DEVELOPMENT OF OBS STUDIO-BASED MATHALTV LEARNING MEDIA IN GRADE VII JUNIOR HIGH SCHOOL MATHEMATICS LEARNING

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ABSTRACT

This research was motivated by the difficulty of students in carrying out the online learning process, the lack of teachers using online learning media specifically on social arithmetic material. The purpose of this study is to develop Social Arithmetic Video learning media (MathalTV). This research uses the Research and Development (R&D) research and development model using the stages of ADDIE development (Analysis, Design, Development, Implementation, Evaluation). This research was conducted at Widuri Family Junior High School with the subject of studying grade 9 students. The results showed that Valid MathalTV Learning media with an average material assessment score of 94.55% of language assessment results got a score of 96.00% and media assessment got a score of 97.50%. While the student response test to assess the practicality of the media got an average score of 86.74% and the teacher's response got 86.67%.
Keywords: Mathematics Learning Media, Learning Videos

INTRODUCTION

Mathematics can make students think critically, mathematics can also make it easier for students to solve problems. Mathematics, an exact science that is often used in everyday life. Moreover, learning mathematics that is fun invites students to be more active in training their abilities without causing feelings of boredom, students can also easily help the development of technology because mathematics is the basis of developing technology in the current era. If mathematics can be understood easily then learners can also solve problems easily. Successfully understand mathematics lessons and follow the mathematics learning process well, the learning outcomes of students obtain satisfactory results. But in reality, Indonesia is experiencing the COVID-19 pandemic, it has been more than 1 year from March 2020 to now, namely August 2021, learning in schools has become online. Students find it difficult to understand online mathematics learning due to the COVID-19 pandemic. In this era of the COVID-19 pandemic, teachers are confused about learning media and what methods must be applied so that the message conveyed is easily understood properly. Students feel that teachers do not explain mathematics learning clearly. The process of learning mathematics online, especially arithmetic material in grade VII junior high school, students tend to be passive, most teachers are less able to bring a pleasant atmosphere. The activeness of students in arithmetic learning is very minimal. Good communication is very necessary in learning mathematics, because with monotonous learning students will feel bored. In online learning, students are less able to understand story problems well, moreover learning only uses learning resources from mathematics books where teachers do not use other media in the mathematics learning process, especially in arithmetic material. Students also feel lazy to learn independently and understand mathematics learning in everyday life. The laziness of students because they are bored cannot understand makes the material or message conveyed by the teacher less well received by students.

Research by (Sammir, 2017) entitled Audio-Visual Based E-Learning Design by Utilizing Web Streaming Using RTMP Protocol and Open Source Source Applications is motivated that by using e-learning technology can facilitate learning to be carried out anywhere and anytime, learning with audio-visual media students can get higher scores compared to conventional approaches. As for previous research on learning media conducted by Unlike the previous research, researchers want to make learning media in which it contains learning material. The media will be made with attractive packaging that can be watched by students directly or indirectly. Media is presented in the form of learning videos such as news broadcasts on television in which there is a host who explains social arithmetic material with the help of the OBS Studio application. From the description above about the problems of students in mathematics learning and with the results of previous research, researchers will conduct research entitled "**Development of OBS Studio-Based MathalTV Learning Media in Mathematics Learning grade VII Junior High School"**

THEORETICAL STUDIES

Learning media is a tool that can help the teaching and learning process that can clarify the meaning of the message conveyed so that the objectives of the teaching and learning process can be achieved perfectly or it can be concluded that learning media is a tool used to make it easier for teachers to convey messages and help stimulate students to pay more attention when learning takes place.

According to (Kusuma et al, 2018) OBS stands for Open Broadcaster Software. OBS is a software used to record video or broadcast live which is then connected to a website. According to (Sammir, 2017) Open Broadcaster Software (OBS) is an opensource software that functions to record and *live stream.* It can be concluded that OBS can record learning slides combined with videos, which makes OBS a flexible software for the learning process. OBS is open-source software and can be used for free. The purpose of *Open source* is that this application is equipped with source *code* so that teachers can use it to develop

MathalTV Learning Media is in the form of audio-visual media developed using PowerPoint, Photoshop and OBS Studio applications. Learning materials will be presented in powerpoint form and recorded using OBS Studio. In addition to the material, there are sample questions that will be explained in detail by talents. The layout will be created with the Photoshop application, with the layout being like a television newscaster. Talent will explain the material with the background screen using GreenScreen and the OBS Studio application. Researchers make videos, and upload them on YouTube. Learning videos with the OBS Studio application can also be broadcast *in live* form. Teachers can use the OBS Studio application with direct learning and students can ask directly in the comments column if there are questions. Direct learning can also be done on youtube. Teachers can upload learning results and students can also re-watch the learning video after the lesson is complete. But researchers will develop MathalTV learning media directly in the form of recorded videos and not broadcast *live.* OBS Studio-based social arithmetic learning media will be like broadcasting on television.

Before this study was conducted, there were several researchers who conducted a similar study including:

1. (Putri et al, 2019) conducted a research in 2019 entitled "Development of Interactive Learning Media Using Adobe Captivate on Simple Harmonic Motion Material", from the results of the study it can be concluded that the learning media has a positive response, the media can also be used for learning.

2. Research (Sammir, 2017) entitled "Audio-Visual Based E-Learning Design by Utilizing Web Streaming Using RTMP Protocol and Open Source Applications" obtained the overall results of research that the use of screen sharing through video streaming for teachers can make a real team learning atmosphere similar to learning in a physical classroom, and interactive learning atmosphere in e-learning can be accessed by students anywhere. The research that will be carried out by researchers is expected to produce a positive response to the use of MathalTV learning media

RESEARCH METHODS

The method used by researchers in this study is the Research and Development (R&D) model. The development model that researchers use is ADDIE (*Analysis, Design, Development, Implementation and Evaluation*). This is related to the purpose of research, which is to develop monopoly arithmetic learning media in mathematics learning. According to Borg & Gall (1983) in Setyosari (2016: 276), research and development is a process used to develop and validate educational products. The product to be developed is in the form of mathalTV learning videos with social arithmetic material based on OBS Studio. After the finished product, the stages of media validation, language validation and material validation are carried out. Furthermore, the media was tested by taking samples of 5 small class test subjects to find out suggestions or input for media improvement before conducting large class trials or field trials. After small class trials are carried out, then large class trials or field trials.

The data collection technique in this study uses questionnaires as a tool to provide ratings and comments from respondents. The calculation of the media validity test is as follows.

The formula calculates the percentage of validity of learning media as follows according to (Prihanto &; Yunianta, 2018):

$$V = \frac{Assessment\ skor}{Max\ score}\ x\ 100\%$$

Information:
V = Presentation of validity score assessmentn

After the validity score results are obtained then interpreted into the media validity scale as follows:

Table 1. Learning Media Validity Scale

Percentase	Criterion	Information
V > 80%	Very Valid	No Revision Required
60% < V ≤ 80%	Valid	Slight Revisions
40% < V ≤ 80%	Quite Valid	Revisions to Taste
20% < V ≤ 80%	Less Valid	Things Revised
V ≤ 20%	Invalid	Remade Product

Source : (Rustandi et al, 2020)

The formula calculates the percentage of practicality of learning media according to (Prihanto &; Yunianta, 2018) as follows:

$$P = \frac{Assessment\ score}{Max\ score}\ x\ 100\%$$

Information:
$P = Presentasi\ penilaian\ skor\ kepraktisan$
The following is a table of scales for the level of practicality in media trials to students:

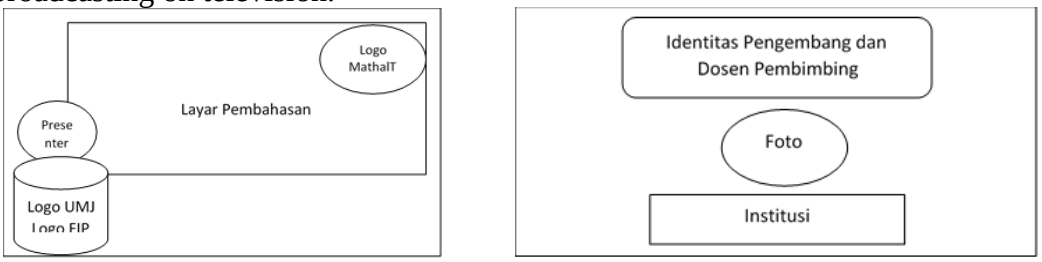
Table 2. Practical Criteriafor Learning Media

Percentage	Criterion
$P > 80\%$	Very Practical
$60\% < P \leq 80\%$	Practical
$40\% < P \leq 60\%$	Quite Practical
$20\% < P \leq 40\%$	Less Practical
$P \leq 20\%$	Impractical

Source : (Rustandi et al, 2020)

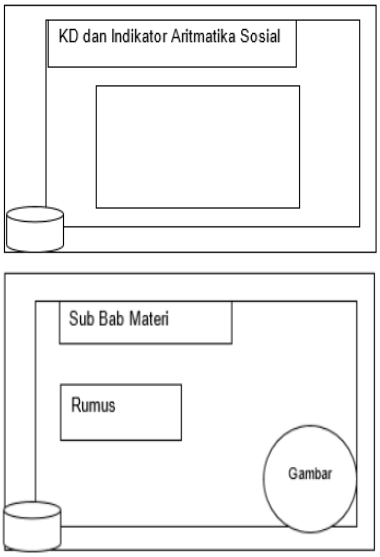
RESULTS AND DISCUSSION

Based on research on the development of monopoly arithmetic learning media in mathematics learning that has been carried out, the results of development and research from the stages of Analysis, *Design*, *Development*, *Implementation* and *Evaluation* are as follows: (1) Analysis. At this stage researchers analyze the needs of students and analyze the curriculum used by students. Researchers made observations on grade 9 students of junior high school widuri families, researchers provided questionnaires through google forms to find out students' difficulties in learning mathematics online. Researchers are informed that there is a lack of learning media provided by teachers. Students find it easier to learn by watching videos on YouTube than through zoom. The curriculum used by students is the 2013 curriculum. (2) Design. MathalTV Learning Media is in the form of audio-visual media developed using PowerPoint, Photoshop and OBS Studio applications. Learning materials will be presented in powerpoint form and recorded using OBS Studio. In addition to the material, there are sample questions that will be explained in detail by talents. The layout will be created with the Photoshop application, with the layout being like a television newscaster. Talent will explain the material with the background screen using GreenScreen and the OBS Studio application. Researchers make videos, and upload them on YouTube. Learning videos with the OBS Studio application can also be broadcast in *live* form. Teachers can use the OBS Studio application with direct learning and students can ask directly in the comments column if there are questions. Direct learning can also be done on youtube. Teachers can upload learning results and students can also re-watch the learning video after the lesson is complete. But researchers will develop MathalTV learning media directly in the form of recorded videos and not broadcast *live*. OBS Studio-based social arithmetic learning media will be like broadcasting on television.



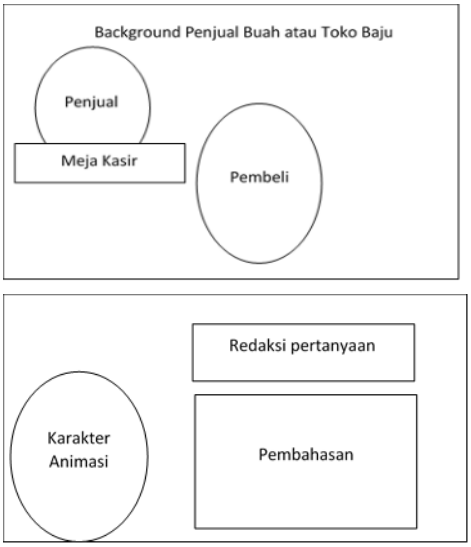
Picture 1. Front Display Design

The front view of the video begins with an opening video display designed using kinemaster video. After the opening video is displayed, the next is the display of the developer's identity, the description of the study program and university and the name of the supervisor. After that, a slide will be displayed containing the title of the material, namely social arithmetic. The display duration is about 30 seconds.



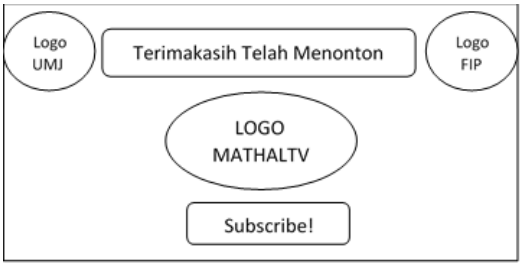
Picture 2. Material Content Display Design

This view explains the basic competencies and indicators as well as the definitions and formulas of each subchapter of social arithmetic material. There are also illustrations of images on each display of material explanations.



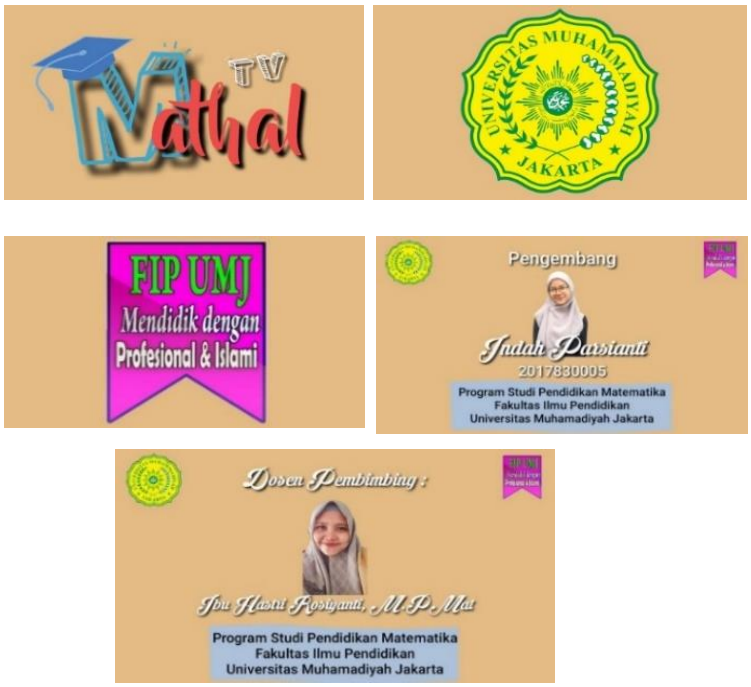
Picture 3. Sample Problem Animation Design

Examples of problems will be explained through animations of buying and selling transactions between sellers and buyers. How to calculate profit, loss, discount, tax, single interest, gross, net, tara will be presented in the example of the animated problem. The duration displayed on the animation is 2-3 minutes each animation.



Picture 4. Final Display Design

Development

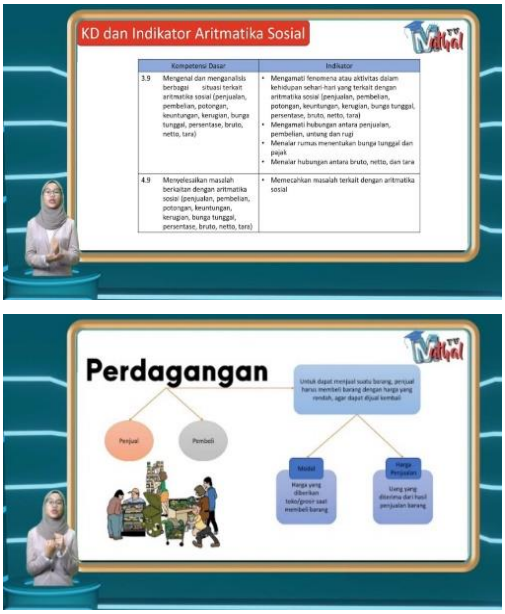


Picture 5. Initial View

The front view of the video was created using *Kinemaster* with a plain background in *Goby Sands* to contrast with the title of the video which uses red and blue fonts. The front view begins with the introduction of the MathalTV logo at seconds 00:03-00:08, followed by the next slide, namely the UMJ logo at seconds 00:09-00:11 and the FIP UMJ logo at seconds 00:12-00:17. The next display is the developer's identity at seconds 00:20-00:26 which contains the developer's name, study program and university information. The identity of the supervisor is also displayed at 00:35-00:39 which contains the name of the supervisor, information about the study program and university. The look was created using *pop* animation and *the Roboto Medium and Beyond The Mountains* fonts on kinemaster. In the identity display of developers and supervisors, there is the UMJ logo in the left corner or FIP UMJ in the upper right corner. The developer's photo is placed in the center.

Picture 6. Presenter View

The next display at 00:45 – 01:03 the presenter opens by saying greetings, introducing themselves and explaining the material to be discussed in the video. After the presenter opens the learning then enters into the discussion. The studio screen displays the MathalTV logo.



Picture 7. Display of Content

This view discusses the basic competencies and notions of social arithmetic at minutes 02:27-03:21. The presenter explains the definition of social arithmetic with a studio screen. The screen displays social arithmetic explanations. The definition display is made using *powerpoint*, the font used is *Arca Majora 3 Bold* with sizes 40 and 24. The animation used for the title is *whip*, explanation using *Rise Up* animation, Image illustration using *Multiple* animation.

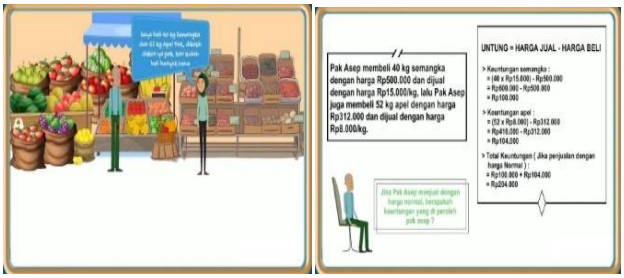
Picture 8. Display of Profit Material Content

The presenter explained the display of profit and profit percentage at minutes 03:23-04:08. The white screen that displays the explanation of profit and profit percentage is a *powerpoint screen.* Explanation of the content of the material is made using power point then displayed into the layout created by *Photoshop.* The merger uses OBS Studio.

Picture 9. Display of Loss Material Content

Loss and Percentage of loss are explained with a presenter and a screen that displays an explanation of loss and percentage loss. The font used for the display of loss and percentage loss

is Calibri *(Body)* with size 40, loss explanation using *Calibri* with size 24 , Formula using *Cambria Math* with size 24. Note uses *Calibri (body)* with size 24. The animations used are *Checkerboard, Wipe, Float* and Image using Fade animation. In the video, the loss and percentage of loss are explained at 04:09-05:51.



Picture 10. Animation Examples of Profit and Loss Questions

Examples of profit, percentage of profit, loss and percentage of loss illustrate daily life with the animated concept of fruit sellers and fruit buyers, shown at minutes 05:53-06:01. The animation is made using *powtoon*, the conversation display uses the *Gochi Hand* font type size 19, the characters in the animation use pointing, *explaining, talking poses.*

Picture 11. Contents Display Discounts and VAT

Discounts and VAT are explained by the presenter and the studio screen is also displayed. The display of discounts and taxes is made using *powerpoint*, using *the Calibri (Body)* font type with size 40, explanation using *Arca Majora 3 Bold* size 24 and formula using *Cambria Math* with size 24. The animations used are *Checkerboard Wipe, Bounce* and images using *Multiple and Teeter animations*. Discounts and taxes are displayed at minutes 07:50-09:02

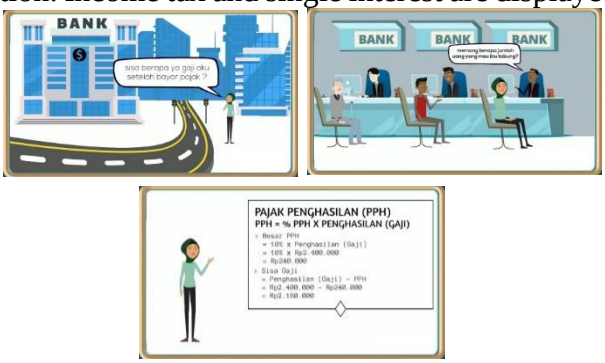
Picture 12. Animation of Sample Discount and VAT Questions

This view describes an example of a discount and VAT created with the *powtoon* application. The concept of the animation is to sell and buy clothes in clothing stores that we often

encounter in everyday life. The fonts used in animated conversations are *nexa* sizes 27 and 30. The explanation uses *Amarant* size 24 and *Anonymous Pro* size 24 . Featured at 09:06-09:57.

Picture 13. Display of Income Tax Content and Single Interest

Income Tax and Single Interest are also explained by the presenter and displayed on the studio screen. Explanation of income tax and discounts made using *powerpoint*, made using *Calibri (Body)* type font with size 40, explanation using *Arca Majora 3 Bold* size 24, *Cambria Math* formula with sizes 16 and 12. The animations used are *Checkerboard, Wipe,* Zoom and Image using *Zoom* animation. Income tax and single interest are displayed at minutes 12:00-13:55.



Picture 14. Animation of Examples of Income Tax and Single Interest Questions

Examples of income tax and single interest problems are made with *the powtoon* application. The concept of the animation is a saving transaction at the Bank. The font used is *Gochi Hand* font size 19, using pose *pointing, explaining.* Examples of income tax and single interest questions are displayed at minutes 13:58-16:45.

Picture 15. Display of Bturo, Netto, Tara Contents

The last sub-chapter on social arithmetic is Gross, Netto and Tara. Gross, Netto and Tara are explained by the presenter and displayed on the studio screen, made using *powerpoint* using *Calibri (Body)* type font with size 40, explanation using *Arca Majora 3 Bold* size 16 and 12. The formula uses *Cambria Math* with sizes 18 and 12. The animations used are *Checkerboard, Wipe, Bounce, Zoom* and images using *Grow and Turn animations.* Gross, Netto and Tara are shown at minutes 17:00-17:42.

Picture 16. Animation Examples of Gross, Netto, Tara Problems

Gross, net, tare animations are created with *the powtoon* application. The concept of the animation is the same as the animation on profit and loss, it's just that what is discussed in the animation is the buyer of the fruit parcel. The font used in animated conversations is *Gochi Hand* font size 19, using talking, *pointing, explaining poses.* An example of the question is shown at 17:43-19:10.

Picture 17. Practice Questions

The question exercise is made using *powtoon,* the concept in the question exercise is the seller and buyer of rice. Animated conversations using *Nexa* size 18 and 20 , Practice questions using *Spartan League* size 20 and lato size 19. The characters contained in the practice question animation use walking, *talking, explaining, standing poses.* Practice questions are shown at 19:38-22:17.

Picture 18. Video Final Look

The final look is made with a plain backgroud in *Goby Sands* and white lettering with *the Roboto Medium* font type. The upper left corner has the UMJ logo and the upper right corner has the FIP logo. The final view is created with *kinemaster.* The final display uses background music, namely *mixkit-romantic-05-759.* The final view is displayed at minutes 22:18-22:36.

After product development, the next step is the validation of media, materials and languages. Researchers received an assessment from validators as follows:

Table 3. Media Expert Assessment Results

No.	**Indicators**	**Average Score (%)**	**Validity Categories**
1	Graphic feasibility	96,00	Highly Valid
2	Media Quality	100	Highly Valid
3	Layout Media	100	Highly Valid
Overall Assessment		**97,50**	**Highly Valid**

The conclusions given by media experts are valid without revision. This indicates that MathalTV Videos are valid and do not need to be revalidated. Based on theassessment in the table above , the graphic feasibility indicator obtained a score of 96.00%, media quality obtained a score of 100%, media layout obtained a score of 100%. Overall, the media assessment results obtained an average score of 97.50% with a very valid category.

Table 4. Material Expert Assessment Results

No.	**Indicators**	**Average Score (%)**	**Validity Categories**
1.	Content Eligibility	92,50	Highly Valid
2.	Serving Components	100	Highly Valid
Overall Assessment		**94,55**	**Highly Valid**

The conclusions given by the material expert are valid without revision. This indicates that the material in the MathalTV Video is valid and does not need to be revalidated. Basedon the assessment in the table above, the presentation component obtained the highest value of 100%. Overall, the results of the material expert assessment obtained an average score of 94.55% with a very valid category.

Table 5. Results of Linguist Assessment

No.	**Indicators**	**Average Score (%)**	**Validity Categories**
1.	Communicative	96,67	Highly Valid
2.	Suitability to learner development	100	Highly Valid
3.	Use of spelling and symbols	93,33	Highly Valid
Overall Assessment		**96,00**	**Highly Valid**

The conclusions given by linguists are valid without revision. This indicates that the language on MathalTV Video is valid and does not need to be revalidated. Based on the

assessmentin the table above, the assessment results from communicative indicators obtained a score of 96.67%, suitability with student development, obtained a score of 100%, and the use of spelling and symbols obtained a score of 93.33%. Overall, the results of the linguist assessment obtained an average score of 96.00% with a very valid category. 4) Implementation Phase. Based on the results of filling out the questionnaire in the student and teacher response trials in the table above, the conclusion obtained is that the video can make it easier for students to carry out the learning process and there are no suggestions for improving the MathalTV video. Here are small class test suggestions or comments:

Table 6. Small Class Test Results

No	Indicators	Suggestions/Comments
1.	Material	The material is packed in very interesting animations
2.	Language	Clear and easy to read
3.	Interest	Videos are presented attractively and are easy to use
4.	Motivation	Interesting videos happy to learn it
Conclusion		**No response shown for media improvement**

The student response test was held on Thursday, July 22, 2021 at 09.00-10.00 using g*ooglemeet.* The subjects of the large class trial initially numbered 22 students, but not all subjects filled out the media assessment questionnaire, so the large class trial was carried out with 20 student response test subjects, including 19 students and 1 mathematics teacher. Beloware the average results of large class trials:

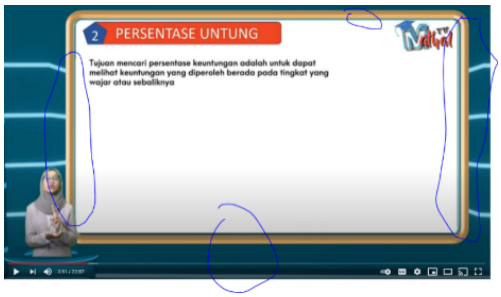
Table 7. Student Response Results

No.	Indicators	Average Score (%)	Categories Practicality
1.	Material	88,07	Very Practical
2.	Language	86,84	Very Practical
3.	Interest	88,42	Very Practical
4.	Motivation	81,75	Very Practical
Overall Assessment		**86,74**	Very Practical

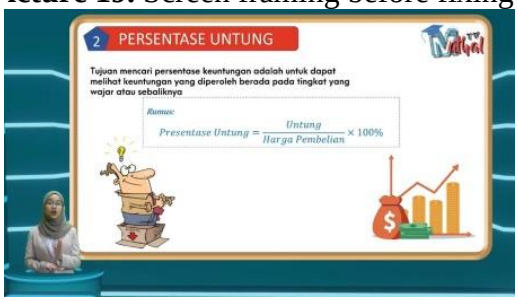
Based on the results of filling out questionnaires in large class trials of MathalTV Videos on social arithmetic material, the interest indicator got the highest score of 88.42% in the very practical category. Overall, it got an average score of 86.74% in the very practical category.

From the results of the improvement test and student response test, it can be concluded that the MathalTV Video on social arithmetic material is **practical** to apply and use in mathematics learning.

5) Evalution Stage. Researchto revise in accordance with the advice given by experts. The following product revisions to improve the product In media validation, researchers make improvements according to the validator's direction, namely fixing the sound that echoes and correcting the screen framing that is not the same between top, bottom, right and left. Here's the fix:



Picture 19. Screen framing before fixing



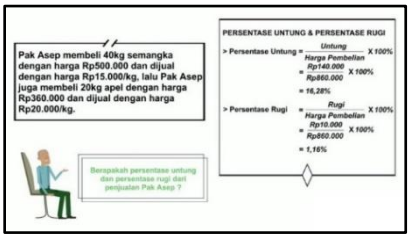
Picture 20. Screen framing after fixing

As for media improvements from material and language validators. Researchers improved the price of apples which was originally the price of apples Rp8000 changed to Rp30,000 / kg so that it was not too different from the current price of apples. Here's the fix:

Picture 21. Apple prices before revision

Picture 22. Apple prices after revision

According to the direction of the material expert, the researcher also added a detailed explanation of the percentage of profit and percentage of loss that was not originally in the MathalTV video. Here's the fix:



Picture 23. Explanation of Profit and Loss Percentage

According to the direction of material and language experts, researchers revised that the word capital was changed to the purchase price so that it was not ambiguous. Here's the fix:

Picture 24. Capital word before revision

Picture 25. Capital word after revision

CONCLUSION AND CONCLUDING

Based on the results of the development and research of MathalTV Video media on social arithmetic material, it can be concluded as follows: Researchers developed MathalTV Video media on social arithmetic material using the ADDIE research and development model. Based on the results of validation calculations by material experts, they get a score of 94.55% with Very Valid criteria, language assessment results get a score of 96.00% with Very Valid criteria and media assessment gets a score of 97.50% with Very Valid criteria. The conclusion of the above validation results is that MathalTV Videos are valid and can be tested to students and teachers.

The results of the student response trial got an average score of 86.74% with the very practical category and the teacher response trial got an average score of 86.67% with the very practical category. Based on the results of trials of experts and users, namely students and teachers, it can be concluded that the learning media MatahTV based on OBS Studio is valid and practical to be used in mathematics learning.

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