

# Development of Interactive Learning Media Projection of Working Drawing on Students of Class X TKR in SMK Markus 2 Medan

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**Abstract-** his study aims to produce an Interactive learning media using a decent macromedia flash application, effective use, easy to learn and can be used individually .This type of research is a development research using Borg and Gall product development model combined with the learning model of dick and carry. This learning product development model is an ang model systematically arranged and meets the characteristics of students in learning. however, the process of making this product includes the following stages: Literature study, planning, development, product development, expert validation of materials experts, media specialists and instructional design experts, revisions, individual trials, after the results of individual trials product revision, after the next revision small group trial and 35 students in SMK markus 2 Medan. data quality (Feasibility) product collected by questionnaire, which will be analyzed with qualitative descriptive data analysis technique. The results of the study showed From the effectiveness of the use of Macromedia Flash media more Effective than using textbook learning media, interctive media using macromedia Flash has to 85,8% more effective than the effectiveness of using textbook learning media. where the graduation rate of students using interactive media macromedia flash is in the number 33 people, while the graduation rate on students who use textbooks only about 23 people.

**Keywords:** *Interactive Media, Macromedia Flash, Projected Work Image*

## I. INTRODUCTION

Education is a conscious effort that is deliberately (controlled, planned consciously and systematically) given to students by educators so that students can develop and be directed to specific goals. Education is also a process of individual development and personality of a person that is carried out consciously and responsibility to improve knowledge, skills and attitudes and values so that they can adjust to their environment.

Sutrisno (2014: 4) said "education can be interpreted as an activity that takes place in certain situations involving the feelings, mental, social, intellectual and motoric of students who in this context are adults who come into contact with technology".

As part of the National Education system, Vocational High Schools (SMK) is one of the educational institutions that aims

to prepare graduates to become workers who have intermediate level knowledge and skills in accordance with a particular field, adaptability in the work environment, see employment opportunities and develop themselves at a later time. To achieve this goal, the development of students who will enter the community must be carried out as optimally as possible, both in the areas of adaptive, normative and productive.

SMK Markus 2 Medan is one of the Private Vocational Schools in the city of Medan that has several expertise programs. One of these expertise programs is Light Vehicle Engineering. Learning at SMK for Light Vehicle Engineering expertise programs requires sufficient theoretical knowledge, accompanied by practical knowledge that is easy to understand. One of the vocational competencies needed by vocational school graduates in the world of work is technical drawing. The picture can be said as a technical language, therefore it is expected that the image must pass on the information accurately and objectively (Sato, 2005: 1), so that understanding of an object in a technical drawing must be correct.

Based on a survey conducted by the author at SMK Markus 2 Medan with a productive subject teacher Mr. M. Simanjuntak, S.Pd, by showing a list of semester X student examination results on technical drawing subjects for the 2013/2014 school year. Class X students of SMK Markus 2 Medan totaled 31 people with KKM (minimum completeness criteria) 70. Gained 60-70 as much as 80.64% (25 people), 71-80 as much as 19.36% (6 people), while the total students who meet the KKM score are only 14 people.

This shows that the students' passing grade is still less than 50%. This is supported by the observations of researchers on Drawing Technique learning activities conducted at SMK Markus 2 Medan found that the tendency of teachers to teach technical drawing subjects in providing an understanding of the concept, is always done through a single delivery technique, so students are less passionate and not so enthusiastic when learning take place so that it affects the value of learning outcomes of technical drawing subjects with the provisions of the existing competency standards.

Based on the above statement can show that interactive media can be a solution in improving student learning outcomes. One of the media that can be used to assist learning activities is Macromedia Flash 8. Macromedia Flash 8

software is one software that can be used to create learning media in the form of presentations, making animation and inserting multimedia in the form of images and sounds with ease in operation. With the development of media using Macromedia Flash 8 software, it will be easier for the teacher to explain the subject matter. The development of flash drawing technique learning media conducted by focusing on the basic competencies of Presenting and Integrating Projected Image Projections.

Based on the background described above, it can identify several problems that occur, namely:

1. Student learning outcomes are still low.
2. Learning technical drawings is still conveyed by way of lectures and only utilizes print media in the form of power points.
3. Conventional learning is more likely to be boring and less interactive and communicative in transferring knowledge.
4. Many students have difficulty understanding the technical drawing lesson material.

## II. REVIEW OF THE LITERATURE

### A. Interactive Learning Media Definition

The word media comes from Latin and is a plural form of "medium" which literally means intermediary or introduction. There are many restrictions that people give about the media. Educational Technology and Communication Association / AECT) in America, restricts the media as all forms and channels that people use to distribute messages / information. Gagne (Sadiman, 2009: 6) states that media are various types of components in the student environment that can stimulate them to learn. Briggs (Sadiman, 2009: 6) argues that media are all physical devices that can present messages and stimulate students to learn.

### B. Media Functions in Drawing Learning Techniques

At first the media only functioned as a visual aid in learning activities, namely in the form of means that can provide visual experiences to students, among others, to encourage learning motivation, clarify and facilitate complex and abstract concepts to be simpler, concrete, and easy to understand. Thus, according to Miarso (1986: 49) the media can function to enhance the absorption or retention of students' learning of learning material.

### C. Learning System with Learning Media

According to Gagne & Briggs (1979: 3) what is meant by instructional activities or learning is "affect learners' events in such a way that learning is facilitated". Instructional activities or learning are a series of events that affect students or learners in such a way that changes in learning outcomes are facilitated. Learning implies that a series of learning activities are designed first so that they are directed towards achieving the expected behavioral changes. The series of activities carried out by students with or without teaching facilities. The learning that is carried out by the facilitator can be called teaching as there is on a regular face-to-face education institution or done by the students themselves without the presence of a teacher as is done in a distance education institution

## III. METHODOLOGY

This research was conducted at SMK Markus 2 Medan located at Jln. Development No. 4 Helvetia Timur sub-district, Medan Helvetia District, North Sumatra for class X students of the Lightweight Vehicle Engineering Expertise Program for even semester 2017 - 2018 in February - March.

This type of research is research and development (R and D) which means this research is product-oriented research. The product developed in this study is learning media. Borg and Gall (1983: 772) stated that "educational research and development (R and D) processes are used to develop and validate educational products." Development research is a process used to develop and validate educational products.

The steps in this research are as follows:

1. Conduct Preliminary Research
2. Making software design,
3. Material collection consisting
4. Develop and create interactive learning media.
5. Review and trial of products.
6. Product Effectiveness Test.

### Data Analysis Technique

Data analysis in this study uses quantitative descriptive analysis. All collected data were analyzed using descriptive statistical techniques which were quantitatively separated according to the categories to sharpen the assessment in drawing conclusions. Qualitative data in the form of questions are not very good, not good, moderate, good, and very well converted into quantitative data on a scale of 1 to 5. The results are averaged and used to be a value with five scales using Linkert scale analyzed descriptively percentage with the following formula

$$\text{Percentage score} = \frac{\text{Number Of Indicators per category}}{\text{Number Of total Category Indicators}} \times 100\%$$

With the assessment criteria as written in the following table.

TABLE 1. Percentage Criteria for Indicators in Learning Media Projected Image Projection Material

Percentage	Criteria	Value
A	Very Good	$80\% \leq x \leq 100\%$
B	Good	$60\% \leq x < 80\%$
C	Medium	$40\% \leq x < 60\%$
D	Poor	$20\% \leq x < 40\%$
E	Veri Poor	$0\% \leq x < 20\%$

Description: X = empirical score

### 1. Average Score

to determine the average value formula can be used:

$$\bar{x} = \frac{\sum x_1}{n}$$

where:  $\bar{x}$  = Calculate Average

$$\sum x_1 = \text{The sum of all prices } x$$

$$n = \text{Number of Samples}$$

2. Standard Deviation

To determine the standard deviation, the formula is used:

$$s = \sqrt{\frac{\sum (x_1 - x_2)^2}{n - 1}}$$

Where s = Standard deviation

$x_i$  = Price of Data i

n = Number of Samples

3. Normality Test

Data normality Union uses the Liliefors technique Money steps used are as follows:

Learning outcome data,  $x_1, x_2 \dots x_n$  made as standard

numbers,  $z_1, z_2 \dots z_n$  by using the formula:

$$Z_i = \frac{x_i - \bar{x}}{s}$$

IV. RESEARCH and CONCLUSION

TABLE 2. Summary of Assessment of Interactive Learning Media for Drawing Technical Learning in Individual Trials

No	Aspect Assessment	Average	Criteria
1	Display	90%	Very Good
2	Presention	91%	Very Good
3	Benefits	95%	Very Good
Average		92%	Very Good

TABLE 3. Summary of Assessment of Interactive Learning Media Learning Drawing Techniques in Small Group Trials

No	Aspect Assessment	Average	Criteria
1	Display	88%	Very Good
2	Presention	87%	Very Good
3	Benefits	89%	Very Good
Average		88%	Very Good

TABLE 4. Summary of Assessment of Interactive Learning Media Learning Drawing Technique in Field Trials

No	Aspect Assessment	Average	Criteria
1	Display	82%	Very Good
2	Presention	80%	Very Good
3	Benefits	81%	Very Good
Average		81%	Very Good

1. Data Analysis Results of Evaluation of material expert

The material expert assessed the interactive learning media Drawing Technique learning based on three aspects, namely the aspect of media display, aspects of material presentation, aspects of learning media content based on the table above shows that the average percentage score

results were 90% for aspects of the learning media display, 84% for aspects of material presentation, 84% for aspects of learning media content. Overall, the category was "very good" with a total percentage of 86%.

2. Data Analysis Results of Evaluation of Instructional Design Experts

Instructional design experts assess the interactive learning media Drawing

Technique based on three aspects namely aspects of learning objectives, aspects of learning media content based on table 40 shows that the average percentage score results are 83% for aspects of learning goals, 86% for aspects of material presentation, 82% for aspects of the structure of learning media content. Overall aspects go to the "very good" category with a total percentage of 82%.

3. Data Analysis of Media Expert Evaluation Results

Media experts assess the interactive learning media Drawing Technique based on three aspects, namely the aspect of media display learning, aspects of material presentation, graphic aspects of learning media based on table 41 shows that the average percentage score results are 88% for aspects of learning media display, 82% for aspects of material presentation, 83% for the graphic aspect of learning media. Overall aspects go to the "very good" category with a total percentage of 85

Submission Of Hypothesis

a. Pretest t test

After the feasibility test and the goodness of the data are completed, the t test pretest will be conducted. This is done to determine whether there are differences in the initial ability of the control class and the experimental class using the Pterest t test.

Based on the calculation results obtained an output  $t_{Count}$  of 8.38 and at  $t_{table}$  1.67 with a 95% confidence level. then it is obtained that  $t_{Count} > t_{table}$  is  $8.38 > 1.67$ . this shows that there are significant differences between student learning outcomes that use learning media and students who do not use learning media.

Test t Post Test

$$H_0 : \mu_1 : \mu_2$$

$$H_a : \mu_1 > \mu_2$$

Information :

$\mu_1$  = Average student learning outcomes that are invited to use interactive learning media using macromedia Flash.

$H_0$  = There is no difference in the results of learning to draw techniques in students who are taught with interactive learning media using Macromedia Flash with students taught using textbooks.

$H_a$  = There are differences in the results of learning to draw techniques on students who are taught with interactive learning media using Macromedia Flash with students taught using textbooks.

After the pretest t test is complete, then the hypothesis testing is continued using the post test t test. this is done to find out if there are differences in student learning outcomes after different treatments are carried out.

Based on the calculation results obtained an output of  $t_{Count}$  4.03 and at  $t_{table}$  1.67 with a 95% confidence level. then it is obtained that  $t_{Count} > t_{table}$  that is  $4.03 > 1.67$  or in other words

$H_0$  rejected and  $H_a$  accepted. From the data above it can be concluded that there is a significant difference between student learning outcomes using learning media and students who do not use learning media, or in other words student learning outcomes that use interactive learning media using macromedia Flash have a higher value than students taught use textbooks.

Based on the results of the research on the development of interactive learning media using Macromedia Flash which has been stated previously, can be summarized as follows.

1. Results of validation from material experts, learning design experts and media experts on interactive learning learning media Learning the sub-material of the working image projection material developed with Macromedia Flash software shows that the average overall is categorized as "Very Good" after several revisions so that the media can used for the next trial. Validation results from individual trials, small groups and limited field trials of the developed media, namely using

Macromedia Flash software, including in the Highly Eligible Category, so that they can be well received and used as learning media. Results of validation and learning design experts on interactive learning media Drawingdrawing techniques developed showed that the quality of learning design gained a total score of 84% including the category "Very Good".2. The use of interactive media using Macromedia Flash more effectively can improve student learning outcomes when compared to using textbook learning media, interactive media using macro media flash has an effectiveness of 85.8% higher than the effectiveness of using textbook learning media. where the graduation rate of students using macromedia flash interactive media is 33 people, while the graduation rate for students who use textbooks is only about 23 people.

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