DEVELOPMENT OF "ADOBE FLASH" SOFTWARE-BASED LEARNING MEDIA MATERIAL FOR GEOMETRY IN 5TH CLASS

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Article Info	Abstract
	The problem of this research is that the process of learning activities is not optimal and the use and use of Adobe Flash media have never been used. This study aims to describe the development of multimedia-based learning media using Adobe Flash in mathematics subjects for fifth-grade elementary school geometry materials and to determine the feasibility of developing multimedia-based learning media using Adobe Flash in mathematics subjects for fifth-grade elementary school geometry materials. This research method is development (R&D) by following the steps of the Puslijatnov Team which was adopted from Borg & Gall. The results of this study are the feasibility of multimedia-based learning media using Adobe Flash in mathematics subjects for fifth-grade elementary school geometry materials seen in the media trial with 6 students obtained a percentage score of 90% categorized as "very feasible" and the results of student responses in the trial use media with 24 students obtained a percentage score of 98% categorized as "very decent".

1. PENDAHULUAN

The competence of teachers in this millennial era is required to be able to contribute positively to all aspects (Sartono et al., 2020), because it is from the hands of these teaching staff who will be one of the determinants of future generations to the nation. In achieving the goal of the golden generation that is aspired to.

Innovation is the right word for a solution to reduce barriers in transferring knowledge in the learning process, innovation does not have to always create something completely new from scratch, innovation can be used for something that already exists, namely by developing it, according to the statement According to (Bahnan, 2019) introductory education, namely, innovation is as a new idea that is applied to initiate or improve a product or process, and service. Innovation in learning can be in the form of strategies, media, teaching materials, or methods in learning.

Because the teaching and learning process is fundamental for humans. So the importance of technology to help the process of learning activities in humans to make everything practical & easy, especially during the process of transferring knowledge, especially in terms of teaching and learning. Following his understanding according to (Hartati, 2019) learning technology is theory and practice in the design, development, utilization, management, and evaluation of processes and resources for learning, learning technology as well as the application of scientific knowledge about the learning process in humans in practical tasks of learning and teaching.

Technology is the result of the application of scientific knowledge by humans under the understanding according to (Nugroho & Arrosyad, 2020) that learning technology is theory and practice in the design, development, utilization, management, and evaluation of processes and resources for learning, learning technology as well as the application of knowledge scientific study of the learning process in humans in the practical task of learning and teaching.

There are so many technologies that can help educators & students in the teaching and learning process. One of them is software. Here the researcher will use software called "Adobe Flash" or formerly known as Macromedia Flash, on computers, especially in learning mathematics in geometrical materials. Since in the process of making the media more than one element (audio, video, image, and animation) and tools or tools, it is called multimedia.

There are several reasons for choosing Adobe Flash as a presentation, namely because the flash has advantages according to (Rindayanti et al., 2020) the final result of flash files has a smaller size (after publishing), flash can import almost all image files and audio files so that Flash presentations can be livelier, animations can be created, run, and controlled. Flash can form executable files (*.exe) so that they can be run on any PC (Personal Computer) without having to install a flash program first.

(Reni et al., 2020) stated that mathematics is abstract ideas that are given symbols that are arranged hierarchically, and the reasoning is deductive so that activities in mathematics are highly mental. Under the statement from (Rahmawati et al., 2020) argues that the abstract mathematical object is a separate difficulty that students in learning mathematics must face. Not only students but teachers also experience problems in teaching mathematics related to its abstract nature. Mathematical concepts can be understood more quickly when they are concrete. Therefore the teaching of mathematics must start from a critical stage. Then it is directed to the semi-concrete location, and in the end, students can think and understand mathematics in an abstract way.

So, the innovation needed by educators in mathematics subjects with spatial geometry materials that use technology support is learning media; the word media that we sometimes hear implicitly turns out to have a more straightforward meaning, based on the nature of language to the description of its characteristics and types, can be seen according to the following experts. According to (Bahnan, 2019) media comes from Latin and is the plural form of the word medium which means intermediary, namely the intermediary of the message source (a source) with the recipient of the message (a receiver). They exemplify this media with films, television, diagrams, printed materials, computers and instructors. The function of learning media consists of various kinds, one of which is the function of media for teachers and students. The function is in accordance with the statement in (Indriawan & Slamet, 2018) the function of the learning media is as follows, the process of learning media for teachers, the teacher provides directions for achieving goals, explains the structure and sequence of teaching well, provides a systematic framework for teaching well , facilitate the teacher's control of the subject matter, assist accuracy, accuracy in the presentation of subject matter, raise the confidence of a teacher, improve the quality of lessons, the function of learning media for students, increase student learning motivation, provide and increase the variety of learner learning, provide the structure of the subject matter and make it easier for learners to learn, provide core information, points systematically so as to make it easier for learners to discover, stimulate learners to focus and analyze, create conditions and learning situations without pressure, learners can understand the material, lesson teaching systematically.

According to (Romadhona & Yundra, 2018), the types of learning media based on the goals and purposes of the grouping are as follows, whiteboard, multimedia, computer, film or image, projector/OHP transparency, audio media. As we know before, that is media, a tool or

intermediary in conveying information, and it can be through audio, video and others. The difference is that multimedia is a combination of these various elements. Following the statement in (Nugroho & Arrosyad, 2020) multimedia is a media facility in which there is a combination of multiple forms of elements (audio, animation, text, images, video, graphics, sound) that can create a dynamic and interactive presentation and has tools to navigate for users and can be online (internet) and offline.

As an intermediary for delivering multimedia information, it also has several advantages. According to the quote in (Widiatno & Nurlaela, 2014) the benefits of learning multimedia, namely: enlarging objects that are very small and invisible to the eye, such as germs, bacteria, electrons and others. , reducing massive things that are impossible to present in schools, such as elephants, houses, mountains and others, showing complex, complicated objects or events that take place sooner or later, such as systems in the human body, the operation of a machine, the circulation of the planet Mars, blooming flowers and others, presenting distant objects or events, such as the moon, stars, snow and others, showing dangerous things or events, such as volcanic eruptions, tigers, poison and others, increasing attraction and student attention.

The software also has a much-needed role in multimedia and also consists of several kinds. As described in (Sukmawaty, 2017) the software needed for the Multimedia system is an operating system; there are three operating systems commonly used to create multimedia, namely MAC OS X, Linux, Microsoft Windows. Other software needed, for example, for editing text OCR (Optical Character Recognition), is required to translate the results of moving written text into editable text either for editing images such as 2D or 3D images or for editing audio and video or animation. A machine can obtain the OCR device for free because it is a scanner built-in. Examples of software for editing 2D images or photos are Adobe Photoshop, GIMP, and Inkscape. Examples of software for editing 3D images are 3Ds MAX, Maya and Blender. Examples of software for video editing are Adobe Premier, ULEAD and Kino. At the same time, examples of software for editing audio are ACID Pro and Audacity. In addition to software for editing, Authoring software is also required, Macromedia or Adobe Flash, Macromedia Adobe Authorware, and Sophie.

The results of obtaining information data from teachers at the Mendo Barat 18 State Elementary School, through interviewing activities, showed that the students' interest, motivation, and attention were not optimal. In addition, the use and use of Adobe Flash media has never been used. So, in order for learning to experience a change in taste, and a different learning atmosphere from usual, so and departing from this the researcher conducted a study "Development of Multimedia-Based Learning Media using "Adobe Flash" in Mathematics Subjects for Class V geometry Materials in State Elementary School 18 Mendo Barat". Based on the background described above, the problem can be focused on the use and utilization of learning media using the "Adobe Flash" software in learning mathematics in geometry materials at State Elementary School 18 Mendobarat. Students' responses to the learning media "Adobe Flash" for the mathematics subject in geometry at the 18 Mendobarat State Elementary School. Practical & valid learning media "Adobe Flash" for mathematics subjects in geometry materials at State Elementary School 18 Mendobarat. In this study, the formulation of the problem is how the characteristics of the development of learning media based on "Adobe flash" are valid & practical in class V elementary mathematics subjects in geometry materials? This study aims to produce a useful & practical "Adobe Flash"-based learning media for mathematics subjects in geometry materials at State Elementary School 18 Mendobarat.

As for the benefits obtained in this study, this research helps produce learning media based on "Adobe flash", experience and knowledge that research will need if later researchers deal directly with similar problems so that the learning process will be successful and as expected.

For students, this research is helpful to increase students' knowledge of the material, can provide different learning experiences, and be responsible for their respective duties in the learning process. For teachers, this research is useful to help teachers explore students' potential for learning mathematics and then get a different teaching experience after using this media because the media used has never been used by educators. Schools, this research can help develop school performance if the results of achieving student knowledge through the development of learning media based on "Adobe flash" in mathematics subjects increase. Other researchers can provide additional references, benefits, and knowledge on what is needed based on the suitability of this research.

2. RESEARCH METHOD

The model used in this study is a theory-based procedural model from the Borg & Gall model. According to (Mahmudi, 2011), the procedural model is a descriptive procedural model that describes the flow or procedural steps that research must follow to produce a particular product. The procedural model is usually a sequence of steps observed in stages from the initial step to the final step.

The development procedure, according to Borg & Gall (Putri et al., 2019) could be carried out more simply involving the main steps:

a. Conducting product analysis;
b. Developing initial products;
c. Expert validation and revision;
d. Scale field trials minor and product revisions;
e. Large-scale field trials and final products;

The subjects of this study were divided into small-scale trial subjects and large-scale trial subjects. The issues of this study consisted of 6 students for the small scale test & 24 fifth grade students of SD Negeri 18 Mendo Barat for the large scale test. In the small-scale test stage, the selection is made based on the highest, medium, and low achievement of students in the school. At the same time, the large-scale test phase is not the case but includes all fifth-grade students of SD Negeri 18 Mendobarat. The product design consist of two stages is presented in Fugre 1.
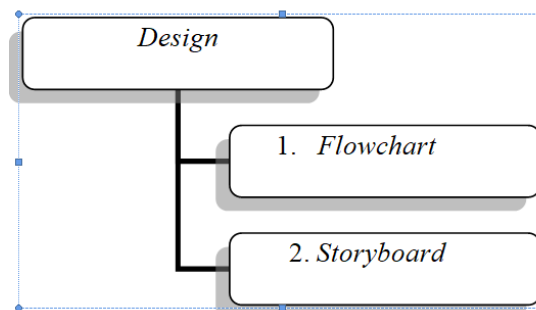
Figure 1. Design stages

1) Flowchart System

The flowchart used in the study serves to describe or describe the flow used in this Adobe Flash media. In contrast, the notion of a flowchart in (Maulidina et al., 2018) is an illustration in the form of a graph accompanied by the steps and sequence of a procedure from a flowchart program that can help the process of analysis, design and coding to break down problems into smaller parts for operation. Flowchart display for this research presented in Figure 2.
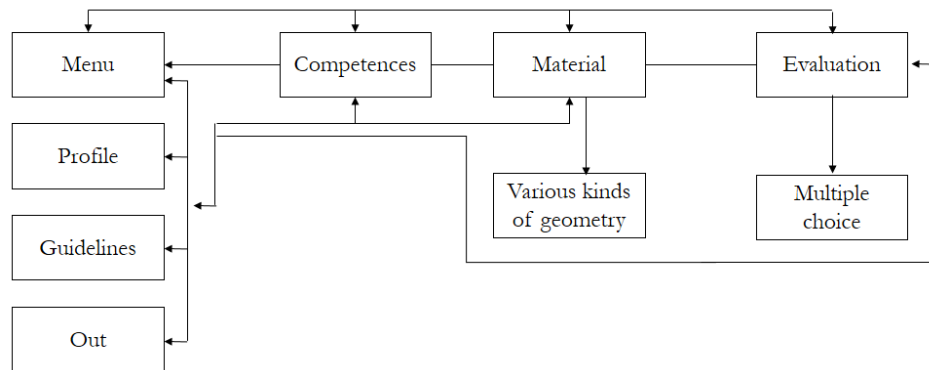
Figure 2. Flowchart display

2) Storyboard

The storyboard here is a guide for programmers and graphic designers in building a multimedia project. In this storyboard, various elements are used in each design of a screen product to be made. According to (Meryansumayeka et al., 2018), the meaning suggests that a storyboard is a mapping of multimedia elements in each screen of media programs presented in Figure 3, 4 and 5.

Figure 4. Scene 1 presented of menu in mind page
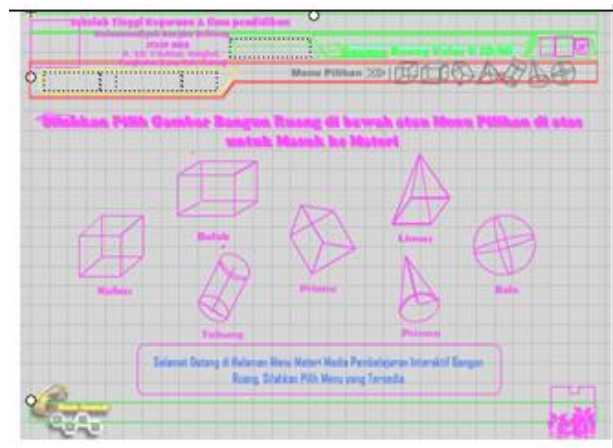
Figure 3. Scene 2 presented material of geometry in material page
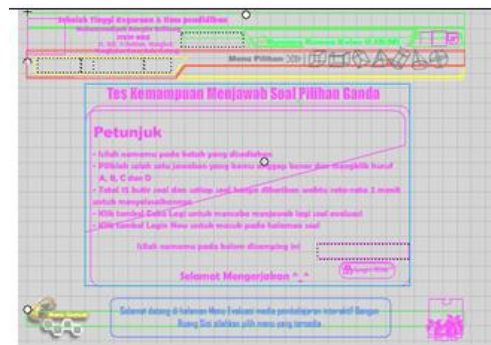
Figure 5. Scene 3 presented evaluation page

Data collection techniques and instruments, field study instruments, namely interviews and observations. Interview. In this study, researchers need instrument techniques in digging up information or data by meeting directly with sources. They are more open and expect flexibility in

the process, so that this is why researchers use interviews. As for the understanding (Arrosyad & Sugiarti, 2020), an interview or interview is a form of verbal communication, so it is a kind of conversation that aims to obtain information. Observation is essentially an active move or act by monitoring, assessing and analyzing what is needed in researching. That is why researchers use this technique. As for the understanding (Arrosyad et al., 2020), observation or observation used in the context of collecting data in a study is the result of the soul's active and complete attention to be aware of the existence of a particular desired stimulus or a deliberate and systematic survey of circumstances social phenomena and psychological symptoms by observing and noting. Then for the research instrument, there is a questionnaire. In this research, numerical data is needed as a condition to analyze whether the process is valid, that is, by checking how many numbers are required for each question. That's why researchers use it. As for the meaning (Suliswiyadi, 2019), a questionnaire list of questions distributed by post to be filled out and returned or can also be answered under the researcher's supervision. Questionnaires generally ask for information asking for information about facts known to the respondent or also about opinions or attitudes. The descriptive criteria for eligibility of multimedia product presented in Table 1.

Table 1. Descriptive Criteria for the Percentage of Eligibility of Multimedia Products

Percentage of Achievement	Interpretation
76% = score = **100%**	Very Eligible
51% = score = **75%**	Eligible

Multimedia validity criteria developed presented in Table 2.

Table 2. Validity criteria

Percentage %	Validity Level	Description
81-100	Very valid	No revision
61-80	Valid	No revision
41-60	Sufficiently valid	Some revisions
21-40	Invalid	Revision
1-20	Strongly invalid	Revision

Based on the description of criteria for multimedia developed in Table 1 and Table 2 explain that the research was carried out at SD Negeri 18 Mendobarat class V with 24 students. Then the student response data were analyzed using the formula developed by Arikunto: feasibility = total score obtained divided by the maximum score then multiplied by 100%.

3. RESEARCH RESULTS

a. Product Requirements Analysis Stage

The product to be developed in Adobe Flash media. The research steps that have been adjusted are:

1) Reviewing the Curriculum

The curriculum used by the State Elementary School 18 Mendo Barat or where the researchers conducted the research was the 2013 curriculum by examining the material in the school, namely the spatial network of the syllabus used based on the class that the researcher, namely level V, had determined.

2) Media Needs Analysis

The identification of the needs that teacher must prepare to develop learning media using Adobe Flash can be seen in the image below as follows:

a) The computer/laptop media device here is used to operate several software for media needs such as designing, editing, and of course for the manufacture of learning media, namely Adobe Flash Professional CS6, which acts as an animation, movie, animation button, and the required vector images. Minimum computer/laptop specifications required are 2GB RAM, 3.5GB Hard-disk, Intel Pentium, 1024x768 Display with the 16-bit video card, java runtime environment 1.6 (included) JRE, Direct X9 graphics card, DVD ROM.

b) This CD, or what is known as a compact disk, is used for a file container containing Adobe Flash media content to facilitate its use and operation.

c) The projector or infocus here plays a role in displaying the appearance of Adobe Flash media so that during the field trial process, it can run properly, namely, being able to fulfil aspects of effectiveness such as delivering information and giving directions.

3) Early Product Development

In compiling this media design, what is done is to design the media by following the guidelines for preparing good and correct media formulated through the stages of the steps taken in the manufacture of learning media for the Flash Animation program.

4) Expert Validation & Revision

Products that have been made will be validated using product validation. Expert validation is an activity carried out by experts to systematically examine and evaluate instruments and effects (Adobe Flash media in mathematics) that will develop according to the objectives. Material experts and media experts do this. Media expert validation aims to provide information and evaluate media based on media design and media preparation aspects.

5) Material Expert Validation

The material validity test aims to assess the feasibility of the media in terms of the material to be presented in the implementation of learning. This validation was carried out using a material expert validation questionnaire. Geometry, if the percentage is included in the eligibility criteria with 80% and Adobe Flash media can be tested in the field. The revision from the material expert, the need for additional three geometry materials is presented in Figures 6 and 7.

Figure 7. Display of sub materials before revision

Figure 6. Display of sub material after revision

6) Media Expert Validation

The number of results of the feasibility assessment by media experts on Adobe Flash media for spatial materials, if a percentage is included in the valid criteria with a ratio of 83% and Adobe Flash media can be tested in the field. Revision from media experts, the need to maximize aspects of the user interface, user experience and content layout presented in Figures 8 and 9.

Figure 8. Main menu display before revision

Figure 9. Main menu display after revision

7) Validation of Linguists

Based on the results of a validation questionnaire by a linguist, which includes ten questions, the total number of assessments is 42, with a complete maximum evaluation of 50. Therefore, the number of results of the feasibility assessment by linguists on Adobe Flash media for spatial material, if a percentage is included in the valid criteria rate of 84%, and Adobe Flash media can be tested in the field.

8) Small-Scale Field Trial

Based on the results of the assessment of the media trial by six students, the total number of evaluations obtained is 298, with a full complete evaluation of 330. The number of assessment results from student responses to Adobe Flash media if the percentage is included in the very feasible criteria with a rate of 90%. Based on the conclusions above, it can be concluded that Adobe Flash media can be continued or used on a large scale or trial use of media without any revision from students.

9) Large-Scale Field Trial

Based on the assessment results of the media use trial by 24 students, the total number of assessments was 1,305, with a maximum total rating of 1,320. Therefore, the number of the evaluation results from student responses to Adobe Flash media, if presented is included in the very feasible criteria with 98%. Therefore, based on the conclusions above, it can be concluded that Adobe Flash media can be used as a learning medium. The final product developed to packed into a compact disk and the design of compact disk presented in Figure 10.

Figure 10. Physical form (compact disk) for final product file holder

4. DISCUSSION

Product requirements analysis stage aims to examine the purpose of the product to be developed as stated (Kartini, 2017) goals and objectives at the context stage in specific programs. Studying the curriculum at SD Negeri 18 Mendo Barat so that the Adobe Flash-based learning media that will be produced does not deviate from the teaching objectives that will be carried out in research to develop media under the existing curriculum in schools. The curriculum analysis presented is as conveyed (Hadziq, 2016) that curriculum analysis is to find out the material taught in certain classes.

Analysis of media needs found that identifying the requirements that must be prepared to develop learning media using Adobe Flash. The computer/laptop media device here is used to operate several software for media needs such as designing, editing, and of course for making learning media, namely Adobe Flash Professional CS6; this is also conveyed (Damayanti et.al, 2018) which acts as an animation, movie, animated buttons, as well as the necessary vector images. Minimum computer/laptop specifications required are 2 GB RAM, 3.5 GB Hard-disk, Intel Pentium, 1024x768 Display with the 16-bit video card, java runtime environment 1.6 (included) JRE, Direct X9 graphics card, DVD ROM.

This CD, or what is known as a compact disk, is used for a file container containing Adobe Flash media content to make it easier to operate. The projector or infocus here plays a role in displaying the appearance of Adobe Flash media so that during the field trial process, it can run properly, namely, being able to fulfil aspects of effectiveness such as delivering information and giving directions (Arrosyad & Nugroho, 2019).

The initial product development after conducting a needs analysis was continued with the design of developing Adobe Flash-based learning media products in the Mathematics Subject geometry. It was also conveyed (Magnatis, 2019) that learning to build space in mathematics lessons can be used by various media according to the purpose.

Expert validation & product revisions that have been made will be validated using product validation. Expert validation is an activity carried out by experts to systematically examine and evaluate instruments and products (Adobe Flash media in mathematics) that will be developed according to the objectives.

The media expert test is carried out in 2 stages; media experts play a role in assessing the feasibility of Adobe Flash media in terms of Physical Appearance, Media Display, Quality Aspects and Media Effectiveness. Based on the results of a validation questionnaire by media experts, which include indicators of physical appearance, media appearance, and aspects of effectiveness quality, The media obtained from the total rating is 79, with a maximum total rating of 95.

The language validity test aims to assess the feasibility of the media in terms of the language used in Adobe Flash learning media in the implementation of later learning. This validation was carried out using a questionnaire in an effort to obtain verification from linguists.

5. CONCLUSION

Based on the results of research and discussions that have been carried out, it can be concluded that the development of Adobe Flash media with the Puslijatnov Team development procedure adopted from Borg & Gall through 5 development steps is declared valid and practical. This is evidenced by the results of the validation of media, language and material experts using a questionnaire instrument and the effects of small-scale and large-scale field trials.

Adobe Flash media development has been declared to validate the validation results of material experts, linguists and media experts. The material assessment results by content experts obtained a percentage score of 80% categorized as "Valid". The results of the media assessment by media experts received a percentage score of 83%, classified as "Very Eligible". The language assessment results by linguists at this stage obtained a percentage score of 84%, categorized as "Very Valid." Then the Adobe Flash media based on the results of the expert's assessment was declared valid or feasible for field trials.

Adobe Flash media development has been declared practical on the results of student responses to media trials and media use trials. The results of student responses to the media trial with six students obtained a percentage score of 90% categorized as "Very Eligible". The results of student responses to the media use trial with 24 students received a percentage score of 98% classified as "Very Eligible". Then the Adobe Flash media based on the results of student responses on media trials and trials of using media was declared practical to be used in the learning process.

Some suggestions that researchers can give related to the research and development of Adobe Flash media are as follows. First, researchers can develop Adobe Flash media with other materials and create different media besides Adobe Flash media. Second, it is recommended that teachers teach using interactive learning media to increase student activity in learning and make it easier for teachers to deliver the material mbeing taught. Students should be more active in the teaching and learning process and further improve their learning outcomes in the Mathematics subject matter of spatial construction. For other researchers, it is recommended to develop different learning media and other subjects. For schools to motivate teachers to create learning media to be more creative and not fixated on the material.

DAFTAR PUSTAKA

Arrosyad, M. Iqbal, & Nugroho, F. (2019). *Learning strategies in elementary school*. CV. Intishar Publishing.

Arrosyad, Muhammad Iqbal, Oktaviani, S. N., Eftia, H., Karisma, N., & Meliyana, B. (2020). NSchool Cultural Values in Fostering Students' Religious Activities. *Atthulab: Islamic Religion Teaching and Learning Journal*, *5*(1), 129–139. https://doi.org/10.15575/ath.v5i1.7697

Arrosyad, Muhammad Iqbal, & Sugiarti, S. (2020). The traces of the revival of the oldest Muhammadiyah elementary school on earth are cognate. *Jurnal Tarbawy: Jurnal Pendidikan Islam*, *7*(1), 33–41.

Bahnan, R. (2019). The use of video media to improve student learning outcomes about the basic competencies of imitating reading. *Cendekiawan*, *1*(1), 13–19.

Damayanti et.al. (2018). Feasibility of Physics Learning Media in the form of Android Pocket Books on Static Fluids. *Indonesian Journal of Science and Matematics Education*, *1*(1), 63–70.

Hadziq, A. (2016). Learning religion and the environment in a natural school culture: the potential for grounding environmental awareness from an early age in schools. *Jurnal Tatsqif*, *14*(1), 1–32.

Hartati, S. (2019). Efforts to improve the learning outcomes of fourth grade students of SD Negeri Seworan on inter-linear relations through the Realistic Mathematics Education (RME) approach with concrete media. *Cendekiawan*, *1*(2), 28–42. https://doi.org/10.35438/cendekiawan.v1i2.164

Indriawan, R., & Slamet, A. (2018). Implementation of Scientific Approach in Economic Learning. *Journal of Economic Education*, *7*(1), 18–23. https://doi.org/10.15294/jeec.v7i1.22418

Kartini, N. H. (2017). Evaluation of baitul arqam program for employees at Muhammadiyah University of Palangkaraya. *Anterior Jurnal*, *16*(2), 144–157.

Magnatis, U. (2019). Efforts to improve the learning achievement of fourth grade students at SD Negeri 7 Sungailiat in mathematics subjects about mixed arithmetic operations through the demonstration method. *Cendekiawan*, *1*(1), 20–28. https://doi.org/10.35438/cendekiawan.v1i1.155

Mahmudi, I. (2011). CIPP: Educational Program Evaluation Model. *Jurnal At-Ta'dib*, *6*(1), 111–125.

Maulidina, M. A., Susilaningsih, & Abidin, Z. (2018). Development of Game Based Learning Based on Scientific Approach for Fourth Grade Elementary School Students. *Jinotep*, *4*(2), 113–118.

Meryansumayeka, Yusuf, M., & Suganda, V. A. (2018). Development of PMRI-Based Learning Videos to Support Students' Mental Calculation in Social Arithmetic Problems. *Jurnal Elemen*, *4*(2), 119. https://doi.org/10.29408/jel.v4i2.634

Nugroho, F., & Arrosyad, M. I. (2020). Multimedia Moodle Development in Web-Based Integrative Thematic Learning for Fourth Grade Elementary School Students. *Cendekiawan*, *2*(1), 49–63. https://doi.org/10.35438/cendekiawan.v2i1.177

Putri, I. S., Solih, S., & Handoyo, A. W. (2019). The Effectiveness of Cooperative Game Techniques to Improve Social Skills of State Elementary School Students 2 Curugbarang Pandeglang. *Cendekiawan*, *1*(2), 51–60. https://doi.org/10.35438/cendekiawan.v1i2.168

Rahmawati, F., Permana, R., & Nurfitriani, M. (2020). The influence of dakota media and activeness on student achievement in FPB and KPK material. *Jurnal Cendekiawan*, *2*(2), 95–103.

Reni, Permana, R., & Nugraha, M. F. (2020). The Effect of Savi's Learning Model And Self-Confidence Level On Student Learning Achievement. *Cendekiawan*, *2*(2), 88–94.

Rindayanti, R., Nugraha, M. F., & Nurfitriani, M. (2020). Development of silent film (motion

visual) media in social sciences subjects types of class IV occupations at SDN Cibeureum. *Cendekiawan*, *2*(1), 13–19. https://doi.org/10.35438/cendekiawan.v2i1.170

Romadhona, F. T., & Yundra, E. (2018). Development Of Edugame As A Learning Media Based On Role Play Games (Rpg) In Digital Simulation Subject Matter For Class X TAV At SMKN 3 Surabaya. *Jurnal Pendidikan Teknik Elektro*, *7*(2), 101–107.

Sartono, L. N., Yanti, S., Cleopatra, M., Sahrazad, S., Informatika, P. T., Pendidikan, P., & Informatika, T. (2020). Counseling and Assistance in Making Processed Banana Products as Selling Value and Additional Income Jual. *AbdiMuh : Jurnal Pengabdian Kepada Masyarakat*, *1*, 1–7.

Sukmawaty. (2017). Analysis of Indonesian Language Errors in Student Thesis of Information Systems Study Program at the College of Informatics and Computer Management (STMIK) Kharisma Makassar. *Jurnal Retorika*, *10*(1), 56–65.

Suliswiyadi, S. (2019). SWOT Analysis of Superior School Development Strategy: A Case Study of Al Firdaus Islamic Elementary School, Magelang Regency. *Jurnal Tarbiyatuna*, *10*(1), 21–31.

Widiatno, R., & Nurlaela, L. (2014). Application of Interactive Multimedia Learning Media (MMI) in Basic Competencies of Basic Cooking Methods to Improve Student Learning Outcomes at SMK Negeri 3 Blitar. *E-Journal Boga*, *03*(Mmi), 89–99.