

Design Of Mathematics Learning Multimedia Base On PBL Model To Improve Student's Creative Thinking Skill

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Abstract:— The purpose of this research is to design learning multimedia that can be used to improve the students' ability to think creatively. This is developmental research using ADDIE model (Analysis, Design, Development, Implementation, Evaluation). Subjects in this research were students of class VIII in MTS Karangajen Muhammadiyah Yogyakarta. The analysis phase was carried out to gather information about potential and problems in this study by conduct the requirement analysis of students in mathematics multimedia learning. The results of the requirement analysis are used to simplify the process of designing multimedia learning in mathematics. This study is limited to the design phase. For further research will continue at the stage of development and dissemination. The result of development is the multimedia consist of the start page, home page, materials page, evaluation page, guidance page, and about page. The results of the feasibility test show that the average score is 80, so the design is included in the category of good and worth developing.

Keywords:— - Social Arithmetic, Moodle, Multimedia, PBL.

1 INTRODUCTION

Creative thinking is a skill that must be owned by the students in 21st-century learning and curriculum in 2013 [1],[2]. However, the ability to think creatively mostly junior high school students is still low [3]. Often, students can not immediately find a solution to the problems of mathematical obtained. Students seemed to just listen, copy or mimic what is given by the teacher. The habit of copying or imitating the work of others make students become people who use only. Habits of students like that to learn concepts as memorization without deep understanding, and students are not able to implement it. This way make students less able to think creatively [4]. Several previous studies showed that PBL learning model can help to improve students' ability to think creatively. Through the PBL learning model, students do not just imitate, but the students explore ways or other solutions in solving mathematical problems. This is supported by the availability of some of the issues that are encouraging students to use some means or provide some solutions in order to solve the problem [5],[6],[7]. In the 4.0 era of the industrial revolution, technology has developed rapidly and become the basis for every aspect of life [8],[9],[10]. E-Learning is one use of telecommunications technology to deliver information to education and training. With advances in information and communication technology development, e-Learning appears as a paradigm of modern education. The great advantage of e-learning including freeing interaction between learners and instructors, or learners and learners, from the limitations of time and space through a model of asynchronous and synchronous learning networks [11]. Among the key players in any effective integration of technology into teaching and learning is the teacher [12].

So that this condition has resulted in a shift in the role of teachers, which is now the teacher can no longer serve as the sole source of information for students' learning activities. In connection with that, the teacher needs a media that can be used as alternative sources of information, one of the media used in multimedia interactively learning which is more fun and exciting for students [8]. Learning media is more diverse, ranging from conventional media such as books or traditional props to modern media audio visual form in cassettes, videos, and other modern visual device. Learning media used to optimize the teaching and learning process, strived to be able to grow creativity and motivation in learning activities to improve the quality of education [13]. Previous research also shows that the use of multimedia learning with PBL learning model can improve students' ability to think creatively [14]. On the other hand, almost all schools in Yogyakarta has internet facilities that easily accessible [15].

2 RESEARCH METHODS

This research is a development Research and Development by using the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) model limited in the design stage [16],[17],[18],[19],[20],[21],[22],[23]. Subjects in this research were students of SMP Muhammadiyah Yogyakarta Karangajen. In the analysis stage, the researcher gathers information about potential and problems that conducted by a requirement analysis. Then, the researcher makes a design product base on the analysis. After the design product was complete, it will get validating from experts to determine the feasibility of product. Steps of development design product are presented in figure 1 below.

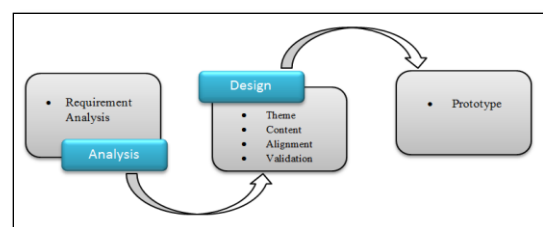


Fig 1. Research Method.

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3 RESULT AND DISCUSSION

Multimedia design of math Learning base on PBL learning model at social arithmetic material by using Moodle can be accessed at <https://aritmatikasosial.gnomio.com>.

3.1 Display Sistem

Here are some description related to display system contained in the multimedia design of math Learning base on PBL learning model at social arithmetic material

3.1.1 Start Page

This page is a start page when we access the site <https://aritmatikasosial.gnomio.com>. On this page, the user can press the "log in" contained the upper right corner in order to access the menus available. This page contains pictures and purchase transactions are a form of activities related to social arithmetic. In addition, there is a log-in menu, home, materials, evaluation, guidance, about, and an overview of the social arithmetic as well as courses that are available in the site. At the bottom of this page contains information about the author. Display start page design can be seen in figure 2.

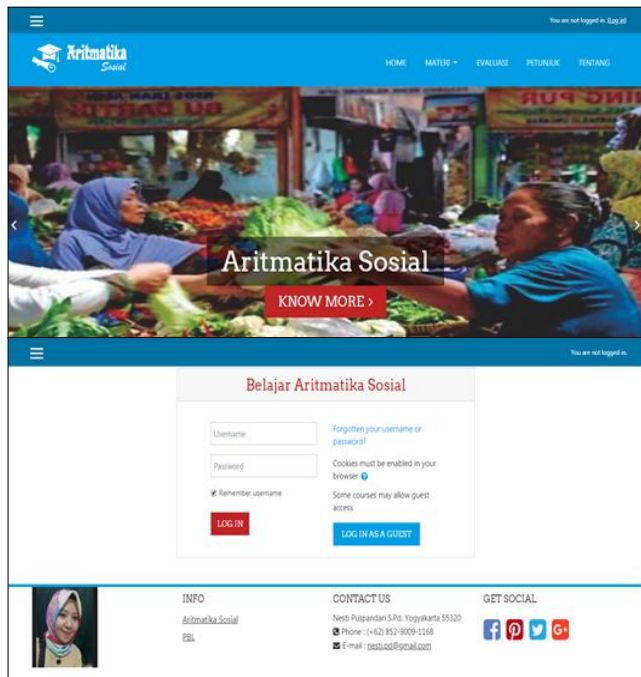


Fig 2. The Start page

3.1.2 Home Page

In the home page, there are several menu options that can be selected by the user, including: materials menu, menu evaluations, user menu, the menu about, calendars, dashboard, as well as the course is available. At the bottom of this page contains information about the author. Display home page can be seen in Figure 3

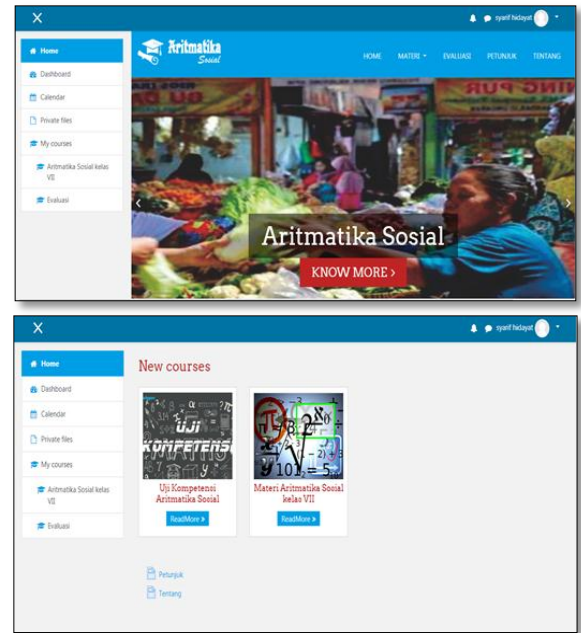


Fig 3. Home page

3.1.3 Material Page

When the student presses the material menu will display the sub material to be covered. After selecting a sub material that will go to the material section where the subject is presented in a detailed, sequential and systematic according to the steps of learning model PBL namely (Granting issues, organizing learning activities, guided independent inquiry and groups, present and develop attainments, and given exercises). Exercises that are given are presented with multiple choices with limited time. After completing the exercises, the user can continue selecting the next sub-material. Page of this material can be seen in Figure 4.

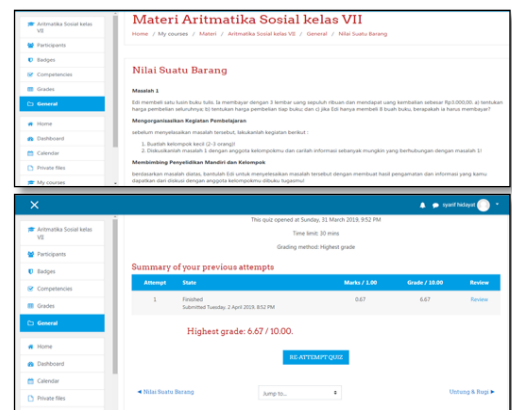
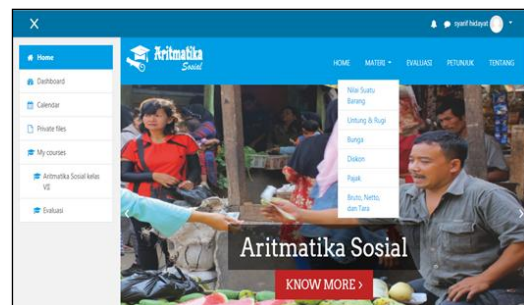


Fig 4. Page Content

3.1.4 Evaluation Page

On this page, the user can perform an evaluation regarding the material has been obtained. Questions on this page is an essay. Users can write the answers on a given column or by uploading an attachment. Where there is a time limit in doing it. After users submit and finish their task, they will see about the time of started on, state, completed on, mark and grade of the task they take, Evaluation page display are presented in Figure 5.

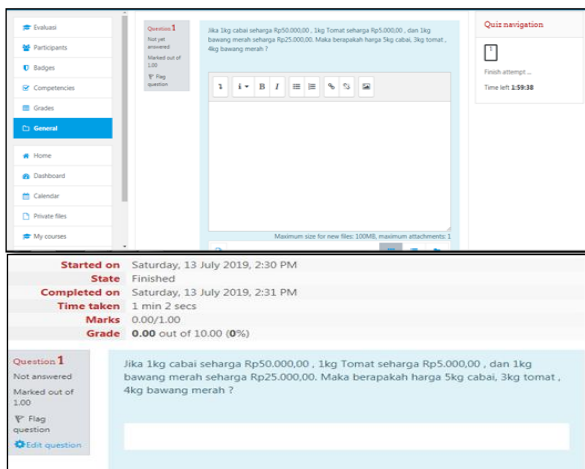
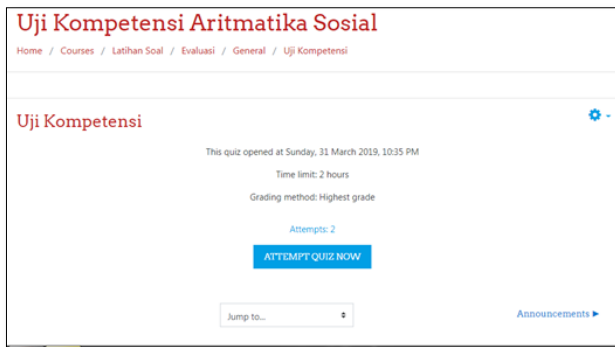


Fig 5. Evaluation Page

3.1.5 Guidelines Page

This page displays the user to access all the multimedia menu contained in this study. Guidelines page display is presented in Figure 6.



Fig 6. User Guide

3.1.6 About Page

This page displays a description of what the mathematics multimedia design base on PBL is. About page is presented in Figure 7.

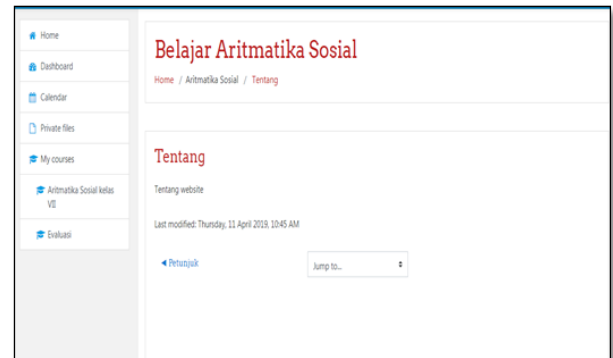


Fig 7. About Page

3.2 Validation Product Design

After the product design is complete, the researcher ask two experts to be the product design validator. This is done to determine the feasibility of the design of the product. The results of the validation by experts are presented in Table 1 below.

TABLE 1
THE RESULTS OF THE VALIDATION

No.	Aspect	Score		Average
		expert 1	expert 2	
1.	Presentation according to the indicators of achievement	70	70	70
2.	The complete multimedia presentation	80	75	77.5
3.	The presentation material encourages students to think creatively	80	85	82.5
4.	Presentation of guiding students in making based learning PBL	90	90	90
	Average	80	80	80

The table above show that the average score is 80, so the design is included in the category of good and worth developing

4 CONCLUSION

This research is a development that resulted in the design

(prototype) multimedia learning mathematics-based PBL (Problem Based Learning) using moodle to improve student's creative thinking skill in which portions of multimedia is in the form of the start page, home page, materials page, evaluation page, guidance page, and about page. Where the result of the feasibility test is good. The multimedia design will be used for further research and development..

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