

DEVELOPMENT OF SIMULATION APPLICATIONS OF TECHNIQUES FOR IMAGING PICTURES FOR MULTIMEDIA DEPARTMENT IN KUNINGAN 3 STATE VOCATIONAL SCHOOL

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ABSTRACT

The study entitled "Development Of Simulation Applications Of Techniques For Imaging Pictures For Multimedia Department In Kuningan 3 State Vocational School" aims to explain the media for learning shooting techniques. The technique of taking pictures is a way to get images that are in accordance with the types of rules used in general. The technique of taking pictures is one of the basic ingredients that was raised in class X students majoring in multimedia of Kuningan 3 State Vocational School Students to be easier in the material and in the material concepts into practice. This desktop-based application consists of a virtual simulation camera with objects in 3D. In this study there is a flow of research in the first place is to analyze the problem and collect data. Data collection is done by means of literature studies, observations, questionnaires and interviews. Second is the application development, the application development method used is the MDLC from Sutopo which consists of 6 stages, namely: a concept where this stage determines the purpose and who is the application development application, the design stage for making architecture, style, appearance and fuel requirements for the program, collect material anywhere, collect materials that fit the needs of the program, assemblies where all materials or objects are made, testing where this is checking the application whether there is a problem or not and distribution where this is an application for the user. The third or the last channel is testing testing, testing with UAT, and N-Gain testing. After each plot has been done, the results obtained by the students are helped by the construction of a simulation application for shooting techniques.

Keywords: Simulation, 3D, Learning Media, Image Capturing Techniques, Virtual Cameras.

PRELIMINARY

1.1 Background

Kuningan 3 State Vocational School is one of the vocational high schools that has a Multimedia

expertise program. In this multimedia department, grade X students are introduced to audio and video processing engineering lessons where basic material is taught about shooting techniques. Shooting technique is a technique to get images in accordance with the applicable type of shoot rules, such as the angle of shooting (Camera Angle), image size (Frame Size), camera movement (Moving Camera), and object movement (Moving Object). In the picture taking technique lesson, students are expected to be able to understand each of the shooting techniques. The method of giving the material used by the teacher is to deliver the material through a power point slide with one hour of study time used for the material and one lesson time used for practice. In practice hours students are made in groups of 4-5 people and for the practice itself can be done indoors or outdoors. In the technical presentation of material delivered by the teacher through power point slides there are still many students who do not understand the material of the shooting technique, so students are constrained in applying material concepts into practice. The number of students who did not understand in the picture taking technique lesson was one of the problems that existed in Kuningan 3 State Vocational School.

Based on the results of interviews with Mr. Deny Priandana, S.Kom. as a productive Multimedia teacher at Kuningan 3 State Vocational School explained that there were still many students who lacked or under the KKM for individual values (Appendix C-1).

Based on the results of the questionnaire with class X students majoring in multimedia Kuningan 3 State Vocational School many students find it difficult to understand the techniques of drawing techniques. This is due to the large number of students who have never studied shooting techniques before. From the results of interviews with several students, students felt bored and found it difficult to understand the material delivered by the teacher because the material was delivered only through a powerpoint slide. From the results of the questionnaire, around 75 students of 105 students did not understand the lesson in shooting techniques.

Based on the description above, a simulation application will be built to help these problems. This application provides objects in 3D so that this

simulation application can resemble the original environment around. In the research conducted by (Agung Gumelar, 2017) explaining that by applying simulations on learning media can facilitate students in understanding the material. In another study conducted by (Claudia, 2016) explaining that using 3D forms in multimedia learning can help students better understand and can increase grades. So with the implementation of this research, an Development Of Simulation Applications Of Techniques For Imaging Pictures For Multimedia Department In Kuningan 3 State Vocational School will be built.

1.2 Purpose and Objectives

Based on the problems that have been presented, the purpose of making this final project is to build a simulation application for shooting techniques for class X, to assist students in learning shooting techniques.

The objectives of this research are as follows:

1. Helping students to be able to more easily understand the material of shooting techniques.
2. Helping students to be able to more easily apply material concepts into practice.

1.3 Research Methodology

The research methodology is a collection of rules, activities, and procedures used by actors in a scientific discipline. The methodology is a theoretical analysis of a method. Following is the flow of the research methodology used can be seen in Figure 1.

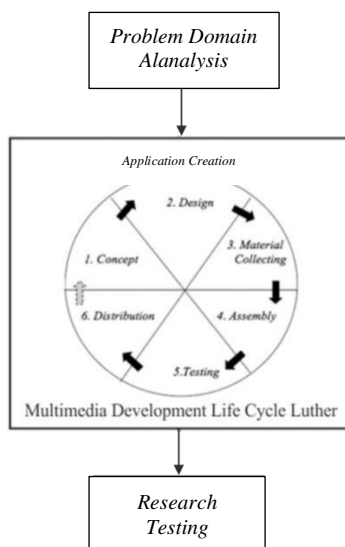


Figure 1 Research Flow

Based on Figure 1, the following is an explanation of the flow of research conducted:

1. Domain Analysis of Problems

Problem domain analysis is the stage for analyzing both the data needed in research and analyzing problems that are in the multimedia department of Kuningan 3 State Vocational School.

The method of data collection in this study was carried out in the following ways:

a. Study of literature

Collect data from sources in the form of books, journals, papers from the library or through internet media related to the research conducted.

b. Questionnaire

Collect data by distributing questionnaires that are in accordance with the research data needed from students who are respondents.

c. Interview

Collect data by asking questions directly to the teacher who teaches the lessons in shooting techniques.

2. Application Creation

The software development method used in making this application is the Multimedia Development Life Cycle (MDLC) method. According to Sutopo the MDLC method has 6 stages, namely:

1. Concept

Stage concept (concept) is the stage to determine the system concept that will be created, determine what functions exist in the simulation application.

2. Design

Design (design) is the stage of making specifications about the architecture of the system to be created, objects, appearance, and material / material requirements.

3. Collecting material

Collecting material is the stage of collecting material that fits the needs of the previous stage, namely design like 3D objects.

4. Assembly

The assembly stage (making) is the stage of merging rather than objects and needs that have been determined in the previous stage and begin to enter the process of making the application.

5. Testing

The testing phase is done after the assembly phase is completed by running the application and see whether the application that has been made has an error or not.

6. Distribution

Distribution phase is the stage where the application is stored in a computer storage media. At this stage the application developed is distributed.

3. Research Testing

At this stage the application that has been built is tested whether it is appropriate and in accordance with the needs based on the research that has been done and collecting student questionnaire data as the user of this application in response to the use of the application.

RESEARCH CONTENT

2.1 Image Capturing Techniques

The shooting technique is a technique to get images in accordance with the type of shoot rules that apply in general. Shooting techniques can be seen

from the area of the frame on an object taken. The techniques contained in shooting are very varied, so the results of taking pictures contained in a film will not make the audience feel bored.

The techniques that exist in shooting are:

1. Camera Angle
2. Image size (Frame Size)
3. Camera movement (Moving Camera)
4. Movement of objects (Moving Object)

2.2 Analysis of the Concept of the System to Be Built

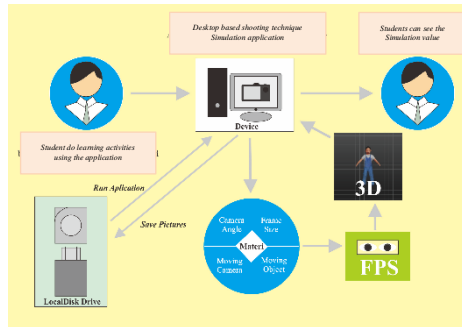


Figure 2. The Sisem Concept That Will Be Built

Analysis of the system concept to be built is a general description of the system to be built. The system is built based on the material taught such as the angle of shooting (Camera Angle), image size (Frame Size), camera movement (Moving Camera), and object movement (Moving Object). The system applies objects in 3D as well as systems that are built using desktop-based FPS (First Person Shooter) mode.

2.3 Material Analysis

Based on the material referring to the 2013 curriculum manual, the following is an analysis of the material in the application of shooting technique simulation.

1. Camera Angle
 - a. Bird eye view, which is taking pictures from a certain height so that it shows a wide environment.
 - b. High angel, which is the angle of shooting right above the object.
 - c. Low angel, which is taking pictures from under the siobjek.
 - d. Eye level, which is taking this image takes an angle parallel to the object's eye.
 - e. Frog eye, that is, the shooting angle is taken parallel to the surface where the object stands.
2. Image size (Frame Size)
 - a. Extreme close up, which is very close to shooting, only displays certain parts of the body of the object.
 - b. Big close up, which is just shooting the head to the chin of the object.
 - c. Close up, that is, the size of the image is limited only from head to neck.
 - d. Medium close up, that is, the images taken are limited from head to chest.

- e. Mid shoot, which is shooting as limited as the head to the waist.
 - f. Knee shoot, which is limited to shooting the head to the knee.
 - g. Full shoot, which is shooting full objects from head to foot.
 - h. Long shoot, which is wider shooting than Full Shoot.
 - i. Extreme long shoot, which is taking pictures beyond the Long Shoot, displays the environment of the object as a whole.
3. Move the Camera (Moving Camera)
 - a. Zooming (In / Out) is the movement of the camera lens that approaches or away from the object.
 - b. Panning (Left / Right) is the movement of a tripod paired with a camera and moved from center to right or from center to left.
 - c. Tilting (Up / Down) is the movement of a tripod that is attached to the camera and moved up and down.
 - d. Dolly (In / Out) is the movement of a tripod that has been given a wheel by pushing the tripod forward or pulling it back and forth.
 - e. Follow, namely taking pictures is done by following objects in moving in the same direction.
 - f. Fading (In / Out) is the change of image slowly.
 - g. Crane Shoot is a camera movement mounted on a wheeled tool and moves on its own with the cameraman, both approaching and away from the object
 4. Move Object (Moving Object)
 - a. The camera is parallel to the object, namely the camera is parallel to the movement of objects, both left and right.
 - b. Walking (In / Out) is an object that moves close to (in) or away from (out) the camera.
 - c. Framing (In / Out) is a movement carried out by an object to enter (in) or out (out) a framing shot.

2.4 Use Case Diagram

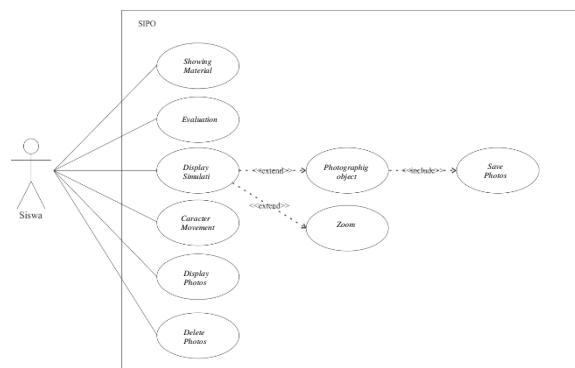


Figure 2. Use Case Diagram

2.5 Testing Scenarios

Test scenarios explain the sequence and the things tested, in the tests carried out on the application

simulation technique of shooting. The test scenarios performed can be seen in table 1.

Table 1. Testing Scenarios

Test Class	Information Test	Type Test
Showing Material	Showing material selected by students	Blackbox
Evaluate	the selection of evaluation answers	Blackbox
Perform an Environmental	Display Simulation	Blackbox
	Character movement	Blackbox
	Zoom	Blackbox
	Photographing objects	Blackbox
	Save photos	Blackbox
	Display photos	Blackbox
	Delete photos	Blackbox

2.6 Testing of Users

In this test using the UAT (User Acceptance Test) method. In testing the backend application the simulation technique of shooting is done by interviewing respondents as users, while frontend testing is done by distributing questionnaires. Based on the results of the interview, for backend application simulation the shooting technique has been running well in functionality and backend appearance

2.6.1 Statement

The following are questions that were asked to the respondents in conducting an application testing simulation of shooting techniques. The question of testing the simulation application for shooting techniques can be seen in table 2.

Table 2. Statement

No	Question
1	Is the appearance of this application interesting?
2	Has this application described the shooting technique material?
3	Is this application easy to use?
4	Does this application make it easy for you to understand the shooting technique material?
5	Is the navigation or button in this application easy to understand?

2.6.2 Test Results

The results of the questionnaire filled out by the respondents will provide answers to the research objectives. The test results can be seen in table 3.

Table 3. Test Results

Respondent	Question					Scorer
	1	2	3	4	5	
1	5	4	4	5	4	22
2	4	5	5	4	4	22
3	4	5	5	4	3	21
4	3	4	5	4	3	19
5	5	5	5	5	3	23
6	5	5	4	4	3	21
7	4	5	5	5	3	22
8	5	5	4	5	3	22
9	4	5	5	5	5	24
10	4	5	5	5	5	24
11	4	5	5	4	5	23
12	4	3	5	5	5	22
13	4	4	5	5	4	22
14	4	4	5	5	4	22
15	4	4	5	5	4	22
16	4	4	5	5	5	23
17	4	5	5	5	5	24
18	4	4	5	5	4	22
19	5	5	4	4	4	22
20	5	5	4	4	3	21
21	5	5	4	4	3	21
22	5	5	4	5	4	23
23	4	5	5	4	5	23
24	4	4	5	4	5	22
25	5	4	5	5	5	24
26	4	4	5	4	4	21
27	3	4	5	5	4	21
28	5	5	4	5	5	24
29	4	4	5	5	5	23
30	5	5	4	5	4	23
31	5	5	4	4	3	21
32	4	4	5	4	5	22
33	4	4	5	4	5	22
34	5	5	4	5	3	22
35	4	5	5	5	5	24
Total Skor						756

Based on the total score obtained from the results of the questionnaire to 35 respondents, the total score was 756. Based on the attitude categories that had been calculated previously, the score of 756 was included in the category of positive attitudes.

2.6.3 N-Gain Testing

N-gain is a way to do statistical tests on the data from the pre test, and post test. N-gain calculation is obtained from the pre test and post test scores. Calculation of competencies that occur before and after learning, can be calculated with the following N-gain formula.

$$n - \text{Gain} = \frac{\text{posttest value} - \text{pretest value}}{\text{maximum value} - \text{pretest value}}$$

While for the category can use the normalized Gain index interpretation (g) according to the modified Hake can be seen in table 4.

Table 4. N-gain score categories

N-Gain Score	Interpretation
$-1,00 < g < 0,00$	Decrease
$g = 0,00$	Stable
$0,00 < g < 0,30$	Low
$0,30 < g < 0,70$	Average
$0,70 < g < 1,00$	High

In doing the N-Gain test, the pretest is done by giving written questions to students. Then for the next meetings in learning shooting techniques, students learn with the help of the application until a predetermined time limit or approaching the school exam. The last meeting of learning with the help of the application will be posttest, students will work on the questions contained in the application to get the results of the posttest. The results of calculations from the pretest and posttest can be seen in table 5.

Table 5. N-gain test results

Student	Value		N-Gain Score
	Pretest	Posttest	
1	80	95	0,75
2	80	95	0,75
3	80	100	1,00
4	70	90	0,67
5	70	90	0,67
6	80	85	0,25
7	70	90	0,67
8	80	95	0,75
9	70	100	1,00
10	80	95	0,75
11	70	100	1,00
12	70	100	1,00
13	80	100	1,00
14	60	85	0,63
15	70	100	1,00
16	80	100	1,00
17	60	100	1,00
18	80	90	0,50
19	70	95	0,83
20	80	100	1,00
21	80	95	0,75
22	70	100	1,00
23	80	90	0,50
24	80	85	0,25
25	80	85	0,25
26	80	95	0,75
27	90	95	0,50
28	80	90	0,50
29	90	90	0,00
30	70	100	1,00
31	80	90	0,50
32	90	95	0,50

33	60	95	0,88
34	80	100	1,00
35	70	100	1,00

Based on the above table in testing with the doing of pretest and posttest which then performed N-Gain calculations and comparisons, it can be concluded that there was a significant increase in students in the material of shooting techniques.

COVER

3.1 Conclusions

Based on the results of the implementation and testing that has been carried out, the conclusion of the final assignment entitled "Development of Application Simulation of Image Capturing Techniques for Multimedia Programs at SMK Negeri 3 Kuningan" is as follows:

1. This simulation application shooting technique can help students make it easier to understand the material.
2. This simulation application shooting technique application can help students make it easier to apply material concepts into practice.

3.2 Suggestions

In the development of Application for Image Capturing Simulation Techniques for Multimedia Department at Kuningan 3 State Vocational School there are still many shortcomings, therefore it is necessary to do some development to make this application better. The suggestions from the author are as follows:

1. This application can be added to the flow of simulation for each shooting technique.
2. This application can be added manually focus / features on the camera.
3. Photo gallery added information on shooting techniques on each photo.
4. The application can record in the form of video.

REFERENCES

- [1] Munir, MULTIMEDIA Konsep & Aplikasi dalam Pendidikan, BANDUNG: Alfabeta, CV., 2012.
- [2] Fahaludin, Iwan, "Pemanfaatan Media dalam Pembelajaran", vol.1, pp. 104-107, Des, 2014.
- [3] D, N, Bonafix (2011) Videografi Kamera Dan Teknik Pengambilan Gambar [online].Tersedia:<http://journal.binus.ac.id/index.php/Humaniora/article/download/4015/3172> [Diakses 11 September 2018].
- [4] L. J. Claudia, "Pengembangan media pembelajaran perakitan komputer berbasis multimedia 3D pada mata pelajaran perakitan komputer untuk siswa kelas X Jurusan TKJ DI SMK NEGERI 1 PACITAN", Komputer dan Informatika, no. 8, pp. 14-22, 2016.

- [5] Gumelar, Agung, “Pengembangan Virtual Bengkel Praktikum Perbaikan Dan Perawatan Mesin Kapal Pada Jurusan TKN Kelas XI (Study Kasus Di SMK N 2 Subang”.
- [6] A. H. Sutopo, Teknologi Informasi dan Komunikasi dala Pendidikan, Yogyakarta: Graha Ilmu, 2012.
- [7] Elias, Herlander, First Person Shooter: The Subjective Cyberspace, Covilha : LabCom Books, 2009.
- [8] Husnun, Aini Nur (2014) Teknik Pengambilan Gambar dalam Film Pendek yang berjudul "MANUSIA KOPI" [online]. Tersedia:<http://eprints.dinus.ac.id/id/eprint/12966> [Diakses 13 September 2018].
- [9] Widiastuti, Nelly Indriani, and Refi Meisadri. "PEMBANGUNAN GAME FIRST PERSON SHOOTER 3D ALIEN HUNTER." Komputa: Jurnal Ilmiah Komputer dan Informatika 2.1 (2015).
- [10] Mustika, E. Prasetya, A. Sugara, M. Pratiwi, “Metode Multimedia Deploiment Life Cycle (MDLC),” Palembang: Politeknik palcomtech Palembang, 2017.