Animated Video Media Based on Adobe After Effects (AEF) Application: An Empirical Study for Elementary School Students

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Abstract. The development of the world of digitization is so fast that changes in the education sector also have an effect on the growing learning model. This study aims to determine the use of Adobe After Effects (AEF) based animation video media in my living environment material in grade IV in elementary school. The initial stage of media testing was carried out on 3 media experts, 3 material experts, 5 class teachers from five schools in different regions. The number of samples in this study amounted to 132 students. The data were collected using a Likert scale questionnaire 1 to 5. Based on the data obtained, it shows the value of: (1) the average value of the media expert test (89.71%) including the criteria "Very Valid". (2) the average value of the material expert test is (84.88%) including the criteria "Very Valid" (3) the average product trial feasibility by the teacher is (90.25%) including the criteria "Very Good" and (4) the average result of product testing by students is (91.79%) are categorized as “Very Good”. The conclusion is that animation video media is very good for use in curriculum learning and is able to construct patterns of thought so as to motivate students in learning. For further research, a development model can be carried out.

1. Introduction

Education is defined as the process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts; the process of action and how to educate[1]. Education is very needed and very valuable [2]. Corona Virus Disease or COVID-19 was declared a pandemic on March 11, 2020, a disease that is endemic to almost all countries in the world [3]. With the spread of the corona virus, learning carried out in elementary schools also uses online / distance learning through parental guidance[4]. Online learning that is carried out makes teachers need learning media as a means to deliver material attractively.

Learning media can be interpreted as hardware or software tools used in the delivery of material by teachers to students in the learning process. The media is expected to make the learning process more effective and efficient in accordance with the learning objectives[5]. To support the implementation of a fun learning process, it is necessary to provide adequate teaching aids that can provide direct experience to students through practicum or demonstrations conducted by the teacher[6]. Teachers can use any type of audio-visual media that is able to provide clarity on the material being studied [7]. Animated media facilitate students' thinking on the cognitive aspects of the level of remembering and understanding[8]. The ability of teachers is expected to be more skilled and
provide facilities to support learning[9]. The use of digital technology as a learning medium has better and more effective implications than others [10].

From the results of interviews with grade IV teachers, it is found that, pThere was a learning process in five different schools, in the use of learning media in the form of concrete objects, power point slides (PPT), videos, the use of used goods, and getting into the natural surroundings. However, not all students like the use of the learning media used, because basically the characteristics of students are different. Therefore, it is necessary to develop an attractive learning media according to the needs of students. Through animated video media based on Adobe After Effects, it is hoped that it can help teachers to deliver material in a shorter time[11]. Thus, it is hoped that science learning will be more attractive to students so that the objectives of learning science will be achieved optimally. Based on the explanation above, it is necessary to develop an animated video learning media that is able to provide a clear picture of the material being studied. The use of animation in learning can help teachers deliver material[12]. In addition, the development of animated video media is expected to be able to optimize the use of existing facilities.

2. Methodology
2.1 Participant
This study involved 3 media experts[20], 3 material experts [21]as well as 5 teachers and 132 students. The experts are lecturers at Prof. Muhammadiyah University. Dr. Hamka. Meanwhile, teachers and students come from public schools in Jabodetabek as users of animated video media based on Adobe After Effects.

2.2 Instrument and Procedure
This research instrument and procedure is a type of survey research. The instrument used was a survey questionnaire that was filled in online using the google form application[3]. There are four types of questionnaires; first there are 3 other questionnaires media experts, material experts and teachers to assess the appropriateness of instructional media, the second questionnaire is for students. The steps developing animated video media based on Adobe After Effects include the five steps ADDIE model. ADDIE stands for Analysis, Design, Development or Production, Implementation or Delivery and Evaluations[22]. The analysis stage of this research, it involves curriculum analysis, syllabus and analysis of the characteristics of students. At the design stage, prepare the material, make a flow chart and make a storyboard. While the research instrument stage was developed for feasibility assessment of the developed Adobe After Effects-based animated video media. At the development stage, the flowchart, materials, storybord already made embedded into the media. To develop animated video media based on Adobe After Effects, the main software used is Adobe After Effects, and the supporting software tools used is Adobe Illustrator. At the design and development stage, evaluation is carried out by experts, so that the media being developed receives corrections and input for improvement. At the implementation stage, the animated video media was declared feasible by media experts and material experts, tested on students in five different schools. Furthermore evaluation stage, at the evaluation is carried out at each stage of development by researchers with the help of experts.

3. Result and Discussion
3.1 Assessment of animated video media based on Adobe After Effects by experts.
Based on the results of media validity by 3 media experts and 3 material experts. Learning media is stated to be very valid with the input and suggestions given[23]. Data from questionnaires by media experts are presented in Table 1 and questionnaire data by material experts is presented in Table 2.
Table 1. Validity Test Results by Media Experts

| Aspect       | Indicator                                                                 | Item No | Percentage Average | Criteria       |
|--------------|----------------------------------------------------------------------------|---------|--------------------|----------------|
| Visual       | Appearance match with background                                           | 1       | 92.22%             | Very Valid     |
|              | Interesting color combination.                                             | 2       |                    |                |
|              | Adjustment of image and animation settings.                               | 6       |                    |                |
|              | The suitability of the image presentation with the material discussed.     | 7       |                    |                |
|              | The text animation that is displayed is clear and attractive.             | 8       |                    |                |
|              | The illustrations are easy to understand and suitable for everyday life.   | 9       |                    |                |
| Audio        | The suitability of the accompanying music with the narrative.             | 3       | 86.66%             | Very Valid     |
|              | The sound presented is clear.                                             | 4       |                    |                |
|              | Between the sound with the animation accordingly.                        | 5       |                    |                |
| Quality      | Video quality is good.                                                    | 10      | 86.66%             | Very Valid     |
| Contents     | Fill in the video coherently according to the material.                   | 11      | 93.33%             | Very Valid     |
| Average      |                                                                           |         | 89.71%             | Very Valid     |

Table 2. Validity Test Results by Material Experts

| Aspect                        | Indicator                                                                 | Item No | Percentage Average | Criteria       |
|-------------------------------|----------------------------------------------------------------------------|---------|--------------------|----------------|
| Quality                       | The completeness of the material presented in accordance with the daily life of students | 1       |                    |                |
|                               | The depth of the material presented is in accordance with the description that supports the achievement of Basic Competencies (KD) | 2       |                    |                |
|                               | The accuracy of the material delivery sequence in the animated video is in accordance with science learning | 3       | 84%                | Very Valid     |
|                               | The accuracy of the procedures presented is according to science learning | 4       |                    |                |
|                               | The accuracy of illustrations and examples is in accordance with the environment of the learners | 5       |                    |                |
| Level of Development          | The suitability of the animated video with the level of development of students | 6       |                    |                |
|                               | Suitability of the material with the development of the times              | 7       | 84%                | Very Valid     |
|                               | The clutter and flow of thought in the animated video                      | 8       |                    |                |
|                               | Suitability with the level of intellectual development of students         | 11      |                    |                |
|                               | Conformity with the level of social emotional development                  | 12      |                    |                |
|                               | Delivered material well through animated videos                            | 13      |                    |                |
Material Benefits

| Benefits                          | Percentage | Criteria   |
|-----------------------------------|------------|------------|
| Encourage seeking more information | 9          | 86.66%     |
| The attractiveness of the material presented using animated videos | 10         |            |
| **Average**                       |            | **84.88%** |

3.2 Appraisal of video animation media based on Adobe After Effects by Guru.

Table 3. Results of product eligibility by the Teacher

| No. | Aspect     | Indicator                                                                 | Item No | Percentage Average | Criteria   |
|-----|------------|---------------------------------------------------------------------------|---------|--------------------|------------|
| 1   | Visual     | Animations (moving pictures) are interesting.                             | 12      | 90%                | Very Good  |
|     |            | The color composition is right.                                           | 13      |                    |            |
| 2   | Audio      | Use sound effects.                                                        | 8       | 88%                | Very Good  |
|     |            | There is music content in the media.                                      | 14      |                    |            |
| 3   | Contents   | Relevant to curriculum goals and learning objectives.                    | 1       | 93%                | Very Good  |
|     |            | The material presented is in accordance with the fourth grade science syllabus. | 2       |                    |            |
|     |            | The material is in accordance with the basic competencies and competency standards to be achieved. | 3       |                    |            |
|     |            | The material presented is in accordance with the objectives of class IV science learning. | 4       |                    |            |
|     |            | The learning flow is clear.                                               | 5       |                    |            |
|     |            | Clarity of material.                                                      | 6       |                    |            |
|     |            | The animated video that is presented clarifies the material.              | 10      |                    |            |
|     |            | There are videos that contain science learning in the real world.         | 11      |                    |            |
| 4   | Language and Writing | Readability of writing.                                                    | 7       | 90%                | Very Good  |
|     |            | The articulation of language is clear and understandable.                | 9       |                    |            |
| **Average**                   |            | **90.25%**                   |         |                    |            |

Based on the results of the assessment by the teacher’s in tabel 3, that the average assessment of the animation video media as a whole is 90.25% which is included in the very good criteria which indicates that the teacher,s can use animated video media based on Adobe After effects as a learning media for style and motion material [24].

3.3 Assessment of animated video media based on Adobe After Effects by Students.

After the media was validated by media experts, material experts an teachers, the media was tried out on students to find out whether animated video media could be used by students to support their understanding of the style an motion material. [25]. The results of the average percentage un each aspect valued 91.79% can be seen in the Table.4

Table. 4 Student Test Results

| No. | Aspect       | Indicator                        | Item No | Percentage Average | Criteria       |
|-----|--------------|----------------------------------|---------|--------------------|----------------|
| 1   | Software     | The triumph of the media.        | 1 and 8 | 92.5%              | Strongly Agree |
|     |              | Ease of user.                    | 2 and 3 |                    |                |
| 2   | Theory       | Language and material intent.    | 7       | 90.15%             | Strongly Agree |

4
The following averages is the final results of animated video media based on Adobe After Effects that have been developed based on the assessments and suggestions of experts, teachers and students which can be seen in Table 1-4. The following is the final result of the animated video media that has been revised by media experts and material experts in Table 5.

Tabel 3.5 The End Result of The Media

| No. | Animated Video Scene section | Information |
|-----|------------------------------|-------------|
| 1.  | ![Opening Section](image1)   | • The opening section contains the title of the 2D animation video of style and motion as a science subject.  
• There is a UHAMKA logo.  
• Researcher Name and NIM  |
| 2.  | ![Teacher Introducing](image2) | • A figure the researcher introduces as a teacher.  
• Opening to explain the material, force and motion.  |
| 3.  | ![Teacher Question](image3) | • The teacher character asks what style is.  |
| 4.  | ![Teacher Explaining](image4) | • The teacher character explains the meaning of style  |
| 5.  | ![Udin Pushing Toy Car](image5) | • Udin's character is pushing his toy car.  |
| 6.  | ![Edo Pushing Table](image6) | • Edo's character is pushing the table.  |
| 7.  | ![Teacher Explaining Effect](image7) | • The teacher explains the next material about the effect of force on motion  |
|   |   |   |
|---|---|---|
| 8. | ➢ The teacher mentions the effect of force on motion. |
| 9. | ➢ The appearance of Udin's character kicking a ball in an example of moving a still object. |
| 10. | ➢ The display when the car is moving then the gas is added in the example of accelerating the movement |
| 11. | ➢ Display when the car is going fast then the car brakes in the example of slowing down motion |
| 12. | ➢ The teacher explains the next material about the influence of force on the shape of objects. |
| 13. | ➢ The teacher explains that objects that are given a force will change lengthwise and flatten. |
| 14. | ➢ The appearance of the Rasya character attracts plastic. |
| 15. | ➢ Tiara character display pressing balloons. |
| 16. | ➢ The teacher character provides cover and encouragement. |
4. Conclusion
Based on the research results, the developed video animation media based on Adobe After Effects have good quality. Judging from the results of assessments by media experts and material experts as well as assessments by teachers and product trials for students. Thus it can be concluded that this research produces animated video media based on Adobe After Effects on my Living Environment Material that is suitable for use as a science learning media.

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References
[1] S. Stoyanov, "A theory of human motivation," *A Theory Hum. Motiv.*, no. August, pp. 1–87, 2017, doi: 10.4324/9781912282517.
[2] AKN Kafah, L. Nulhakim, and AS Pamungkas, "Development of video learning media based on powtoon application on the concept of the properties of light for elementary school students," *Gravity J. Ilm. Researcher. and Learning Fis.*, vol. 6, no. 1, pp. 34–40, 2020, doi: 10.30870 / gravity.v6i1.6825.
[3] NGF Made Yeni Suranti, "Variations of Models and Learning Platforms for Prospective Teachers During the COVID-19 Pandemic Period," 2020.
[4] WAF Dewi, "The Impact of Covid-19 on the Implementation of Online Learning in Schools Basic, "Educative J. Educator Science., Vol. 2, no. 1, pp. 55–61, 2020, doi: https://doi.org/10.31004/edukatif.v2i1.89.
[5] YD Puspitarini and M. Hanif, "Using Learning Media to Increase Learning Motivation in Elementary School," *Anatol. J. Educ.*, vol. 4, no. 2, pp. 53–60, 2019, doi: 10.29333 / aje.2019.426a.
[6] R. Haryadi, M. Vita, IS Utami, I. Ihsanudin, Y. Setiani, and A. Suherman, "Briquettes production as teaching aids physics for improving science process skills," *J. Phys. Conf. Ser.*, vol. 1157, no. 3, 2019, doi: 10.1088 / 1742-6596 / 1157/3/032006.
[7] T. Suryansah and S. Suwarjo, "Development of Learning Videos to Increase Motivation and Cognitive Learning Outcomes of Class IV Sd Students," *J. Prima Educasia*, vol. 4, no. 2, p. 209, 2016, doi: 10.21831 / jpe.v4i2.8393.
[8] M. Jannah and Julianto, "Development of Digestive System Animated Video Media to Improve Student Learning Outcomes in Class V Science Subjects," *J. Researcher. Educator. School Teacher. Basic*, vol. 6, no. 2, pp. 124–134, 2018.
[9] SG Lee, S. Trimi, and C. Kim, "Innovation and imitation effects' dynamics in technology adoption," *Ind. Manag. Syst data.*, vol. 113, no. 6, pp. 772–799, 2013, doi: 10.1108 / IMDS-02-2013-0065.
[10] LN Amali, N. Zees, and S. Suhada, "Motion Graphic Animation Video As Alternative Learning Media," *Jambura J. Informatics*, vol. 2, no. 1, 2020, doi: 10.37905 / jji.v2i1.4640.
[11] R. Kandakatla, EJ Berger, JF Rhoads, and J. DeBoer, "Student perspectives on the learning resources in an Active, Blended and Collaborative (ABC) pedagogical environment," *Int. J. Eng. Pedagogue.*, vol. 10, no. 2, pp. 7–31, 2020, doi: 10.3991 / ijep.v10i2.11606.
[12] D. Hariyanto and T. Köhler, "A Web-Based Adaptive E-learning Application for Engineering Students: An Expert-Based Evaluation," *Int. J. Eng. Pedagogue.*, vol. 10, no. 2, pp. 60–71, 2020, doi: https://doi.org/10.3991/ijep.v10i2.11834.

[13] PD Wisada, IK Sudarma, and I. wayan Yuda, "Development of Character Education-Oriented Learning Video Media," *J. Educ. Technol.*, Vol. 3, no. 20, pp. 140–146, 2019.

[14] ND Retnowati and MG Rahmawan, "Animated E-Learning Mathematics and Physics for Class I Junior High School Students," *Space J. Ilm. Bid. Technol.*, Vol. 8, no. 2, p. 139, 2017, doi: 10.28989 / space.v8i2.127.

[15] D. Miranda, "Development of Animated Videos Based on the Love of the Homeland Character for Early Childhood," *J. Vision of Educators.*, Vol. 11, no. 2, pp. 12–22, 2019, doi: 10.26418 / jvip.v11i2.32565.

[16] KDYA Palguna, IMG Sunarya, and IM Putrama, "Development of Promotion Media Based on Music and Video Arrangement Profiles of the Department of Information Engineering Education," *Pengembers. Media Promotion Based. Music and Video Arrangement Jur. Educat. Tech. Inform.*, vol. 5, no. 1, pp. 1–10, 2016.

[17] D. Maharani and M. Hotami, "Rendering Video Advertising With Adobe After Effects and Photoshop," *J. Manaj. Inform. and Tech. Comput.*, vol. 2, no. Rendering Video Advertising, pp. 105–111, 2017.

[18] Nurdyansyah, "Developing ICT-Based Learning Model to Improve Learning Outcomes IPA of SD Fish Market in Sidoarjo," *Proc. Int. Res. Clin. Sci. Publ. Educ. Technol.*, vol. 1, no. 2010, pp. 775–781, 2016.

[19] A.. Sobron, Bayu, Rani, and Meidawati, "Students' Perceptions in the Study of the Effect of Online Learning on Science Learning Interest," *SCAFFOLDING J. Educator. Islam and Multiculturalism*, vol. 1, no. 2, pp. 30–38, 2019.

[20] E. Fitriani, S. Suhartono, and I. Mugiarti, "Simulation of 3D molecules using Augmented Reality in chemical bonding topic," *J. Phys. Conf. Ser.*, Vol. 1402, no. 5, 2019, doi: 10.1088 / 1742-6596 / 1402/5/055058.

[21] E. Fitriani, M. Paristiowati, and B. Mukaarromatunnisa, "Titration pre-lab demonstration videos in basic chemistry laboratory activity: Design and development," *J. Phys. Conf. Ser.*, vol. 1402, no. 5, 2019, doi: 10.1088 / 1742-6596 / 1402/5/055047.

[22] K. Basriyah and D. Sulisworo, "Development of Powtoon-Based Animation Videos for Flipped Classroom Learning Models in Materials," *J. Semin. Nas. Edusainstek*, pp. 152–156, 2018.

[23] S. Ainsworth and N. VanLabeke, "Multiple forms of dynamic representation," *Learn. Instr.*, vol. 14, no. 3, pp. 241–255, 2004, doi: 10.1016 / j.learninstruc.2004.06.002.

[24] RK Lowe and JM Boucheix, "Principled animation design improves comprehension of complex dynamics," *Learn. Instr.*, vol. 45, pp. 72–84, 2016, doi: 10.1016 / j.learninstruc.2016.06.005.

[25] RE Mayer and R. Moreno, "Animation as an aid to multimedia learning," *Educ. Psychol. Rev.*, vol. 14, no. 1, pp. 87–99, 2002, doi: 10.1023 / A: 1013184611077.