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Design and Testing of Chemistry Learning Media in The Form of Weblog-Based Android Applications on Hydrocarbon and Petroleum Materials

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ABSTRACT. This research focuses on the design and testing of chemistry learning media in the form of a web;og-based Android application for hydrocarbon and petroleum topics. The study aims to assess the validity, practicality, and student responses to this mobile learning tool. Conducted at SMA Negeri 1 Tambang, the research follows a research and development (R&D) methodology based on the Borg and Gall model. Data were collected through interviews, literature reviews, and questionnaires, targeting both teachers and students. The learning media, created using appsgeyser, integrates materials, quizzes, animations, and assignments to enhance engagement and comprehension. The findings indicate that application is valid, with assessments from media and subject matter experts achieving scores between 80% and 95%. Student feedback shows that 70% found the media easy to use, while 100% described it as engaging. Furthermore, teachers reported a high level of practicality in its use. Overall the use of this weblog-based Android application holds potential for improving student motivation and understanding of complex chemical concepts, particularly hydrocarbons and petroleum. Future recommendations include broader implementation and further refinements to the media content based on trial feedback.

Keywords: chemistry learning media, android application, weblog, hydrocarbon, petroleum

INTRODUCTION

Technological advances affect learning in terms of the use of learning media in schools and other educational institutions (Adam, 2023). The use of learning media in the teaching and learning process can arouse new interests and desires, generate motivation and stimulation of learning activities, and even have psychological effects on students (Ariadi et al., 2024). The development of science and technology encourages the learning process to be more applicable and interesting as an effort to improve the quality of education (Lamia, 2022). Success in achieving learning objectives is strongly influenced by several factors, such as learning strategies, learning methods and approaches, and learning resources used in the form of books, modules, worksheets, and media (Trinura Novitasari, 2023). The learning process is a communication process that requires media, so learning media becomes one of the important elements in its successful implementation (Afifah et al., 2023).

The learning process is a communication process and takes place in a system, where without the media communication will not occur and the communication process will also not be able to take place optimally (Kahfi et al., 2019). Based on the results of preliminary studies conducted by researchers on 56 students from two classes at SMAN 1 Tambang, 49 of them have an *android*. In fact, 38 out of 49 students who have an android prefer to use an *android* rather than a book. Based on the above problems, one form of learning media development is the utilization of information and communication technology in the field of education (Liana Nurhaeti, 2023). M-learning is a learning media using mobile devices such as cell phones, *PDAs, laptops* and *tablet PCs (Ahdan et al., 2020)*. SMAN 1 Tambang is known that the school has never utilized *android* as a learning media. This condition causes low motivation of students to learn, thus affecting the cognitive achievement of students. Learners who underachieve are not caused

by their lack of ability, but because there is no motivation of students to learn (Lubis & Dahlan, 2023).

Researchers intend to develop a product in the form of chemistry learning media in the form of weblog-based *android* applications in the hope of fostering student learning motivation because many concepts of chemical material are abstract and difficult to understand, especially Hydrocarbon and petroleum materials (Afrina et al., 2023). This Weblog-based *Android* application is an application that is built and designed basically using a Weblog and then made into an *android* application in apk format so that it can be installed on a mobile phone with an android system (Adawiyah, 2020). How to make an application using Appgeyser. Appgeyser is a web where you can create various kinds of applications (safitri & Aziiz Hari Mukti, 2021).

Based on the description above, the research problem can be formulated is how is the validity of chemical learning media in the form of weblog-based Android applications on hydrocarbon and petroleum materials, how is the practicality of chemical learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials, how do students respond to chemical learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials.

Based on the formulation of the problems that have been mentioned, this study aims to determine the validity level of chemistry learning media in the form weblog-based android applications on hydrocarbon and petroleum materials, determine the level of practicality of chemistry learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials and determine the response of students to chemistry learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials

The developed learning media contains materials, quizzes, animations, and tasks about hydrocarbon and petroleum materials that can be used by students (Isna Permata & Rusmini, 2023).

METHOD

This research was conducted in the even semester of the 2018-2019 academic year, the time of data collection for this research began around December 2018 at SMA Negeri 1 Tambang. The subjects of this research are those who validate learning media products in the form of weblog-based android applications produced, namely media experts in this study selected 2 chemistry teachers at SMAN 1 Tambang who are experts in chemistry material, especially hydrocarbon and petroleum material, practitioner experts in this study selected 1 chemistry teacher at SMAN 1 Tambang who is an experts in chemistry learning. In this study, 10 students were selected randomly from class XI MIA4.

The object of this research is learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials. This research uses the type of Research and Development research. This Research is a study that develops learning media in the form of weblog-based android applications that are expected to increase student learning motivation (Khatib Sulaiman dalam no et al., 2023).

Data collection techniques in this research are: literature study, interviews and questionnaires. Interviews were conducted at the preliminary study stage to analyze the needs of teachers and students. The interview was conducted when the researcher conducted PPL (Field Practices Experience). Questionnaire, researchers used three types of questionnaires, namely: Validity questionnaire by media experts and material experts, practicality test questionnaire by teachers and student response questionnaire. The questionnaire scale table is as follows.

Table 1. Scale Questionnaire by Media Expert

Rating Scale	Alternative Answer
5	Excellent

Rating Scale	Alternative Answer
4	Good
3	Good Enough
2	Fairly Good
1	Not Good

The Analysis techniques used in this research are qualitative descriptive analysis techniques and qualitative descriptive analysis techniques that describe the results of validity tests and qualitative descriptive analysis techniques that describe the results of validity tests and practicality tests.

Qualitative Descriptive Analysis

Performed by grouping information from qualitative data in form of input, criticism, and suggestions for improvement contained in the validation questionnaire, practicality test questionnaires, practicality tests, and student response questionnaires.

To determine the level of validity and the basis for making decisions to revise the design results, the assesment qualification criteria are used as in the following table:

Table 2. Criteria for Learning Media Practicality Test Result

No	Percentage of the scoring results (%)	Criteria
1	81%-100%	Very valid
2	61%-80%	Valid
3	41%-60%	Valid Enough
4	21%-40%	Less valid
5	0%-20%	Invalid

In the study, it was determined that the validity and practicality of the product without revision reached an interval of 61%-80% with valid or practical criteria. Thus, the assessment results from the validators if they give a final result of 61%, then the designed product can be used as a learning media in the form of a weblog-based android application.

RESULT AND DISCUSSION

Result

The object of research conducted at SMA Negeri 1 Tambang uses media in the from of a weblog-based Android application. This development research stage becomes 5 as follow: 1) Initial Data Collection Stage, As initial information to carry out learning media development activities, 2) Literature Study, literature study to learn the concepts or theories that will be used to strengthen the learning media to be developed, 3) Field Study, field studies were conducted at SMAN 1 Tambang to identify the needs of learning media in the form of weblog-based android applications. Field studies were conducted through interviews with chemistry teachers and initial observations when researchers conducted PPL (Field Practice Programme). The result of this field study became the basis for the design and development of learning media in the form of weblog-based android applications on hydrocarbon and petroleum materials.

Planning Stage

The planning stage includes the design of products that will be produced in the development process. This stage consists of 3 steps, namely : 1) developing ideas, 2) conducting concept analysis, 3) making flowcharts and storyboards.

Product Development Stage

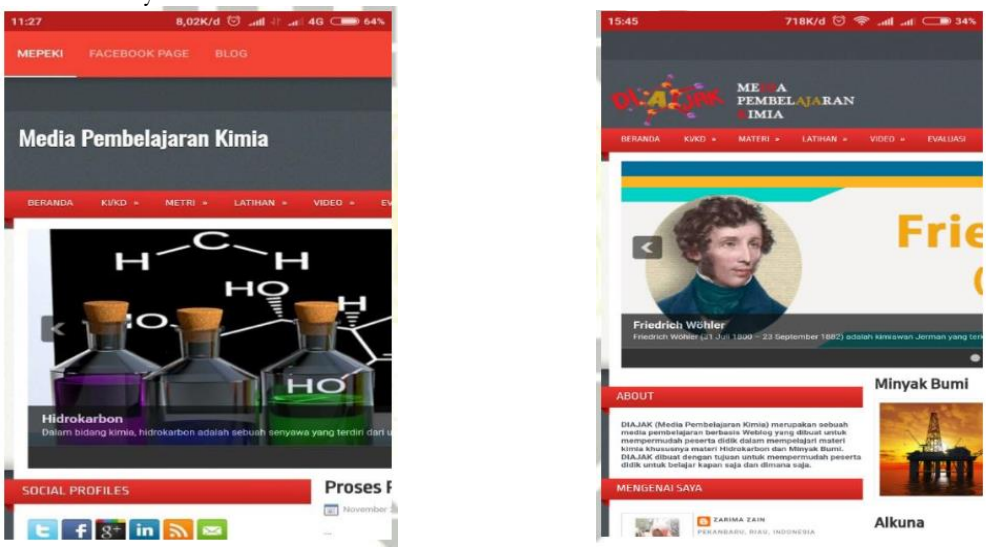
Learning media is developed by creating media components including material text, making rough drafts, creating images, quizzes, audio, and video which are then combined into learning media. After completing the preparation of the learning media, validation is then carried out by giving questionnaires and initial product to 4 validators consisting of media expert validators and material expert validators. If the learning media is said to be valid then a practicality test will be carried out by 1 chemistry teacher at SMAN 1 Tambang and if the media is not valid then the researcher will make revisions until the media is declared valid.

Product Trial Stage

At this stage, the learning media that has been declared valid and has been tested for practicality will then be tested on students. Trials are carried out in various ways, namely: 1) Product validity test by media expert validors and material experts, carried out to see the validity of the learning media developed. The expert test was carried out using a validation sheet. Furthermore, the results were analysed to serve as the basis for making revisions. Based on the table above, it can seen that the overall percentage of the experts assessment is very valid. Because it is in the range of 81% to 100% so that chemistry learning media in the form of weblog-based Android applications can be tested at school; 2) Practicality test to determine the usability of a product, which is practical, easy to understand and happy in using the product by students. The practicality test was conducted by implementing the product to 1 chemistry teacher from SMAN 1 Tambang. The practicality test was carried out using a practicality test instrument sheet. Furthermore, the result were analysed to be used as the basis for making revisions; 3) Learner respons test to determine the response of students about the learning media developed. The learner response test was carried out by implementing the product to 10 students from SMA 1 Tambang. The learner response test was carried out using the learner response test sheet. Furthermore, the results were analysed to be used as the basis for making revisions.

Product Revision Stage

Product revisions are suggested by the results of the field test, namely, material expert, religious expert, media expert and practicality the result. This improvement is very likely to be done more than once, so that the main product draft (model) is obtained which is ready to be tested more widely.



Before Revision **After Revision**

Figure 1. Name Improvement and logo addition

In figure 1, Improvement were made to the name and logo on the developed chemistry learning media, based on suggestion and input from media design experts on the grounds of lack of creativity and color in the display of learning media so that the appearance of less attractive.

Before revision **After Revision**

Figure 2. Improved name and metri menu name to material

In figure 2, the writing of the metri menu is corrected menu into Material based the suggestions and input from learning media design experts on the grounds of typing errors so that the appearance of learning media is not neat.

Before Revision **After Revision**

Figure 3. Improved the name of video 1 to video title

In figure 3, the name of video 1 was corrected to the title of the video based on suggestions and input from learning media design experts on the grounds that it was more in line with the name of the video title. After making several improvements and obtaining valid cri teria, This research was continued to the next stage, namely the trial stage to the school.

Discussion

This study aims to produce in the form of chemistry learning media in the form of Weblog-based Android applications on hydrocarbon and petroleum materials that are valid and

practical through the assesment of media design experts, learning material experts, teachers and students. In this study, researchers used the development procedure according to Borg and Gall which was limited to the fifth stage, namely until the initial product revison stage (Kohlbeck et al., 2021).

Data collection

The initial stage in the Borg and Gall development process is data collection, namely by conducting field studies to find out the needs of students and literature studies to review literature and journals so that the reasons for the need to develop chemistry learning media in the form of weblog-based Android applications on hydrocarbon and petroleum materials are obtained. Analysis of the needs of students is carried out to find out and understand the needs of the students themselves. One of the characteristics of students identified is that they often use cellphones but their use is not optimal. The data collection stage is also carried out to find and create images for the media display so that when used it is boring.

Planning

The second stage, this chemistry learning media is equipped with materials, video exercises, evaluations and bibliography on hydrocarbon and petroleum materials designed in the form of Weblog-based Android applications.

Media development stage

In the third stage, parts of the developed chemistry learning media were designed, namely the home page, KI/KD, material, exercises, videos, evaluations, and bibliography. At this stage, validation was also carried out by 2 media design experts, 2 learning material experts. The fourth stage of the development process by Borg and Gall is a limited trial. Validation by material expert in Figure 1.

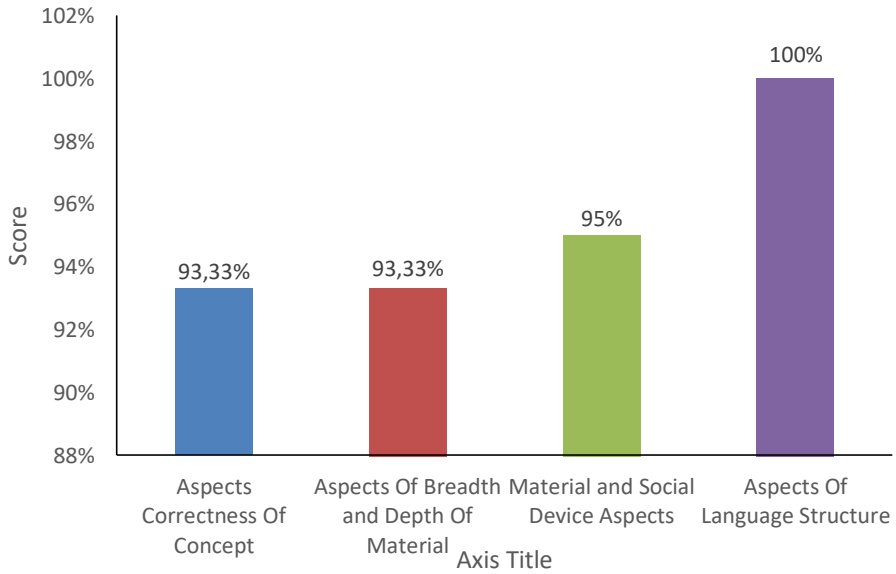


Figure 1. Graph of Overall Material Expert Validation Result

The highest results are in the aspects of structure and language and aspect of material and question sets, namely 100% and 95% with very valid criteria. While the lowest aspects are aspects of the truth of the concept and aspect of the breadth and depth of the material, namely 93.33%

with very valid criteria because the truth of the concept and the breadth and depth of the materil presented are very good.

Validation by media expert in figure 2.

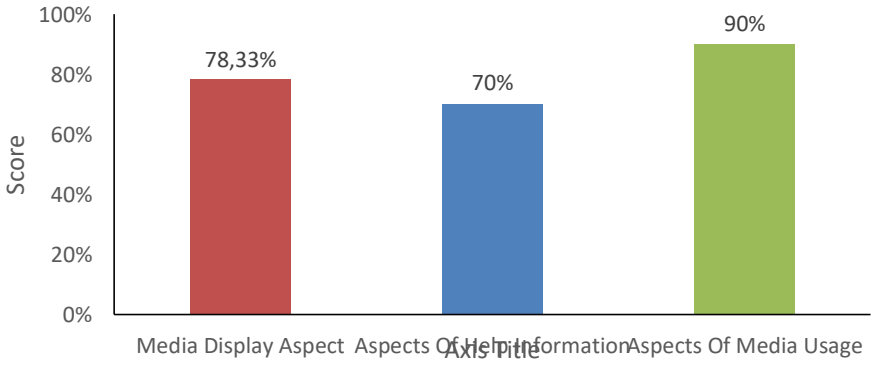


Figure 2. Graph of Overall Media Expert Validation Results

The highest percentage is obtained in the aspect of media use, which is 90% with very valid criteria because the media developed is very easy to use. The media display aspect and the help information aspect have a percentage of 78.33% and 70% with valid criteria, this is because in the aspect of the appearance of learning media there are some that need to be corrected.

Practicality test by chemistry teachers in Figure 3.

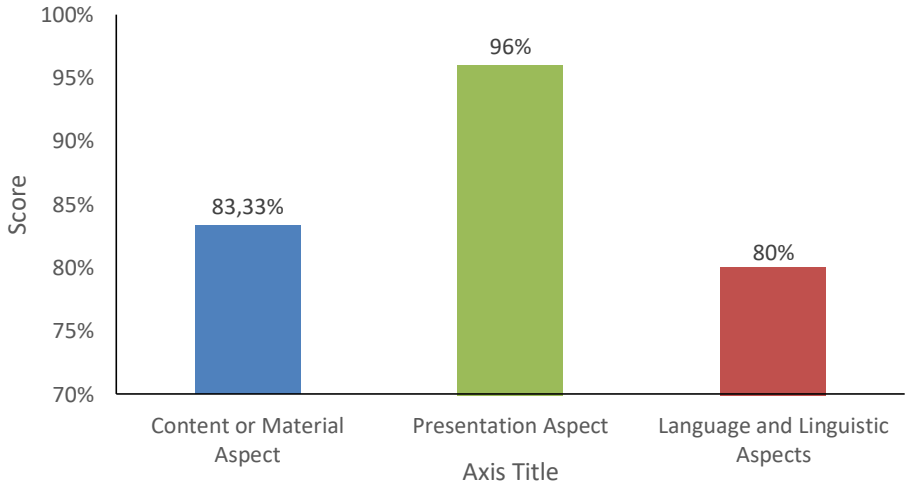


Figure 3. Graph of Practicality Result by Chemistry Teachers

The result of the practicality test by chemistry teachers, the highest result were obtained from the presentation aspect 96%. This is because in the presentation aspect, the indicators of the use of chemistry learning media are correct and the layout and appearance of the media are very attractive. While the content and material aspects and linguistic aspects have a percentage of 83.33% and 80% very valid criteria.

Learner response in Figure 4.

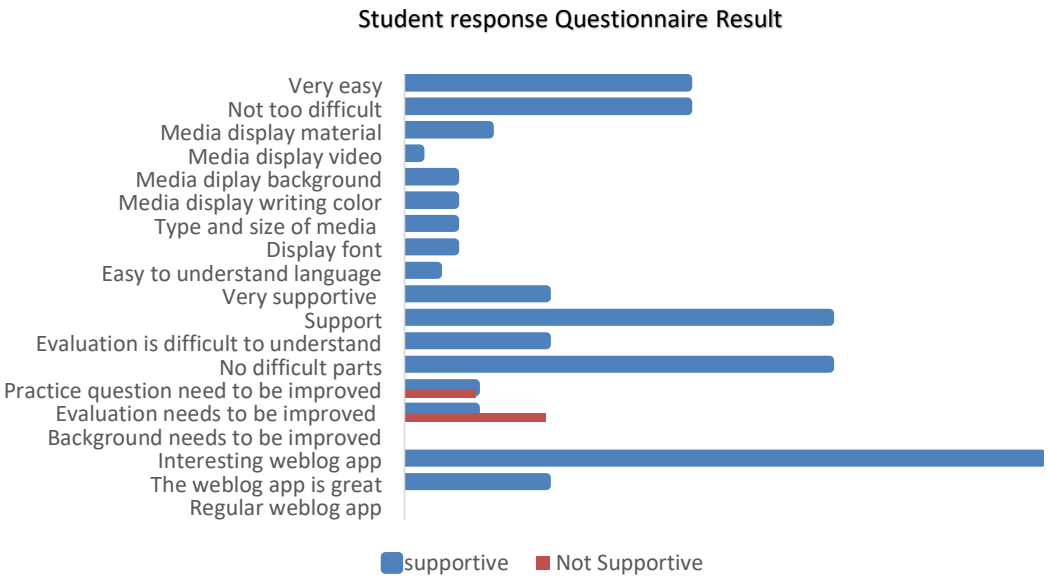


Figure 4. Graph of Parcipant Response Result

The results of students responses that 50% of students consider the operation of learning media developed is very easy, 21.95% consider the images and materials provided support the learning media developed, 70% of students consider there are no parts that are difficult to understand in the learning media developed, 30% of students consider the image/animations is part that need be improved form the learning media developed, and 100% of students consider the media developed is very interesting.

CONCLUSION

Based on the design research and trial of chemistry learning media in the form of Weblog-based Android applications, several conclusions can be drawn, namely this research is designed based on the research and development stages by Borg and Gall which include : first, the initial data collection stage, where at this stage the result obtained that students need a chemistry learning media in the form of a weblog-based Android application base on curriculum analysis and analysis of various chemical learning media prototype in the stage produces chemistry learning media product in the form of weblog-based android application.

The feasibility of chemical learning media in form of weblog-based android application on hydrocarbon and petroleum materials is based on material expert validators reached a percentage of 95,38% with very valid criteria, media expert validators reached a percentage 80,83% with very valid criteria. Chemistry teacher assessment responses through the practicality test obtained a percentage of 86,33% with very good criteria. The response of class XI students at SMAN 1 Tambang to the overall design of chemistry learning media in the form of weblog-based android applications, 60% stated that it was very good.

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