HTML5-based Learning Media in the Educational Psychology Course

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Abstract. This study aims to develop an html5-based application as a learning media for Educational Psychology; Furthermore, knowing the validation assessment of media experts and material experts as well as students on html5-based learning media in the Educational Psychology course. This research is a type of research and development (Research and Development) following the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation), namely the analysis, design, development, implementation, and evaluation stages. Validation was carried out by the course Lecturer Team and IT Lecturer Team and tested on students of the Early Childhood Education Teacher Education study program at Medan State University. The evaluation results of the material aspect validation test followed the indicators on the assessment9instrument. The results of the media aspect validation test assessment of 92% showed that it was in the very feasible category. The effectiveness of learning media for HTML5-based Educational Psychology courses was declared effective, indicated by the difference between the pretest and posttest scores of 40%.

Keywords: Educational Psychology, HTML 5, Learning Media.

1 Introduction

Rapid technological advancement has both significant positive and negative effects. Therefore, this can have an impact on all aspects of users' lives, including the social, cultural, economic, political, and educational spheres. One of the positive effects of the rapid development of technology is its use as a means and infrastructure to support a higher quality teaching and learning process in the field of education. Technology advancement also provides solutions to problems that arise in the field of education, particularly in the creation of a practical and high-quality learning process through the development of teaching and learning media.

Indonesia has been running for several years since the 4.0 technology revolution grounded all corners of the archipelago. Many educational programs in schools, colleges, and other educational institutions have implemented technology learning activities. However, few have not made innovations or reforms in utilizing technology as a learning medium. The presence of technology in education, particularly at the university level, will often provide benefits now and in the future. The growing era will help professional lecturers meet the needs of delivering learning to their students. However, a new history has emerged in education, both formal and non-formal, worldwide due to the COVID-19 pandemic [1]. Due to the

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spread of covid-19, the educational process, which was supposed to bring together lecturers and college students and then gather in the lecture room with all learning process activities, had to be halted.

Efforts put in place by the government to prevent the spread of COVID-19 are the creation of many new policies, one of which is by stipulating several regulations in Indonesia, including the implementation of quarantine in their respective homes and restrictions on mobility and macro-scale social activities [2]. Social distancing and self-quarantine at home, which are a must, also significantly affect the world of education. Teachers who are needed to be educators and managers are instructed to stay sensitive and vigilant in the event of pandemic conditions., even if it means working from home (work from home), so that the process of learning activities, both material delivery and evaluation, continues [3]. The government also demands that these academics be able to harmonize subject matter by utilizing and using technology in their curriculum.

Increased understanding of students in learning materials is the hope of using technology in learning activities in the classroom. The world of education needs to take advantage of technology so that it can be used to find information and convey the results of information and knowledge obtained [4]. Utilization of technology with the hope that it can bring benefits to students, increase critical thinking power, and create a sense of pleasure and interest in the process of learning activities. Especially during a pandemic like this, the need for technology is felt.

The use of monotonous teaching methods by lecturers in teaching so far can cause boredom to students, lack of student participation, noise factors that can cause communication disorders during teaching, students mixed information, and lack of interest or attention to lecture material [5, 6].

According to preliminary findings from research done so far in the PG-PAUD Study Program Educational Psychology course, the learning model still relies on text. Student achievement is still poor because instructors do not provide engaging learning materials during online learning. Students are always only involved in reading books/theories and are silent in class, so most students feel bored when receiving the material. Learning this Educational Psychology course will be easier and more enjoyable if it involves the direct participation of students. This is also following the results of several previous studies, which stated that the problems experienced by students during the pandemic were the low digital literacy of students and students having difficulty understanding the material that was still theoretical/textual [7,8].

Using learning media in online and offline learning activities is one of the efforts to create a sound quality learning system. Lecturers require media as a medium for communicating learning materials to students so that students may comprehend the topic more readily. Likewise, the opinion [9] is that learning media is a tool that allows students to be interested, understand, and happy in learning. It is also welcomed [10] which states that a process of learning activities that utilize learning media properly will provide effectiveness and efficiency in improving student learning outcomes, so that good progress is obtained from student learning outcomes.

Seeing the problems in the world of education and the increasing development of technology and communication can lead to innovations that utilize technological and communication advancements to solve problems in the world of education. These technological advancements can facilitate innovative, efficient, and simple education. Therefore, HTML 5-based media will be created so that students can develop innovative and effective learning media. The research and application of HTML 5-based interactive learning

media that researchers will study are devoted to the Educational Psychology course. The Educational Psychology course is one of the compulsory subjects to be mastered by undergraduate students of the Early Childhood Education Teacher Education program at the Faculty of Education, State University of Medan. This course covers cognitive development theory, learning behavior theory, approaches to learning, information processing models, constructivist learning, learning modalities, and a learning environment. Therefore, a more attractive, efficient, and effective learning medium is necessary to enhance the quality of learning in the Educational Psychology course.

Learning media is a pretty important tool for the learning process; the media will help the learning process be more exciting and not monotonous [11]. In addition, the media can increase student interest and motivation in the learning process. However, in reality, the current learning media is still limited, especially in Educational Psychology lecture material. Most students dislike the subject because it is dominated by theory rather than practice.

2 Research Methods

The type of research used in this research is Research and Development (RnD). The research and development method, or in English Research and Development (RnD) is a research method used to produce specific products and test their effectiveness of these products [12]. Research and Development (RnD), according to [13] are research methods used to produce specific products and test their effectiveness of these products. The researcher conducts research and development on the Educational Psychology course.

The learning media development model in this study uses the ADDIE development model. According to [14] explaining that the ADDIE development model consists of five stages which include 1) Analysis step: Analyzing the need to determine problems and appropriate solutions for students as well as hardware and software, design (design); 2) Design step: Product design includes flowchart design, overall media design (story board), preparation of material text, questions and answers as well as background collection, images and buttons, development: At this stage it is made using web-based software (HTML-5) by using the Construct-II software This application is an application for developing HTML-5 web without programming code. Construct-II can also be taught to students to increase their creativity in managing content and creating other web and mobile applications that support student learning and enthusiasm for learning; 3) Development step: Application development includes making interfaces (interfaces), testing (testing), and deploying. At this step, validation is also conducted by a team of materials specialists and a team of communication, 4) Implementation step: Researchers conduct product trials for PG-PAUD students online in the fourth implementation stage.

The product trials that researchers developed were conducted on 30 PG-PAUD students to determine the effectiveness and practicality of the products that researchers developed; At this stage the media was tested on students using a pre-experimental design with a one group pretest-posttest design. According to [14] the one-group pretest-posttest design is a trial model that is given a pretest before and a posttest after treatment to see more accurate student cognitive results. 5) And in the last stage, namely the evaluation stage, at this stage, the researcher evaluates the products that have been developed from the results of the implementation, namely from the responses of students and experts who aim to find out the achievement of development goals.

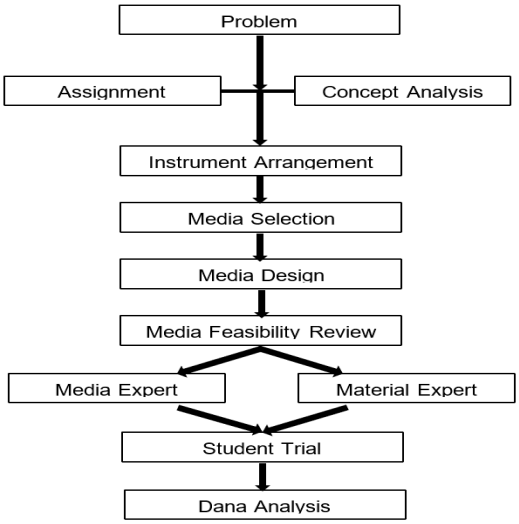

Fig. 1. Research Flow

The study sample is a reflection of the population that can be measured and investigated [15]. The sample in this study was 1 lecturer as a material expert, namely a lecturer in Educational Psychology, and 1 lecturer as a media expert, namely a lecturer in the field of Information Technology. The sample in this development research field trial is PG-PAUD study program students who take Educational Psychology courses in the even semester of 2022/2023, both classes A and B totaling 70 students.

The research instrument uses a material expert assessment questionnaire to determine the feasibility of the questions/practice items, while the media experts to determine the feasibility of the learning media and determine the feasibility of the items to be used as content for student learning evaluation. The types of data used in this development research are quantitative and qualitative. Quantitative data were obtained by acquiring material validation scores and media validation. The practicality results were obtained from the expert and student responses questionnaire, and the effectiveness results were obtained from the pre-test and post-test scores. At the same time, qualitative data is obtained from the results of input and suggestions from media experts and material experts from the validation sheet. The material expert's review sheet is analyzed and then validated and interpreted qualitatively. Meanwhile, the media analysis was analyzed and then validated with the interpretation of scoring on the Likert scale which included aspects of difficulty, discriminatory power, validity and reliability..

The interpretation of the research instrument questionnaire assessment uses a Likert scale as shown in table 1 below:

Table 1. Likert scale

Rating	Scale
0 % - 20 %	very unfeasible
21 % - 41 %	unfeasible
41 % - 60 %	feasible enought
61 % - 80 %	feasible
81 % - 100 %	very feasible

3 Result and Discussion

The product developed is the core of the implementation of this research development. This development research aims to obtain an html5-based interactive learning media product in the Educational Psychology course aimed at PG-PAUD FIP State University of Medan students.

Needs analysis activities were carried out using questionnaires, document studies, and interviews [16]. At this stage, the researchers conducted observations and interviews. Observation activities start from a) analysis of existing problems, namely the lack of media when learning activities are carried out and the lack of use of technology by students in education. b) The researcher then conducted interviews with the team of lecturers in Educational Psychology, revealing that the problems and obstacles faced in providing online and offline learning were due to the lack of innovative supporting media to assist lecturers in teaching and learning activities. Researchers also conducted interviews with PG-PAUD students, especially those who took the Educational Psychology course, to find out the problems and obstacles faced by students in understanding the material in these courses. Students still had difficulty understanding the materials. The analysis results show that most students already have their smartphones and are used to operating them. However, the utilization and use in learning activities have not been carried out optimally because their smartphones are more often used for playing games, opening whats app, watching youtube, and playing tik-tok. Likewise, with supporting lecturers, lecturers have not been optimal in utilizing and developing technology-based media following the needs and demands of the times. Curriculum analysis activities examine the hardware needs of builders in the form of laptops or computers with specifications of 2 GB RAM and 1 GB internal memory so that they can run Construct-II software properly and smoothly.

In the design phase, product design is carried out. This design activity begins with outlining the media content, then proceeds to the stage of compiling the description of the material, making flowcharts, and compiling the script. The flowchart shows the topics discussed in the educational psychology course and the procedures that can be followed after the program user (user) response. Then, the script is loaded about button design, text design, application background design, and menu display design. At this stage, the researcher also made the instrument. The instrument will measure the qualifications of the products produced by using validation sheets for material experts and media experts to measure product validity, as well as making teacher and student response questionnaires to measure the products' practicality.

Furthermore, in the development stage, the realization of HTML5-based learning media products is designed using the Construct-II software. Therefore, the feasibility of HTML5-based learning media designed using the Construct-II software is validated constructively and empirically. In construct validation, namely, validation carried out by material experts for items and media experts for media components that have been made, while in empirical validation, namely validation which is carried out directly through item analysis on questions tested on students.

Then in the fourth stage, namely implementation. The trial that was carried out was a trial from the PG-PAUD FIP UNIMED students. The researcher coordinates with the team of lecturers for the Educational Psychology course before conducting product trials. Then the researcher gave a pre-test to students. After that, students were given an HTML-5-based learning media application accompanied by a post-test to measure the effectiveness of the media in conveying the material and student's understanding of the material. The fifth stage is

evaluation (evaluation). In the final stage of media development, an evaluation is carried out after implementation to determine the effectiveness and feasibility of HTML-5-based learning media.

The feasibility of the items in the media, the assessment used on the material expert assessment instrument, namely the lecturer in Educational Psychology, uses assessment aspects, namely material, construction, and language [17]. From the material aspect of the fourth indicator on the assessment instrument, measuring students' critical thinking skills, it is known that the questions distributed according to the indicators only amount to 12 items. The rest of the items are not measured critical thinking skills. The number of questions distributed in the construction aspect follows the assessment indicators. In the linguistic aspect, the number is the use of standard language and communicative language. Therefore, it does not cause multiple interpretations with the number of questions distributed following the assessment indicators. The recapitulation of item validation by material experts showed that the 20 items presented in the media followed the indicators in the assessment questionnaire by material experts.

In addition, the empirical validation is done by analyzing the items on the media that have been tested. In the analysis of this item, there are four types: the level of difficulty, discriminatory power, the validity of questions, and the reliability of questions [18]. The results of the item analysis on the level of difficulty of the questions there are 12 questions in the "Medium" category, while six questions are in the "Easy" category, and there are two items that are included in the "Difficult" category. In the analysis of discriminating power, there are 11 questions in the "Medium" category. In contrast, there are four questions in the "Good" category, and in the "Poor Good" category, there are five questions. Further, the average validity of questions at the sufficient validity level, the reliability of questions in Figure 2 can be presented as follows :

Table 2. Reliability of the Question *Reliability Statistics*

Cronbach Alpha	N of items
,696	20

Based on the test results, Cronbach's Alpha value is 0.696, which is greater than 0.6. Therefore, it can be said that the question is reliable. So from the overall item analysis conducted, there are 14 out of 20 questions can be said to be valid. On the feasibility of components in the media, the assessment used by Walker and Hess [19] through technical quality and instructional quality is carried out by media experts, namely lecturers in the field of educational technology. Therefore, the technical quality assessment validation results on the readability aspect of 90% are categorized as very feasible.

Regarding ease of use, the percentage of the feasibility of 90% is categorized as very feasible. Then on the aspect of display quality, the percentage of eligibility of 92% is categorized as very feasible. In program management, 80% of the feasibility is categorized as feasible. In the instructional quality, there are three aspects with four indicators with a percentage of 100% categorized as very feasible. The results of the recapitulation of media validation by media experts on technical quality and instructional quality obtained a percentage of 92.2%, so it can be categorized as very feasible according to the opinion.

These results follow research [20,21] which shows that the average media validation results are 95.63%. Therefore, from the overall results, the feasibility of learning media for

HTML5-based Educational Psychology courses follows the media expert assessment question indicators.

Then the next stage is the trial stage for students [22], The effectiveness of this media is obtained through student trials by looking at the completeness of learning outcomes and improving student learning outcomes from the results of the completeness of learning outcomes that 85% of students get a score of 75. This is clear from the pretest results, which show that 45% of students, or as many as nine, finished the test. However, after using HTML5-based learning media and post-test, the results showed that the number of students with good grades was 85%, or 17. So it can be concluded that student learning outcomes after using HTML5-based learning media have increased by 40%.

Meanwhile, improving students in critical thinking uses a gain score with the provision that learning outcomes increase if the gain is > 0.3. The results showed that only three students were in the low category for the average student achievement in the high category. So it can be concluded that the success of student learning outcomes is increasing. Students' critical thinking skills can also increase through HTML5-based learning media on the concept of business entities in the Indonesian economy.

These results follow research [23,24] which states that the average increase in student learning outcomes is 0.70 in the very high category. The effectiveness of HTML5-based learning media is because it has several advantages, including a more attractive appearance adapted to the concept of the material being studied and answer options that can be randomized to encourage students to study more diligently and not depend on their friends. Then students can find out the score of the work results directly.

4 Conclussion

Material and media experts studied the feasibility of learning media for HTML5-based Educational Psychology courses. The feasibility of the content expert shows that the items presented in the HTML5-based learning media of the Educational Psychology course follow the indicators on the assessment instrument. Likewise, the percentage of media feasibility results from the media expert's assessment of 92% indicates it is in the very feasible category. In addition, the effectiveness of the learning media for the HTML5-based Educational Psychology course was declared effective, proven by the difference in the pretest and posttest scores of 40%, where the pretest value was 45%, and the posttest value was 85%. This research contributes to improving student learning outcomes with high average scores.

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