Development of Learning Media Website Based Using Blended Learning for 2D and 3D Animation Subjects for Vocational High Schools

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Article Info

ABSTRACT

Vocational High Schools adapts to the working field which is increasingly leading to the use of various digital devices, one of the professions is an animator. Therefore, Vocational High Schools provide competencies Multimedia expertise which includes 2D and 3D animation subjects. From the result of observation and interview about this subject found that: (1) The use of learning demonstration method by teachers are not in sync with the needs of students and less effective; and (2) There is no interactive media that relevant with the needs, attractive and sophisticated makes learning motivation decrease. So, it is necessary to develop a website-based media that uses Blended Learning. The purpose of this development research is to describe, create, measure the feasibility and influence of this media on students' learning motivation. There are four main features, that is pretest, material recommendations, interactive discussions, and posttests. Website creation is using ADDIE application development model and the product validation using expert judgment, there are a material expert validator and a media expert validator. For the trial of media feasibility will consist of individual scale trial, small group scales trial, and large group scales trial, respondents from the trial were students of Vocational High Schools class XI Multimedia. Based on the research results obtained: (1) Validation by material experts resulted in 89.30% classified as very valid criteria; (2) Validation test by media expert validator resulted in 95.37% classified as very valid criteria; (3) Individual scale trial for feasibility resulted in 98.33% classified as very valid criteria; (4) Small group trial for feasibility resulted in 85.64% classified as very valid criteria; (5) Large group trial for feasibility resulted in 88.82% classified as very valid criteria; and (6) Test of learning motivation level resulted in 81.15% classified as high motivation criteria.

I. INTRODUCTION

The development of technology and information will have a major impact on the quality of education. The emergence of new technology demands an increase in educational competence. This will also make the competition in getting a job will be tougher. The education sector must make adjustments continuously and consistently to become a better development. New professions come up to suit the community's need for digital products or services which then become business opportunities. One of these professions is an animator or animation maker, competences in this profession is able to create two dimensional and three-dimensional animated images. The goal of Vocational High School is prepared

students to be able suits the need of certain fields, be able to adapt to the working field, and be able to find opportunities to develop themselves. Vocational High Schools focus on three program objectives, there are productive, normative, and adaptive. Therefore, Vocational Schools provide Multimedia Skills (MM) competencies that provide various kinds of expertise for students, especially in the animation, design and film, one of them is 2D and 3D Animation subjects.

However, the facts found based on observations and interviews with students and teachers at schools regarding 2D and 3D Animation subjects found problems that (1) Learning using demonstration methods was not relevant with the needs of students and was less effective; (2) there is no interactive media that fits the needs and attracts the attention of students, makes students' learning motivation less; (3) and the learning is conventional and does not follow technology. Meanwhile, in order for an application to have an effect, structured learning steps are needed [1]. In addition, learning media is important in delivering information to students [2].

The conventional teaching method or Teacher Centered Learning (TCL) that has been happening so far, of course has many deficiencies. Conventional is positioned the teacher as the subject or center and students as the object or audience. This model is considered to make students inactive and low levels of learning motivation, that's why the teacher must combine the conventional model with technology for adapt to the learning styles of various learners [3].

The paradigm of the development of learning models from TCL to SCL (Student-Centered Learning) needs to adapt with the evolving information technology [4]. The use of Information and Communication Technology (ICT) generaly used in educational institutions, including vocational schools. The use of e-learning media is an effort made for innovation in learning with technological developments [3].

E-learning media allows the occurrence of TCL to SCL. However, learning activities cannot be fully replaced by media technology, this is because in essence the process of interaction between teachers, students and learning resources cannot be explained by tools. Although students can learn on their own using e-learning media, the existence of a teacher is very much needed as a supportive director/facilitator to support students during the learning process. Therefore, the appropriate method is Blended Learning. This method supported by the condition of the SMK infrastructure in Malang City which is sufficient for the use. Based on the previous research, there is an increase in learning motivation between students with Blended Learning compared to students with conventional learning [5].

E-learning can be made in several media, including mobile applications, desktop applications, websites, etc. The selection of the platform must be considered properly in order to achieve the media effectiveness. Website is a platform that is widely used to implement the Blended Learning model. The use of the website as a learning medium can be used specifically as a tool that supports the learning process within the Blended Learning. Website media can create an interactive learning process [6].

That case is the basis for the goals of the development research : (1) Describing website learning media with blended learning models for 2D and 3D animation subjects that are suitable for use; (2) Developing website learning media with blended learning model for 2D and 3D animation subjects that are suitable for use; (3) Testing the feasibility of website learning media with the blended learning model for 2D and 3D animation Subjects to determine the product feasibility; and (4) Knowing the effect of Website Learning Media with Blended Learning Model for 2D and 3D Animation Subjects on students' learning motivation.

II. METHODS

The model to be used is ADDIE. ADDIE stands for analyze, design, development, implementation and evaluation, these words are the stages that will be carried out as a sequence of development procedures [7]. In accordance with the existing flow in Branch (2009) as shown in Fig. 1 [8]. About the activities to be carried out, refers to the concept of ADDIE stages which is shown in Table 1 [9].
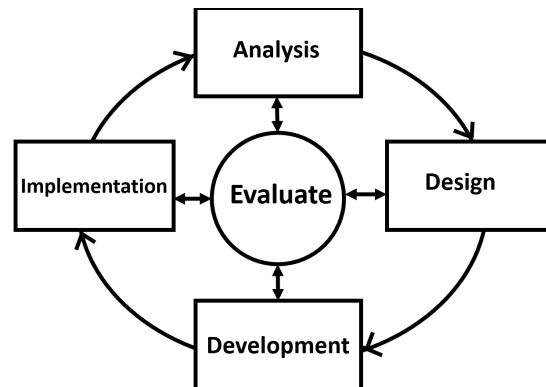

Fig. 1. ADDIE's Model

Tests on this development use subjects that adjust to the sampling, which include: (1) Validity testing is carried out by expert lecturers of learning media and material experts, that is teachers who teach 2D and 3D animation subjects at SMKN 4 Malang; (2) individual feasibility test, that is two students of class XI Multimedia at SMKN 4 Malang; (3) The small group feasibility test is 10 students of class XI Multimedia at SMKN 4 Malang; and (4) The large group feasibility test and

measurement of learning motivation were 30 students of class XI Multimedia at SMKN 4 Malang.

TABLE I.   ADDIE'S ACTIVITY STAGES

Activities	Concept	Stages
Analysis	Identify causes of problems	1. Gap and needs analysis 2. Determine learning objectives 3. Analysis of students, learning environment and material characteristics 4. Evaluation of the analysis stage
Design	Verify content that users will learn with appropriate media and testing methods	1. Design 2D and 3D subject matter 2. Blended Learning implementation design 3. Designing Wireframe and Flowchart of Learning website 4. Design stage evaluation
Development	Create and validate media	1. Develop content in the form of modules, presentations, videos and learning evaluation questions 2. Creating a Learning website media 3. Validation of media experts and materials experts 4. Evaluation of the development stage
Implementation	Setting up a learning environment and student engagement	1. Prepare teachers, students and learning environment 2. Test 3. Evaluation of the implementation phase
Evaluation	Assessing the quality of learning processes and products	Overall evaluation is based on the opinion of supervisors, validators and respondents

This research will use quantitative and qualitative data types. Quantitative is data containing numbers obtained after distributing questionnaires to material experts, media experts and student respondents. While qualitative is data in the form of interviews, responses, suggestions or criticisms from experts and student respondents. The data collection instrument chosen for development research is a questionnaire/question form. The scale used is the Likert scale. Likert is intended to find out the affective value, opinion of an individual or group of social environments [10]. The Likert scale uses numbers in the form of a question column followed by an answer column in which each answer has a certain level which has been described in Table 2.

TABLE II.   LIKERT SCALE SCORING

No	Answer Options	Score
1	Very Agree	4
2	Agree	3
3	Disagree	2
4	Very Disagree	1

The instrument is designed based on the standardization of media and learning materials [11]and the student motivational instrument by [12]. The aspects that are assessed to measure the quality of the material are relevance, quality of content & objectives as well as instructional quality. Then to measure the feasibility of the media using aspects of technical quality, content quality & objectives and instructional quality. Meanwhile, to measure student motivation, the following aspects are used: (1) Diligent in facing the task; (2) Be tenacious in the face of adversity; (3) Prefer to work independently; (4) Tired of routine tasks; (5) Can defend his opinion; (6) Strong in believing in something; and (7) Happy in solving problems.

The data analysis technique used is descriptive content analysis and percentage descriptive. With the aim of translating quantitative data to form a new percentage, then using words that are included in the type of qualitative data. Here is the formula (1) is used to determine the percentage value (%) of validity and feasibility [13].

$$Va = \frac{TSe}{Tsh} \; x \; 100 \qquad (1)$$

where, Va is validity score, TSe is the total score of the questionnaire, and Tsh is the maximal score. Then, formula (2) is used to determine the percentage value (%) of the level of learning motivation (Arifin, 2011).

$$P = \frac{F}{A} \; x \; 100 \qquad (2)$$

where, P is percentage of learning motivation, F is the total score of the questionnaire, and A is the maximal score.

From the percentage that has been generated, this value then becomes a reference for determining the validity criteria that are used to make decisions about the feasibility of the media

shown in the Table 3. Meanwhile, to determine the criteria for the level of learning motivation in the Table 4.

TABLE III.   MEDIA CRITERIA FEASIBILITY

No	Validity level (%)	Criteria
1	85,01-100,00	Very valid and can be used without revision
2	70,01-85,00	Quite valid and still needs minor revision
3	50,01-70,00	Less Valid and it is recommended not to use because of major revisions
4	01,00-50,00	Invalid and should not be used

TABLE IV.   CRITERIA FOR LEARNING MOTIVATION LEVEL

No	Percentage (%)	Criteria
1	86,00 - 100	Very High Motivation
2	71,00 - 85,99	High motivation
3	56,00 - 70,99	Moderate Motivation
4	41,00 - 55,99	Low Motivation
5	01,00 - 40,99	Very Low Motivation

III. RESULT AND DISCUSSION

This development research resulted in a web-based learning media product for 2D and 3D animation subjects with the name "Belajar". This media was developed for the Blended Learning model for students of SMK class XI of Multimedia skill competence. "Belajar" can be accessed through a browser application either on a computer, laptop or smartphone. The materials included are, (1) The principles of 2D animation; (2) Simple 2D animated objects; (3) Tweening animation technique; (4) 2D animated digital puppeter images; and (5) 2D animated digital puppeter motion. "Belajar" was tested by two stages of testing, there are stage of expert validation consisting of material validation and media validation, and the second is the feasibility trial stage consisting of individual trials, small group trials and large group trials.

"Belajar" learning media consists of several pages, there are the sin up page, sign in, dashboard, course, pretest, posttest, profile, and guide. There are three main pages, there are: (1) The pretest is shown in Fig. 2. is a page that will only appear when the user first opens the course, displaying ten multiple choice questions whose results are used as pre-test scores; (2) Material recommendations with interactive discussion are shown in Fig. 3, contains material presented in three tabs where each tab contains a different form of material, that is a pdf extension module, a presentation slide show, and an explanation video or tutorial. At the bottom of the material there is a comment column where students and teachers can ask and answer each other; and (3) The assignment or posttest is shown in Fig. 4 which contains tasks that must be done to complete a course.
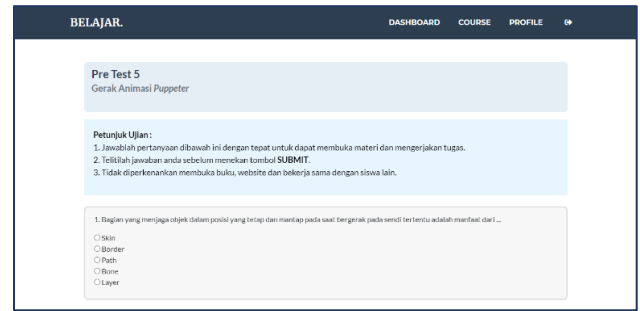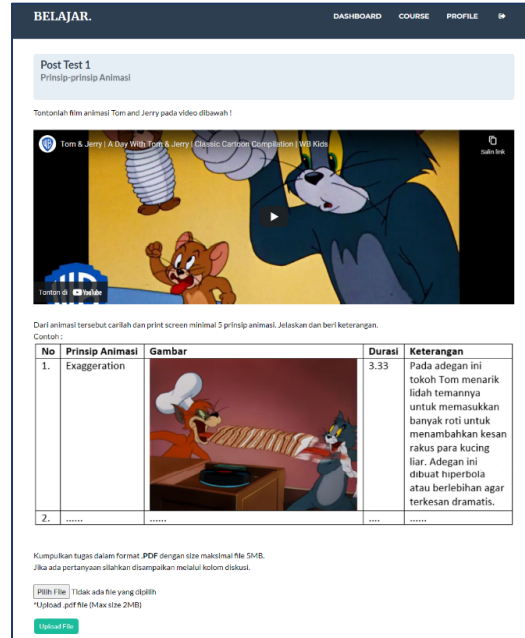

Fig. 2.   Cover Page
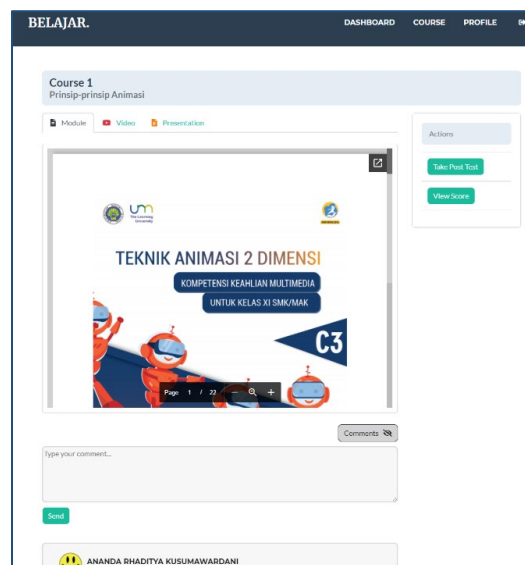

Fig. 3.   Material List Page

Fig. 4.   Basic Competencies and Learning Objectives Page

After making the media, the next step is to test the product in accordance with what has been described in the research methodology that has been described. The first is media validation by experts. Table 5 shows the validation results from material experts and Table 6 shows the validation results from media experts based on the Equal. 1 and the criteria scale in Table 3.

TABLE V. MATERIAL EXPERT VALIDATION RESULTS

Aspects	TSe	TSh	Va(%)	Criteria
Relevant	38	40	95,00	Very Valid
Content Quality and Purpose	11	12	91,66	Very Valid
Instructional Quality	13	16	81,25	Enough
Average			89,3	Very Valid

TABLE VI. MEDIA EXPERT VALIDATION RESULTS

Aspects	TSe	TSh	Va(%)	Criteria
Technical Quality	34	36	94,44	Very valid
Content Quality and Purpose	11	12	91,66	Very valid
Instructional Quality	16	16	100,00	Very valid
Average			95,37	Very valid

Based on Table 5 the average number is in the range of 85.01%-100.00% and is included in the very valid criteria and can be used without revision. The results obtained from the average of the relevant aspects 95% included in the very valid criteria, the quality aspects of the content and objectives 91.66% included in the very valid criteria and the instruction quality aspect 81.25% included in the valid criteria. By testing the validity of this material, the Learning web media can help achieve learning objectives because the material has been assessed as relevant, and appropriate. Learning media should pay attention to the criteria for the suitability of the material with the objectives of learning [11].

Meanwhile, in terms of media, based on Table 6, the average number is in the range of 85.01%-100.00% and is included in the very valid criteria and can be used without revision. These results were obtained from the average of the technical aspect 94.44% which was included in the very valid criteria, the aspect of content quality and objectives 91.66% entered the very valid criteria and the instruction quality aspect 100% entered the very valid criteria.

By doing this media validity test, the Learning web media is declared feasible and can be used from a technical point of view, content and also the instructions used. A good media is clear and neat [14]. Good media presents content and features clearly and neatly, this includes the arrangement or format of the presentation, sound, text and images.

The results of the validation will be a revision or improvement for the next stage, that is the media feasibility trial. The first result is the individual scale shown in the Table 7. The second result is the small group scale shown in the Table 8. and the third is the large group scale shown in the Table 9.

The results are based on the Equal. 1 and the criteria scale in Table 3.

TABLE VII. INDIVIDUAL TRIAL RESULTS

Aspects	TSe	TSh	Va(%)	Criteria
Relevant	36	36	100,00	Very valid
Content Quality and Purpose	19	20	95,00	Very valid
Instructional Quality	12	12	100,00	Very valid
Average			98,33	Very valid

TABLE VIII. SMALL GROUP TRIAL RESULTS

Aspects	TSe	TSh	Va(%)	Criteria
Relevant	322	360	89,44	Very valid
Content Quality and Purpose	175	200	87,50	Very valid
Instructional Quality	96	120	80,00	Valid
Average			85,64	Very valid

TABLE IX. SMALL GROUP TRIAL RESULTS

Aspects	TSe	TSh	Va(%)	Criteria
Relevant	979	1080	90,64	Very valid
Content Quality and Purpose	535	600	89,16	Very valid
Instructional Quality	312	360	86,66	Very valid
Average			88,82	Very valid

Based on the results of the individual stage in the data in the Table 7 it can be seen that the assessment of each aspect, the first is the technical aspect with 100%, the second is aspect of the quality of the content and objectives with 95%; and the three is aspects of instruction quality with 100%. A 100% result is very likely to occur in the test, this is because the high probability is caused by the number of respondents who are only two students. Furthermore, when viewed from the results of the small group stage in the data in the Table 8 it is known that the assessment of each aspect, the first is the technical aspect with 89.44%, the second is the quality aspect of the content and objectives with 87.5%; and the three is aspects of instruction quality with 80%.

From the results obtained the highest percentage is in the aspect of technical quality, if reviewed the technical quality includes object color, size, clarity and quality of objects in the learning media. The media must be of good quality. This is regarding the visual development of both images and videos that must be in accordance with technical requirements [14].

The last is the large group stage testing, the results are in the Table 9 it is known that the assessment of each aspect, the first is technical aspect with 90.64%, second is the content and objective quality aspects with 89.16%; and the three aspects of instruction quality with 86.66%. With the collection of feasibility data for large groups, data on student learning motivation when using the product was also obtained, the result

shown in the Table 10. The results are based on Equal. 2 and the criteria scale in Table 4.

TABLE X. LEARNING MOTIVATION MEASUREMENT RESULTS

Aspects	F	A	P(%)	Criteria
Persevere in the face of the task	309	360	85,83	High
Tenacious in the face of adversity	204	240	85,00	High
Prefer to work independently	285	360	79,16	High
Tired of routine tasks	94	120	78,33	High
Can defend his opinion	187	240	77,91	High
Strong in believing in something	185	240	77,08	High
Happy to solve problems	203	240	84,50	High
Average			81,15	High

The percentage results for each aspect: (1) Aspects of being diligent in facing tasks are 85.83%; (2) The tenacious aspect faces difficulties of 85.00%; (3) Aspects prefer to work independently by 79.16%; (4) the aspect of boredom on routine tasks is 78.33%; (5) Aspects can defend their opinion by 77.91%; (6) The strong aspect in believing in something is 77.08%; and (7) The aspect of being happy to solve problems is 84.58%. From these results, all aspects are included in the criteria for high motivation. According to Aurora & Effendi (2019) E-Learning learning media has a positive and significant effect on learning motivation. Learning motivation is one of the success factors in achieving the goals of a learning [15]. The existence of learning motivation will affect the learning success of students. The achievement of learning success is if there is a will and drive their self to keep learning.

IV. CONCLUSION

Based on the results and comparisons with relevant research, it can be concluded that the "Belajar" as web learning media is very feasible to use and has a positive impact on students' learning motivation in 2D and 3D animation subjects. The results of the research as a whole are: (1) Validation by material experts produces a percentage of 89.30% which is included in the very valid criteria; (2) Validation by media experts resulted in a percentage of 95.37% included in the very valid criteria; (3) The results of the individual feasibility test resulted in a percentage of 98.33% including the very valid criteria; (4) The results of the feasibility test in a small group resulted in a percentage of 85.64% including the very valid criteria; (5) The results of the feasibility trial in a large group in a percentage of 88.82% including the very valid criteria; and (6) The results of the measurement of learning motivation after using "Belajar" in a percentage of 81.15% so that it was included in the criteria for high motivation.

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