalam rangka menyelesaikan tugas akhir berupa penyusunan skripsi mahasiswa Fakultas Ilmu Tarbiyah dan Keguruan (FITK) Universitas Islam Negeri Maulana Malik Ibrahim Malang, kami mohon dengan hormat agar mahasiswa berikut:

Nama : Nurul Isnaini
NIM : 14140014
Jurusan : Pendidikan Guru Madrasah Ibtidaiyah (PGMI)
Semester - Tahun Akademik : Genap - 2017/2018
Judul Skripsi : The Development of Roda Putar Game as Learning Media on Mathematics Subject Solid Figure Materials of SDN Purwantoro 4 Malang
Lama Penelitian : Mei 2018 sampai dengan Juli 2018 (3 bulan)

diberi izin untuk melakukan penelitian di lembaga/instansi yang menjadi wewenang Bapak/Ibu.

Demikian, atas perkenan dan kerjasama Bapak/Ibu yang baik disampaikan terima kasih.

Wassalamu'alaikum Wr. Wb.



Dekan,

Dr. H. Agus Maimun, M.Pd
NIP. 19650817 199803 1 003

Tembusan :

1. Yth. Ketua Jurusan PGMI
2. Arsip

The logo of Universitas Islam Negeri Maulana Malik Ibrahim Malang is a large, light green shield-shaped emblem. It features a central yellow calligraphic design. The text "UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM" is written in a circular path around the top, and "PUSAT PERPUSTAKAAN" is written along the bottom. The entire logo is semi-transparent.

APPENDIX 2
LETTER OF RESEARCH SDN PURWANTORO 4
MALANG



PEMERINTAH KOTA MALANG
DINAS PENDIDIKAN
SD NEGERI PURWANTORO 4
KECAMATAN BLIMBING
JL. Batubara Malang Telp. (0341) 4378373
MALANG

SURAT KETERANGAN

Nomor : 421.2/488/35.73.300.01/026/2018

Yang bertanda tangan di bawah ini :

Nama : Dra.Hj.Ulfah Khamidah, M.Pd

NIP : 19641119 199111 2 001

Jabatan : Kepala Sekolah SDN Purwanto 4

Menerangkan bahwa mahasiswa yang bernama :

Nama : Nurul Isnaini

NIM : 14140014

Benar-benar telah melaksanakan penelitian di SDN Purwanto 4 demi menyelesaikan tugas skripsinya yang berjudul "*The Development of Roda Putar Game as Learning Media on Mathematics Subject of Solid Figur Material for 5th grade at SDN Purwanto 4 Malang*"

Malang, 5 Mei 2018

Kepala Sekolah SDN Purwanto 4



Dra.Hj. Ulfah Khamidah, M.Pd

NIP. 19641119 199111 2 001



APPENDIX 3
CONSULTATION SHEET



BUKTI KONSULTASI SKRIPSI
JURUSAN PENDIDIKAN GURU MADRASAH IFTIDAIYAH

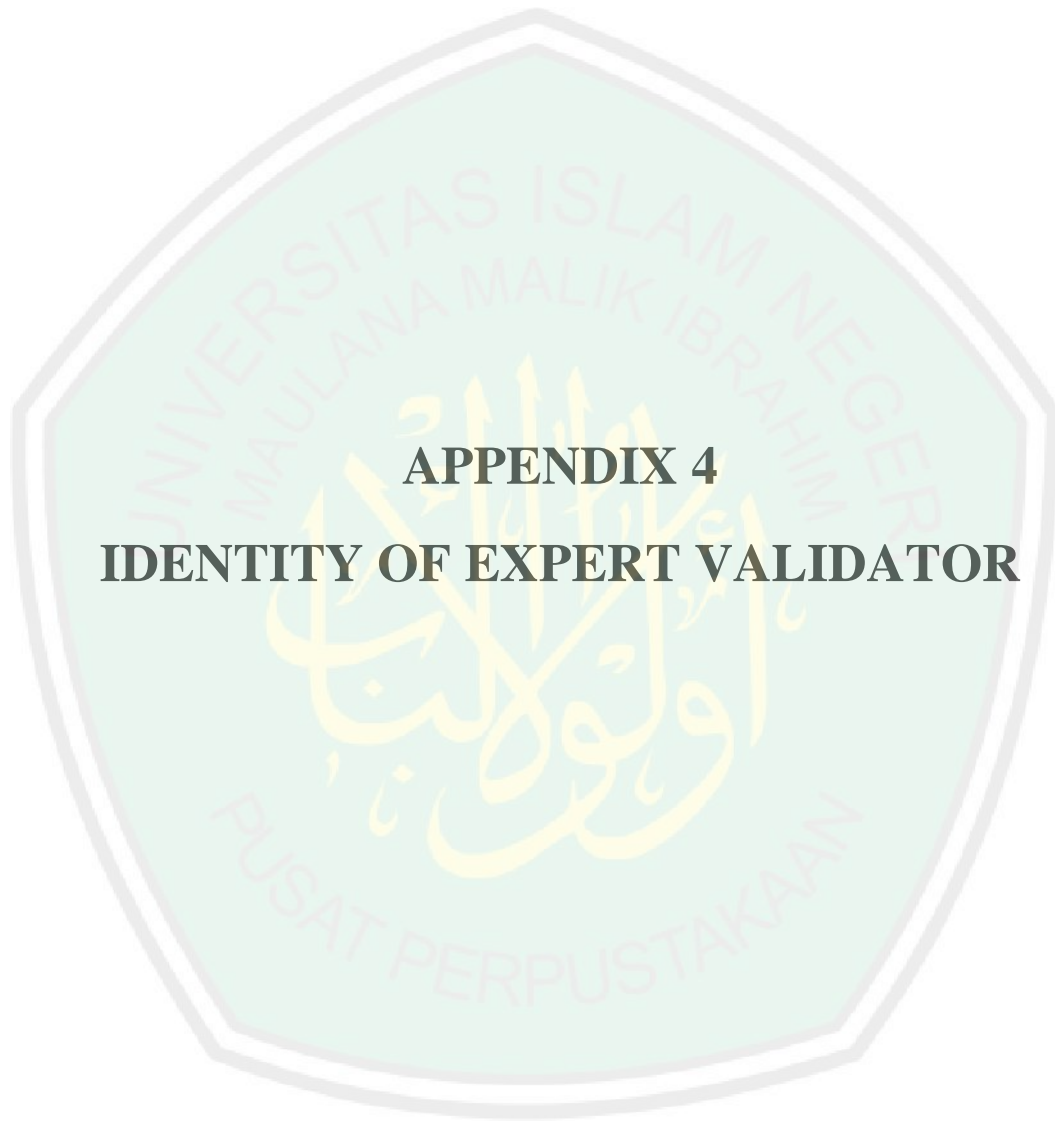
Nama : MURUL ISNANI
NIM : 19140019
Judul : The Development of Learning Media Based on Rodo
Putar Game on Mathematic Subject of Solid Figure
Material for 5th Grade of SDN Purwontoro 4 Malang.
Dosen Pembimbing : Dr. Alfiana Yuli Epiyanti

No.	Tgl/ Bln/ Thn	Materi Konsultasi	Tanda Tangan Pembimbing Skripsi
1.	21 / 5 / 2018	Bab I, II, III	
2.	29 / 5 / 2018	Instrumen Penelitian	
3.	10 / 7 / 2018	Bab IV (Hasil Penelitian)	
4.	8 / 8 / 2018	Bab IV	
5.	22 / 8 / 2018	Bab IV	
6.	10 / 9 / 2018	Bab IV	
7.	9 / 10 / 2018	Bab V	
8.	12 / 11 / 2018	Bab VI	
9.	20 / 11 / 2018	Abstrak	
10.			
11.			
12.			

Malang, 20.....
Mengetahui

Ketua Jurusan PGMI,

H. Ahmad Sholeh, M.Ag
NIP. 197008032006041001

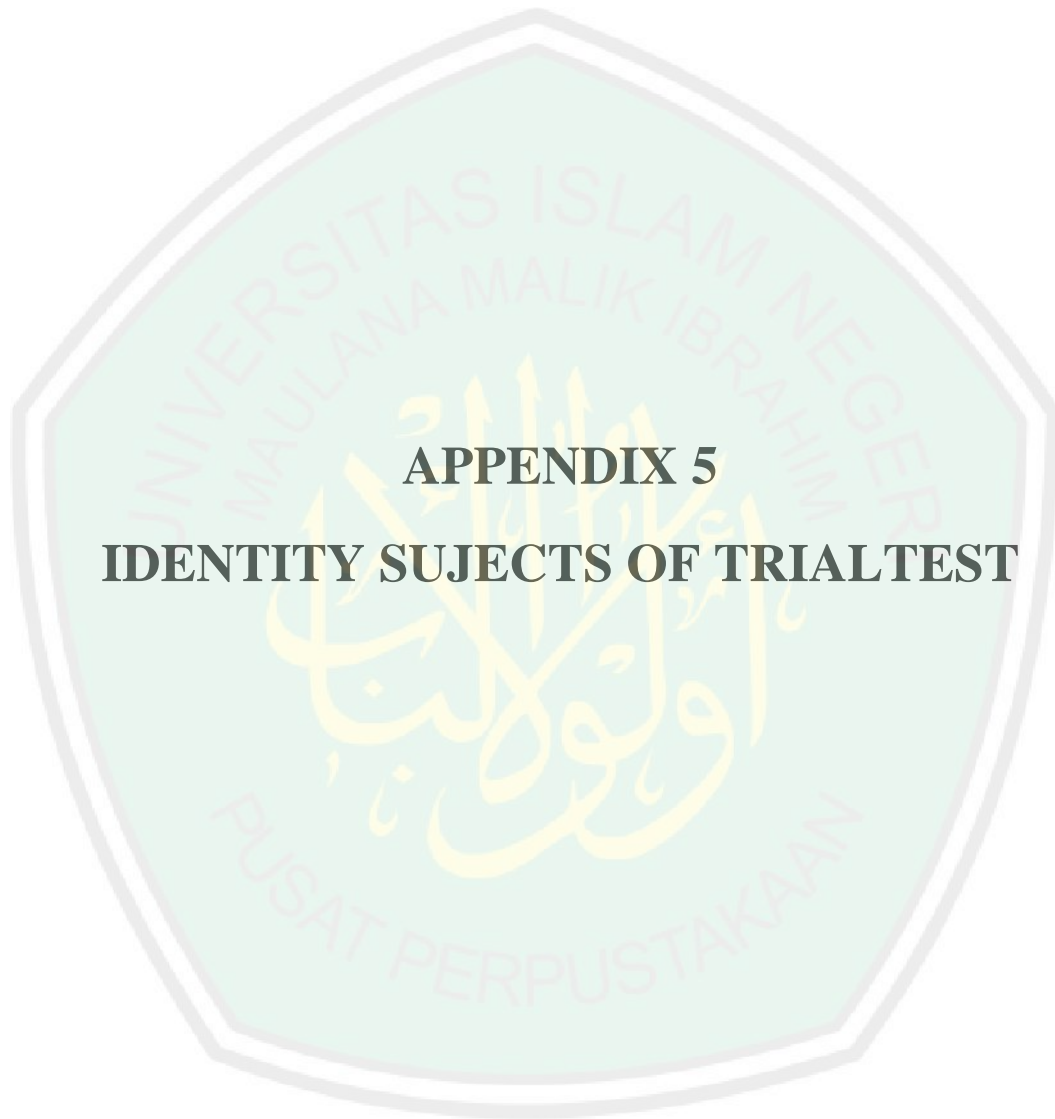


APPENDIX 4
IDENTITY OF EXPERT VALIDATOR

IDENTITY OF VALIDATOR MEDIA

NO	Name	Profision	Subject Expert
1.	Ahmad Makki Hasan, M.Pd	Lecture of Arabic and learning media UIN Maulana Malik Ibrahim Malang	Media expert
2	Ria Norfika Y. M.Pd	Lecture of Mathematics and Learning ON Primary School UIN Maulana Malik Ibrahim Malang	Content expert
3	Sri Idha Suprapti S.Pd	Teacher on Mathematics Subject at SDN Purwantoro 4 Malang	Learning expert





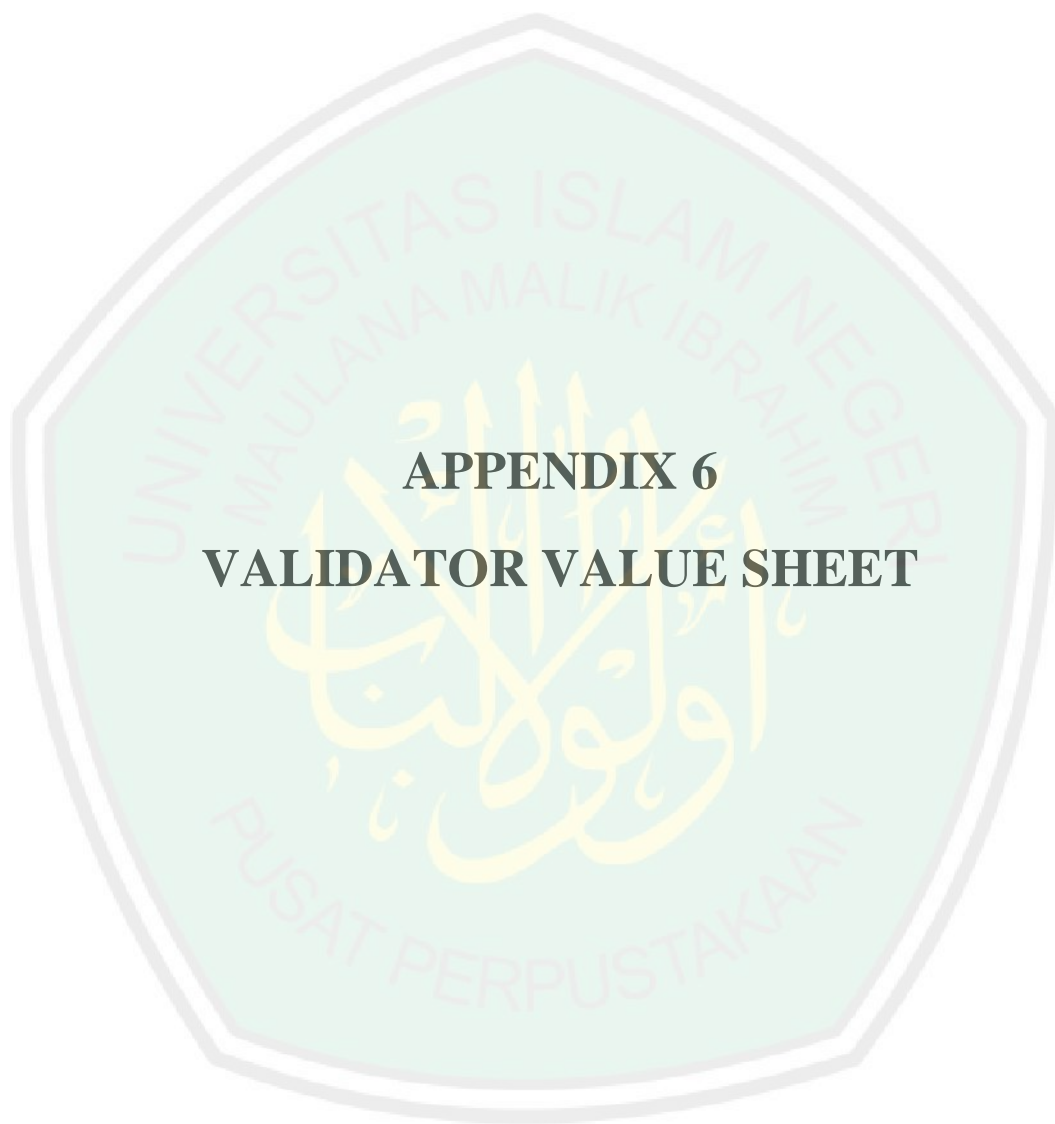
APPENDIX 5
IDENTITY SUBJECTS OF TRIAL TEST

IDENTITY SUBJECT OF TRIAL TEST

No	Name Of Student	Profision
1.	Amanda Ayu	Student 5 th grade at SDN Purwanto 4 Malang
2.	Ahmad Rizki N.P	Student 5 th grade at SDN Purwanto 4 Malang
3.	Agung Rizki R	Student 5 th grade at SDN Purwanto 4 Malang
4.	Arya Widya Utama	Student 5 th grade at SDN Purwanto 4 Malang
5.	Deva Yulia A.P	Student 5 th grade at SDN Purwanto 4 Malang
6.	Dwi Elsa Iroh	Student 5 th grade at SDN Purwanto 4 Malang
7.	Defina Puspita S	Student 5 th grade at SDN Purwanto 4 Malang
8.	Eka Mydina R.F	Student 5 th grade at SDN Purwanto 4 Malang
9.	Febian Hartionto	Student 5 th grade at SDN Purwanto 4 Malang
10.	Gaizka Zahra R	Student 5 th grade at SDN Purwanto 4 Malang
11.	Hafizhah Ashila	Student 5 th grade at SDN Purwanto 4 Malang
12.	Huzen Rifai Hamzah	Student 5 th grade at SDN Purwanto 4 Malang
13.	Intan Nur Aziz	Student 5 th grade at SDN Purwanto 4 Malang
14.	Juvita Anggi Fadila	Student 5 th grade at SDN Purwanto 4 Malang
15.	Mischa Elvarado Sindhu G	Student 5 th grade at SDN Purwanto 4 Malang
16.	M.Azzara Naufal Sandi	Student 5 th grade at SDN Purwanto 4 Malang
17.	M. Adit Tiya Dani S	Student 5 th grade at SDN Purwanto 4 Malang
18.	Muhammad Andriansyah P	Student 5 th grade at SDN Purwanto 4 Malang
19.	Mochamad Figo Setiawan	Student 5 th grade at SDN Purwanto 4 Malang
20.	Nur Hamiza	Student 5 th grade at SDN Purwanto 4 Malang
21.	Natasya Arthamevia	Student 5 th grade at SDN Purwanto 4 Malang
22.	Natasya Novita Dewi	Student 5 th grade at SDN Purwanto 4 Malang
23.	Novita Anggraeni	Student 5 th grade at SDN Purwanto 4 Malang

24.	Raditya Ady Saputra	Student 5 th grade at SDN Purwantoro 4 Malang
25.	Rahan Febrian Firdaus	Student 5 th grade at SDN Purwantoro 4 Malang
26.	Reva Putri Alisya	Student 5 th grade at SDN Purwantoro 4 Malang
27.	Ridho Ilham Firdaus	Student 5 th grade at SDN Purwantoro 4 Malang
28.	Rio Ferdinand Septiansyah	Student 5 th grade at SDN Purwantoro 4 Malang
29.	Saskia Aulia Azizha	Student 5 th grade at SDN Purwantoro 4 Malang
30.	Sayyid Ahmad Almalki	Student 5 th grade at SDN Purwantoro 4 Malang
31.	Rasya Sasikirana W	Student 5 th grade at SDN Purwantoro 4 Malang





APPENDIX 6
VALIDATOR VALUE SHEET

LEMBAR VALIDASI AHLI MATERI

The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang.

Nama : Ulfia Churidatul A. M.Pd

Instansi : UIN Maliki Malang

Pendidikan :

Tanggal : 02 Juni 2018

Instruction :

1. Bapak/ibu dimohon untuk memberikan penilaian (memvalidasi) beberapa aspek yang terdapat dalam media pembelajaran Roda Putar.
2. Penilaian cukup dengan memberikan tanda cek (✓) pada kolom penilaian yang sebaris dengan pernyataan yang diberikan. Angka – angka tersebut dapat ditafsirkan sebagai berikut:

1 = Sangat tidak tepat	4 = Tepat
2 = Kurang tepat	5 = Sangat tepat
3 = Cukup tepat	
4. Dibagian akhir Bapak/Ibu dimohon memberikan kritik dan saran untuk kesesuaian kegiatan pembelajaran menggunakan Roda Putar.

NO	Butir Pertanyaan	SKOR				
		1	2	3	4	5
1.	Kesesuaian materi yang disajikan dengan KI-KD				✓	
2.	Kesesuaian materi yang disajikan dengan Indikator				✓	
3.	Materi yang disajikan pada media pembelajaran sesuai dengan tujuan				✓	

	pembelajaran matematika.					
4.	Kualitas tes dan penilaian				✓	
5.	Kesesuaian materi dengan tingkatan siswa kelas 5				✓	
6.	Bahasa yang digunakan dalam menyajikan materi				✓	
7.	Pemberian latihan untuk pemahaman konsep					✓
8.	Sistematika penyajian materi				✓	
9.	Tingkatan kemenarikan media pembelajaran roda putar dapat menarik minat belajar siswa				✓	
10.	Kejelasan sajian media pembelajaran pada mata pelajaran matematika materi bangun ruang					✓

Kritik :

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Saran :

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Kesimpulan :

Media Pembelajaran Roda Putar ini :

- Layak untuk diuji coba tanpa revisi
- Layak untuk diuji coba dengan revisi sesuai saran

Malang, 20 Juni2018

Ahli Materi

Ulfra Churtdaful A, M.Pd.

LEMBAR VALIDASI AHLI MEDIA

The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang.

Nama : Ahmad Mubti Hasan

Instansi : UIN Malang

Pendidikan : S3

Tanggal : 28 Mei 2018

Instruction :

1. Bapak/ibu dimohon untuk memberikan penilaian (memvalidasi) beberapa aspek yang terdapat dalam media pembelajaran Roda Putar.
2. Penilaian cukup dengan memberikan tanda cek (✓) pada kolom penilaian yang sebaris dengan pernyataan yang diberikan. Angka – angka tersebut dapat ditafsirkan sebagai berikut:
1 = Sangat tidak tepat 4 = Tepat
2 = Kurang tepat 5 = Sangat tepat
3 = Cukup tepat
3. Dibagian akhir Bapak/Ibu dimohon memberikan kritik dan saran untuk kesesuaian kegiatan pembelajaran menggunakan Roda Putar.

NO	Butir Pertanyaan	SKOR				
		1	2	3	4	5
1.	Kemenarikan desain media pembelajaran roda putar.			✓		
2.	Kesesuaian warna, yang digunakan dalam media pembelajaran roda putar.			✓		
3.	Media pembelajaran roda putar dapat tahan lama.			✓		
5.	Keamanan bahan yang digunakan dalam pengembangan media pembelajaran roda putar.		✓			

6.	Petunjuk penggunaan media pembelajaran roda putar mudah dipahami oleh siswa dan guru.		✓			
7.	Kesesuaian materi dengan media pembelajaran roda putar.			✓		
8.	Kemudahan sistem pengoprasian Media pembelajaran roda putar.		✓			
9.	Mengukur efektifan media pembelajaran roda putar dalam kegiatan pembelajaran.		✓			
10.	Media pembelajaran roda putar dapat menarik minat belajar siswa.			✓		

Kritik :

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Saran :

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Kesimpulan :

Media Pembelajaran Roda Putar ini :

- Layak untuk diuji coba tanpa revisi
- Layak untuk diuji coba dengan revisi sesuai saran

Malang, 20 - Mei - 2018

Ahli Media


Ahmad Makki H.
 NIP : 201001041294

cpLEMBAR VALIDASI AHLI MEDIA

The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang.

Nama : Ahmad Makti Hasan

Instansi : UIN Malang

Pendidikan : S₃

Tanggal : 30 Mei 2018

Instruction :

1. Bapak/ibu dimohon untuk memberikan penilaian (memvalidasi) beberapa aspek yang terdapat dalam media pembelajaran Roda Putar.
2. Penilaian cukup dengan memberikan tanda cek (✓) pada kolom penilaian yang sebaris dengan pernyataan yang diberikan. Angka – angka tersebut dapat ditafsirkan sebagai berikut:

1 = Sangat tidak tepat	4 = Tepat
2 = Kurang tepat	5 = Sangat tepat
3 = Cukup tepat	
3. Dibagian akhir Bapak/Ibu dimohon memberikan kritik dan saran untuk kesesuaian kegiatan pembelajaran menggunakan Roda Putar.

NO	Butir Pertanyaan	SKOR				
		1	2	3	4	5
1.	Kemenarikan desain media pembelajaran roda putar.					✓
2.	Kesesuaian warna, yang digunakan dalam media pembelajaran roda putar.				✓	
3.	Media pembelajaran roda putar dapat tahan lama.					✓
5.	Keamanan bahan yang digunakan dalam pengembangan media pembelajaran roda putar.				✓	

6.	Petunjuk penggunaan media pembelajaran roda putar mudah dipahami oleh siswa dan guru.						✓
7.	Kesesuaian materi dalam media pembelajaran roda putar.						✓
8.	Kemudahan sistem pengoprasian Media pembelajaran roda putar.						✓
9.	Keefektifan media pembelajaran roda putar dalam kegiatan pembelajaran.				✓		
10.	Media pembelajaran roda putar dapat menarik minat belajar siswa.						✓

Kritik :

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Saran :

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Kesimpulan :

Media Pembelajaran Roda Putar ini :

- Layak untuk diuji coba tanpa revisi
- Layak untuk diuji coba dengan revisi sesuai saran

Malang, 30 Mei 2018

Ahli Materi


Ahmad Maffi Hasan
 NIP: 201001091299

	dengan materi					
6.	Kesesuaian media pembelajaran roda putar dengan tujuan pembelajaran					✓
7.	Bahasa pada petunjuk penggunaan dalam media pembelajaran roda putar mudah dipahami				✓	
8.	Media pembelajaran roda putar dapat menarik minat belajar siswa					✓
9.	Media pembelajaran rooda putar praktis digunakan dalam kegiatan pembelajaran				✓	
10.	Kejelasan sajian media pembelajaran pada mata pelajaran matematika materi bangun ruang					✓

Kritik :

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Saran :

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Kesimpulan :

Media Pembelajaran Roda Putar ini :

- Layak untuk diuji coba tanpa revisi
- Layak untuk diuji coba dengan revisi sesuai saran

Malang...5...Juli.....2018

Ahli Pembelajaran



Sri Laha Suprapti, S.Pd



APPENDIX 7
INTERVIEW SHEET

DAFTAR PERTANYAAN WAWANCARA

Nama Narasumber : Ibu Sri Idha Suprapti S.Pd

Lokasi Wawancara : SDN Purwantoro 9 Malang

Waktu Wawancara : 9 Mei 2018

1. Media pembelajaran apakah yang biasa digunakan pada pelajaran matematika materi

bangun ruang? untuk menjelaskan jaring-jaring menggunakan kardus bekas odol dan sabun, tapi hanya bisa digunakan sekali dan 1 model jaring

2. Bagaimanakah hasil belajar siswa? siswa kadang lupa bawa hasil belajar standart beberapa masih banyak dibawah KKM

3. Bagaimanakah tampilan media pembelajaran berbasis permainan roda putar? menarik & unik sehingga siswa dapat tertarik untuk belajar bangun ruang

4. Bagaimana antusias siswa saat proses belajar mengajar menggunakan media

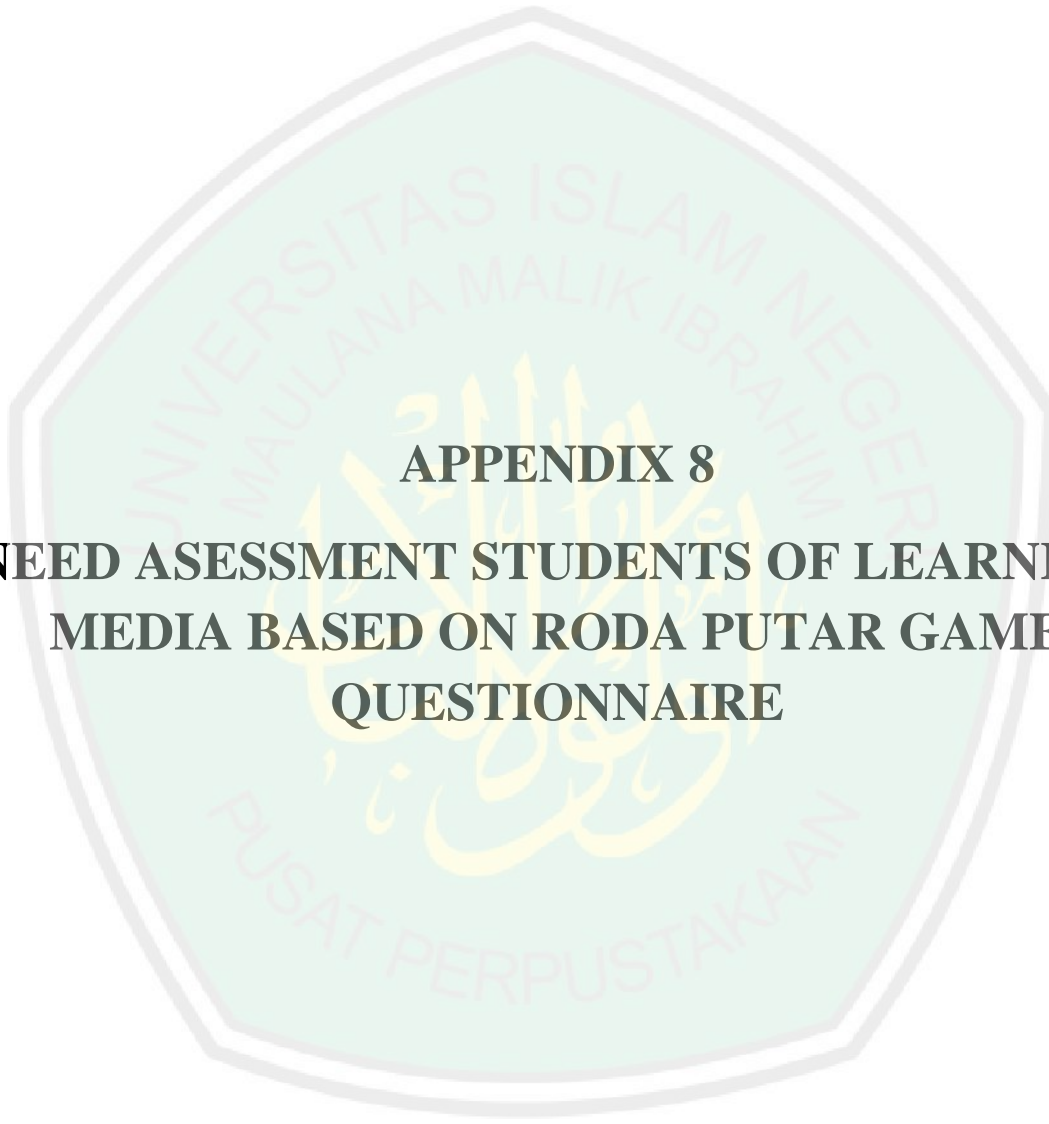
pembelajaran berbasis permainan roda putar? siswa sangat antusias, lebih cepat menjawab soal karena tidak mau kalah dari temannya yg lain.

5. Apakah media pembelajaran berbasis permainan roda putar dapat membangun

semangat belajar siswa? dengan metode permainan yang terdapat pd media membuat siswa semangat mengerjakan, yg biasanya matematika dianggap sulit

6. Apakah media pembelajaran berbasis permainan roda putar memudahkan siswa dalam ^{sekarang mau mengerjakan}

menemukan macam - macam bentuk jaring - jaring kubus dan balok? sangat memudahkan bahannya awet, dapat digunakan berkali - kali, dapat dirubah menjadi bermacam - macam bentuk jaring - jaring kubus & balok, siswa dapat menemukan langsung secara nyata tanpa harus mengimajinasikan bentuk dri jaring - jaring kubus dan balok



APPENDIX 8
NEED ASESSMENT STUDENTS OF LEARNING
MEDIA BASED ON RODA PUTAR GAME
QUESTIONNAIRE

**ANGKET TINGKAT KEBUTUHAN SISWA TERHADAP MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR**

*The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid
Figure Material for 5th Grade of SDN Purwanto 4 Malang.*

Nama : Agung Rizki R

Kelas : 5

Sekolah : SDN Purwanto 4

Instruction :

A. PETUNJUK PENGISIAN ANGGKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian lebih senang belajar menggunakan media pembelajaran berbasis permainan roda putar?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
2. Apakah media pembelajaran berbasis permainan roda putar memudahkan kalian untuk memahami materi bangun ruang?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
3. Apakah pembelajaran berbasis permainan roda putar memudahkan kalian untuk menemukan macam – macam jaring – jarring balok dan kubus?
 - a. Sangat tidak senang

- b. Kurang senang
- c. Senang
- d. Cukup senang
- e. Sangat senang

4. Apakah soal pada media pembelajaran berbasis permainan roda putar menarik untuk dikerjakan?

- a. Sangat tidak senang
- b. Kurang senang
- c. Senang
- d. Cukup senang
- e. Sangat senang

5. Apakah media pembelajaran berupa permainan roda putar mudah dipahami?

- a. Sangat tidak senang
- b. Kurang senang
- c. Senang
- d. Cukup senang
- e. Sangat senang



ANGKET TINGKAT KEBUTUHAN SISWA TERHADAP MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR

The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid Figure Material for 5th Grade of SDN Purwantoro 4 Malang.

Nama : Natasya A

Kelas : 5

Sekolah : SDN Purwantoro 4 Malang

Instruction :

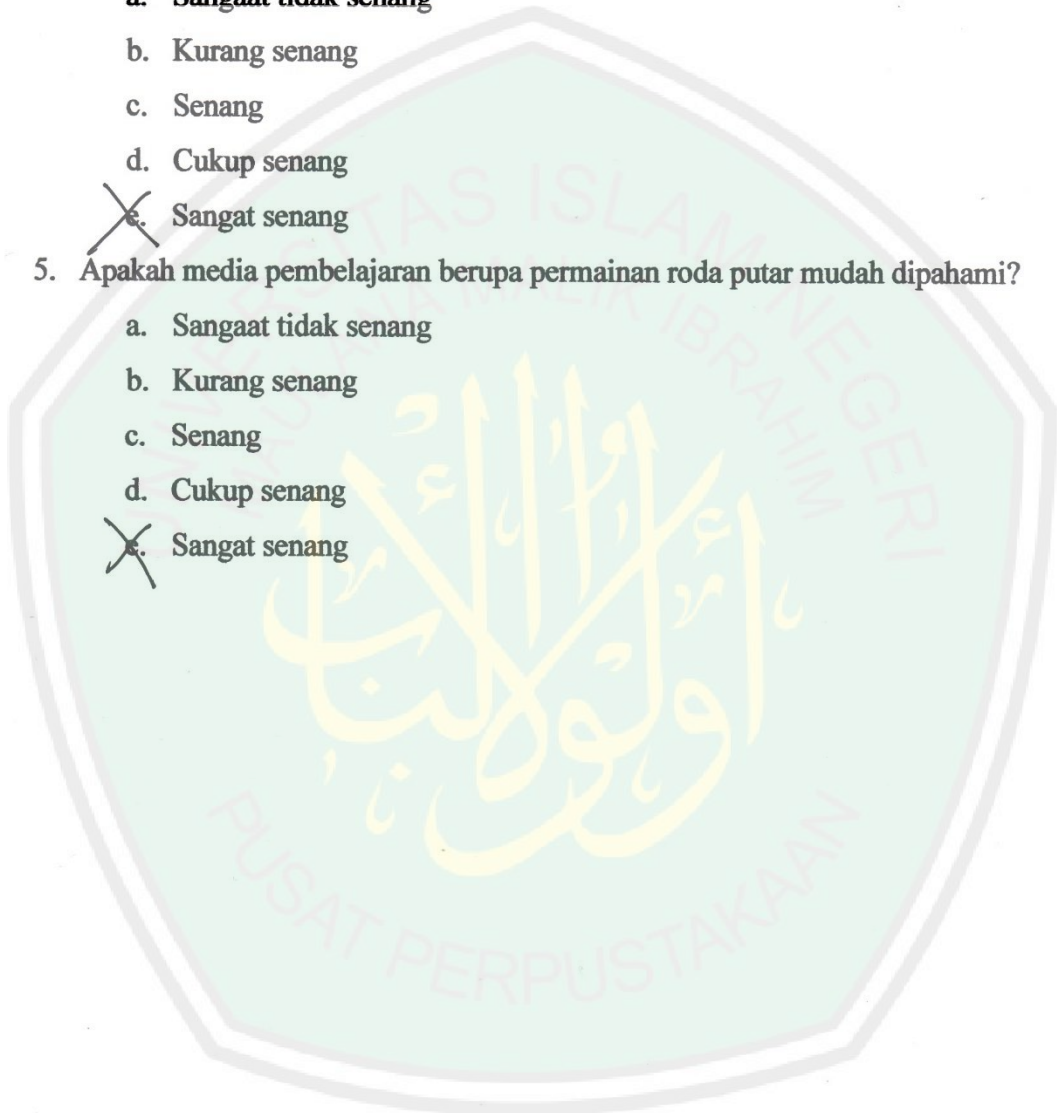
A. PETUNJUK PENGISIAN ANGKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian lebih senang belajar menggunakan media pembelajaran berbasis permainan roda putar?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - ~~e. Sangat senang~~
2. Apakah media pembelajaran berbasis permainan roda putar memudahkan kalian untuk memahami materi bangun ruang?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - ~~e. Sangat senang~~
3. Apakah pembelajaran berbasis permainan roda putar memudahkan kalian untuk menemukan macam – macam jaring – jarring balok dan kubus?
 - a. Sangat tidak senang

- b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
4. Apakah soal pada media pembelajaran berbasis permainan roda putar menarik untuk dikerjakan?
- a. Sangaat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
5. Apakah media pembelajaran berupa permainan roda putar mudah dipahami?
- a. Sangaat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang



ANGKET TINGKAT KEBUTUHAN SISWA TERHADAP MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR

*The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid
Figure Material for 5th Grade of SDN Purwantoro 4 Malang.*

Nama : Sayyid A.A
Kelas : 5
Sekolah : SDN Purwantoro 4

Instruction :

A. PETUNJUK PENGISIAN ANGKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian lebih senang belajar menggunakan media pembelajaran berbasis permainan roda putar?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
2. Apakah media pembelajaran berbasis permainan roda putar memudahkan kalian untuk memahami materi bangun ruang?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
3. Apakah pembelajaran berbasis permainan roda putar memudahkan kalian untuk menemukan macam – macam jaring – jarring balok dan kubus?
 - a. Sangat tidak senang

- b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
4. Apakah soal pada media pembelajaran berbasis permainan roda putar menarik untuk dikerjakan?
- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
5. Apakah media pembelajaran berupa permainan roda putar mudah dipahami?
- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang





APPENDIX 9
PRE TEST

Soal Pre – Test

Nama : Deva Fulia
Kelas : 5
No Absen : 5

Nilai
50

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1. Kubus yang memiliki panjang rusuk 8 cm, maka berapakah volume kubus tersebut...

- a. 8 cm^3
- b. 16 cm^3
- c. 64 cm^3
- d. 512 cm^3



2. Volume sebuah kubus yaitu 2.744 cm^3 , maka berapakah panjang rusuk kubus tersebut...

- a. 13 cm
- b. 14 cm
- c. 15 cm
- d. 16 cm

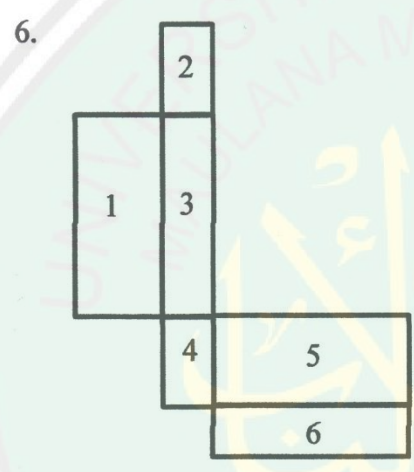
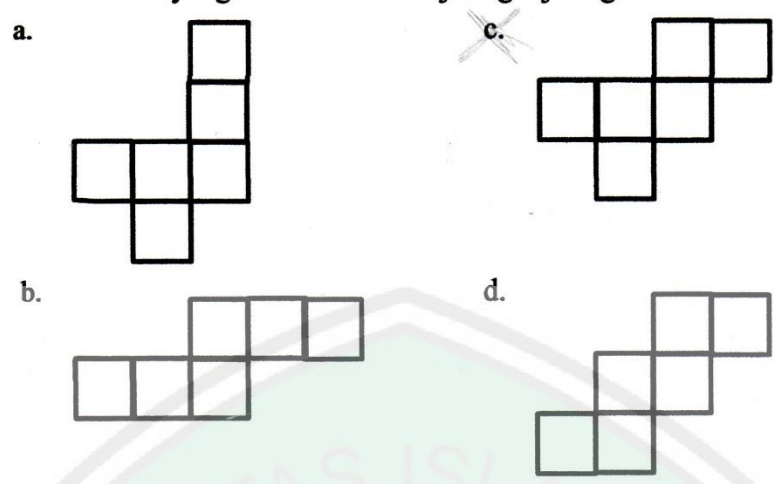
3. Volume balok dengan panjang 7 cm, tinggi 5 cm dan lebar 3 cm adalah ... cm^3

- a. 15 cm^3
- b. 45 cm^3
- c. 75 cm^3
- d. 105 cm^3

4. Ayah akan membuat 3 akuarium berbentuk balok yang memiliki ukuran sama, dengan panjang 13 dm, lebar 7 dm dan tinggi 9 dm, maka berapa luas 3 akuarium tersebut tersebut...

- a. 2137 dm^3
- b. 2257 dm^3
- c. 2457 dm^3
- d. 3217 dm^3

5. Dibawah ini yang bukan termasuk jaring – jaring kubus adalah...



Pada jaring – jaring balok disamping, jika nomer satu adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

- a. 3
- b. 4
- c. 5
- d. 6

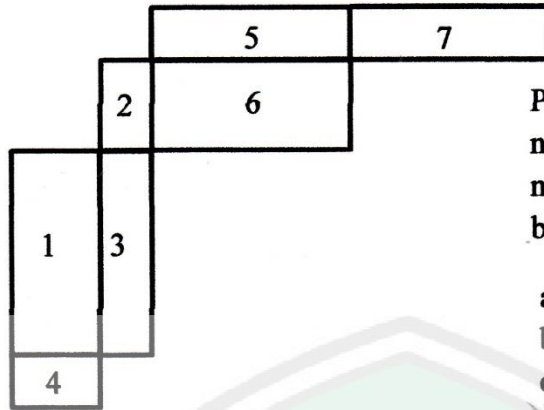
7. Sebuah bak tahu berbentuk kubus memiliki panjang rusuk 12 dm berapakah volume bak tahu tersebut...

- a. 1638 dm^3
- b. 1728 dm^3
- c. 2197 dm^3
- d. 2744 dm^3

8. Sebuah balok memiliki volume 1.274 cm^3 , jika tinggi balok 14 cm maka luas alas balok tersebut adalah... cm^2

- a. 42 cm^2
- b. 91 cm^2
- c. 630 cm^2
- d. 637 cm^2

9.



Pada jaring – jaring balok disamping, nomer berapakah yang harus dibuang agar menjadi jaring – jaring balok yang benar...

- a. 4
- b. 5
- c. 6
- d. 7

10. Sebuah bak tahu berbentuk kubus memiliki volume 3375 cm^3 , maka panjang rusuk bak tahu tersebut...

- a. 15 cm
- b. 25 cm
- c. 35 cm
- d. 45 cm

~ SELAMAT MENGERJAKAN ~

Soal Pre – Test

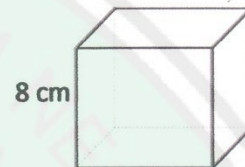
Nama : EKA . M
Kelas : 5
No Absen : 8

Nilai
60,

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1. Kubus yang memiliki panjang rusuk 8 cm, maka berapakah volume kubus tersebut...

- a. 8 cm^3
- b. 16 cm^3
- c. 64 cm^3
- d. 512 cm^3



2. Volume sebuah kubus yaitu 2.744 cm^3 , maka berapakah panjang rusuk kubus tersebut...

- a. 13 cm
- b. 14 cm
- c. 15 cm
- d. 16 cm

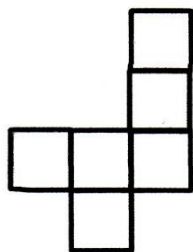
3. Volume balok dengan panjang 7 cm, tinggi 5 cm dan lebar 3 cm adalah ... cm^3

- a. 15 cm^3
- b. 45 cm^3
- c. 75 cm^3
- d. 105 cm^3

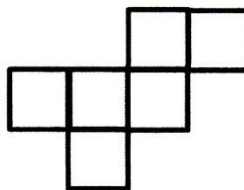
4. Ayah akan membuat 3 akuarium berbentuk balok yang memiliki ukuran sama, dengan panjang 13 dm, lebar 7 dm dan tinggi 9 dm, maka berapa luas 3 akuarium tersebut tersebut...

- a. 2137 dm^3
- b. 2257 dm^3
- c. 2457 dm^3
- d. 3217 dm^3

5. Dibawah ini yang bukan termasuk jaring – jaring kubus adalah...



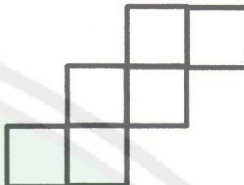
c.



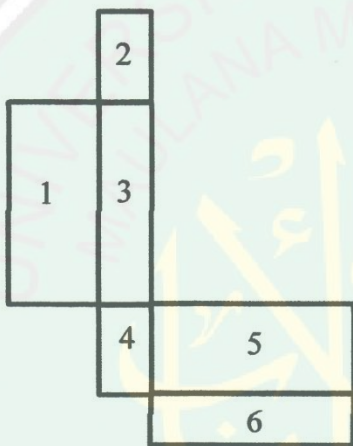
b.



d.



6.



Pada jaring – jaring balok disamping, jika nomer satu adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

- a. 3
- b. 4
- ~~c. 5~~
- d. 6

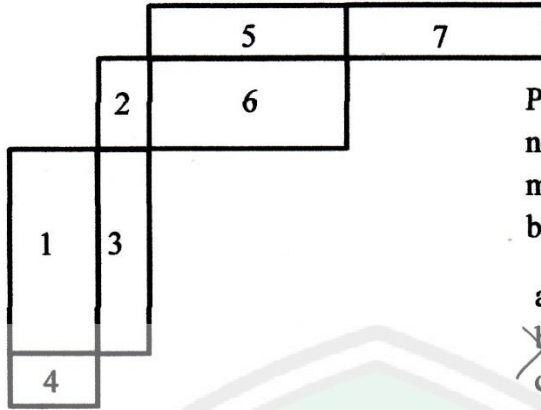
7. Sebuah bak tahu berbentuk kubus memiliki panjang rusuk 12 dm berapakah volume bak tahu tersebut...

- a. 1638 dm^3
- ~~b. 1728 dm^3~~
- c. 2197 dm^3
- d. 2744 dm^3

8. Sebuah balok memiliki volume 1.274 cm^3 , jika tinggi balok 14 cm maka luas alas balok tersebut adalah... cm^2

- a. 42 cm^2
- ~~b. 91 cm^2~~
- c. 630 cm^2
- d. 637 cm^2

9.



Pada jaring – jaring balok disamping, nomer berapakah yang harus dibuang agar menjadi jaring – jaring balok yang benar...

- a. 4
- ~~b. 5~~
- ~~c. 6~~
- d. 7

10. Sebuah bak tahu berbentuk kubus memiliki volume 3375 cm^3 , maka panjang rusuk bak tahu tersebut...

- a. 15 cm
- ~~b. 25 cm~~
- c. 35 cm
- d. 45 cm

~ SELAMAT MENGERJAKAN ~

Soal Pre – Test

Nama : M. Azzara
Kelas : 5
No Absen : 16

Nilai
60

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1. Kubus yang memiliki panjang rusuk 8 cm, maka berapakah volume kubus tersebut...

- a. 8 cm^3
- b. 16 cm^3
- c. 64 cm^3
- d. 512 cm^3



2. Volume sebuah kubus yaitu 2.744 cm^3 , maka berapakah panjang rusuk kubus tersebut...

- a. 13 cm
- b. 14 cm
- c. 15 cm
- d. 16 cm

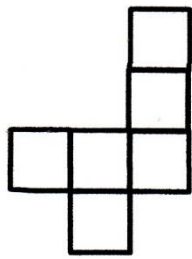
3. Volume balok dengan panjang 7 cm, tinggi 5 cm dan lebar 3 cm adalah ... cm^3

- a. 15 cm^3
- b. 45 cm^3
- c. 75 cm^3
- d. 105 cm^3

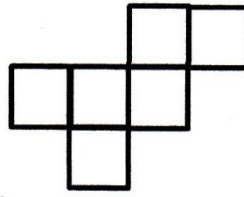
4. Ayah akan membuat 3 akuarium berbentuk balok yang memiliki ukuran sama, dengan panjang 13 dm, lebar 7 dm dan tinggi 9 dm, maka berapa luas 3 akuarium tersebut tersebut...

- a. 2137 dm^3
- b. 2257 dm^3
- c. 2457 dm^3
- d. 3217 dm^3

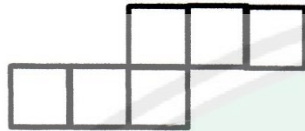
5. Dibawah ini yang bukan termasuk jaring – jaring kubus adalah...



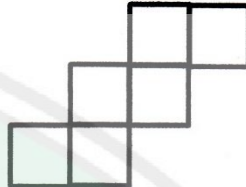
c.



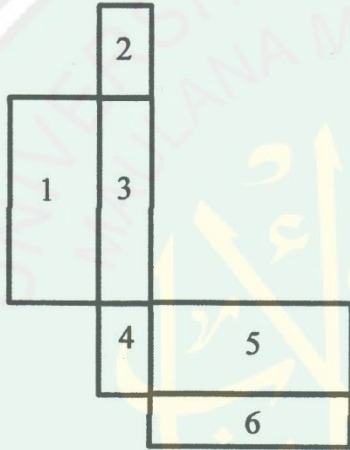
b.



d.



6.



Pada jaring – jaring balok disamping, jika nomer satu adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

a. 3

b. 4

~~c.~~ 5

d. 6

7. Sebuah bak tahu berbentuk kubus memiliki panjang rusuk 12 dm berapakah volume bak tahu tersebut...

~~a.~~ 1638 dm^3

b. 1728 dm^3

c. 2197 dm^3

d. 2744 dm^3

8. Sebuah balok memiliki volume 1.274 cm^3 , jika tinggi balok 14 cm maka luas alas balok tersebut adalah... cm^2

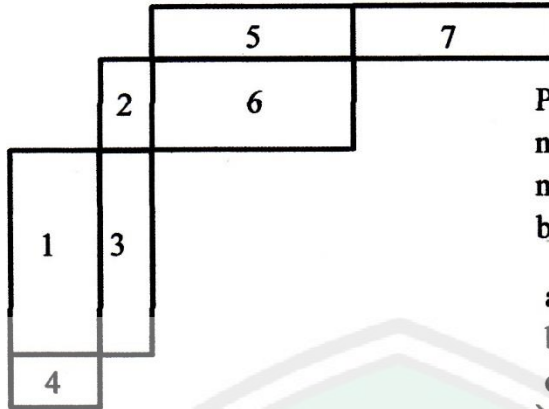
~~a.~~ 42 cm^2

b. 91 cm^2

c. 630 cm^2

d. 637 cm^2

9.



Pada jaring – jaring balok disamping, nomer berapakah yang harus dibuang agar menjadi jaring – jaring balok yang benar...

- a. 4
- b. 5
- c. 6
- ~~d. 7~~

10. Sebuah bak tahu berbentuk kubus memiliki volume 3375 cm^3 , maka panjang rusuk bak tahu tersebut...

- ~~a. 15 cm~~
- b. 25 cm
- c. 35 cm
- d. 45 cm

~ SELAMAT MENGERJAKAN ~



APPENDIX 10

POST TEST

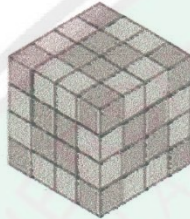
Soal Post – Test

Nama : Deva Xulia
Kelas : 5
No Absen : 5

Nilai
80

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1. Berapakah satuan kubus pada gambar disamping...

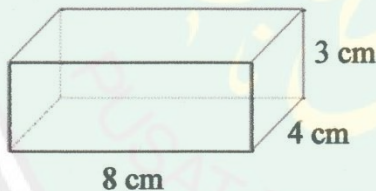


- a. 62 kubus
- b. 64 kubus
- c. 84 kubus
- d. 88 kubus

2. Volume sebuah kubus yaitu 2.197 cm^3 , maka berapakah panjang rusuk kubus tersebut...

- a. 9 cm
- b. 11 cm
- c. 13 cm
- d. 17 cm

3. Volume pada gambar disamping adalah...

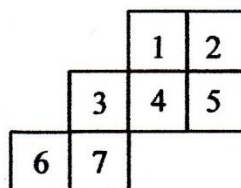


- a. 15 cm^3
- b. 96 cm^3
- c. 105 cm^3
- d. 115 cm^3

4. Volume balok dengan panjang 11 cm, tinggi 6 cm dan lebar 5 cm adalah ... cm^3

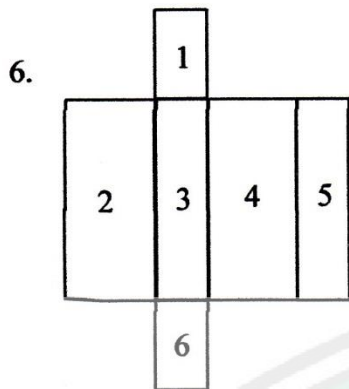
- a. 330 cm^3
- b. 335 cm^3
- c. 340 cm^3
- d. 345 cm^3

5.



Pada gambar jaring – jaring disamping nomer berapakah yang harus dibuang agar membentuk sebuah kubus...

- a. 3
- b. 4
- c. 5
- d. 6



Pada jaring – jaring balok disamping, jika nomer 6 adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

- a. 1
- b. 2
- c. 3
- d. 4

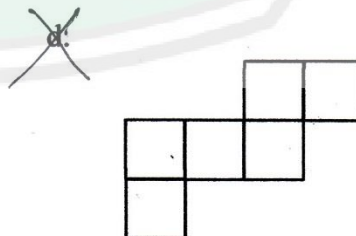
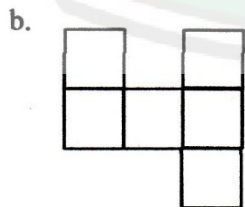
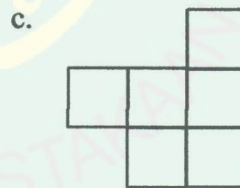
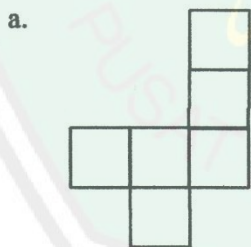
7. Volume tahu yang berbentuk kubus sebesar 343 cm^3 . Maka besar rusuk tahu tersebut adalah...

- a. 3 cm
- b. 7 cm
- c. 9 cm
- d. 11 cm

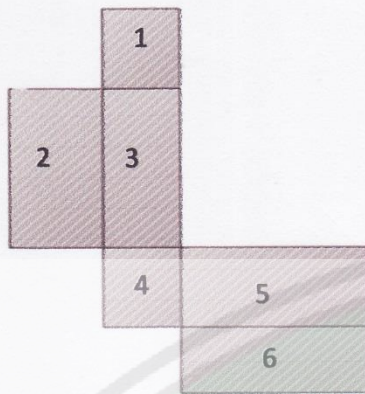
8. Luas alas balok 240 cm^2 , Jika volume balok 3.600 cm^3 maka tinggi balok adalah ...

- a. 10 cm
- b. 12 cm
- c. 15 cm
- d. 18 cm

9. Dibawah ini yang merupakan jaring – jaring kubus adalah...



10.



Pada jaring – jaring balok disamping, jika nomer 6 adalah atap balok maka bagian alas balok ditunjukkan oleh nomer...

- a. 1
- ~~b. 3~~
- c. 5
- d. 6

~ SELAMAT MENGERJAKAN ~



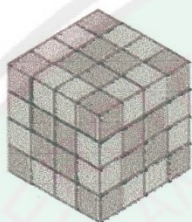
Soal Post – Test

Nama : EKA . M
 Kelas : 5
 No Absen : 8

Nilai
70

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1.



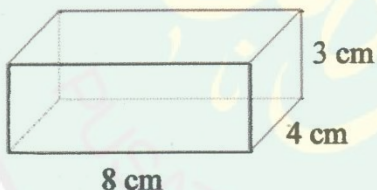
Berapakah satuan kubus pada gambar disamping...

- a. 62 kubus
- b. 64 kubus
- c. 84 kubus
- d. 88 kubus

2. Volume sebuah kubus yaitu 2.197 cm^3 maka berapakah panjang rusuk kubus tersebut...

- a. 9 cm
- b. 11 cm
- c. 13 cm
- d. 17 cm

3.



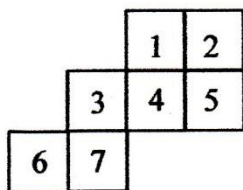
Volume pada gambar disamping adalah...

- a. 15 cm^3
- b. 96 cm^3
- c. 105 cm^3
- d. 115 cm^3

4. Volume balok dengan panjang 11 cm, tinggi 6 cm dan lebar 5 cm adalah ... cm^3

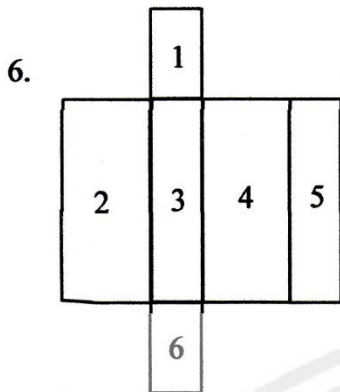
- a. 330 cm^3
- b. 335 cm^3
- c. 340 cm^3
- d. 345 cm^3

5.



Pada gambar jaring – jaring disamping nomer berapakah yang harus dibuang agar membentuk sebuah kubus...

- a. 3
- b. 4
- c. 5
- d. 6



Pada jaring – jaring balok disamping, jika nomer 6 adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

- a. 1
- b. 2
- c. 3
- d. 4

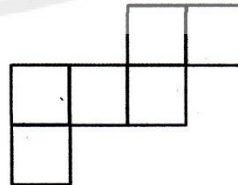
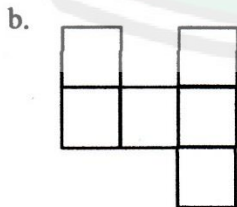
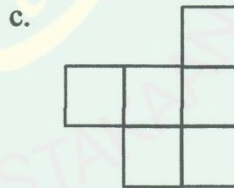
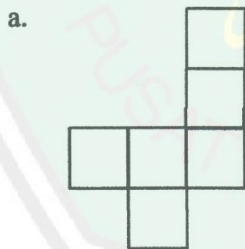
7. Volume tahu yang berbentuk kubus sebesar 343 cm^3 . Maka besar rusuk tahu tersebut adalah...

- a. 3 cm
- b. 7 cm
- c. 9 cm
- d. 11 cm

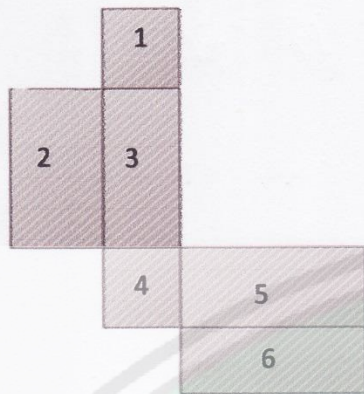
8. Luas alas balok 240 cm^2 , Jika volume balok 3.600 cm^3 maka tinggi balok adalah ...

- a. 10 cm
- b. 12 cm
- c. 15 cm
- d. 18 cm

9. Dibawah ini yang merupakan jaring – jaring kubus adalah...



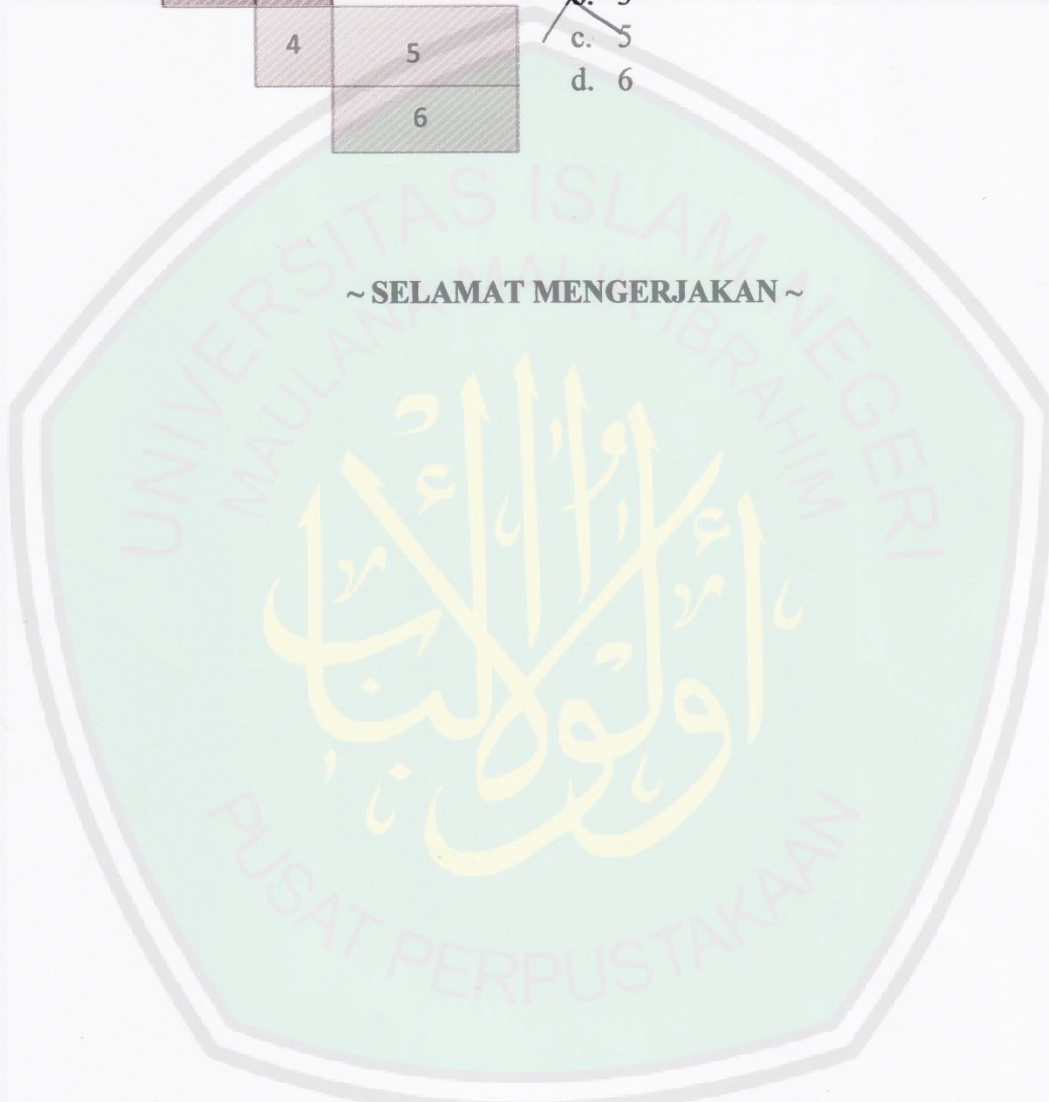
10.



Pada jaring – jaring balok disamping, jika nomer 6 adalah atap balok maka bagian alas balok ditunjukkan oleh nomer...

- a. 1
- ~~b. 3~~
- c. 5
- d. 6

~ SELAMAT MENGERJAKAN ~



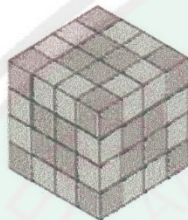
Soal Post – Test

Nama : M. Azzara
 Kelas : 5
 No Absen : 16

Nilai
90

I. Pilihlah salah satu jawaban yang paling benar dan tepat dengan cara memberi tanda silang (X) pada huruf a, b, c atau d!

1.



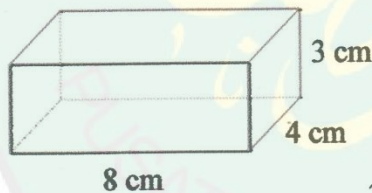
Berapakah satuan kubus pada gambar disamping...

- a. 62 kubus
- b. 64 kubus
- c. 84 kubus
- d. 88 kubus

2. Volume sebuah kubus yaitu 2.197 cm^3 , maka berapakah panjang rusuk kubus tersebut...

- a. 9 cm
- b. 11 cm
- c. 13 cm
- d. 17 cm

3.



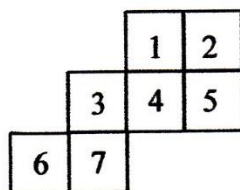
Volume pada gambar disamping adalah...

- a. 15 cm^3
- b. 96 cm^3
- c. 105 cm^3
- d. 115 cm^3

4. Volume balok dengan panjang 11 cm, tinggi 6 cm dan lebar 5 cm adalah ... cm^3

- a. 330 cm^3
- b. 335 cm^3
- c. 340 cm^3
- d. 345 cm^3

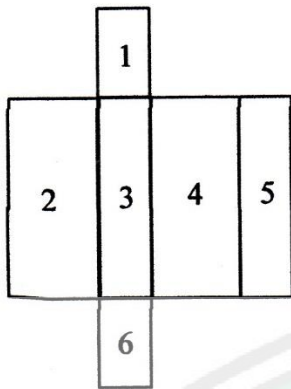
5.



Pada gambar jaring – jaring disamping nomer berapakah yang harus dibuang agar membentuk sebuah kubus...

- a. 3
- b. 4
- c. 5
- d. 6

6.



Pada jaring – jaring balok disamping, jika nomer 6 adalah alas balok maka bagian atap balok ditunjukkan oleh nomer...

- a. 1
- b. 2
- c. 3
- d. 4

7. Volume tahu yang berbentuk kubus sebesar 343 cm^3 . Maka besar rusuk tahu tersebut adalah...

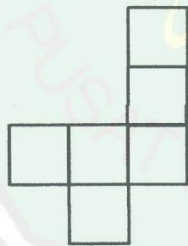
- a. 3 cm
- b. 7 cm
- c. 9 cm
- d. 11 cm

8. Luas alas balok 240 cm^2 , Jika volume balok 3.600 cm^3 maka tinggi balok adalah ...

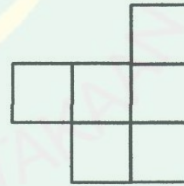
- a. 10 cm
- b. 12 cm
- c. 15 cm
- d. 18 cm

9. Dibawah ini yang merupakan jaring – jaring kubus adalah...

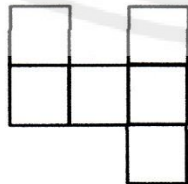
a.



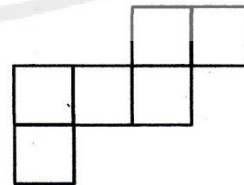
c.



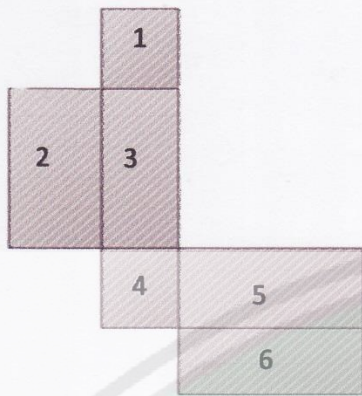
b.



d.



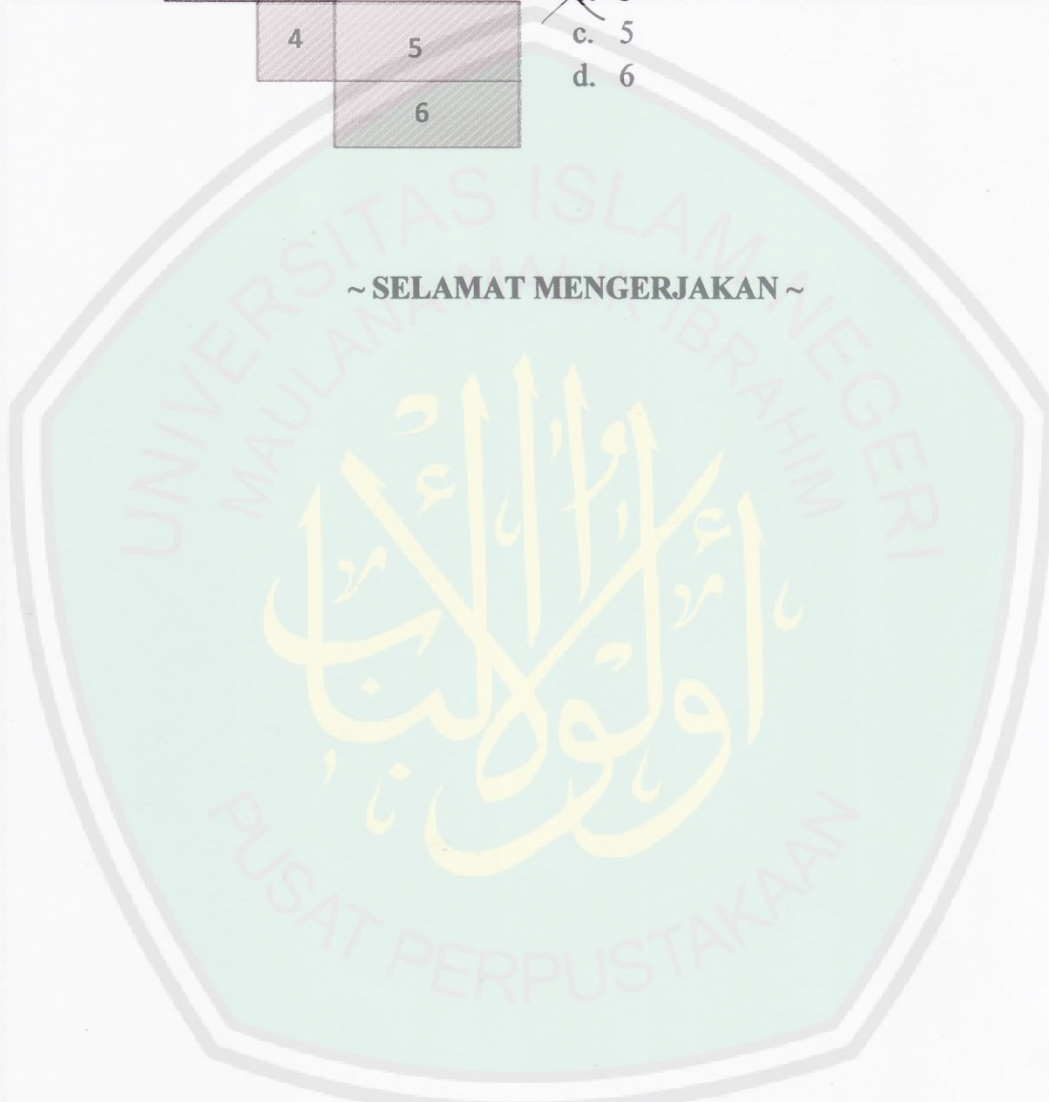
10.



Pada jaring – jaring balok disamping, jika nomer 6 adalah atap balok maka bagian alas balok ditunjukkan oleh nomer...

- a. 1
- ~~b. 3~~
- c. 5
- d. 6

~ SELAMAT MENGERJAKAN ~





APPENDIX 11
FEASIBILITY OF LEARNING MEDIA BASED
ON RODA PUTAR GAME QUESTIONNAIRE

**ANGKET RESPONDEN TINGKAT KEMENARIKAN MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR**

*The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid
Figure Material for 5th Grade of SDN Purwantoro 4 Malang.*

Nama : Ahmad Rizki
Kelas : 5
Sekolah : SDN Purwantoro 4
Instruction :

A. PETUNJUK PENGISIAN ANGKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian senang belajar menggunakan media pembelajaran roda putar?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
2. Apakah media pembelajaran roda putar dapat memberikan semangat belajar kalian?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang

3. Apakah media pembelajaran roda putar mudah digunakan saat pembelajaran?
- Sangat tidak senang
 - Kurang senang
 - Senang
 - Cukup senang
 - Sangat senang
4. Apakah media pembelajaran roda putar menarik untuk mempelajari matematika materi bangun ruang?
- Sangat tidak senang
 - Kurang senang
 - Senang
 - Cukup senang
 - Sangat senang
5. Apakah media pembelajaran roda putar dapat memudahkan kalian dalam memahami materi bangun ruang?
- Sangat tidak senang
 - Kurang senang
 - Senang
 - Cukup senang
 - Sangat senang
6. Apakah petunjuk penggunaan yang tersedia dalam media pembelajaran mudah dipahami?
- Sangat tidak senang
 - Kurang senang
 - Senang
 - Cukup senang
 - Sangat senang

**ANGKET RESPONDEN TINGKAT KEMENARIKAN MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR**

*The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid
Figure Material for 5th Grade of SDN Purwantoro 4 Malang.*

Nama : Nor Hamiza
Kelas : 5
Sekolah : SDN Purwantoro 4
Instruction :

A. PETUNJUK PENGISIAN ANKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian senang belajar menggunakan media pembelajaran roda putar?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
2. Apakah media pembelajaran roda putar dapat memberikan semangat belajar kalian?
 - a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang

3. Apakah media pembelajaran roda putar mudah digunakan saat pembelajaran?
- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
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 - e. Sangat senang
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 - b. Kurang senang
 - c. Senang
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 - e. Sangat senang
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- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang
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- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang

**ANGKET RESPONDEN TINGKAT KEMENARIKAN MEDIA PEMBELAJARAN
BERBASIS PERMAINAN RODA PUTAR**

*The Development of Roda Putar Game as Learning Media on Mathematic Subjects of Solid
Figure Material for 5th Grade of SDN Purwantoro 4 Malang.*

Nama : Agung Rizki R
Kelas : 5
Sekolah : SDN Purwantoro 4
Instruction :

A. PETUNJUK PENGISIAN ANGGKET

1. Sebelum mengisi angket mohon mempelajari media pembelajaran roda putar terlebih dahulu.
2. Berikan tanda (x) pada salah satu jawaban a, b, c, d atau e pada jawaban yang sesuai dengan respon yang kalian anggap tepat.

B. Pertanyaan – pertanyaan angket

1. Apakah kalian senang belajar menggunakan media pembelajaran roda putar?
 - a. Sangaat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - Sangat senang
2. Apakah media pembelajaran roda putar dapat memberikan semangat belajar kalian?
 - a. Sangaat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - Sangat senang

3. Apakah media pembelajaran roda putar mudah digunakan saat pembelajaran?
- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
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4. Apakah media pembelajaran roda putar menarik untuk mempelajari matematika materi bangun ruang?
- a. Sangat tidak senang
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- a. Sangat tidak senang
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 - c. Senang
 - d. Cukup senang
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6. Apakah petunjuk penggunaan yang tersedia dalam media pembelajaran mudah dipahami?
- a. Sangat tidak senang
 - b. Kurang senang
 - c. Senang
 - d. Cukup senang
 - e. Sangat senang



APPENDIX 12
DOCUMENTATION OF ACTIVITIES



Suasana pengerjaan soal pre-test



Menentukan kelompok pertama



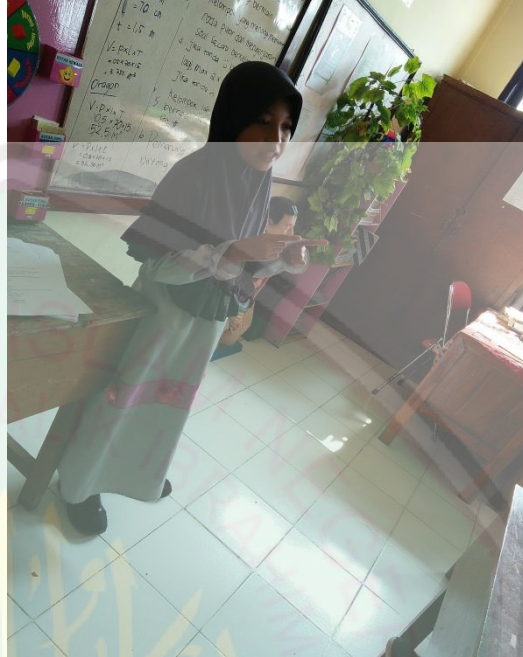
Suasana pengerjaan soal



Suasana kerja kelompok



Pembacaan soal



Pembacaan soal



Suasana pengerjaan soal post-test



foto bersama ahli design mesia

The logo of Universitas Islam Negeri Maulana Malik Ibrahim Malang is a shield-shaped emblem. It features a light green background with a white border. The text "UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM" is written in a circular path around the top and sides. In the center, there is a yellow calligraphic design. At the bottom, the text "PUSAT PERPUSTAKAAN" is written in a circular path.

APPENDIX 13
LEARNING MEDIA BASED ON RODA PUTAR
GAME

RODA PUTAR BANGUN RUANG KUBUS & BALOK

Kompetensi dasar
3.1 Menjelaskan dan menentukan volume bangun ruang dengan menggunakan konsep luas permukaan bangun datar dan rumus tinggi
3.2 Menjabarkan dan menentukan jaring-jaring bangun ruang
Indikator
3.1.1 Menjabarkan dan menentukan volume balok
3.1.2 Menjabarkan rumus luas dan area bangun datar
3.1.3 Menjabarkan dan menentukan volume balok
3.1.4 Menjabarkan volume bangun ruang di permukaan
3.1.5 Menjabarkan dan menentukan jaring-jaring balok
3.1.6 Menjabarkan dan menentukan jaring-jaring balok

KELAS
5



KOTAK REWARD

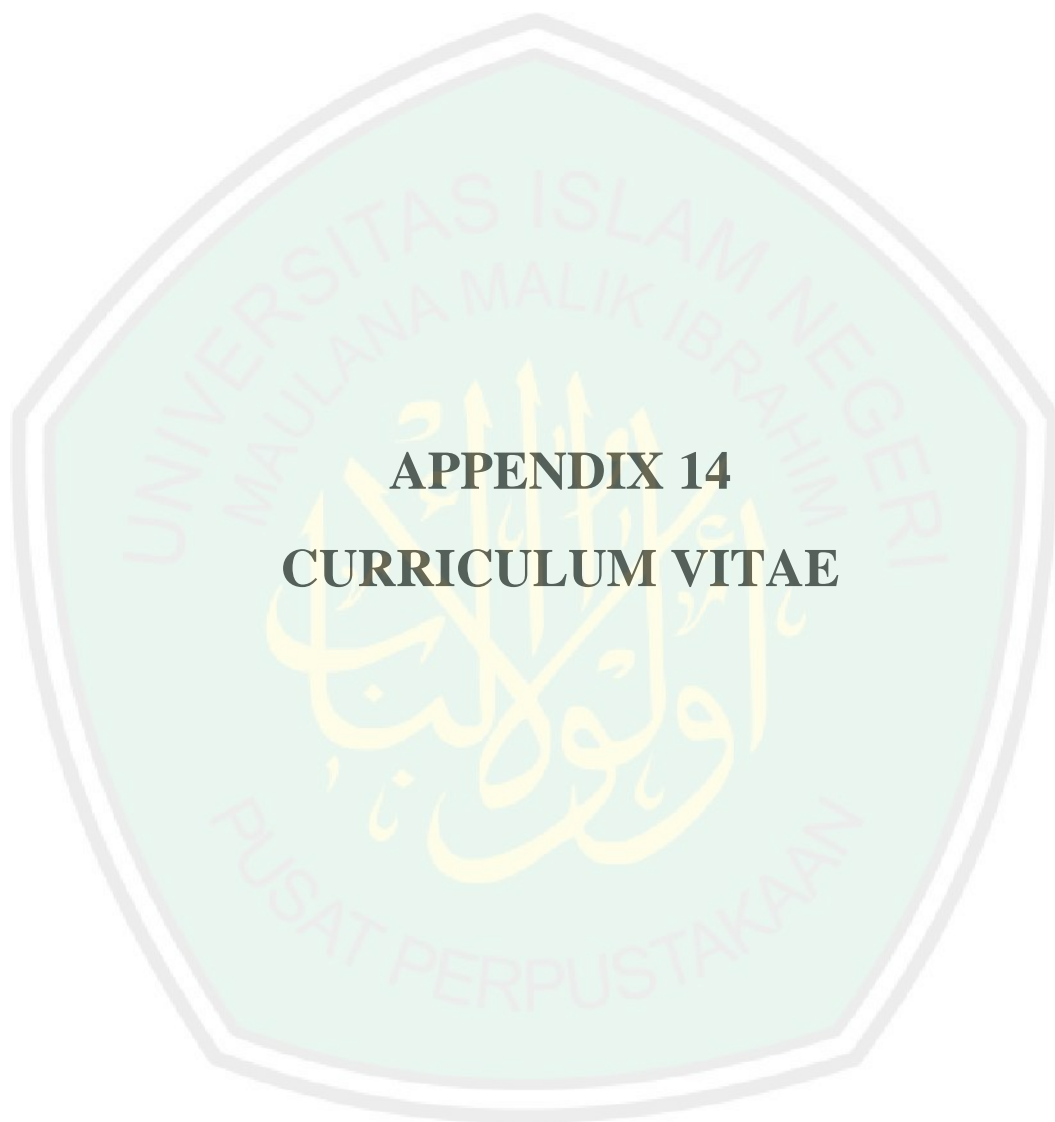
KOTAK SOAL
KUBUS
VOLUME

JARING - JARING

KOTAK SOAL
BALOK
VOLUME

KOTAK SOAL
KUBUS
JARING-JARING

KOTAK SOAL
BALOK
JARING-JARING



APPENDIX 14
CURRICULUM VITAE

CURRICULUM VITAE



Name : Nurul Isnaini

Place of Birth : Lumajang

Date of Birth : October 12th 1995

Faculty : Tarbiyah And Teaching Training Faculty

Study Program : Islamic Primary Teacher Education Program

Address : JL Terusan Batubara Kel. Pandanwangi
Kec. Blimbing Malang

Contact Person : 085871584493

Biography of Education : SDN Pandanwangi 1 Malang (2002 - 2008)
SMPN 16 Malang (2008 - 2011)
SMA Al – Rifa’ie Gondanglegi Malang
(2011-2014)
Universitas Islam Negeri Maulana Malik Ibrahim
Malang (2014 - 2018)

Malang, June 29th 2018
Writer

Nurul Isnaini