MULTIMEDIA APPLICATION DEVELOPMENT AS A MEDIA OF WELDING LEARNING FOR STUDENT OF CLASS X

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ABSTRACT

Welding is the one of subjects are on expertise package in SMKN 2 Bandung. The learning process committed by communicating theory and lab work. In the classroom, students are asked to listen and understand well the subject matter which is presented by the teacher. In the process of students evaluation, the teacher should prepare sheets of questions first. While at the time of practical activities in the workshop progresses, the students practice in accordance with the subject matter already taught earlier in the class.

As much as 73,34% of students have difficulty in understanding of the welding course. By applying learning media-assisted computer-based multimedia is expected to facilitate students in understanding the course and also have an illustration of the welding course. With the simulation through the multimedia application as a learning medium for welding, it will facilitate teachers in providing an overview of the welding course and help to provide learning evaluation.

Based on the results of research and testing that have been done, the multimedia application as a learning medium for welding to class X is obtained conclusion that the application was built to facilitate students in understanding the welding course. This application can also facilitate the teachers in delivering the lessons and help to provide learning evaluation for students.

Keywords: Welding, Media of learning, Multimedia, simulation, SMKN 2 Bandung

1. INTRODUCTION

Welding is the one of subjects are on expertise package in SMKN 2 Bandung. The learning process committed by communicating theory and lab work. In the classroom, students are asked to listen and understand well the subject matter which is presented by the teacher. Based on the initial results of the data collection questionnaire toward students of class X in SMK N 2 Bandung in mechanical engineering courses which have difficulty in understanding the welding material reaching 73.34%. Based on the results of the interview to Mr. Saepudin Zuhri, s. Pd as the teacher the teaches welding, material difficulties faced is in the process of granting material just explain the theories in the book with the media write and dipapan difficulty in giving an overview on the material being studied as in when kickstart las techniques and tools are used. In addition to that of the teacher in will do the evaluation of the students have to prepare everything as preparing sheets-sheet problem. At the time the activity is also not practical can be performed in accordance with planned because the existing facilities in the workshop limited, then any students taking turns to do practical work activities not carried out simultaneously because the props are limited and time is inadequate. Therefore, students often getting in trouble while doing welding lab course activities as well as the difficulties teachers gives an overview to the students when to introduce welding equipment and welding techniques. Because the presence of the media learning as a tool to understand welding material.

By utilizing multimedia learning as an interactive media is expected to be an additional media in the learning process so that the delivery of the material and the simulation becomes more interesting and easy to understand. Interactive multimedia or other means of communication is to convey information using a computer through a media text, image, audio, animation, and videos are interacting and integrate so that form a more interesting information.

Based on problems that have been outlined required a method-based interactive learning simulations that can make it easier for students to have a picture or illustration is more clearly on the welding process with a more interesting with media-based desktop in hopes the students more easily absorb the knowledge so as to improve understanding. It can also be expected to facilitate teachers in delivering learning, provides an overview to the students as well as facilitates teachers in delivering the evaluation to students. Then carried out research entitled "Multimedia Application Development As Learning To Welding Students Class X (case study at SMK N 2 Bandung)".

1.1 Pengelasan

Welding in General is a way to connect the metal using heat. The heat energy in the process of welding is required to heat the liquid until the weld material/melting so that the connected welding materials with or without welding wire as filler material. Because certain welding condition does not require a filler material on welding processes [8].

1.2 Computer Assisted Instruction

Computer Assisted Instruction is the development of a technology information packed with multimedia. Use of computers in Computer Assisted Instruction related to students as well as educators. CAI can be used as a medium of teaching and training in studying disciplines. As for the format of the presence in the CAI as follows:

1. ***Tutorial***
   Delivery of material made in the tutorial as teachers are presented with text, images, animation, and sound.
2. ***Simulation***
   Delivering process simulation for real without incurring risks.
3. ***Dril and Practice***
   Provides a set of reserved or questions that are randomly displayed via software. So that the user can perform the exercises of a matter that has been provided

1.3 Multimedia

Multimedia Fusion is a form of media in the creation of computer programs in the form of elements of information such as text, images, sounds, animations and videos. Here is the explanation.

1. **Text**

Text is an element commonly used data delivery when compared to other elements. The text serves as a complement of a picture. If a picture is not equipped with text or a few words it would be difficult to understand and the picture will be less interesting to look at. the following is a text that can be seen in Figure 1.

.



Figure 1. Text

2. **Figure**

The image is an element of submission of data which is capable of representing the message in text form. The image is an important part in multimedia. With an image, a message can be expressed more easily and beautifully. The following is a picture that can be seen in Figure 2.

.



Figure 2. Image

3. **Sound**

The voice is the element of the submission of the data that users can obtain information by using the sense of hearing. In multimedia, sound technology has a role in the delivery of a message. The following is a picture of a sound or audio that can be seen in Figure 3.



Figure 3. Audio

1.4 Simulation

Simulation is a method of training that is indicative of a situation with a real state. In a study using simulation methods, user built capabilities related to skills in bernteraksi and communicate in groups. Simulation is the Act of using a real model continued with the experimentation against a model to study the system. Simulation can also approximate a decision taken, however, still have to note where and when this simulation can be applied.

2. RESEARCH CONTENT

2.1 Description of the system

Applications that are built to have two users namely teachers (admin) as a data manager and students (users) as the application user has different access rights. Therefore, the security mechanisms such as the login is done differently. This mechanism is used to verify access rights admin and user applications. On the application of multimedia-based desktops created built.

On the application of the student-built learning basic material about welding is presented using visual information by combining several components such as text, images, video, sound, and simulation. On simulated students given illustrations of basic welding with a welding line makes on the workpiece using a 3D animation that makes the simulation becomes more interesting. Once students understand the material and illustrations of the simulations carried out evaluations and exercises by providing multiple choice questions that have to be carried out by students. The given question is material and simulation of welding has been studied previously. Students are obliged to understand the material and the simulation. If the evaluation and exercise has been

carried out, the application will provide a response in the form of the answer to question the value of the results of the evaluation. the following is a general architecture of the system being built.

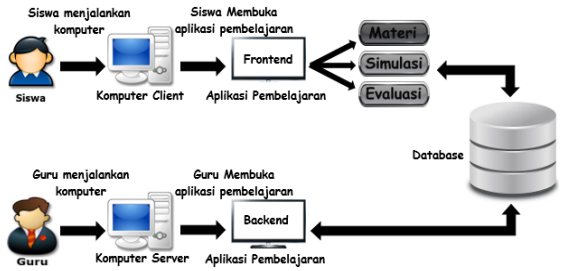


Figure 4. Common Application Architecture

2.2 Description of the Concept of Applications Built

Application of multimedia as a medium of learning welding Students Class X in SMKN 2 Bandung is an application used to facilitate teachers in providing material and illustrations are delivered. This is a concept from an application that is built can be seen in table 1 below.

Table 1. The description of the concept of Applications built

Item Build	Description
Judul	Multimedia application development as a medium of instruction for the students classes X welding in SMK N 2 Bandung
User	Teacher pengampu subjects and class X students majoring in Machine Techniques SMKN 2 Bandung
Audio	The audio contains about backsound animations that are built and instruments
Animation	Animation in applications built using 3D animation
Interactive	The interaction between the user and the application is built with reading material, conduct simulations, and conduct evaluations and exercises

to produce a multimedia application to use visual media to deliver the message information. Here's a visual concept of multimedia learning applications are built.

1. Screen Format

Applications that are built are designed with screen size 800 x 600 pixels. The following is a screen size format pictures can be seen in Figure 5.

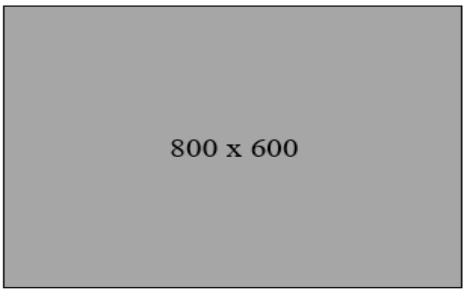
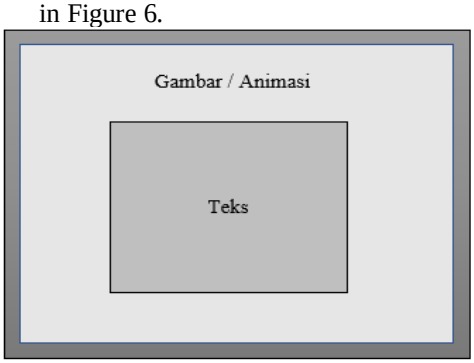


Figure 5. Screen Size

2. Layout

The layout is setting the position of the elements of the application such as images, animation, text so that the material contained in the application can be carried out well. The following is a picture of the layout can be seen in Figure 6.



Gambar 4. Layout

3. Color

Color is an important element in multimedia. the colors used in this multimedia application using pastel colors. The following is a pastel colors that can be seen in Figure 7.

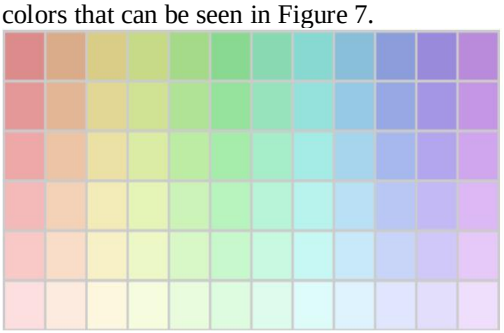


Figure 7. Pastel Colors

2.3 Implementation Of Interface

implementation of the interface is the display of each page in the application is built and shaped his coding program files. The following is an implementation of the interface to the students.

2.3.1 Implementation Of Interface Main Page



Figure 8. Interface Main Page

2.3.2 Implementation Of Interface Material Options



Figure 9. Material Selection Interface

2.3.3 Implementation of Interface Material

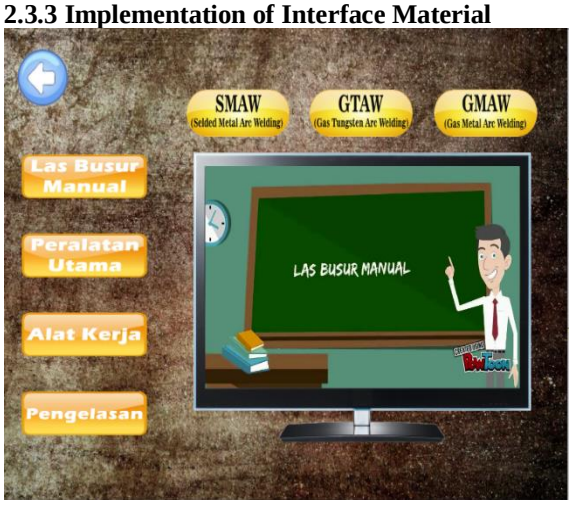


Figure 10. The Interface Of The Welding Material

2.3.4 Implementation Of Interface Simulation Options



Figure 5. Simulation Interface Option

2.3.5 The Welding Simulation Interface Implementation

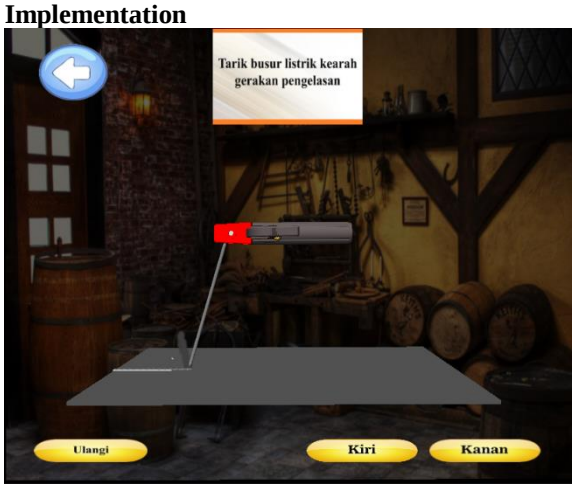


Figure 12. The Welding Simulation Interface

2.3.6 Multiple Choice Exercise Interface Implementation

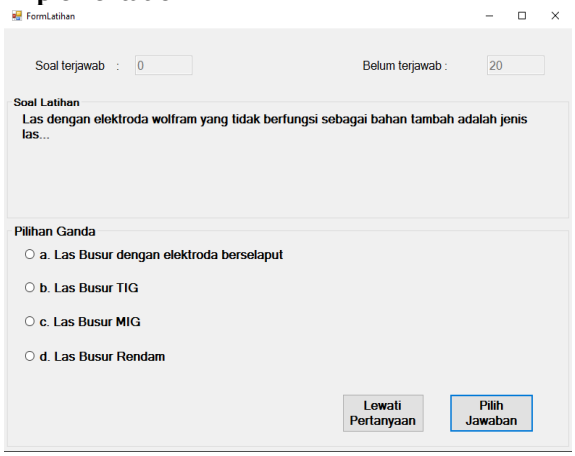


Figure 13. Multiple Choice Exercise Interface

2.3.7 Student Login Form Interface Implementation



Figure 14. Student Login Form Interface

2.3.8 the implementation Interfaces multiple choice Evaluation



Figure 15. Multiple Choice Evaluation Of Interface

2.4 Testing

Software testing phases; to find flaws or errors in the device that was tested. The purpose of doing the testing is to determine whether the software is built in accordance with the original purpose of the building of the application. Software testing media learning welding consists of alpha testing (blackbox) and beta testing.

2.4.1 Pengujian Alpha (*Black Box*)

Pengujian alpha dilakukan dengan cara menguji kesesuaian fungsional yang terdapat didalam aplikasi yang diuji. Pengujian alpha terdiri dari skenario pengujian aplikasi, kasus, hasil pengujian aplikasi dan kesimpulan pengujian.

2.4.1.1 Alpha testing (Black Box)

Alpha testing is done by means of functional suitability test contained in the application being tested. Consists of alpha testing application testing scenario, cases, application testing results and the conclusion of testing.

Table 1. Scenario Testing

No	Class Test	Test	Types Test
1	Login	Identity verification of the students	*Black box*

2.4.1.2 Cases and test results

This is a case for testing software already built using the method based on the blackbox table 2 that has been previously made.

Table 2. The case of the test results and Student Login

Cases and test results (Data)			
Input Data	**The Expected**	**Observation**	**Conclusion**
Sample input NIP: 101 Password:	the password belonging to the main page of the admin in the admin main page	the password belonging to the main page of the admin in the admin main page	[√] Received [ ] Rejected
Cases and test results (Data)			
Input Data	**The Expected**	**Observation**	**Conclusion**
Sample input NIP: 101 Password: admin	message appears "NIP or Password wrong" message appears "	message appears "NIP or Password wrong" message appears "	[√] Received [ ] Rejected
Cases and test results (NIP)			
Input Data	**The Expected**	**Observation**	**Conclusion**
Sample input NIP: Password: password	Message appears "enter your Password" message appears "enter your Password"	Message appears "enter your Password" message appears "enter your Password"	[√] Received [ ] Rejected
Cases and test results (Empty Password)			
Input Data	**The Expected**	**Observation**	**Conclusion**
Contoh masukan NIP : 101 Password :	Muncul Pesan “Masukkan Password Anda”	Muncul Pesan “Masukkan Password Anda”	[√] Received [ ] Rejected

Cases and test results (Empty Data)			
Input Data	**The Expected**	**Observation**	**Conclusion**
Contoh masukan NIS : Password :	Message appears"content of NIP and Password with complete" message appears "Please enter the NIP and Password"	Message appears "content of NIP and Password with complete" message appears "Please enter the NIP and Password"	[√] Received [ ] Rejected

2.4.1.3 Conclusion of testing System

Based on the results of testing a black box has done with cases that were tested, then it can be inferred that the functional application of multimedia in learning welding has been running well as expected.

2.4.2 Beta Testing

Beta testing is the testing that was done objectively. the dilakuka beta test for regarding the satisfaction of users with user friendly terms point to further distribute to users. Beta testing is done by giving the format of questionnaires on user and interviews with prospective teachers.

2.4.2.1 Interview

The interview was conducted on users who have admin user types (teacher). As for the results of the interviews have been conducted with Mr. Saepudin Zuhri s. Pd, as the prospective users of the admin user. The following is a table of questions and answers interviews with teachers can be seen in table 4.

Table 3. Interview with Teacher

No	Questions and Answer
1	**Answer:** Before the implementation of multimedia learning applications welding why teachers feel difficulty in delivery of the subject matter?
	Questions: Before this application implementation a teacher feel difficulty in granting material because it is only through the medium of the Board. the absence of the media in providing illustration of lessons so that students understand the lesson.
2	**Question:** Before his application is implemented in the teachers feel difficulty in granting material because it is only through the medium of the Board. the absence of the media in providing illustration of lessons so that students understand the lesson.
	Answer: With the multimedia application is very helpful learning teachers in delivering the material and provide illustrations relating to material about welding and better yet was also made to other subjects.
3	**Question:** How did the teacher associated with welding learning multimedia application interface?
	Answer: The look of the application is already nice and easy to understand.
4	**Question:** How did the teacher related material that is loaded in the application of multimedia learning welding?
	Answer: Material contained in the application is in compliance with the taught and is pretty good in delivery due to be shown in the form of video animations.
5	Question: How did the teacher related simulations that are loaded in the application of multimedia learning welding?
	Answer: Its nice, simulation can help teachers deliver the material due to the use of 3D simulation in describing and it works
6	Question: How did the teacher about granting student evaluations, process data, and value?
	Answer: Very helpful as it does not need to prepare a sheet-sheet problem, although initially the difficulties in its use due to the unfamiliar process data reserved and value students use application but long has begun to be understood.
7	Question: How did the teacher about the enthusiastic students learn welding material using multimedia applications?
	Answer: Yes, students are enthusiastic because of the new media in helping them understand the lessons of welding.
8	Answer: What about the value of students? is there any improvement?
	Answer: There is little value to increase, perhaps because enthusiastic students learn welding using multimedia applications.

Based on the results of the interviews with the teachers, can be summed up this learning applications can facilitate teachers in teaching activities, because the material is appropriate, look interesting, and can make it easier for students to understand the material welding as well as facilitate teachers in delivering the evaluation.

2.4.2.2 Questionnaire

A questionnaire given to 31 students of the class as a user of the software to be built. Here is a question posed to the students can be seen in table

Tabel 4. Pertanyaan

No	Questions	SS	S	CS	TS	STS
6	With the multimedia application of learning enables you to learn welding subjects					

To gauge the attitude of the user applications built using the likert scale tela. Likert scale is a scale used to measure the attitude, the opinion of a person or group about events or social symptoms that have been specifically defined by the researchers in the study variables refer to. With likert scale, then the variable will be elaborated indicators measured variables. Then the indicators serve as a starting point to structure the measurement items instruments which can be either a statement or a question that needs to be answered by the respondent [10]. the following is a weighted assessment of which can be seen in table 6.

Weight rating:

Table 6. Weight Rating

Answer	Point Assessment
Strongly Agree (SS)	5
Agree (S)	4
Quite Agree (CS)	3
Disagree (TS)	2
Strongly Disagree (STS)	1

To find out the number of answers from the users of the software via a percentage, that is used as follows:

$$P = \frac{S}{Skor\ Ideal}\ x\ 100\%$$

P : The percentage of the values sought
S : The Number Of Frequency
Skor Ideal : Highest Value

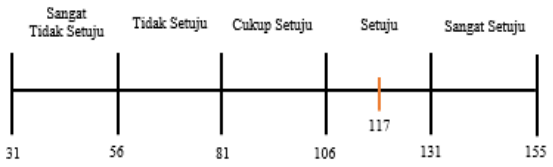
To find out the frequency based on the class is as follows:

Table 5. Frequency Table

Answer	Score
Strongly Agree (SS)	131 – 155
Agree (S)	106 – 130
Quite Agree (CS)	81 – 105
Disagree (TS)	56 – 80
Strongly Disagree (STS)	31 – 55

Following is the result of an answer already computed value with the formula that has been described.

QUESTIONS AND TEST RESULTS					
Question No. 6	With the multimedia application of learning enables you to learn welding subjects?				
Category Answers	SS	S	CS	TS	STS
Respondents	4	16	11	0	0
Sample	31	31	31	31	31
Jumlah	(4x5) + (16x4) + (11x3) + (1x2) + (0X1) = 117				
The Results	(117/155) x 100 = 75,48%				



Based on the results of testing a questionnaire that can be seen in table 4.33, got 75.48% 117 percentage score on the status of the answers agree that it can be concluded that the existence of this learning multimedia application making the students more easily understand and learn the material welding.

3. CLOSING

Based on the results of implementation and testing has been done on a thesis entitled "the development of Multimedia Applications as a medium of instruction for the students Classes X Welding in SMK N 2 Bandung", then the inferred.

1. This application can facilitate students in learning welding material.
2. This application can help teachers in the delivery of the material and a picture or illustration related to the welding material.
3. These applications can assist teachers in delivering the evaluation.

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