Instructional Media with Programmer Hypertext Preprocessor to Eliminate the Boredom of Learning Mathematics

Herfa Malina Dewi Soewardini[1*]
Department of Mathematics Education and Postgraduate Program in Math Educatioan
Universitas Wijaya Kusuma Surabaya and Universitas Negeri Surabaya
Surabaya, Indonesia
herfasoewardini_fbs@uwks.ac.id

Suhartono[2], and Herry Setiyawan[3]
Department of Primary Reacher Education
Universitas Wijaya Kusuma Surabaya
Surabaya Indonesia

Tri Dayat[4], and Ayu Sugiarti[5]
Department of Mathematics Education
Universitas Wijaya Kusuma Surabaya
Surabaya, Indonesia

***Abstract*—Studying mathematics often makes students feel bored because teaching is usually in the form of lectures, followed by practice exercises. Finally, students become passive and do other activities outside the context of learning. But if the teacher uses audiovisual media, more students are seen actively learning. The purpose of this research is to develop an audiovisual learning media with 4D research design (define, design, develop, and disseminate) that can eliminate the boredom of learning. Learning media using PHP (Programmer Hypertext Preprocessor) turns out to be very interesting to students and can eliminate boredom in learning mathematics.**

Keywords—boredom, mathematics learning, instructional media

I. INTRODUCTION

The effort to improve the quality of student learning, many strategies can be done, especially in improving the learning system in schools. Education is more focused on how the teacher attempts to encourage or facilitate students to be more active in receiving lessons, not on what students learn. The teacher is still using the conventional method which explains the experience with the lecture method, and the blackboard is used as a medium to describe the lesson, especially on the Pythagorean theorem material. The students only listen and write on the board without understanding what is taught by the teacher. Finally, students feel bored, and the learning outcomes obtained by students are not optimal because there is no active role of students in teaching and learning activities. Along with the development of science and technology (science and technology) at this time, there is still a lack of teachers developing media that utilizes the sophistication of software tools in computers [1]. The development of this media is producing specific products. In the other side, the teacher does not have much knowledge about various computer programs which can increase the activeness and learning outcomes of students. In this case, learning strategies can help students to understand the course of a learning concept clearly. One way that teachers can use to help students understand the material is to use a PHP (Programmer Hypertext Preprocessor) program.

Development of Media PHP (Programmer Hypertext Preprocessor) is in the form of multimedia presentations combined with text and images [2]. In this program, it is packaged using wifi or LAN (Local Area Network) during the teaching-learning process.

The use of this media also makes use of Mozilla Firefox or Google Chrome to log in. After students fill in their username and password, then enter students can use the media of learning mathematics using the PHP program (Programmer Hypertext Preprocessor). In this media, there is already a Pythagorean theorem material which is packaged and designed as attractive as possible so that students better understand the Pythagorean theorem.

PHP is a web programming language explicitly designed for creating web pages. In these mathematics learning media using Web applications with PHP so that the media is more exciting and easily understood by students.

PHP stands for Hypertext Preprocessor Programmer that using server-side scripting language in web development which embedding in HTML documents. The use of PHP allows the Web dynamically so that maintenance of the website becomes more comfortable and more efficient. PHP is an Open-Source software that distributed and licensed for free and downloaded freely, and the official website is http://www.php.net. PHP is written using C language [3], [4].

II. METHODS

A. Type of research

This type of research used in this research is the development research-oriented to product development [5]. This research aims to produce mathematics learning media using PHP Phytagoras theorem material for eighth-grade students at SMP Negeri 10 Surabaya.

B. Research Design

In this research development, researchers used a learning system design model that is simple and easy to learn, namely the 4D model [6]. The device development model like this consists of 4 stages of development, namely define, design, develop, and disseminate or adapted into a 4P model, namely the definition, design, development, and dissemination as in Figure 3.1.

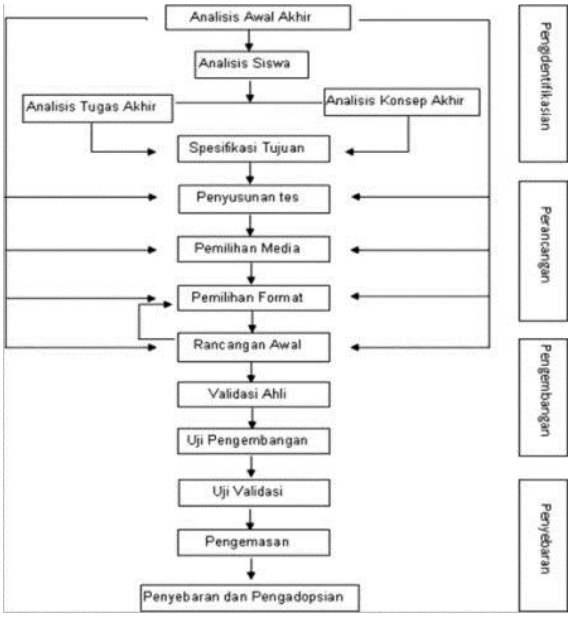


Figure 2.1. 4D Learning Design Model

The 4D learning design model have phases such as:

1. Define Phase

The purpose of this stage is to set and define learning requirements. In determining to learn, elements begin with the analysis of objectives of boundaries of the material developed by the device. This stage includes five main steps, namely (a) front end analysis; (b) student analysis; (c) task analysis; (d) concept analysis; and (e) formulation of learning objectives.

2. Design Phase

The purpose of this stage is to prepare a prototype of a learning device. This stage consists of 3 steps, namely: (a) preparation of the benchmark reference test, an initial step that connects the define stage and the design stage. (b) The selection of media that is suitable for the purpose, to convey the subject matter; (c) format selection.

3. Development Phase (Develop)

The use of this stage is to produce a revised learning tool based on expert input. This stage includes, (a) device validation by experts followed by revisions; (b) simulation, which is the activity of operating a lesson plan; and (c) limited trials with real students. The results of stages (b) and (c) using as a basis for revision. The next step is further trials with the number of students who are in line with the actual class.

4. Disseminate

This stage using tools which developed on a broader scale, for example, in another level, school, and teacher. Another objective is to use the device in the KBM effectively.

Analysis of the effectiveness of learning is carried out thoroughly starting from the aspects of learning completeness, teacher activities, student activities, and responses [6], [7].

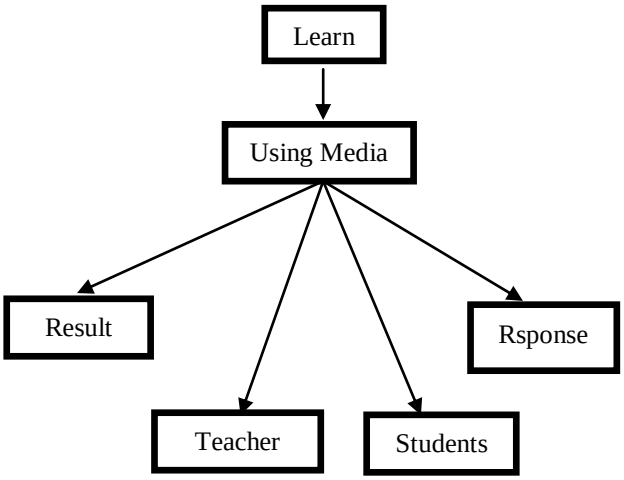


Figure 3.1. Analysis of the effectiveness of learning

Validity analysis of learning media [8] by calculating the average of each criterion from the validator,

$$K_i = \frac{\sum_{h=1}^{n} V_{hi}}{n}$$

K_i = average of each criterion

V_{hi} = score for each validator-h and each criterion-i

n = many population

the proportion of each aspect, $A_i = \frac{\sum_{j=1}^{n} K_{ij}}{n}$

A_i = average of criterion

K_{ij} = score for validator i and criterion-j

n = many criterion

and the average total validity of the three elements of the media

$$V_{a\,media} = \frac{\sum_{i=1}^{n} A_i}{n}$$

$V_{a\,media}$ = total average of validity of media

From that average total validity, then categorized according to the following validity criteria.

3 <= $V_{a\,media}$ <= 4 valid

2 <= $V_{a\,media}$ <= 3 less valid

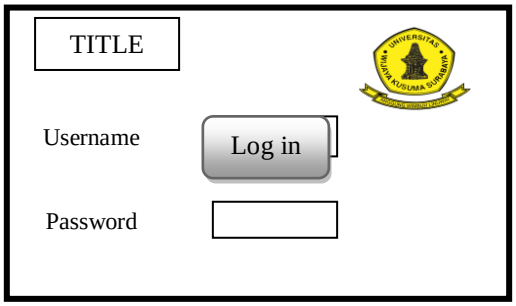
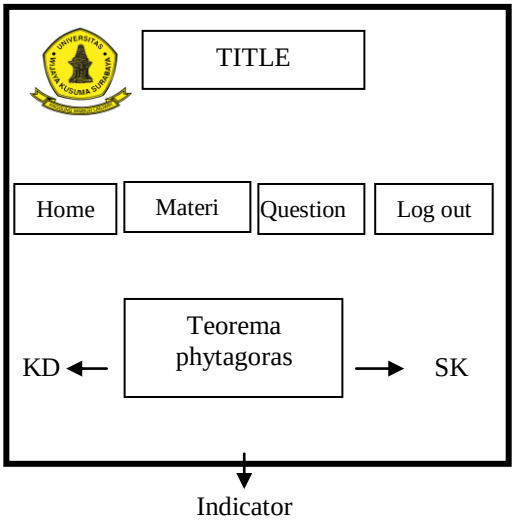
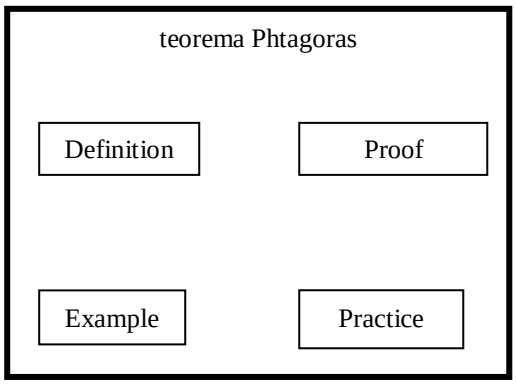
1 <= $V_{a\,media}$ <= 2 no valid

Then validity of analysis of the effectiveness of learning was student completeness classically by 85% while individual student completeness if the score is at least 75 on the student learning outcomes test in the media. Teacher activity is in the category of less, enough, good, very good. Student activities are in the class in the active and inactive groups. Student responses categorized weak (0-50%), strong (51-74%), and very strong (75-100%).

III. RESULT AND DISCUSSION

The first step was designing the media PHP, trial to the subject made validation for the media from the content side and media side PHP form designs are arranged as follows

Tabel 3.1 Media PHP

Visual	Notes
	The start page contains your name and password by clicking log in
	the menu page contains essential competencies, indicators, and competency standards. On the menu page, some pages contain material, questions, and log out.
	The discussion page contains the discussion of evaluation questions. On this page, only teachers can enter, because before coming to this page, they must fill in the password.

The results of the validation of the material in learning media by material experts indicate that media PHP (Programmer Hypertext Preprocessor) has valid criteria with an average validation value of 3.84. In the assessment of the three material experts said that the material presented in the media without revision.

The results of the learning media validation have shown that mathematics learning media PHP (Programmer Hypertext

Preprocessor) have an average value of total validation of 3.67. In the assessment of media experts said that the media developed also without revision.

From the general evaluation conducted by the validators, both material experts and media experts, it can be concluded that the learning media of PHP (Hypertext Preprocessor Programmer) that was developed practically for use.

The analysis of the completeness of student learning outcomes: All students complete individually because they score above the minimum completeness criteria. Based on the calculation of the percentage of completeness classically obtained 86.67% because it gets a score of 3.

The results of student responses about the media that can eliminate the boredom of learning, nine students expressed strongly agree, twenty students agreed, and one student stated disagree, so the student response value of 81.67% was obtained so the first item included in the category is very strong and positive. Based on these results, it turns out students prefer to use the learning media PHP (Programmer Hypertext Preprocessor) than learning that only listens to the teacher's explanation.

All of student learning outcomes that has been obtained about three aspects that support the effectiveness of learning :

(1) Completeness of Learning Outcomes is complete.

(2) Teacher activity is very good.

(3) Student activity is very active.

(4) Student responses are positive.

So learning to use media PHP (Programmer Hypertext Preprocessor) is effective.

The student responses have shown that nine students expressed strongly agree, twenty students agreed, and one student disagrees. The student response value was 81.67%, and the first item included in the category is powerful and positive about eliminating their bored. Based on these results, it turns out students prefer to use the learning media PHP (Programmer Hypertext Preprocessor) than learning that only listens to the teacher's explanation.

All of student learning outcomes that have obtained about three aspects that support the effectiveness of learning :

(1) Completeness of Learning Outcomes is complete.

(2) Teacher activity is perfect.

(3) Student activity is very active.

(4) Student responses are positive.

So learning to use media PHP (Programmer Hypertext Preprocessor) is useful.

In developing PHP (Hypertext Preprocessor Programmer) media, a learning system design model that is simple and easy to learn is the 4D model. The device development model like this consists of four stages of development, namely define, design, develop, and disseminate or be adapted into a 4P model, namely defining, designing, developing, and distributing.

At the defining stage, five main steps have been carried out, namely: front end analysis, student analysis, concept analysis, task analysis, and learning objective specifications. The analyze starting from raising and applying the fundamental problems faced in junior high school mathematics learning by interviewing two students and two teachers in the field of mathematics. Students do not like math because the teacher uses blackboard and powerpoint with lectures. He also often feels bored when the teacher delivers the material. Boredom in the lesson ultimately makes students less understanding of the material.

At the design stage, four steps have also been carried out, namely: test preparation, media selection, format selection, and initial design. This four-step includes making validation sheets for media experts and material experts; practicality assessment sheet; test questions; teacher observation sheet activity; observation sheet of student activities; and student response questionnaire sheets.

The development phase is also suitable for several activities, namely: designing programs and conducting media assessments. Creating a schedule is done to make the learning media of PHP (Programmer Hypertext Preprocessor) as attractive as possible. The evaluation of the program was carried out by three material experts and three media experts. The assessment shows that this media is appropriate for use in research.

The deployment phase is the last step carried out and has implemented PHP (Programmer Hypertext Preprocessor) media to students who are many or on a broader scale. The application was for students of class VIII-J Surabaya 10 Public Middle School, which include in the lowest ranking among other courses.

Of all stages, according to the 4D model by Trianto turned out to have advantages that could attract students' attention. This model reinforced by the results of responses that show that students can eliminate boredom from the beginning of viewing the PHP media display.

IV. CONCLUSION

Based on the research results, the conclusion was the form of developing mathematics learning media with PHP (Programmer Hypertext Preprocessor) program using 4D research design (define, model, develop, and disseminate) is very interesting and could eliminate the boredom of learning mathematics. The development of the subject matter of instructional media was good quality because it has fulfilled three aspects of quality, namely: valid, practical, and useful.

ACKNOWLEDGMENT

Thank you to the school, mathematics teacher and all students of class VIII who have helped in the implementation of this research for even more excellent benefits

REFERENCES

[1] S. Mumtaz, "Factors affecting teachers' use of information and communications technology: A review of the literature," *J. Inf. Technol. Teach. Educ.*, 2000.

[2] J. Zhang *et al.*, "PHP: What is PHP-Manual," *my PHP.net*, 2015.

[3] W. Sanders, *Learning PHP Design Patterns*. 2013.

[4] E. Winarno, A. Zaki, and SmitDev Community, *Pemrograman Web Berbasis HTML5, PHP, & JavaScript*. 2014.

[5] E. Ingleby, "Research methods in education," *Prof. Dev. Educ.*, 2012.

[6] Trianto, "Model Pembelajaran Terpadu," *Konsep Strateg. dan Implementasinya dalam KTSP*, 2014.

[7] Trianto, *Panduan lengkap penelitian tindakan kelas (classroom action research) Teori & Praktik*. 2011.

[8] J. Kirk and M. Miller, *Reliability and Validity in Qualitative Research*. 1986.