Development of Web-Based Learning Media in the Subject of Research Methodology (Supporting Blended Learning System) at Kartanagara University

by Sudarman Sudarman

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Abstract: This development research aims to develop web-based learning media for supporting blended leaerning system, find out the results of the development of materials and web-based learning media, and find out the obstacles when implementing web-based learning media in the Research Methodology subject at FKIP Unikarta, Tenggarong. The development model was adapted from the ADDIE instructional design model. The results of the study show that: (1) the development of web-based learning media: www.rahmattep.com through the stages of analysis, design, development, implementation, and evaluation; and (2) the results of the development of web-based learning media are categorized as feasible to be used in the Research Methodology subject based on validation by material experts, media experts, lecturers of the course. Student responses include aspects of ease of understanding, appearance, and quality of interactions, interests, and interests, showing decent results. The results of this development are categorized as good. Constraints that occur during the development process of web-based learning media are: (1) the limitations of students in understanding internet networks; (2) internet networks that are not optimal at the time of application; and (3) lack of time and explanation of the application of web-based learning media.

Keywords: development, research methodology, media web, blended learning

I. INTRODUCTION

The added value of web-based learning or with other names such as online learning as part of blended learning compared to teacher-centered learning is that of helping students to obtain the right knowledge and skills so that they become active, independent and collaborative learners [1]. Web-based learning resources have the potential to support learning processes where students have the ability to explore knowledge and improve their learning skills [2]. In learning activities, determining the right learning material is an important problem in an effort to help students achieve competence. According to the Ministry of National Education [3] that in the curriculum or syllabus, learning material is only written in broad outline in the form of basic material. This condition is one of the obstacles to learning activities.

Minister of National Education Regulation concerning Process Standards states that the learning process in education units is held interactively, inspiring, fun, challenging, motivates students to actively participate, and provides sufficient space for an initiative, creativity, and student independence. This condition implies that the lecturer is expected to apply more innovative learning so as to encourage students to learn optimally, both independently and in groups in the classroom.

Learning activities are teaching and learning processes that have goals in achieving student learning outcomes, and an effective learning process so as to successfully provide understanding, intelligence, perseverance, opportunity, and good quality. In addition, it also provides changes in behavior and applicability in their lives [4]. Learning process is a process of interaction between educators and students who almost entirely use language or communication media. Thus, communication plays an important role in the learning process. However, in the communication process does not always run smoothly, even misunderstandings or concepts often occur. Therefore, the use of a media is very helpful for lecturers in the delivery of learning material so that there is no misconception [5].

Learning media is needed in teaching and learning activities, learning media are all tools and materials used to achieve educational goals. The use of learning media in the field of education can take the form of internet-based media, including portals, forums, blogs, web or other types of e-learning media. The internet media provides new solutions for the development of education [6].

The development of science and technology has provided changes in learning material. According to Dick & Carey [7], there are two types of learning material, namely written teaching material (written) and teaching material that is provided (mediated) or called printed material (non-printed material). According to Reisser, non-printed teaching materials are teaching materials developed to enrich students' understanding of the subject matter, in addition to filling in the shortcomings that arise due to problems in reading culture, time constraints and to answer the diversity of learning styles of students [8]. Means, the development of web-based learning media can make the most of its media capabilities. Therefore, it needs to be revealed about the use of web-based learning media in the Research Methodology course at FKIP Unikarta, Tenggarong. In this institution still apply conventional learning, namely learning by lecturers

who in the delivery of the material using standard learning media, such as powerpoint or without learning media then provide questions/assignments to students with the limited material. Whereas from physical factors or the competence of lecturers and students, the institution is categorized as feasible in the use of information technology-based media for educational development.

However, they have not been able to utilize the wifi facilities provided by the institution to the maximum. The internet is more widely used to access social media (Facebook, Twitter, Yahoo Messenger). This situation becomes ironic when students' interest in accessing the internet is high, there are no internet-based learning media that is able to support and direct students to effective independent learning. Therefore, it is necessary to compile web-based learning media that can be accessed through the internet anywhere and anytime, either with a notebook, handphone or the other device. Through the learning media, it is expected that the use of the internet by students in learning will be maximized and quality.

As a form of realization, it is necessary to design a combination of learning approaches between the process of obtaining information through face-to-face and website, whether it is basic exploration, deepening, enrichment, or expansion. In addition, it is also necessary to develop web-based learning media through the internet network in an effort to use information and communication technology to support learning activities. The approach that is in line with these expectations is e-learning based on websites with special designs. The basic assumptions are (1) easy and fast to use; (2) the power of interconnection of exploration, deepening and expansion of material from various sources; (3) encourage the expression of learning autonomy; and (4) encourage the creation of a learning culture. With these conditions, web-based learning media can be used in indirect learning, i.e. without face to face between lecturers and students, anywhere and anytime without having to wait for time to study on campus to deepen knowledge of Research Methodology [9].

Learning media is all things in the form of tools, methods and techniques used to convey learning messages from the message source to the recipient of the message so that there is interaction between teaching and learning in order to achieve the learning objectives effectively and efficiently [10] and can be classified in four models, namely the model according to (1) Wilbur Schramm, (2) Gagne, (3) Allen, and (4) Gerlach and Ely [11] In general, the criteria that must be considered in the selection of learning media are (1) objectives; (2) target students; (3) media characteristics; (4) time; (5) fees; (6) availability; (7) context of use; (8) technical quality, and (9) the principle of media use [12].

Learning media is needed in the practice of learning. The learning model in this study distinguished web-based learning and conventional learning. Web-based learning is a learning that can be accessed through the internet or web-based (WBT)

networks [13] as one type of application of electronic learning (e-learning), namely the application of computer-based learning, virtual classes, and digital classes (The American Society for Training and Development / ASTD (*http://www.about-elearning.com/*). In addition, it also has four characteristics that are Interactivity, Independence, Accessibility, and Enrichment as things that distinguish e-learning from conventional learning activities.

The main principles in web-based learning are: (1) the interaction (communication) between participants and instructors; (2) the use to create a consistent and simple learning environment, and (3) the relevance of accurate information to improve students' understanding, In addition, it also requires the cooperation of many people in reflecting possible design scenarios [14] One form of web-based learning is the blended learning method. Driscoll has reviewed the results of research conducted that blended learning as a place for combining all types of learning in conventional classes with e-learning, two types of e-learning, or two types of offline learning, while integrating material delivered in traditional classes of virtual synchronous classes and asynchronous learning [15].

II. METHODS

This research is a development research (R & D) to produce learning software products in the form of web-based learning media, and test its effectiveness in lecturing on Research Methodology. The development model follows the ADDIE instructional design model which includes analysis, design, development, implementation, and evaluation. The application of the ADDIE model procedure in making web-based learning media in the Research Methodology course is shown in Table 1.

Data collection instruments used in the study was: (1) questionnaires (questionnaires); and (2) documentation. Questionnaires were used to obtain data about the validity of the results of the development of web media and came from validation by experts in research methodology, validation by media experts, and assessment of lecturers and students. The type of questionnaire used is in the form of a checklist arranged based on the instrument lattice. Documentation is used to obtain data directly from research sites, including relevant books, regulations, activity reports, photographs, documentary films, and data relevant to the study.

Based on data obtained through research instruments analyzed using descriptive statistics. The use of this descriptive statistical technique is to determine the quality and effectiveness of web media based on data obtained from the assessment of a reviewer group consisting of expert lecturers, lecturers, and students. Data in the form of input, correction of suggestions and criticisms of the products produced, then selected for relevance by researchers. Relevant advice is used as the material for revising the product.

Table 1
Stages of Web Learning Media Development Research Methodology

Stage	Description
Analysis (analysis problem and component learning)	The wifi network on campus is available but not yet used well in the learning process. Supported by students who have high interest in access the internet, so that the media will be developed web-based learning.
Design	Design of web preparation learning media products systematic presentation of material, illustrations, visualization and design evaluation tools.
Development Product	Text writing, creation of navigation buttons, creation and image installation, search and discussion forum creation on CMS software. Making hyperlinks, as well as making and installation of quizzes. At this stage an evaluation is carried out formative in the form of material validation by material experts, validation media by media experts and assessments from lecturers, which are then used for improvement.
Implementation	Using web learning media for learning in the classroom. At this stage a summative evaluation is carried out assigning tasks to find out the effectiveness of web media for classroom learning.
Evaluate	The informative evaluation in this study is validation from experts research methodology material and media experts and assessments from lecturers and 50 students. External evaluation (evaluation summative) is intended to determine the level of mastery student towards competence

III. RESULTS AND DISCUSSION

A. Web-Based Learning Media Development

The preliminary results of this study are the formation of products (learning media) in the form of e-learning web, Research Methodology Course with Qualitative and Quantitative Research Methodology material at *www.rahmattep.com.* This learning media contains Research Methodology material with competency standards "Students Have Cognitive, Psychomotor and Affective Competencies", the basic competencies in the web are at the end of the lecture Research Methodology students have competence: (1) cognitive, namely knowing, understanding and distinguishing various research methods in the field of education; (2) psychomotor, namely selecting and carrying out research steps in accordance with the topic or problem of the final project they choose; and (3) effective, namely avoid methods that are not commendable in research, for example plagiarism.

This web is presented with a choice of home menus, lecture material (systematic and quantitative and qualitative thesis writing), research methodology, forums, and educational technology, contact us and user login. The preparation of this web-based learning media, the development method used in this study is the ADDIE model (analysis, design, development, implement, evaluation).

B. Results of the Development of Web-Based Learning Materials and Media

Web-based learning media created by the developer is still not perfect so that a feasibility test is needed in order to obtain input for the sake of this learning media perfection. Therefore, material validation was carried out by material experts and media validation by media experts and then a limited trial for 1 Eye Lecturer. In addition, the lecturer of the course stated that this learning media was suitable for use or trial in the field. The validator provides suggestions for web improvement so that the learning media can be further improved and students can be motivated by the development of current learning.

C. Development of Web-Based Learning Media in the Subject of Research Methodology

The development method used in this study is the ADDIE model (analysis, design, development,

implement, evaluation). In the Analysis Phase, problem analysis and learning component analysis are carried out. Problem analysis was carried out through observation to the Unikarta campus with the result that: (1) the Research Methodology Course at the FKIP Education Technology Study Program was still motivated by classroom learning; (2) internet facilities have not been utilized properly; (3) WiFi facilities available there are more often used to access social media; and (4) the interest of students to access the internet is quite high. Therefore, it is necessary to develop a learning media that will better guide students to self-study by utilizing the wifi facilities available on campus.

Research Methodology Material chosen is the systematics of thesis writing, this learning media is arranged according to: (1) Competency Standards: Knowing the systematics of thesis writing; and (2) Basic Competencies: (a) Cognitive, namely knowing, understanding and distinguishing various methods of education in the field of education (b) Psychomotor, that is, selecting and implementing research steps in accordance with the topic or final project problem that they choose, and (c) Effective, namely avoiding methods that are not commendable in research, such as plagiarism.

Analysis of the learning situation is carried out based on the learning situation in the FKIP Unikarta's Educational Technology Study Program, especially in the lectures of the Research Methodology Lecture, it is boring, almost every student learns only to listen to lecturer lectures or explain learning material; the learning situation in the morning hours makes students sleepy and learning becomes less effective. On the other hand, almost all students have known the internet and are able to operate computer devices that are connected to the internet or through gadgets, they often search for assignments online.

In the learning design web-based research methodology is carried out through several stages: (1) the preparation of the structure of the web-based learning media structure describes the entire contents of the material that has been determined in accordance with the indicators and learning objectives included in the development product and the order of presentation; (2) determination of the systematic presentation of material, illustrations, and visualization by

determining the order in which the material is presented. In determining the systematic, a sitemap is made as shown in Figure 1 below; (3) writing the draft of the initial learning media product is done part by part according to the framework that has been compiled. In this step, a software design is produced, namely the creation of storyboards and the creation of a script for the logic of the presentation of material. This manuscript is a clear and detailed written presentation of the material to be presented which is contained in the syllabus. While storyboarding is a form of elaboration of a script that is poured into a frame by frame screen display on paper.
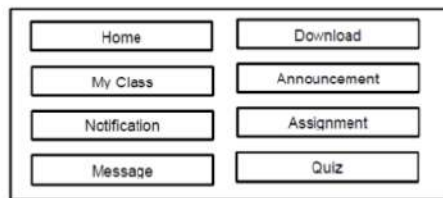
Home	Download
My Class	Announcement
Notification	Assignment
Message	Quiz

Figure 1
Web-Based Learning Sitemap

In the stage of development (development) of this product, we made and assembled our page; which includes writing text, installing images, hyperlinks and making the material. The software used is LMS Wordpress in the form of databased. Before creating a webpage and others, the template that is used will be used for a more attractive web display. After being selected then the creation of a web page or page is guided by the sitemap.

Text writing refers to the script of the logical flow of presenting all material systems that will be published on the web. Some things that need to be considered in text usage are font size, text type, outline, heading, sequences, text number, paragraph length, sentence length, word length and clarifying the text. Writing text in the web is called posting an article on a web page, or called a hyperlink that is intended to be a way to connect a section of a web page to another page or website. Image installation is done by looking for images that are adjusted to each material title so that it can help students to better understand the lecture material presented. Installation of images also pays attention to the layout in the text and in slides.

This web media is used for learning so that evaluation is needed in the form of tasks. Tasks have been created during learning, so the task needs to be entered into web pages in the form of word/pdf using uploads. With this task, students can directly send the correct assignment by clicking on the column that has been provided, and the developer can direct the results year. In this stage, formative evaluation is carried out in the form of improvements or revisions after obtaining input and suggestions from material experts and media experts in the form of material validation and media validation. If this product is declared valid by material experts and media experts then web media products can be applied/tested in the field or in learning.

In this implementation phase as a stage to utilize or use the learning package in learning activities. At this stage, an evaluation is conducted to find out the feasibility by looking at the responses of teachers and students. In addition to knowing the effectiveness of the media, it will be a task collection. The implementation of web-based learning media was used in the learning activities of the Research Methodology Course at the FKIP Unikarta's Educational Technology Study Program, as well as applied to its teaching lecturers.

The evaluation phase includes internal and external evaluation. Internal evaluation (formative evaluation) is carried out to determine product quality. Formative evaluation results are used as feedback to make improvements. Formative evaluation in the form of validation from research methodology experts and media experts as well as assessments from research methodology lecturers and students. External evaluation (summative evaluation) is intended to determine the level of student mastery of the competencies that have been taught. This means to know the effectiveness of web media in improving learning outcomes.

D. Analysis of Validation Results and Try Out Subjects

Validation is a trial process and revises the teaching package that has been developed. In this study validation is an evaluation process carried out in the development and implementation stages. The evaluation process includes formative and summative evaluation. Formative evaluation of the implementation in the form of validation from Research Methodology experts and media experts as well as assessments from lecturers and students. This evaluation was conducted to find out the quality of web-based learning media products.

External evaluation (summative evaluation) is intended to determine the level of mastery of students towards the competencies that have been taught. This means to know the effectiveness of web media in improving learning outcomes. Material validation by material experts was carried out by lecturers from research methodology courses. In addition to the material experts also gave an assessment of the aspects of learning and material aspects summarized in the following diagram (Figure 2).
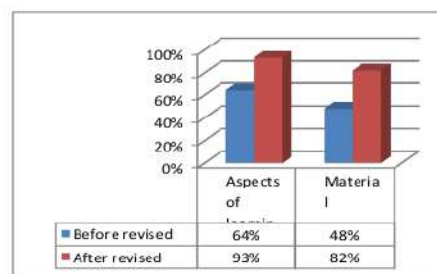
	Aspects of learning	Material
Before revised	64%	48%
After revised	93%	82%

Figure 2
Diagram Percentage Score Assessment

E. Material Expert on Media

From the diagram, the results of the assessment by the material experts above obtained the percentage score results before being revised, namely the learning aspect of 64% and the material aspect of 48%. After being revised it increased to 93% in the learning aspect and 82% in the material aspect. The percentage of the score obtained was converted back into the web quality category so it was concluded that the quality of the web was good, and stated by material experts that web media was feasible to be implemented or tested in the field. Media validation is carried out by media experts, a lecturer who is competent in their field from Unikarta Faculty who manage or operate the Fisip Unikarta web. Some suggestions are given, including: (1) Content in the delete that is not necessary or has nothing to do with the course taken or writing that is on the Web; (2) Passwords do not need to be displayed so that students do not confuse writing; (3) the web is better filled in according to the course so that it does not appear empty because of its usefulness to collect tasks and there are lecture material, research methodology, forums, educational technology; (4) lecturer data is loaded especially the data of research students; and (5) Contact Us or maps if the address written cannot be better entered in the address of Unikarta so that outsiders can go there by looking at maps from Google.

Media experts also provide an assessment of aspects of web display as summarized the results of the assessment by the media experts above obtained results on aspects of web display before being revised (54%), and after being revised to (85%). To find out the quality of the web media, the percentage score is converted back into the web quality category so that conclusions can be drawn about web quality and show good results. In the aspect of web display before being revised (54%) if it is based on the score interpretation criteria included in the category enough, and after being revised into (85%) if it is based on the score interpretation criteria included in the excellent category. Media experts also state that web media is feasible to be applied/tested in the field.

In Validation on the quality of display, content, language, and interactivity of web-based learning media by Lecturers of Research Methodology Subjects at the FKIP Unikarta Educational Technology Study Program. The assessment results by the Lecturer of the Research Methodology above the results were obtained, the assessment of the aspect of the display with a percentage score of 65%, the aspect of the content of 44%, the aspect of language 53%, and the interactivity aspect of 60%. After revised the results were obtained, assessment of the aspect of the display with a percentage score of 100%, on the aspect of 76% content, 86% language aspect, and 90% interactivity aspect. To find out the quality of web media, the percentage score is converted back into a web quality category so that conclusions can be drawn about web quality. The percentage of web scores is then converted based on the score interpretation criteria table.

In the aspect of display with a percentage score of 65% if based on the criteria of interpretation of scores included in the good category, on the aspect of content 44% included in the category enough, aspects of language 53% included in the category enough, and aspects of interactivity 60% included in enough category. After revising the results were obtained, assessment of the aspect of the display with a percentage score of 100% included in the excellent category, on the 76% aspect included in the good category, 86% language aspect included in the excellent category, and 90% interactivity aspect included in a very good category.

The validation test was carried out garade V semester students FKIP Unikarta Educational Technology Study Program. The results of student responses to learning media can be summarized from the student responses showed that the ease of understanding aspect had a score of 79%, aspects of appearance and quality of interaction 75.3% and on aspects of interest and attractiveness 77.7%. To find out the quality of web media, the percentage score is converted back into a web quality category so that conclusions can be drawn about web quality. The percentage of web scores is then converted according to the score interpretation criteria table. On the aspect of ease of understanding has a percentage score of 79% is based on the criteria of interpretation of scores included in the good category, aspects of appearance and quality of interaction 75.3% included in both categories and on aspects of 77.7% interest and attractiveness also included in the good category. Based on the results of lecturer assessment and student responses, this web-based learning media generally meets good quality for use in learning research methodologies.

F. Advantages and Disadvantages of Web-Based Learning Media Developed

Some of the advantages of this web-based learning media as a learning media for lecturing in research methodologies include: (1) an online system that can be used outside of study hours without having to depend on the teacher; (2) can be accessed anywhere whenever and by anyone as long as it is connected to the internet network; (3) it is interactive so it is very interesting to be used as an independent learning medium; and (4) can be accessed via internet-connected gadgets too.

In addition to having the advantages of this media also have limitations, including:

1. This media cannot be operated in addition to using computers, gadgets and the internet. This has resulted in the limited use of this learning media only for students who use computers, gadgets and internet networks.
2. Different access speeds on internet network usage so that the speed to open the web is also different, if the connection is slow, open the web too long.
3. Learning via the web is still rarely used and is known as a learning media at this time so that it has obstacles for lecturers and students to use.

4. It takes a long time to prepare for these web-based learning suggestions.

IV. CONCLUSION

Based on the results of the development of web-based learning media for research methodology courses at FKIP Unikarta Tenggarong, can be summarized as follows:

1. The development of web-based learning media in research methodology courses at FKIP Unikarta Tenggarong has been carried out by researchers through several stages according to the ADDIE model, with procedures/stages: (a) analysis in the form of problem analysis and learning needs; (b) the design is the preparation of the structure of the web media structure, the determination of the systematic presentation of the material, and the writing of the initial draft of the web learning media and storyboard creation; (c) develop namely the creation and assembly of web pages, which includes writing text, installing images, hyperlinks, and creating and installing tasks; (d) implement is to use it in learning activities; and (e) evaluate is the validation of research methodology experts, media experts, as well as assessments from lecturers and students.

2. Feasibility of learning media products developed is determined through the validation stage by media, material experts, lecturers, and students.

    a. Validation of media experts, when viewed in terms of media quality, obtained an assessment before revision with enough categories with suggestions and revisions, after being revised obtained a value with a very good category, which means the learning media is worth using with suggestions.

    b. Validation of material experts when viewed in terms of the quality of material and learning. The assessment of the material expert before being revised obtained a score with enough categories. After revision, get a very good category. This means that the material deserves to be applied or tested in the field with suggestions.

    c. Assessment by the lecturer of the study methodology sample obtained the results before being revised to get a grade with enough categories. After being revised, it has a very good category.

    d. Student response results can be seen in the ease of understanding aspect has a percentage score (79%) is based on the score interpretation criteria included in both categories, aspects of appearance and quality of interaction (75.3%) included in both categories and on aspects of interest and attractiveness (77.7%) also included in the good category.

3. Obstacles that occur when developing web-based learning media are: (a) limitations of students who understand the internet network or learning media make them difficult; (b) internet network that is not optimal when applying it; and (c) lack of time and explanation makes lecturers and students less understanding in the application of web-based learning media.

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based learning resources", International Journal of Continuing Engineering Education and Life-Long Learning, 2013.
Publication

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8 Setuju, D Ratnawati, A Wijayanti, W Widodo, B R Setiadi. "ICT-based learning media development", Journal of Physics: Conference Series, 2020
Publication

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