Improvement of student awareness on cleanliness and environmental health through stop motion video technology

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Abstract. The aim of research to add variety of technology-based learning media for elementary school students and knowing the effect of using Video Stop Motion technology on student awareness about hygiene and environmental health. The Research and Development (R&D) study was used in this research by adapting the ADDIE model (Analysis-Design-Develop-Implement-Evaluate). This research start from analysis step to Implement step from ADDIE model. The object of this research is Video Stop Motion technology while the subject of this research is the first-grade students of SD Labschool UPI Purwakarta Campus. Interviews and oral tests were used to collect the data. Data analysis techniques were carried out by qualitative and quantitative descriptive analysis. The results of the study show that: Stop Motion Video technology can be a technology-based learning media for elementary school students and there is the influence of using Video Stop Motion technology on students’ awareness of hygiene and environmental health.

1. Introduction

Clean living habits must be embedded in efforts to improve health. These efforts can be conducted through several ways, at home and at school. Clean living habits at home starts with washing both hands or cleaning before eating and before going to bed, using footwear when going out and in the restroom and wearing clean clothes. Clean living habits in schools start with coming to school with clean bodies, clothes and footwear that are clean and proper, disposing of garbage in the trash, defecating and urinating in the toilet and after cleaning it when finished. This habit is very appropriate to be implementation as early as possible because these habits will be carried over to adulthood later. Personal health of students needs attention from competent parties [1].

Environmental care is an attitude and action that always seeks to prevent damage to the surrounding natural environment and develop efforts to repair the damage that has occurred. The attitude of caring for the environment is one of the attitudes of the 18 attitudes that must be developed in character education. A caring attitude is also reflected in the graduates’ standards of attitude domains that must be met by students in the 2013 curriculum [2].

A caring attitude is the willingness to act (disposition to react) positively (favorably) or negatively (unfavorably) to certain objects. (Sensitivity to the environment must be owned by every individual because the environment is a place of residence for living things, including humans. In the
environmental education, the learning process leads to form behaviours that care for the environment that are applicable and touch everyday life. The environmental education, is used as a method for habituating daily environmental care behaviours [3].

However, in reality there is a lack of concern for environmental hygiene and health. This is in line with the research data from ministry of health of republic Indonesia. It is known that only 20 percent of the total Indonesian people care about cleanliness and health. This means that, out of 262 million people in Indonesia, only about 52 million people have concern for the cleanliness of the surrounding environment and its impact on health. This shows the need for an effort to increase awareness of the importance of hygiene and environmental health [4].

In this regard, not only the role of the school of unhealthy behaviour also causes more serious problems such as the threat of infectious diseases. If elementary school students (SD) understand the behaviour of a clean and healthy life it is possible to reduce the high rate of disease. So the knowledge that exists in schools needs to be improved by providing opportunities to practice once a week or by deepening material about clean and healthy behaviour [5].

The effort that should be made is to plant character from the outset the character of environmental care as a strong foundation for an individual. The attitude of caring for the environment can be planted based on the school curriculum and programs that have been planned by the school. Efforts to plant character education care for the environment through school curricula and learning processes [1].

Planting character caring for the environment can be done through learning activities in schools. The use of learning media is the right tool to be carried out to convey the character of environmental care. Media that is considered right one of them is Stop Motion video technology. Video is the most meaningful media compared to other media such as graphics, audio and so on. The use of videos in interactive multimedia will provide a new experience. "Video is the technology of capturing, recording, processing, and storing, transferring, and reconstructing the sequence of still images by presenting scenes in motion electronically". Video provides rich and living resources for multimedia applications. Video is a moving image. If the object in the animation is artificial, the object on the video is real [6]. Stop Motion video technology is a technology-based learning media that presents students with interesting and easy-to-understand images of the meaning implied in it. But the content contained in the video is content that discusses environmental hygiene and health in everyday life. Based on learning in grade 1 the theme is a Clean, Healthy and Beautiful Environment. In accordance with the aim of planting the character of environmental care which has an impact on awareness to maintain the cleanliness of environmental health.

Use media such as Stop Motion video technology can provide a good explanation through visualization of subject matter, so that it can be understood by students [7]. This is in line with Rahman’s statement that says the use of Stop Motion video technology can convey a material carefully. Because, made by photographing frem by frem with object animation techniques. This the explanation of subject matter with Stop Motion video technology provides great opportunities for students understanding of the material learned [8].

Stop Motion video technology will motivate students to care about their environment in the form of stimulus in terms of awareness and action. "The attitude of caring for the students' environment can arise when students are invited to learn to care about how to act caring." In other words, inviting students to jump directly into the environment will foster an attitude of caring for students towards the environment. Students will understand that all human behavior that is destructive to nature, will have a bad impact felt by humans themselves, thus students will have a caring and aware attitude towards the surrounding environment [9]

2. Methods
This study used the R & D (Research and Development) approach. The model used in this study is the ADDIE model. The ADDIE model consists of 5 interrelated and systematically structured stages. The ADDIE development model stage consists of five stages including analysis (analysis), design (design), development (development), implementation (implementation) and evaluation (evaluation).
ADDIE development research steps in this study are presented in chart form as shown in Figure 1 [10].

![Figure 1. Steps of the ADDIE Development Model](image)

The first stage in this research is Analysis which consists of an analysis of needs and student characteristics, material analysis, analysis of media makers, and specification analysis. The second stage is Design which consists of making a flowchart, making a storyboard media, composing a question, making background, image, and buttons on the application. The third stage is Development which consists of making stop motion video technology, media validation, and media revisions. The fourth stage is Implementation is the stage of media testing at school. Then the final product is obtained in the form of technology-based learning media.

The study was conducted at SD Lab-school UPI Purwakarta Campus, located at Jalan Veteran No. 8, Purwakarta Indonesia. The time of the study was carried out in May 2019. The research subjects in this development research consisted of 2 media experts, 2 material experts, 12 students in small scale field trials and 25 students in large scale field trials consisting of all first-grade students. Teaching materials provided are Learning 6 Subtheme 4 Working together to Maintain Hygiene and Environmental Health, Theme 6 Clean, Healthy and Beautiful Environment.

Data collection techniques used in this study were interviews and oral tests. Interviews were conducted with homerooms to obtain data on needs in research and development. Oral tests were used to obtain assessment data on the influence of media developed on students' ability to understand hygiene and environmental health in small-scale field trials and large-scale field trials.

Data analysis techniques used in this study were qualitative descriptive analysis and quantitative analysis. Leather descriptive analysis is used to process interview results with learning media experts, learning experts, material experts, homerooms and students. Data analysis techniques are used to group information from qualitative data in the form of responses, criticisms, and suggestions for improvements and product revisions to the development of stop motion video technology. Quantitative descriptive was used to analysis the effect of stop motion video technology on student awareness about hygiene and environmental health.

Quantitative data analysis was carried out on the results of tests conducted individually on the first-grade students of SD Lab-school UPI Purwakarta Campus about student learning in learning 6 subthemes 4 themes 6, as follows:

### Learning Outcomes Data Analysis:

The formula used to calculate the average score obtained from the evaluation results for the determination of the initial score and post-test quiz [11] is as equation 1.

\[
\bar{X} = \frac{\sum x}{N}
\]

Information:
- \(X\) = Average value
- \(\sum x\) = Total score of all students
- \(N\) = Number of students

From the average score data from the above test results, the normalized gain test is then performed to determine the quality of improvement in student learning outcomes. To find out the improvement in student learning outcomes by using the normalized gain formula proposed by Meltzer [12] as shown in Table 1.

\[
N - Gain = \frac{\text{Post Test Score} - \text{Pre Test Score}}{\text{SMI} - \text{Pre Test Score}}
\]
Table 1. Category of Normalized Gain Score [12]

| Gain Score | Interpretation |
|------------|----------------|
| 0.00 < g ≤ 0.30 | Low |
| 0.30 < g ≤ 0.70 | Medium |
| 0.70 < g ≤ 1.00 | High |

To find out the value individual student abilities from each given, the researchers used the formula for students absorption as equation 3 and completeness was scored in Table 2.

\[
\text{Student Absorption (DSS)} = \frac{T}{Tt} \times 100\%
\]

Information:
- DSS = Student learning completeness (Student Absorption)
- T = Number of scores obtained by students
- Tt = Total score

Table 2. Completeness of Individual Student Learning [13]

| Percentage | Completeness of Student Learning |
|------------|---------------------------------|
| 90% ≤ A ≤ 100% | A (Very Good) |
| 75% ≤ B < 90% | B (Good) |
| 55% ≤ C < 75% | C (Enough) |
| 40% ≤ D < 55% | D (Less) |
| 0% ≤ E < 40% | E (Bad) |

To find out the value individual student abilities from each given, the researchers used the formula for Clasical absorption as follows:

\[
\text{Classical Absorption (DSK)} = \frac{\text{Number of students who get a value of } \geq 70}{\text{total number of students}} \times 100\%
\]

The success criteria are determined by the passing limit based on the minimum completeness criteria of 70 determined by each school. Each student is said to have passed if he has achieved a score of ≥70 with 85% classical learning completeness, meaning 85% of the total number of students is considered to have reached the subject matter if it has reached the established Minimum Mastery Criteria. To find out how the influence of the two variables, the Simple Linear Regression Analysis was used with the help of SPSS V.16.0 software for Windows

3. Results and Discussion

3.1 Result

3.1.1 Stop motion video technology is a varied learning media. Based on the results of interviews with 25 students obtained the results that Stop Motion video technology makes students happy and interested in participating in learning activities. This was supported by observations when the learning activities took place and the students seemed focused and conducive when the stop motion video technology was played. The results of interviews with homeroom teachers also showed that Stop Motion video technology became a medium of learning that varied for learning activities that made students conducive and enthusiastic about participating in the learning process.

3.1.2 Stop motion video technology influences student learning outcomes. Based on the results of interviews with 25 students that the use of technology-based media has a good influence on improving student understanding of given teaching material. It was also proven by the results of oral tests which
showed an increase in student learning outcomes in the very good category based on Meltzer. Here's the explanation:

Students' pretest and posttest scores were calculated based on individual learning completeness to find out the number of students who had grades above the Minimum Mastery Criteria. This calculation is based on knowing the achievements of the research. If you look at the Minimum Mastery Criteria for Theme subjects at SD Labschool UPI Purwakarta Campus ≥ 70, students who have a Minimum Mastery Criteria score are students who have a score of 7 and above (Table 3).

**Table 3. Classical Learning Completeness**

| Score   | Value | Pre Test | Post Test |
|---------|-------|----------|-----------|
|         |       | Number of Student | Information | Number of Student | Information |
| <7      | 0-69  | 1        | Not Completed | 0          | -          |
| ≥7      | 70-100| 24       | Completed    | 25         | Completed  |
|         |       | Highest Value 98 | 100 |
|         |       | Lowest Value 68 | 90 |
|         |       | Classical Learning Completeness | 96% | Reached | 100% | Achieved |
|         |       | Total Score 223.25 | 242.5 |
|         |       | Average Score 8.93 | 9.7 |
|         |       | N-Gain 0.77/Highest |

Table 3 shows the completeness of classical learning. The results of the N-Gain calculation show an increase in student learning outcomes in the high category based on the Meltzer constant of 0.77 and all students complete their learning outcomes in a classical manner. This shows that the use of Stop Motion video technology can improve student learning outcomes. Table 4 show the score of some representative students who have high, medium and low grades.

**Table 4. Samples for improving student learning outcomes**

| Student Categories | Pre Test Score | Post Test Score | N-Gain |
|--------------------|----------------|-----------------|--------|
| High               | 9.8            | 10              | 1      |
| Medium             | 8.2            | 9.5             | 0.72   |
| Low                | 6.8            | 9               | 0.69   |

Table 4 shows a sample of increasing student learning outcomes that represent research subjects after using stop motion video technology in teaching and learning activities in learning 6 sub-themes 4 themes 6. Improving student learning outcomes shows significant results and occupies in the high category based on Meltzer constant. To find out how the influence of the two variables, the Simple Linear Regression Analysis was used with the help of SPSS V.16.0 software for Windows and the result shows in Table 5.

**Table 5. Effects of Using Stop Motion Video Technology**

| r   | r² | Influence of Variables | Influence of Other |
|-----|----|------------------------|--------------------|
| 0.810 | 0.655 | 65.5%                  | 34.5%              |

Table 5 shows the effect of using Stop Motion Video Technology (independent variable) of 65.5% which means it is in the high category while other influences are 34.5% which are in the low category. It can be concluded that there is the effect of Stop Motion video technology on student awareness of cleanliness and environmental health.
3.2 Discussion

3.2.1 Stop Motion Video Technology is a technology-based audio-visual learning media using video features as the medium. Stop motion video technology is a videography technique created by a combination of photos. Usually, to create movement, objects are photographed many times while moving. Photos of the movement of many objects and a little bit of this into its own animation. This is what makes a unique stop motion video [14]. The uniqueness of Stop Motion video technology is an attraction for students where the sense of hearing and sense of vision gets a stimulus so that a response arises in the learning process students feel happy, enthusiastic, focused and conducive. Likewise for teachers, conditioning students when learning becomes easy.

3.2.2 Audiovisual media is very effective for improving student learning outcomes. The acquisition of learning outcomes through vision (eyes) and hearing (ears) is a very significant difference. Approximately 90% of individual learning outcomes are obtained through vision and only 5% of hearing and 5% with other senses [10]. Other research shows that learning activities will be more effective and easier if aided by visual means, where 11% of learning is obtained from hearing, while 83% is obtained from vision. Students' memory ability is obtained by 20% of what is heard, and 50% of experience what has been seen and heard [15]. This has become a support for this stop motion video technology that has an effect on improving student learning outcomes.

3.2.3 Student Awareness about Environmental hygiene and health. One of the character values is the character of environmental awareness. The character of environmental awareness is very important for students. Basically, school is a social system where students carry out social interactions with teachers, peers, and the environment. Thus the environment cannot be separated from student activities [15]. In the component of implementing an environment-based curriculum, students are involved in learning activities about environmental protection and management and communicate the results of environmental learning innovations through electronic media, print media and so on. The use of technology-based audiovisual media in this case stop motion video technology is one of the right media. Stimulus in the form of photos and sounds that make students respond to the video content being displayed. The output is students become aware of the importance of health and environmental cleanliness. Then other outputs on the component of participatory environment-based activities, the activities class cleanliness, maintain the park by each class and take action or organizations in the living environment. In addition, students utilize environmental facilities that are provided optimally as a source of learning for the environment, such as land use, school facilities (forests, school garden parks, greenhouses, toga, and biopori) for environmental learning [16].

4. Conclusion

The results of Stop Motion video technology trials in Grade 1 students of SD Labschool UPI Purwakarta Campus can fulfill the objectives to be achieved from this study. Based on the results of qualitative descriptive analysis Stop Motion video technology can be a variety of technology-based learning media for elementary school students. Likewise the results of quantitative descriptive analysis through Stop Motion video technology student learning outcomes obtain a high category, evidenced by the achievement of learning outcomes based on the Meltzer constant of 0.77 and all students declared complete in learning and based on the results of linear regression calculations indicate a high influence of technology use Stop Motion video at 65%. Thus, this shows Stop Motion video technology has an effect on students' awareness of hygiene and environmental health.

5. References

[1] PurbantaraA Purwono E P & RustiadiT 2013 Survei Kebersihan Pribadi Siswa Sekolah Dasar Negeri dalam Wilayah Pedesaan dan Perkotaan di Kabupaten Semarang Tahun Ajaran 2012/2013 Journal of Physical Education, Sport, Health and Recreation 26 368-371
[2] Kementerian Pendidikan Nasional 2010 Panduan Pelaksanaan Pendidikan Karakter Jakarta
[3] AripinI 2017 Pembelajaran Pendidikan Lingkungan Hidup Berorientasi 3R *Reuse, Reduce And Recycle* Untuk Meningkatkan Kreativitas Dan Sikap Peduli Lingkungan. *Jurnal Bio Educatio* 2 1-11

[4] Williams, D.R., Costa, M.V., Odunlami, A.O. and Mohammed, S.A., 2008. Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. *Journal of public health management and practice: JPHMP, 14*(Suppl), p.S8.

[5] Cahyaningrum R 2016 Tingkat Pengetahuan Perilaku Hidup Bersih Sehat (PHBS) Terhadap Kebersihan Pribadi Siswa Kelas IV dan V SD Negeri Kraton Yogyakarta Tahun 2015/2016 PGSD Penjaskes 8 4

[6] Fadhli M 2016 Pengembangan media pembelajaran berbasis video kelas iv sekolah dasar *Jurnal Dimensi Pendidikan dan Pembelajaran* 3 1 24-33

[7] Milkova E 2015 Multimedia application for educational purposes: Development of algorithmic thinking *Applied Computing and Informatics* 11 176-88

[8] Lailatul RRI 2014 Penciptaan Karya Animasi Stop Motion Kobaran Semangat Bung Tomo *Jurnal Seni Rupa* 2 2 129-136

[9] Saptono 2011 *Dimensi-dimensi Pendidikan Karakter* Jakarta: Erlangga

[10] Sugiyono 2015 *Metode Penelitian Kombinasi Mix Methods* Bandung Alfabeta

[11] Hermawan R Mujiono & Suherman A 2007 *Metode Penelitian Pendidikan Sekolah Dasar* Bandung UPI PRES

[12] Natanagara IS 2015 *Penerapan Pendekatan Matematika Realistik untuk Meningkatkan Kemampuan Pemahaman Matematika Siswa Kelas V dalam Pembelajaran Matematika* Skripsi PGSD UPI Kampus Purwakarta.

[13] Mulyasa E 2009 *Implementasi Kurikulum Tingkat Satuan Pendidikan Kemandirian Gurudan Kepala Sekolah* Jakarta: Bumi Aksara

[14] Manovich, L., 2006. Image future. *animation, 1*(1), pp.25-44.

[15] Jatmiko S & Mukmin 2016 Penggunaan Media Audiovisual untuk Meningkatkan Hasil belajar IPS di SMP *Jurnal-jurnal Ilmu Sosial* 151 53-72

[16] Yossinia Rianto S & Setrian L 2016 Kepedulian Siswa dalam Lingkungan sebagai Outcome Program Adiwiyatadi SMAN 14 *Jurnal Pendidikan Geografi* 11-7