Development of Webblog-Based Learning Media to Improve Student Learning Outcomes in Chemical Bonding Material

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Abstract
This study aims to develop learning media, indicators, and indicators of whether student learning outcomes use webblog learning media developed on chemical bonding material that is higher than the predetermined KKM value. This research is a research development or Research and Development (R&D). By using the ADDIE development model (Analyze, Design, Development, Implementation, Evaluation). The sample used in this study were students of class X MIA 1 at SMA Negeri 8 Medan using purposive sampling technique. From the results of the analysis, the media developed by webblog learning. Results The results by the lecturers obtained an average feasibility of 90%, and an average score of material experts was 95%. Thus the learning media developed is valid and very suitable for use as learning media. The learning media developed were then tested on students to see students' chemistry learning outcomes. Testing was carried out using 1 experimental class which was carried out with webblog learning media. The hypothesis test shows that the average student learning outcomes of the experimental class are 78.29 with a minimum completeness criteria (KKM) 75. Based on statistical analysis at the 5% significance level it can be stated that the student learning outcomes using the developed webblog media are higher than the KKM values that have been set.

Keywords: Development, Learning Media, Webblog, Chemical Bonds section

Introduction

The 2013 curriculum aims to prepare Indonesian people to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and affective and able to contribute to the life of society, nation, state, and world civilization. In the 2013 curriculum, teachers act as learning facilitators, trainers, collaborators, knowledge navigators, learning partners, mentors, and counselors. In the 2013 curriculum, teachers also provide more alternatives and responsibilities to each student in the learning process. The main problem in learning in formal education (schools) today is the low absorption of students (Yudha, 2022). This achievement is of course the result of learning conditions that are still conventional and do not touch the realm of the dimensions of the students themselves, namely how to actually learn. In a more substantial sense, that the learning process until today still provides access for students to develop independently through discovery in their thinking process. In learning the classroom atmosphere tends to be teacher-centered so that students become passive (Trianto, 2016). The learning process in the classroom is directed at the child's ability to memorize information, the child's brain is forced to remember and hoard various information without being required to understand the information it remembers (Sanjaya, 2013).

Chemistry subject matter is often considered a difficult subject, because chemistry itself is abstract. In fact, the chemical material itself was discovered from research in the laboratory. Chemical bonds like chemistry in general, the learning includes three levels of thinking, namely the macroscopic level that can be observed, the

sub-microscopic level that cannot be observed and the symbolic level. The three levels must be presented by the teacher or lecturer so that there is no misinterpretation. Chemical bonding in general includes abstract concepts, making it one of the lessons that are difficult for students to understand (Unal, 2010). Based on research conducted This statement is in accordance with the results of the author's observations and interviews with teachers at SMA Negeri 08 Medan who have implemented the 2013 curriculum and the lack of use of interesting learning media and lack of time in delivering learning materials so that not all materials are delivered. Teachers tend to use infocus and present material only on slide shows that contain reading quotes. Therefore, modern learning media innovations are needed and are able to make students learn actively and interactively.

One of the media that is very popular today is the use of the internet in the world of education, especially in the manufacture of internet-based learning media. Through the internet accessing information is very easy to do anytime and anywhere, but there are several things that need to be considered, namely the information obtained by high school students is not structured, this results in learning activities that are not optimal. With the internet-based learning media, it is hoped that high school students will get the maximum learning experience through a structured learning process that can be accessed anytime and anywhere and the most important thing is that it is controlled by the teacher (Daud, 2015).

Learning that is done with the help of the web is to overcome various obstacles in conventional learning, especially the limitations of teaching materials, learning resources, and time can be mediated with the help of web learning. In the web-assisted learning process, teachers can upload concept maps, learning objectives, material reviews and some apperception questions on the available web. The goal is that students can prepare themselves before the learning process takes place so that the learning process can take place optimally. Through the use of the web, students can access material as often as needed in order to repeat material that has not been understood (Putri, 2015).

Along with the rapid development of information technology (IT), the need for an IT-based teaching and learning concept and mechanism in this case is E-learning. The concept of E-learning has been widely accepted by the community, as evidenced by the implementation of E-learning in educational institutions. The application of E-learning as a technology also requires a design so that it can create effective learning, and improve student learning outcomes so that learning objectives can be achieved maximally (Azizah, 2017).

The results of the research on web-based chemistry learning media developed Dumgair (2013), obtained an average score of 81.6 from a maximum score of 100, with an ideal percentage of 81.6%. This means that web-based chemistry learning media can be used as a source of independent learning for high school students. Further research was conducted by Almira that the application of E-learning-based weblogs as an effective source of student self-learning is used in teaching chemistry in an effort to improve learning outcomes by 71.30% .

Method

This research is a type of research in the form of Research and Development which is adapted from the ADDIE development model. ADDIE Development stands for Analyze, Design, Develop , Implement, and Evaluate.

This research was conducted online via Google Form, with the research subjects being students of SMA Negeri 8 Medan The sample used in this study were students of class X MIA 1 at SMA Negeri 8 Medan using purposive sampling technique. The research implementation time is in the 10th month of the even semester of the 2022/2023 Academic Year. This research and development uses several methods in collecting data, namely interviews, questionnaires, and pretest-posttest questions. Interviews were conducted by researchers to determine the learning methods and media commonly used by teachers in the learning process at SMA Negeri 8 Medan. And the questionnaire used in this study was in the form of a validation questionnaire given to material experts and media experts. Questionnaires are used to test the feasibility of the developed media.

In this study, there were 2 instruments used, namely non-test instruments in the form of questionnaires and test instruments in the form of pre-test and post-test questions. through the google form, this was done to obtain information on the validity, reliability, distinguishing power, and level of difficulty of the evaluation questions to be tested in small groups or to be applied in the experimental class in this study. The valid, reliable, and good questions were used as pre-test and post-test.

To determine the feasibility of the learning media used a Likert Scale measurement scale. The research instrument using a Likert Scale for the purposes of quantitative analysis, then the answer can be given a score. The initial data analysis in this study was pre-test and post-test data, namely data before and after using the

learning media that was built (treatment). Furthermore, the final data analysis was carried out with the N-gain test and the Paired Sample t-test.

Results and Discussion

This study uses the Research and Development (R&D) Method used to produce a specific product, and test the effectiveness of the product that. To be able to produce certain products, research is used needs analysis used survey or qualitative methods, and to test the effectiveness of the product so that it can function in the wider community, it is necessary research to test the effectiveness of the product (Sugiarti, 2020). The development of web-based chemistry learning media using Webblog has been carried out by researchers through several stages, including needs analysis, design, implementation, and testing. In the needs analysis stage, the researcher found the problems and potentials in SMA Negeri 8 Medan. The problem found by researchers is the availability of less study time, the learning process tends to be monotonous so that students become passive, this causes students to get bored and has an impact on low student learning outcomes. The class teacher said that in the 2022/2023 school year students were less interested in understanding chemistry lessons. In addition, many students have difficulty understanding the material because there are too many materials and limited learning resources. Teachers have not used web-based learning media as a teaching aid for the lecture method that has been used so far. In fact, SMA Negeri 8 Medan has the potential of a computer room along with a number of computers that can be utilized. Based on the problems and potentials above, researchers feel the need to develop Web-based learning media using Webblogs that can be operated by each student anywhere and anytime.

Next, the researcher determines the material to be applied by using learning media developed in accordance with the learning objectives that have been set. Then the researchers compiled material and evaluation questions that were in accordance with the needs in the learning outcomes of the Chemistry subject matter of Chemical Bonds, namely the basic competence was 3.5. Comparing Ionic Bonds, Covalent Covalent Bonds, and Metallic Bonds relating to the properties of substances

Based on the indicators, the material in the competency standard is appropriate if it can be delivered using Webblog-based learning media. Blogs as one of the application services from the internet can be used by teachers and students as an unlimited learning resource. Teachers can upload all information related to the learning material being taught by adding multimedia (images, animations, sound effects and videos) to make it interesting and easy to learn (Kosassy, 2018). In this study it is said to be appropriate because the Webblog learning media product can be used to convey Chemical Bonds material.

The second stage, researchers make product designs into prototypes. Before compiling the prototype, the researcher made a summary of the material along with 40 questions that would be tested to find the validity of these questions. In addition to being valid, the questions must be reliable and have good distinction. The prototype that was made was then realized in the form of a Web-based learning media product using a Webblog. The design designed by the researcher determines the development of the embodied media. The design is made with connecting buttons from one menu to another so as to make the learning media an interactive learning medium. By designing a website-based multimedia that is educative, interesting and fun, it can be an alternative way of educating a new and effective way for educators to overcome the condition of students' disinterest/saturation in the learning process (Ardiansyah, 2016).

The third stage is the implementation stage. Implementation is the embodiment of design into a medium. The embodiment of the design into the media uses a Webblog, where there are several advantages to using this Webblog including, easy to access anytime and anywhere, accessible for free, teachers can provide information about learning easily only through one link that is already connected in several links such as videos and quizzes. which can connect directly to Youtube and Google Forms.

After the product has been realized, the researcher then conducts the testing phase. Testing is the stage where the product design goes through the validation stage by experts and is then applied to the experimental class. Material validation is carried out to assess the design of materials that have been packaged into learning multimedia. Media validation is carried out to assess the learning design used in product development (Sofia, 2016). There are two experts in the validation of this product, namely material experts and media experts. The feasibility test by material and media experts is in accordance with the feasibility test aspects of existing research media. Aspects in the validation questionnaire of the two expert teams are the development of research by (Fahreza 2022). Aspects of material validation include aspects of content and language quality, while aspects of media validation include aspects of media quality, appearance, and language.

The feasibility of the product is determined from the results of the evaluation of the validator. The validators in this study are material experts and media experts. Materials and media experts aim to evaluate how appropriate the materials and media developed and provide suggestions or revisions if necessary.

The percentage obtained from the evaluation of material experts is 95%, where the material is included in the very feasible criteria and there is no suggestion from the validator for improvement, the validator states that the material is suitable for use in research without any suggestions for improvement. In media evaluation, the percentage gain from media experts is 90%. This percentage is included in the media criteria. Very feasible to use. Suggestions from media experts are the need to add a blog owner profile, concept maps are made in line with the material if it can be connected again via a direct link connected to the material, for quizzes it is better not to use a password so that students can access it easily and try the quiz directly without having to be in the learning process. . Based on the validation from these experts, the researcher revised 1 time.

The percentage is very reasonable from material experts and media experts, indicating if the developed media can be used in the experimental class. Accuracy in learning objectives, teachers can use the media, as well as the availability of time to use and according to students' thinking levels are some of the good learning criteria to use. The feasibility of learning media to be used relates to the need for media as a tool to facilitate the arrival of subject matter to students.

To overcome the problem of low learning outcomes, students can also use media that refers to students' attention in the process of teaching and learning activities. Learning media is one component of learning that has an important role in learning activities at school (Sugiharti, 2020). Improved learning outcomes after using the media can be seen after treating the experimental class. The treatment was carried out in the sample class or referred to as the experimental class, namely class X MIA 1 SMA NEGERI 8 MEDAN. From the data obtained, the average score of the pre-test was 47.31 and the post-test was 78.29 and the N-gain was 58% which was included in the medium category. This shows an increase in learning outcomes. This increase proves the reason the media can enhance learning outcomes.

From the test results of the one simple t-test, the value of Sig. (2-Tiled) obtained is 0.002, which is smaller than 0.05. So from these results it is concluded that the hypothesis is accepted, which means that the student learning outcomes by learning using webblog media on chemical bonding materials are higher than the minimum completeness criteria (KKM). The minimum completeness criteria is 75. This study supports existing research, including research by Yudha (2023) which aims to produce valid and practical learning blogs as learning media in improving learning outcomes. The results of this study indicate that blogs are very helpful in obtaining increased learning outcomes. This is also in accordance with the research conducted by Sartono in his research using blog media, the average value of students is only 55.08. After students use blog media, the average value obtained is 87.08. There was an increase of 32 or 58.10%. Based on these studies, it can be concluded that webblogs can help improve student learning outcomes.

Conclusion

Based on the evaluation by material experts, the product obtained a feasibility with a percentage of 95% which means it is very feasible and there are no suggestions and improvements so that it can be used directly in research. The media expert got a feasibility score with a percentage of 90% which means it is very feasible but there are suggestions/revisions. And based on the experimental results in the sample class, the average pre-test (before using the media) was 47.31 while the average post-test (after using the media) was 78.29. According to the calculation of the one simple t-test, the value of Sig. (2-Tiled) obtained is 0.002, which is smaller than 0.05. So from these results it is concluded that the hypothesis is accepted, which means that student learning outcomes by learning using webblog media on chemical bonding material are higher than the minimum completeness criteria (KKM). With the minimum completeness criteria is 75.

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