Interactive Web Learning Media Development

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Submission date: 11-Oct-2020 02:10PM (UTC+0700)
Submission ID: 1411513307
File name: Interactive_Web_Learning-with_Erny.pdf (3.18M)
Word count: 2942
Character count: 16658

ATLANTIS PRESS
Advances in Social Science, Education and Humanities Research, volume 387
3rd International Conference on Education Innovation (ICEI 2019)

Interactive Web Learning Media Development for Improving Basic Pattern Learning Outcomes

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***Abstract*—The learning process always requires new educators and new experiences will be gained by students in the process. The phenomenon of the development of information and communication technology makes the dependence of ICT products and ideas gradually replace the conventional method. This study teaches students to learn archetypal construction easily in Basic Pattern lessons. The media used in the learning process is interactive web learning. The study uses the 4D development method, with results: (1) web-based interactive learning is very appropriate for archetypal construction competencies; (2) the implementation of learning is very well done; (3) student responses are highly interested in the media; (4) interactive web learning media implemented with problem-based learning models can improve student learning outcomes. Students involved in learning using interactive web media have good scores on the cognitive domain. Their psychomotor skills also increase compared to students who study with conventional methods.**

Keywords*—learning media; 4D development method; interactive web

I. INTRODUCTION

The teaching and learning process always requires new innovations so that educators and students get new experiences in the process carried out. Along with the dynamics of the development of information technology today, the expected innovation is not impossible to materialize. The phenomenon of the development of information and communication technology makes people face new challenges. Dependence on products and ideas of information and communication technology, will gradually replace the conventional methods that are already known to the public.

Through the implementation of the 2013 curriculum, the government seeks to improve the quality of education to improve and prepare the quality of a reliable generation in the future. The previous curriculum, KTSP 2006, was refined to become a 2013 Curriculum with several revised versions.

In Vocational Schools the subjects are divided into adaptive, normative, and productive subjects. Among the productive subjects in the fashion expertise study program, there are Basic Pattern subjects. Basic Pattern is a subject that provides competence and embeds concepts about pattern construction to students, as a provision to enter the business world/industry in the field of fashion. The application of the scientific approach to learning elementary patterns involve process skills such as observing design, classifying patterns, measuring models, designing construction patterns, explaining detailed patterns and concluding the results of construction patterns according to the design, according to those planned in the lesson plan. The expectation of the 2013 Curriculum implementation is the learning outcomes of students in accordance with the competencies needed by the community and business/industry. They are divided into adaptive, normative, and productive subjects. Among the productive subjects in the fashion expertise study program, there are Basic Pattern subjects. Basic Pattern is a subject that provides competence and embeds concepts about pattern construction to students, as a provision to enter the business world/industry in the field of fashion. The application of the scientific approach to learning Elementary patterns involve process skills such as observing design, classifying patterns, measuring models, designing construction patterns, explaining detailed patterns and concluding the results of construction patterns according to the design, according to those planned in the lesson plan. The expectation of the 2013 Curriculum implementation is the learning outcomes of students in accordance with the competencies needed by the community and business/industry.

Until now there are still some obstacles in the clothing department at vocational high schools, such as: 1) pattern-making competencies that require understanding of construction and mathematical calculations, as the main obstacles for students majoring in fashion or students who are just learning fashion, 2) there are many competency formulas that are difficult to teach because of the lack of facilities, media, and learning resources, 3) the creation of learning media that require complex and expensive skills and knowledge of design. Although the clothing and technology sectors are equally well-established but very different from each other because they occupy the supply chain and separate routes on the market. The presence of electronic miniaturization innovations makes them blend so that technology products are easily used by fashion consumers. The development of a blend of cultures has created challenges for the field of design and communication technology to significantly bring fashion products to various layers of consumers [1].

Learning using interactive web media is an innovation that has a major contribution to changes in the learning process, where the learning process is no longer just listening to the description of the teacher's subject matter but students also carry out other activities such as observing, working, demonstrating and others. the contents of the lesson can be visualized in a more dynamic and interactive form so that students will be motivated to engage further in the learning process. The teaching and learning process is better, no longer monopolized by the presence of teachers, because students can learn anywhere, anytime, with anyone according to their respective interests and learning styles [2].

Based on preliminary observations of teachers and students in clothing department in vocational schools, the learning media used are source books in printed and electronic books, and PowerPoint media. The lessons used are teacher-centered and teacher information sources. There are internet laboratory facilities and computers that are connected to the internet, but have not been used optimally in fashion learning. The content of the pattern making lesson on the Basic Pattern subject, requires students' ability to think and master complex pattern-making techniques. There were many obstacles in mastering the concept of construction patterns, among others: (1) lack of student motivation for mathematical calculation experts from the fashion method taught, (2) low learning outcomes, and (3) low skills in applying pattern construction systems in other lessons which is related. The task is done incompletely; (4) the results of pattern making tend to be the same and less creative (they only copy friends or teachers). The use of problem-based learning methods is very appropriate to do in studying the basic patterns of women's clothing in the Basic Pattern lesson, to improve student learning outcomes [3].

Problem-based learning has been widely adopted in various fields and educational contexts to promote critical thinking and problem solving in authentic learning situations [4]. Problem-based learning is a learning model designed to develop students' ability to solve problems [5]. Problem based learning methods that are supported by the development of learning media and skills training are expected to improve the cognitive, affective and psychomotor domains, creativity, scientific and academic insights of students in departmental clothing. Align with the dynamic world of fashion that is always changing rapidly and following the speed of technology [6]. The use of problem-based learning methods is expected to be an alternative to guide students in understanding concepts in the field of fashion, building knowledge related to subjects, training learning independence, increasing the ability to communicate ideas and solve problems [7].

Research on the topic of web-based interactive learning media has been carried out by many researchers such as Fransisca, Yuda, and Syuhendri. Based on the tests carried out the results of a web-based learning media are feasible, practical and effective in improving learning outcomes [8]. In Yuda's research he concluded that learning media can easily make students understand the master concept and improve student creativity [8]. The same results are shown in Syuhendri's experiment that after students learn with web-based learning media, they become easy to improve their learning skills compared to students having to hear the teacher's speech [9].

Based on the background of the research, an experiment was conducted to develop interactive web-based learning media to improve the cognitive skills of students in the Archetype lesson. Before entering the experimental design system, it must be understood correctly the meaning of learning media and interactive web.

Media comes from Latin, is plural of "media" which literally means "intermediary" or "introduction" is an intermediary or introduction to the source of the message with the recipient of the message. The definition of learning media includes which suggests that learning media is messenger technology that can be used for learning purposes [10]. Briggs argues that learning media is a physical means for delivering learning content such as books, films, videos, etc. [11]. Miller [12] revealed that learning media is a communication tool in the form of print and hearing, including hardware technology. Based on these three opinions, it can be concluded that learning media is everything that can channel messages, can stimulate the thoughts, feelings, and willingness of students so that it can encourage the creation of motivation and learning processes in the students themselves.

Interactive learning media is a message of media delivery between educators to students that enables communication between humans and technology through methods and infrastructure in the form of application programs and utilization of electronic media as part of their educational methods.

Interactive web is a web technology that allows users to interact with every part of the web. The interactive web can be used in every part especially in the field of education. In education, which is important is when students can interact with each part of the web, not only must each interaction have some lessons. Students unconsciously learn something when students access the web [13].

The interactive web can teach cognitive and psychomotor skills at the same time. Cognitive skills that students can get in the subject matter that contains part of the lesson with interactive media students are more interested in reading, seeing and hearing lessons. Psychomotor skills that can be obtained by students in interactive web games, students can click and see how lessons are processed with visualization to enable students to improve their psychomotor skills [14].

Many studies on interactive webs are proven if the interactive web can improve many sectors, especially in the field of education. Nearly 96% of researchers say that interactive web is an easy way to improve student skills [15].

II. METHOD

This study uses the 4D method to create interactive web-based learning media before it is implemented in vocational schools. In general, the 4D method can be explained by the image below.

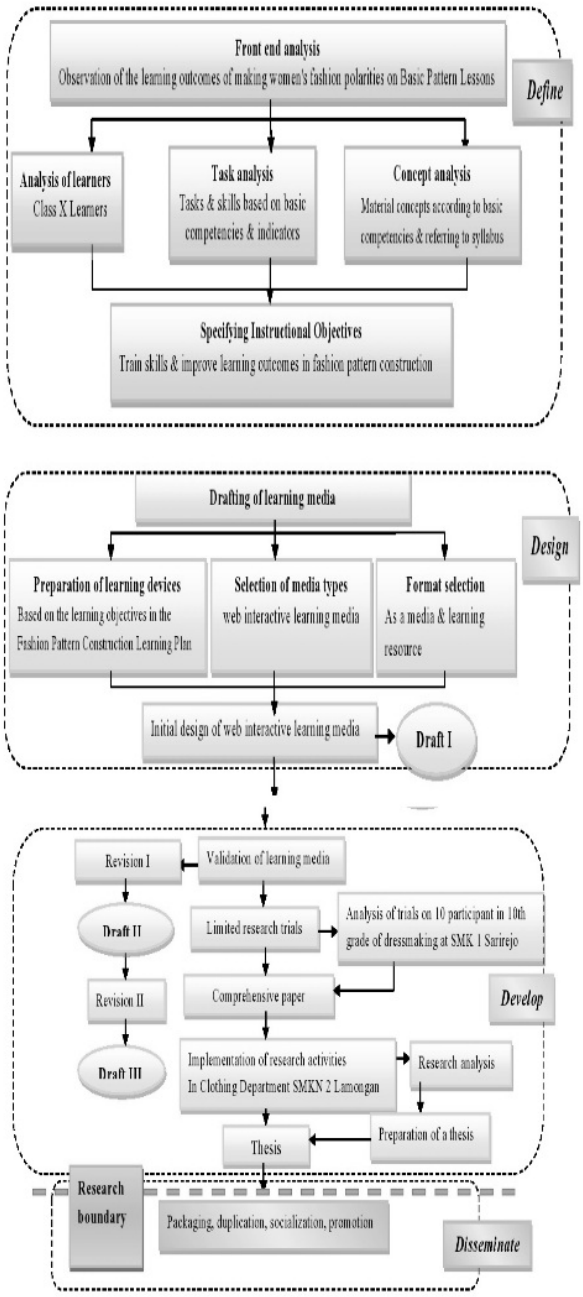

Fig. 1. 4D Flow of Web-Based Interactive Learning Media Development on Basic Pattern Subjects

Based on the research flow, it will explain how learning media are built:

A. Determine Section

The defining stage is carried out to analyze the boundaries of the content of the lessons to be developed in interactive web learning media, which consists of five basic steps, namely [16]:

- Front-end analysis
- Student Analysis
- Task Analysis
- Concept Analysis
- Determining Instructional Objectives

B. Design Section

This stage aims to design learning media by paying attention to the selection of materials in accordance with the objectives of learning, the selection of interactive media, and the selection of learning models [17].

- Learning materials.
- Media selection
- Selection of Media Formats
- Selection of Learning Models

C. Development Section

- The development phase aims to produce the final draft of interactive web learning media and good items. Activities at this stage are expert validation and field trials. The development phase includes [18]:
- Expert Validation
- Revised
- Testing Productss

The fourth phase of the research was not carried out due to time constraints and research funding.

III. Results and Discussion

Media that has been designed using the 4d method is shown in the following figures.

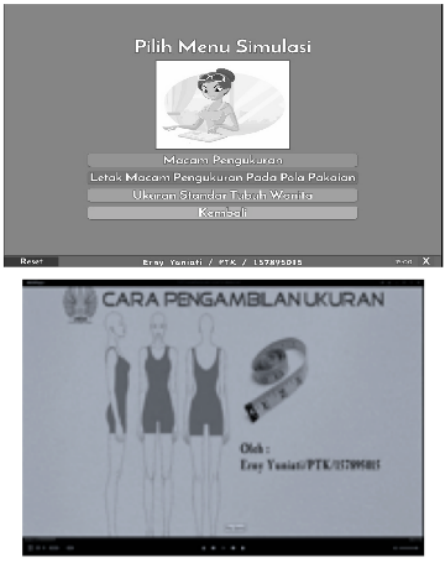

Fig. 2. Learning Media Preview

Calculation of the average score for media is done after making learning media using the 4d method. Obtained the results of the average learning media score of 84%, based on the assessment of expert validators. The average score obtained uses the following equation.

$$(V_1 + V_2 + V_3) / \Delta V$$

Explanation:

- V_1 = Validator 1
- V_2 = Validator 2
- V_3 = Validator 3
- ΔV = Total Validator

Prepared learning media, applied as an experiment at Vocational Schools 2 Lamongan. The experiment using 2 classes, one class using conventional methods namely web media and one class using interactive web learning media. Each class consists of 32 students who are randomly obtained, with the initial ability before being given treatment is the same ability on average.

In the initial stage is to provide several tests to ensure students' first knowledge of Basic Patterns, this test is called a pretest. After the pretest, learning was done using web interactive learning media. At the end of the trial period given a test to ensure that student knowledge has improved, this test is called posttest.

The cognitive learning outcomes of the experimental class used the pretest-posttest instrument in the form of 20 items. The lowest learning outcome score for the pretest is 20 and the highest score is 45, and the experimental class average score is 29.84. The value of cognitive learning outcomes shows the lowest posttest value of 75, the highest posttest value of 100, and the posttest average value of 84.22.

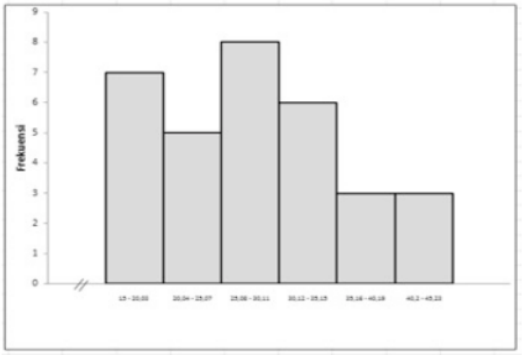

Fig. 3. Histogram oof Group Data Pretest Score of Experimental Class

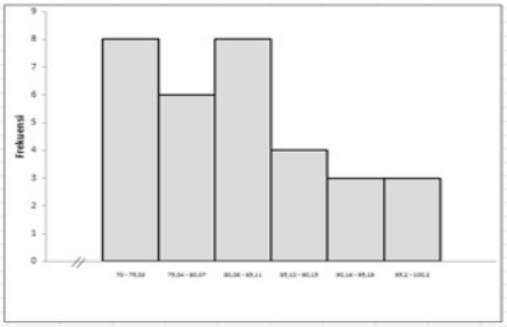

Fig. 4. Histogram of Group Data Pretest Score of Experimental Class

The cognitive learning outcomes of the control class using the pretest-posttest instrument were 20 items. The cognitive class score of the cognitive learning outcomes shows the lowest value for pretest of 15, the highest score of 45 and the average score of the control class pretest is 26.72. The value of the learning outcomes of the cognitive control class shows the lowest posttest value of 70, the highest posttest value is 95, and the average value of the control class posttest is 79.51.

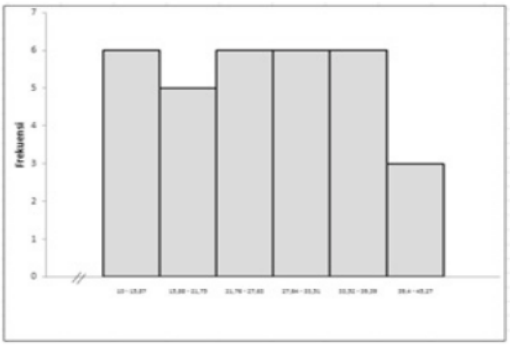

Fig. 5. Histogram of Group Data Pretest of Control Class

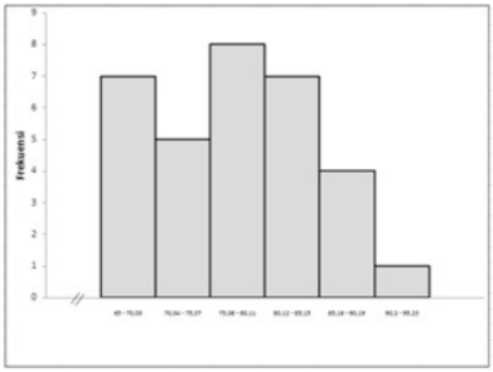

Fig. 6. Histogram of Group Data Posttest Score of Control Class

The following are the results of statistical analysis for total cognitive learning outcomes scores.

TABLE 1. INDEPENDENT SAMPLE RESULT T-TEST FOR LEARNING OUTCOMES

		T-Test for Equality of Means			
		T	***Df***	***Sig.(2 tailed)***	***Mean Differenc e***
Total cognitive learning outcomes scores	Equal variances assumed	2,299	62	0,025	4, 68750
	Equal variances not assumed	2,299	61,457	0,025	4, 68750

IV. CONCLUSION

Through the results of the study, it can be seen if interactive web-based learning media can improve student skills in the cognitive realm. This is proven by data that the learning media developed has a score of 87% from expert validators. Means that the learning media developed are worthy of being used in the Archetype lesson. This data has been proven by the posttest scores of students who have increased from 29,84 to 84,22.

Interactive learning media will be a challenge in the future, this learning media must be increasingly developed in many lessons especially in vocational education because interactive web is very suitable when applied to vocational education because in vocational education requires cognitive and psychomotor skills to meet vocational education needs.

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