

DEVELOPMENT OF MATHEMATICS ANIMATION VIDEOS (MAV) WITH THE QUR'AN CONTEXT ON MATHEMATICAL REASONING ABILITY

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Abstract

Digital technology can help the learning mathematics process with learning designs in videos by linking mathematical material to the Qur'an context. This is used to help students use mathematical reasoning skills to solve problems and are less interested and enthusiastic when learning, so they can understand the material well and have religious values from the non-Qur'anic text presented. This study aims to create media and learning resources for mathematics in the Qur'an context on mathematical reasoning abilities. The e-module development model used is ADDIE. The data collection instrument uses a validation instrument as a useful data collection tool whether or not the video was developed. Moreover, the practicality instrument is a practicality aspect test given to students after participating in the learning process using the developed product. The study results obtained a score of 3.61 for the material expert and a score of 3.56 for the media expert with the criteria of being tested. The results of student mastery of 82.9% with reasonably practical student responses indicate that the Islamic-based animated video media used is effective and practical. Based on the study's results, the developed media meets the valid, practical, and effective criteria to help develop students' reasoning abilities.

Keywords: ADDIE models; Al-Qur'an; animation video; mathematical reasoning ability

Abstrak

Teknologi digital dapat membantu proses pembelajaran matematika dengan desain pembelajaran berupa video dengan mengaitkan materi matematika dengan konteks dalam Al-Qur'an. Hal tersebut digunakan agar dapat membantu siswa menggunakan kemampuan penalaran matematis untuk dapat memecahkan masalah, serta kurang tertarik dan antusias ketika belajar, sehingga mampu memahami materi dengan baik dan memiliki nilai-nilai religius dari nonteks Al-Qur'an yang disajikan. Penelitian ini bertujuan untuk menciptakan media dan sumber belajar matematika dalam konteks Al-Qur'an pada kemampuan penalaran matematis. Model pengembangan e-modul yang digunakan adalah ADDIE. Instrumen pengumpulan data menggunakan instrumen validasi sebagai alat pengumpulan data yang valid atau tidaknya video yang dikembangkan. Dan instrumen praktikalitas yakni berbentuk uji aspek kepraktisan yang diberikan kepada siswa setelah mengikuti proses pembelajaran menggunakan produk yang dikembangkan. Hasil penelitian diperoleh skor 3,61 untuk ahli materi dan skor 3,56 untuk ahli media dengan kriteria layak untuk diujicobakan. Hasil ketuntasan belajar siswa 82.9% dengan tanggapan siswa cukup praktis menunjukkan bahwa media video animasi berbasis Islam yang digunakan efektif dan praktis. Berdasarkan hasil kajian, media yang dikembangkan memenuhi kriteria valid, praktis, dan efektif untuk membantu mengembangkan kemampuan penalaran siswa.

Kata Kunci: ADDIE model; Al-Qur'an; kemampuan penalaran matematis; video animasi.



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INTRODUCTION

Integrating mathematics learning with Islamic values aims to balance the spiritual and intellectual sides (Tijah, 2019). Combining mathematics with Islamic values will also form behavioural habits imbued with faith and piety to Allah SWT (Elhoshi et al., 2017). Besides that, it is also an integral part of developing human character education that is religious, humanist, intelligent, rational, objective and dignified (Sala-fudin, 2015). In the learning mathematics, Islamic values can be integrated through emphasizing the Qur'an value aspects in mathematics teaching materials, making analogies to the value of kindness in learning mathematics, stories about Islamic mathematicians, and *uswahtun hasanah* values (Abdullah et al., 2021; Jannah et al., 2021; Tijah, 2019; Kusno, 2017).

However, the facts on the ground show different things. The 2018 TIMSS and PISA studies result put Indonesia in a low ranking in learning mathematics. It can be seen that students' motivation to learn mathematics is still low. According to the problem analysis results in previous research, one of the reasons is a lack of reasoning and problem-solving abilities due to a lack of providing concept reinforcement and giving portions of reasoning and contextual problem-solving to students (Turmuzi et al., 2022). Learning mathematics is challenging and complex because it is abstract, and implementing learning is less meaningful (Fitrah & Kusnadi, 2022). Mathematics learning in schools is still carried out partially, or there is still a minimum of mathematics learning material that is integrated with Islamic religious learning (Nurhamdiah et al., 2020; Wahyuni, 2018), even though there are schools labelled "madrasah" and are under the auspices

of the Ministry of Religion should be able to instil Islamic values in every lesson in class, not closing possibilities in learning mathematics (Safitri et al., 2020). Ironically, there are still students who graduate from madrasas with no differences and unique characteristics from public schools regarding Islamic values education (Bahri, 2019; Pratama, 2019; Syafe'i, 2017).

The pre-survey results shows that mathematics learning in Singa Putih Islamic Senior High School haven't used learning media. Teachers still used textbooks obtained from books published by the government or private publishers and still monotonous in giving basic materials using the expository method. Beside that, Islamic values have been inserted in mathematics learning, but only orally or even there is no connection between mathematics material and Islamic values. For the last, students' curiosity and also reasoning competence of students is still low. Students think mathematics is a challenging, tedious, less meaningful subject with nothing to do with life.

Based on the problem above, students need a learning media for mathematics subject. The specific learning media to be developed is animated video media with Islamic values to facilitate the mathematical reasoning abilities of high school students. Video media is video-based media, which is media that presents material with audio and visual elements that contain concepts, principles, and procedures to help understand learning material (Apriansyah, 2020; Fatmawati et al., 2018; Prasetya et al., 2021), while animation can be interpreted as moving an inanimate object sequentially as if it were alive (O'Byrne et al., 2018; Weng & Yang, 2017). Animated videos are supported by moving pictures or as if

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they were alive. They were more attractive to students (Iseu Synthia et al., 2019; M. Alduwairi, 2018). Islamic nuanced learning is mathematics learning carried out integratively with Islamic values, linking it with the Al-Qur'an, hadith, Islamic history and others (Ulum et al., 2021). Meanwhile, mathematical reasoning is a thinking process that connects facts or evidence that leads to conclusions in learning mathematics (Akrom et al., 2020; S. I. Hasanah et al., 2019a).

Animated videos in learning provide an understanding of mathematical concepts more authentically than other learning media, generating interest in learning and significant learning outcomes (Akmalia et al., 2021; Han, 2019; Ultra Gusteti et al., 2021). On the other hand, learning mathematics that is integrated with Islamic values provides a different learning experience for students because it can build awareness that mathematics is very close to our lives, especially in the Islamic context, and strengthens students' faith (beliefs) that mathematics is God's knowledge which is taught to humans so that humans think (Abdussakir & Rosimanidar, 2017; Wulandari & Puspawati, 2016). As well as with mathematical reasoning abilities, it will be able to assist students in building knowledge and capacity in solving mathematical problems, uncovering patterns and properties of mathematics, and explaining mathematics into ideas and arguments (S. I.

Hasanah et al., 2019b; V. M. Putri & Yerizon, 2020).

Development of animated videos by (Bulut et al., 2017), developing cartoon animation videos on fractional material and their application based on the views of teachers and students in Turkey (Han, 2019), (Bulkani et al., 2022) developing culturally characterized animated videos for elementary students to improve learning outcomes, and (Cook, 2022) develop lego-based animation videos on algebra material. However, of the five developments, animated videos only contain material without additional menus, such as quiz links or independent practice questions. On the other hand, little research has been carried out regarding video animation in mathematics learning by associating Islamic values, such as research by Rachmiati & Mansur (2021), developing animated videos by associating verses from the Qur'an with fractional material for elementary students in mathematical understanding.

RESEARCH METHODS

This study was Research and Development. The animated video media with Islamic nuances will be carried out on the mathematical reasoning abilities of high school students. Development is carried out using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) developed by (Molenda et al., 1996). The schematic of the ADDIE model stages is in Figure 1.

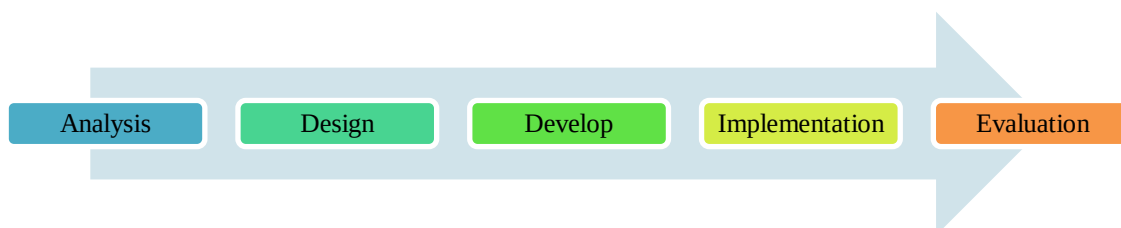


Figure 1. ADDIE model (Molenda et al., 1996b)

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Then the processes that will be carried out are (1) *analysis* (the process of forming, which includes initial and final observations, student observations, observation of assignments and formulation of learning objectives), (2) *design* (the process of forming, namely the process of designing an animated video that is in sync with spatial material the flat side of the 2013 curriculum, (3) *develop* (the manufacturing process which includes expert validation and product revision), (4) implementation (product trial process), and finally the process is product evaluation (*improvement*) after use.

The product developed in this study is Al-Qur'an-based mathematical animation video learning media (MAV) for the mathematical reasoning abilities of class X students. MA Pondok Pesantren Singa Putih Prigen Pasuruan, and through data using descriptive qualitative techniques. After using comics for mathematics learning tools in the form of student responses through questionnaires and learning achievement tests through test sheets. Student response sheets and test sheets were given to 35 students, which were then quantified to get the result as a number measured by making animated videos as teaching materials. The Likert scale was used as an evaluation tool to check the effectiveness of the product. Validation is done to determine the feasibility of the learning media developed before being tested with learning activities.

RESULTS AND DISCUSSION

Every stages of the research have been carried out. The final product of this research is Mathematics Animation Video (MAV) teaching materials in the Qur'an context. The explanation for every stages in this research will be explained as follows:

1. *Analysis Stage*

This stage aims to establish and determine learning conditions by analyzing the problems that arise, including learning objectives and learning material limitations. Based on the results of unstructured observations and consultation with the mathematics teacher at Singa Putih Islamic Boarding School on mathematics learning activities, the learning process has been carried out using the *lesson study method*. The problems are then analyzed and described in detail with five steps: preliminary analysis, student analysis, concept analysis, task analysis, and learning objectives.

Preliminary analysis, the teaching materials used by students are teaching materials in the form of learning videos from YouTube. This activity raises and strengthens the fundamental problems encountered in MA mathematics learning in inverse function material. Teaching materials in the inverse function material still have many weaknesses, namely in language and content. Language challenges students to understand the material in the form of algebra, while the material only provides examples of problems in the abstract, while material in the form of algebra occurs in everyday life (no concept application).

In addition, those who have information about fundamental math problems at the Singa Putih Superior Islamic Boarding School, such as the absence of learning *videos* due to the need for appropriate mathematics teaching materials, have the potential to increase student potential, such as exciting learning *videos* to be studied independently. Students also have difficulty understanding math material because it is presented independently. After all, students lack interest and are

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motivated to want to watch the material in the program. This is because the *video* presented is not a dissertation with an animated display with discussion adjusted to the characteristics of the students so that students are less interested in learning mathematics when presented in the video. Moreover, the videos only take and are shared from other people's *YouTube links*. The *videos* often used do not have educational materials such as *videos* that can help students achieve the goals of the 2013 curriculum, a generation of intellectually and spiritually intelligent Muslims. The main video can be accessed through digital-based technology, such as animated videos on the Kinemaster application.

Student Analysis activities at this stage examine student characteristics which include knowledge, skills, and initial attitudes to achieve learning objectives based on core competencies. In addition, information was also obtained regarding the characteristics of students, especially for mathematics subjects where enthusiasm and understanding of the material presented were not yet visible, and students enjoyed the questions presented every day. Furthermore, students stated that they could learn and understand well if they could connect questions with previous material, provide reasons and proof, and apply what they learned in solving mathematical problems. It was found that students had problems connecting their mathematical abilities in solving problems, namely mathematical reasoning abilities.

Task analysis is a collection of procedures for determining content in teaching materials. Activities explain the structure of the content of teaching materials, the steps that students must take in teaching materials, and the

information obtained. The information in question is the problem that will be presented in teaching materials obtained from the internet or other supporting media.

Concept Analysis Activities at this stage explain the concepts students must find and learn in teaching materials. The concept in question is understanding questions related to various inverse functions on Islamic-based animated videos that discuss the material with algebraic material. The first stage in producing a product is determining the potential and problems by conducting field studies and obtaining information about the potential in Islamic boarding schools. Singa Putih Superior Islamic Boarding School has not provided learning tools by utilizing developmental technology such as LCD and projectors in class; teachers do not provide learning videos other than videos taken from other people's *YouTube links*, so learning media is increasingly diverse, but not many learning media are by the 2013 curriculum.

The objective conditions previously used at the Singa Putih Superior Islamic Boarding School only used prints and printed books as packages and worksheets from schools. This school has not used animated videos on the Kinemaster application. In printed textbooks and *YouTube videos*, there is no combination of subjects with Islamic values and refers to training mathematical reasoning abilities students but only discuss general knowledge. As a result, educators provide very little understanding of Islam. They do not discuss or apply one core competency, a competency related to student spirituality. Animated video material based on Islamic values, including mathematical reasoning

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abilities, is still rare. Most of the animated video teaching materials that can be found are usually packaged and designed using the kinemaster application (Darmayanti, Baiduri, & Inganah, 2022; R. F. Putri et al., 2021). So that in the preparation of animated video teaching materials assisted by this Islamic-based kinemaster application, integrate or link the subject matter with Islamic values and the arguments of the Koran to improve students' spiritual competence and train habituation to students' reasoning abilities in solving mathematical problems.

2. Design Stage

The next step is product design after gathering information at the definition stage. Several things were done at the product design development stage of Mathematical Animation Videos (MAV) in the Qur'an context on the mathematical reasoning abilities of inverse function material in class X. MAV was prepared according to the 2013 Core Curriculum Basic Competence. MAV was built with contextual learning stages, mathematical reasoning abilities, and Islamic values through the Qur'an. The design starts from the sample or MAV view.

MAV is designed with the help of the *PowerPoint* application. The cover contains the logo of the author's university, titled "Inverse Learning from the Study of Islamic Values". The grade level and the author's name. Writing the title helps attract the audience's attention and is the start of the video (Gray et al., 2020; N. Hasanah et al., 2022). The following view is the habit of doing something, especially when you are going to study, and it is consistently applied and becomes a mandatory habit, namely praying.

The second display is a habituation form the teacher gives students every time to carry out learning activities at the Singa Putih Superior Islamic Boarding School, prayer before studying. This prayer is essential to fortify us from feeling rushed, impatient in studying knowledge, and not calm to the point where we have difficulty understanding the knowledge we are studying.

The MAV main menu includes: (a) instructions for use, (b) describing the contents of the animated video, (c) ranking the contents of the animated video, and can describe the topic of the MAV.

The MAV content begins with introducing the founder of the Singa Putih Featured Islamic Boarding School, now known as PP. Munfaridin's white lion, namely KH. Muhammad Sayifulloh Arif Billah in 1992, in Figure 2. This section is designed so that students know the background of this PP and aims to introduce the main buildings that are the hallmark of this PP, namely the "Golden Crown Building" and its habits. PP where they are studying.



Figure 2. Display of PP Founders. Singa Putih Media MAV

MAV is also equipped with Basic Competency (KD), Competency Achievement Indicators (GPA), and learning objectives so that readers know and understand learning objectives. The primary competency used in this e-book

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is KD 3.6 class X SMA/MA Curriculum 2013: "explaining compositional operations on functions and inverse operations on inverse functions and their properties and determining their existence." However, in this *animated video*, the author limits learning to inverse functional material only to strengthen the linkage of the Qur'an with inverse function material and exercises that contain mathematical reasoning abilities. The following shows the KD, IPK, and Learning Objectives pages.

The presentation of the material is constructed with contextual learning stages, namely invitations, explorations, explanations, and solutions, as well as take action (Mufidah et al., 2020; Nurdin et al., 2020; Tamur et al., 2020). The invitation stage contains stimuli in audio-visual QS Al-Ankabut: 57. In Figure 3 is the stage where students are invited and interested in learning mathematics.



Figure 3. Suggestion

In exploration, students can analyze life and death illustrations as functions. Students are asked to provide answers to the forms provided. After that, at the explanation stage, the teacher can validate students' opinions at the exploration stage. A relationship between illustrations of on and off concepts with inverse functions, as well as to familiarize students' mathematical reasoning abilities, the teacher gives a

problem that students must be able to solve (Andi Mattoliang et al., 2022; N. Hasanah et al., 2022). Problems can be solved through the relationships between mathematics and life and related to charity or morals and nobility, which students must then solve by filling in the *link* embedded in the description. Moreover, in the end, the teacher and students concluded about the inverse function.

Furthermore, to further strengthen students' understanding, the MAV is given examples of functional questions in a context that contain Islamic values and indicators of mathematical reasoning ability starting from the stimulation of the verses of the Koran about spreading benefits and goodness. An example is a PP student. The white lion Munfaridin wanted to throw his little hadst into the bathroom. This adapts to the development of current world conditions. The contextual problems is expected to increase students' understanding and interest in mathematics. Contextual problems which contain indicators of mathematical reasoning show in Figure 4.

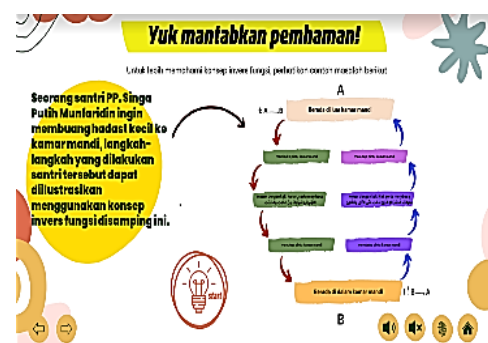


Figure 4. Contextual problems which contain indicators of mathematical reasoning

MAV also has reverse illustrations of everyday life, for example, entering and leaving a mosque. Suppose the activity starts from point A, outside the mosque, to point B, inside the

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mosque. From point A to point B, one has to go through three stages: opening the door, stepping on the right foot while praying, and closing the door. Then the opposite is the activity from point B to point A. It starts with opening the door, stepping on the left foot first while praying, and closing the door again. The following shows an inverted illustration of everyday life in Figure 5.

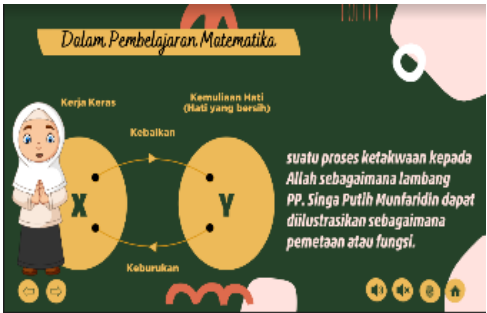


Figure 5. Exploration, explanation, practice questions (reasoning indicators), and conclusions

The contents of the MAV end with practice questions for students to work on and the results are sent via the form link provided.

3. Develop stage

In this study, the finished mathematical animation video (MAV) design will enter the development stage, consisting of expert validation and revision activities. Figures 6 and 7 display the MAV media containing Al-

Qur'an-based inverse function material on mathematical reasoning abilities.



Figure 6. Learning in videos with Al-Qur'an-based content



Figure 7. Practice questions and quizzes on videos with Al-Qur'an based content

MAV research and development that has been designed is validated by teachers and practitioners from PP—Singa Putih and S2 lecturers totalling four people. Validation is also done to obtain input, suggestions, opinions, and evaluation of the developed MAV. The validation of material, media, linguists, and material practitioners in Table 1.

Table 1. Material and media expert validation results

Expert Validation	Indicator	Score	Average	Category
Material Expert	Indicator Competency	3.53	3.61	Very feasible and doable
	Material accuracy	3.67		
	Update material	3.73		
	Encourage curiosity	3.45		
	Integrated Islamic Values	3.67		
Media Expert	Media Quality	3.41	3.56	Very feasible and doable
	Design Regularity	3.43		
	attractiveness	3.57		
	convenience	3.65		
	Video Content	3.73		

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Table 1 shows the validation results of material, media, and stage 1 practitioner experts on the feasibility of Islamic-based MAV on mathematical reasoning abilities as teaching materials. Overall, from the table above, the average total media validation is 3.56 and material validation is 3.61, with an outstanding (very valid) category. This means that Al-Qur'an-based mathematical animation video media (MAV) on mathematical reasoning abilities is feasible for testing. This is in line with research conducted by (Anjarwati et al., 2023; Burckley et al., 2015; Nidzam et al., 2020; Perry et al., 2022), which states that video-based learning media can be carried out at the trial stage if it meets the valid criteria from the results of the Validator's assessment both in terms of media and material.

The product design validation by material experts, media experts, and class X teachers follows. Based on expert feedback and revised the product design.

4. Implementation Stage

After the validation stage, the product was tried out by material experts, media experts, and linguists. Al-Qur'an-based MAV media trials on mathematical reasoning abilities that have been revised based on the validation results will then be tested on 35 class X MA PP students. Singa Putih Pasuruan Prigen. This media trial was carried out on 10 July-19 July 2022 for 90 minutes (2 × 45 minutes) to know the practicality and effectiveness of the MAV media that has been developed. At the end of the activity, students are given a test containing mathematical reasoning abilities to work on. In addition, the teacher also gave a response questionnaire after using the MAV. The teacher will analyze the test and response questionnaire data in Table 2.

Table 2. Results of analysis of student responses to the practicality of MAV media

Indicator	Score	Average Score	Percentage	Category
Benefits of using MAV media with Islamic nuances on students' mathematical reasoning abilities	3.71	3.73	89.4%	Very Practical
The ease of using MAV media with Islamic nuances on students' mathematical reasoning abilities	3.82			
displays Islamic nuances in mathematical reasoning abilities	3.75			
MAV media with Islamic nuances on the mathematical reasoning abilities of high school students	3.64			

The student response results were measured based on data obtained from filling out response questionnaires by 35 students, with an average percentage of student responses of 89.4 % with a very positive category, meaning

students like using Al-Qur'an-based MAV media on mathematical reasoning abilities as a medium. This is in line with research developed by (Amrullah et al., 2021; Darmayanti, Baiduri, & Inganah, 2022; Sugianto et al., 2022;

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Vidyastuti et al., 2022), which states that media is said to be practical can be measured by the results of the positive response shown by students towards the media being developed. The effectiveness is in Table 3.

Table 3. Posttest analysis results of students after using MAV Media

	Result
Total Students	35 students
Finished Students	29 students
Unfinished Students	6 students
Average Score	82,9%
Category	Very Effective

The student learning outcomes value obtained from a test with five questions from the MAV media Al-Qur'an based on mathematical reasoning abilities will then be analyzed according to PP's minimum completeness criteria (KKM): Singa Putih Prigen, namely 75. The results showed that all students scored above the KKM or more than equal to 75, with a percentage of 82.9 % in the very effective category. While learning outcomes are measured based on indicators of mathematical reasoning ability. This is in line with the results of research conducted (Darmayanti, 2022; Firmansyah & Kamal, 2020; Ihsan et al., 2021; Saleh & Satriawan, 2020), which stated that the effectiveness of media could be seen from the test of student learning outcomes after using the media concerning the minimum completeness criteria (KKM). If students can fulfil the KKM, then the media can be said to be effective.

5. Evaluation

This stage is a refinement of animated video-based learning media developed after being used in the learning process. Any deficiencies in

MAV-based learning media are evaluated and corrected to ensure the learning media is suitable for the learning process.

Based on the results of the analysis of the data used in this study, all of them can fulfil all the indicators of mathematical reasoning steps and pass the KKM, which are adjusted to those used by Islamic boarding schools, so that this animated video media can help and facilitate the learning process and learning program (Artayasa et al., 2021). (Bustanil S et al., 2019) states that animated videos, as teaching materials are compiled, can refer more to the document's validity and the opinions of teachers and students who show that the material is appropriate and easy to use. The things above are valid or feasible to use, get positive responses from students after using the media, and help the student learning process with the completeness achieved by all subjects. This research is also in line with (Lisgianto & Suhendri, 2021), assisting the learning process and improving student learning outcomes, requiring quality learning materials according to their needs, accepted by students, and expediting the student learning process (Lubis et al., 2020)

Suitable media is valuable in terms of media and material and can be used in the learning process. It can be seen from the results of the research that Al-Qur'an-based math animation video (MAV) is a learning media developed which can be said to have good quality in terms of value, positive student feedback and overall student learning.

From the overall results, the quality of MAV as a learning media is said to be good if it meets three criteria, namely valid (worth trying), practical (easy to use as measured by student

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questionnaires) and practical (facilitates learning as measured by student learning achievement tests).

Students in these small and large-scale trials viewed the provided videos intended to test the product's attractiveness. In addition, six students were selected based on their mathematical abilities at the end of the product trial: two with high abilities, two with moderate abilities, and two with low abilities. After that, students are given a number to rate the attractiveness of the video. The results of students' responses to Islamic-based MAV media on mathematical reasoning ability were 89.4 per cent with the fulfilling criteria: "Efficient". This shows that the MAV developed has attractive criteria to be used as a tool in the teaching and learning process—activities in class X MA PP. Prigen Pasuruan White Lion.

Applying mathematics with MAV in the Qur'an context for class X X MA PP students. The superior White Lion Prigen Pasuruan is said to be very good and fun, which meets the criteria, namely: (a) MAV can be learned independently (self-instruction) (Rachmavita, 2020); (b) MAV can contain all documentation in general (independently) (Kumaat, 2020); (c) MAV is independent depending on other methods (stand-alone) (Efendii et al., 2020); (d) MAV can be adapted to developments in science and technology (adaptive) (Listiawati & Qomariah, 2020); (e) MAV users can easily understand the contents of MAV (user friendly) (Sugianto et al., 2022). In addition, as part of the communication process between students and teachers, learning resources such as MAV must be able to clarify the message conveyed by the teacher, be able to adjust the time, save costs and effort, generate

enthusiasm for learning and create conditions so that children can learn independently effectively. (Friantini et al., 2020; Winatha, 2018 ; Hasanah et al., 2022)

CONCLUSIONS AND RECOMMENDATIONS

A mathematics MAV in the Qur'an context on mathematical reasoning abilities was developed under the media title "Inverse Learning from the Study of Islamic Values ". A mathematics MAV supports the urgency of debriefing, increasing student morale through Islamic religious values and the Qur'an, and familiarizing students' mathematical reasoning abilities.

Based on the research and discussion results, an Islamic Value-Based MAV was developed for material and media experts for class X, with a criterion fit test. Student response to Islamic-Based MAV was fulfilling criteria, namely "Very Practical" This shows that the MAV developed has attractive and practical criteria to be used as a tool in teaching and learning activities in Class X MA PP. Singa Putih Prigen Pasuruan.

Student learning outcomes can fulfil all indicators of mathematical reasoning ability and pass the KKM according to what is used pp. The Singa Putih Prigen Pasuruan. Suggestions for further research, it is hoped that they can develop abilities in terms of different characteristics such as learning styles, gender or others and disseminate media so that it can be used by students and teachers from other schools.

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