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DEVELOPMENT OF WEB-BASED LEARNING MEDIA ON NERVOUS SYSTEM MATERIALS FOR HIGH SCHOOL STUDENTS

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Abstract

Today's teachers are facing students who are no strangers to the digital world. Digital technologies that are developing are learning media, which can be used in education, such as smartphones and others. Therefore, the rapid development of digital learning influences the learning process both in the classroom and outside the classroom. This study aims to determine responses to the feasibility of web-based learning media. This type of research is research and development. Data were analyzed with quantitative description. The research instruments used were questionnaires. The results found that this web-based learning media, based on the results obtained, according to the material experts' feasibility of using web Learning media, reached an assessment score of 95%, with a very valid Achievement category. In comparison, according to media experts, the feasibility of using web Learning media reached an assessment score of 88%, with a very valid Achievement category. The response given by 36 Class XI students of Baitul Aziz Deli Serdang Private High School showed a positive response such as motivating students to learn the web flexibly so that an overall score of 88% was obtained in the very good category. Teacher responses to web-based learning media also showed a positive response, such as media (web) which was used to facilitate teachers in giving assignments so as to obtain an assessment score of 75% in the good category. The response of students and teachers is useful to know the learning process in utilizing internet media and material delivery and knowing the feasibility of the web media used.

Keywords: Development; Web-Based Learning Media; Feasibility.

Abstrak

Guru masa kini berhadapan dengan siswa yang sudah tidak asing lagi dengan dunia digital. Teknologi digital yang berkembang adalah media pembelajaran yang dapat digunakan dalam dunia pendidikan seperti smartphone dan lain-lain. Oleh karena itu, pesatnya perkembangan pembelajaran digital mempengaruhi proses pembelajaran baik di dalam kelas maupun di luar kelas. Penelitian ini bertujuan untuk mengetahui tanggapan terhadap kelayakan media pembelajaran berbasis web. Jenis penelitian ini

adalah penelitian dan pengembangan. Data dianalisis dengan deskripsi kuantitatif. Instrumen penelitian yang digunakan adalah kuesioner. Ditemukan hasil bahwa media pembelajaran berbasis web ini, berdasarkan hasil yang diperoleh, menurut kelayakan ahli materi penggunaan media pembelajaran web, mencapai skor penilaian sebesar 95%, dengan kategori Prestasi sangat valid. Sebagai perbandingan, menurut ahli media, kelayakan penggunaan media pembelajaran web mencapai skor penilaian sebesar 88%, dengan kategori Prestasi sangat valid. Respon yang diberikan oleh 36 siswa Kelas XI SMA Swasta Baitul Aziz Deli Serdang menunjukkan respon yang positif seperti memotivasi siswa untuk belajar web dengan fleksibel sehingga diperoleh skor keseluruhan dengan jumlah sebesar 88% dengan kategori sangat baik. Respon guru terhadap media pembelajaran berbasis web juga menunjukkan respon yang positif, seperti media (web) yang digunakan untuk memudahkan guru dalam memberikan tugas sehingga memperoleh skor penilaian sebesar 75% dengan kategori baik. Respon siswa dan guru bermanfaat untuk mengetahui proses pembelajaran dalam memanfaatkan media internet dan penyampaian materi serta mengetahui kelayakan media (web) yang digunakan.
Kata Kunci: Pengembangan, Media Pembelajaran Berbasis Web, Kelayakan.

Introduction

Education is an integral part of the teaching and learning process. Almost all fields, especially Education, have experienced significant advances in Information Technology. Educators need to understand technology. Today, science and technology are advancing and developing. Therefore, technological advances in the world of Education affect the way teachers interact with students. Digital technology can be applied to the learning system (Salsabila et al., 2021). Educators must be able to keep up with the times for the progress and good of the nation, especially in terms of Education. Education is learning that enhances students knowledge and understanding. Learning fosters students respect for the educational institution and its values. They also have the opportunity to participate in the learning process and gain access to educational materials or tasks assigned to them.

Learning Media can be used for learning or teaching activities and help students understand abstract topics. The purpose of using media is for students to create something new and use something that already exists in various ways practical in daily activities (Maulana et al., 2022).

The use of media is related to the learning process in the classroom, which can help teachers in the delivery of lesson materials and create an active learning atmosphere that is innovative, creative, and fun (Magdalena et al., 2021). Technology is a tool, machine, method, process, activity, or idea designed to facilitate human activities in

everyday life. Technology helps people's lives become better and more accessible (Aspri & Syahrani, 2022).

Teachers must be able to change their learning approach. Monotone learning models and techniques are found in this study. Since teachers do not seek to change the learning model, students quickly get bored. As a result, this study found that teachers must be more creative and understand technology to adapt education to changes in curriculum that are adapted to the times (Fitriah & Mirianda, 2019). Teachers stated that biology learning went well because teachers and students participated actively. However, the researchers found only a few students actively interacted with teachers in the classroom. The teacher said that 50% of the XI graders liked the biology lesson in the classroom, and another 50% did not like it. Therefore, teachers should interact more actively when teaching to interest students in biology.

The results of research and observations show that teachers use lectures, question and answer, and discussion as a school learning method. Student Worksheet (SW) and Google Classroom are used as online learning tools. Obstacles in the learning process, such as the learning length and the uncomfortable classroom environment, only allow some students to focus and understand what is being delivered. The school does not use E-SW and only uses printed books as learning resources, so there is not enough learning time in the classroom, and students need more time to learn the material. The study will be conducted by creating an interactive learning website that allows readers to interact and provide feedback.

The purpose of web-based learning media is to use the internet as a student learning tool that can be used anytime and anywhere. Web-Based Learning Media will be a solution for educators to create subject matter that suits their students.

Metode

This research will be conducted at Baitul Aziz Deli Serdang Private High School on St. Pusaka/Muara Kolam No.313, Deli Serdang Regency, North Sumatra. The research was carried out in October 25th – November 09th, 2023. This research is a research development (*R&D*) with the *ADDIE* model. The ADDIE Model has evaluations or revisions at each stage to minimize errors in the product being developed (Wijayanto, 2022). *ADDIE* Model consists of 5 components or steps, namely Analysis, Design, Development, implementation, and Evaluation. ADDIE model is easy to develop and designs for learning being developed (Khasanah et al., 2023).

Sample or Participant

The sample or participant in this research were students in class XI Baitul Aziz Private High School, which consisted of 2 classes where the total number of students in class XI Baitul Aziz Private High School was 36 people. Sampling was carried out using a total sampling technique in XI Science class. Of the 36 class XI students at Baitul Aziz

Private High School, less than half with a percentage of 30.56% do not own a laptop, smartphone, computer, and 69.43% stated that they own a laptop, smartphone, computer and are able to use it properly. Most students with a percentage of 77.73% stated that they often use the internet to study, while a small percentage with a percentage of 22.23% stated not often because as many as 16.67% stated that devices such as laptops, smartphones, computers owned were not feasible and 19.45% stated that the network in the surrounding environment was not good. If learning media is applied, students who are familiar with the flow of information, communication, and technology will easily understand it. The research subjects 1 media expert, 1 material expert, and teachers response. While students response become part of the research object.

Instrument

The instruments in this research include questionnaires and interviews. The results were obtained from the material expert feasibility test questionnaire, which was used as input for the material displayed on the learning media. Media expert due diligence is used as input for web-based learning media designed with the Sitemaraf web application. Interviews were conducted in 2 ways, namely direct question and answer and also used in the form of a questionnaire. A questionnaire is data collected based on what the researcher submits to the respondent in writing, and the answers are given in writing. The questionnaire used is an open questionnaire were assessed using the Guttman scale.

Data Collection Techniques

The techniques used are school observations and interviews with educators who teach biology in XI science class.

Research Procedure

1. Analysis Stage

The analysis stage is a stage of collecting information that can be used as material for making products; in this case, the product produced is a learning resource. Researchers conducted an analysis based on student characteristics, student learning needs, and student learning materials. Analysis was carried out by interviewing biology teachers and by filling out interview questionnaires. The analysis is carried out observation, analysis of the material that students find challenging to understand, which will be displayed in the website application.

2. Design Stage

The design stage, researchers design the initial product and develop web-based learning media. According to Gagne and Briggs, learning media is a tool used to convey the content of learning material that can stimulate students to participate in the learning process. The design stage starts with collecting the included materials, such as material

descriptions, images, videos, and e-SW. The website was designed based on the results of validation questionnaires (Hamid, et al., 2020).

3. Development Stage

The development stage is carried out based on the development of web-based learning media, such as creating web pages on the Sitemaraf application. Web-based learning is also e-learning that is specialized in learning using the internet, especially in the form of websites and web mail. All of these facilities are still web-based. The website itself is a number of pages that can be in the form of content (content) according to the type of website. Website content is delivered in various forms such as text, audio, and video. In conclusion, web-based learning is a learning that can be accessed through the internet network (Saputri, 2022).

4. Implementation Stage

The implementation stage, the only thing that was done was a trial of the web sitemaraf application, which was carried out during 2 class meetings (120 minutes/meeting) with two classes, namely grade XI-1 and XI-2. The implementation stage is the practice stage. Web-based learning media as a research product. At the practical stage, the media will be tested for the feasibility of web-based learning media on nervous system material. After testing, the product is validated (Amthari, et al., 2021). Validation is carried out by material experts, design experts and media experts. Media experts provide recommendations and criticisms of existing media and students through questionnaires with quantitative descriptive analysis.quantitative descriptive techniques are used to analyze questionnaire data on the feasibility of web learning media (Ziden, 2023)

5. Evaluation Stage

The evaluation stage was carried out by validators who were members of material experts and media experts, as well as responses from teachers and grade 11 students at Baitul Aziz Deli Serdang Private High School. Before being tested, the product is validated. Material experts and media experts carry out variant dating. Validators and respondents respond to assessments, recommendations, and criticism of existing media.

Data analysis

Data analysis with a qualitative approach was obtained from teacher interviews, observation of school learning, and validator suggestions. Data analysis groups information from highly informative data that form responses, criticisms, and suggestions for improvement and revision of web media development product if there is further research. These data were obtained before the researchers conducted the study, precisely during the analysis of the needs of Grade XI students in High School and at the implementation stage.

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Results and Discussion

The results or research finding obtained from the questionnaires formulated based on theories and expert opinions and filled in by respondents, who were then processed into information. Respondents involved in data retrieval were 36 students, one material expert, and one media expert. Measurements were conducted on experts using a likert scale with a score of 5, which means very agreed, 4, which means agreed, and 3, which means entirely agreed; a score of 2 means not agreed, and a score of 1 means significantly disagree. The development of web-based learning media follows the *ADDIE* development model, which consists of five stages, namely analysis, design, development, implementation, and evaluation. The developed product is then tested for feasibility with product validation and trials to find out the extent to which the product is suitable for use by teachers and students and improve students' understanding of concepts after using the web (Nuraida, 2019).

Description The Results of Analysis Phase

Based on the results of observations in Class XI Baitul Aziz Private High School Deli Serdang, they obtained some information. In general, students in this class basically have a reasonably active nature. However, the activity has not been well directed to the interests of student learning. They don't know what the nervous system is and how it works. For example, when the teacher asks a question about how the nervous system will coordinate the actions of each part of the body by sending movement signals.

Based on the analysis, it can be seen that a media is needed that directs students curiosity and activeness in a positive direction. Media is used to give students insight into the nervous system. In line with these problems, learning the nervous system with web-based learning media can help develop learning activities in the classroom.

Description The Results of Design Stage

The Sitemaraf web application was designed to attract students in Class XI of Baitul Aziz Private High School, media by the basic competencies established by the independent curriculum.

Web-based learning media is designed to encourage students to have active discussions in learning and learn quickly without having to be flexible in the classroom. Web-based learning Media is equipped with color images and learning videos. Web-based learning Media by the name of the web application *Sitemaraf* seems to be activities that exist in the media and are presented in the form of sentences and communicative images. Thus, this media designer will be more favored by students and can support the learning process later. Completeness in the web-based learning media with the name “Sitemaraf " web application is reading material, videos, images, modules, and E-SW (*Electronic Student Worksheet*).

To compile E-SW, here are the steps: (1) Conduct analysis of learners based on initial characteristics. The purpose of this analysis stage is to obtain the collection of various

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information needed in the initial data research. This stage is carried out using data from observations and interviews with biology subject teachers (Triana et al., 2022). Then obtained learning achievement competencies that are understood and can be done by students after completing learning (Lavtania et al., 2021). (2) Conduct curriculum analysis, then analyze material and learning objectives. Material consisting of Basic Competencies (BC) and Core Competencies (CC) (Triana et al., 2022). (3) Collecting materials, existing documents, assignments, discussion materials, and practice questions as well as all forms of instructions that can invite students to be active in the learning process. (4) Designing a learning web with wordpress and presenting the E-SW page as one of the features that complement the web. (5) Consultation of E-SW perfection with teachers to be adjusted to the media used to access E-SW.

The Media that has been created is further validated. This validation phase aims to obtain recognition of feasibility and obtain improved input on the developed media. At this stage, the media is validated by material and media experts. Before validation, the following image displays the web-based learning media called *Sitemaraf* in Figure 1:

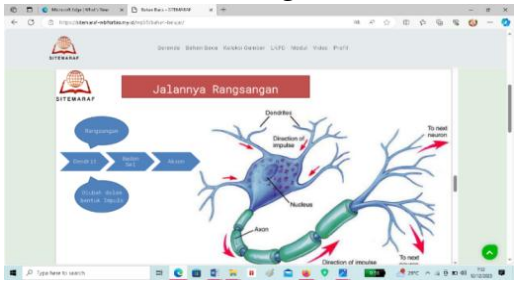

Figure 1. Displays the web-based learning media called *Sitemaraf* before validation

The following web-based learning media with a web application named *Sitemaraf* after validation and revision. We can see the image display of the web-based learning media called 'Sitemaraf' after validation in Figure 2:

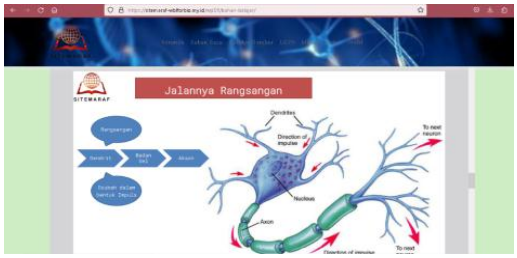

Figure 2. Web-Based Learning Media with Web Application Names *Sitemaraf* Which is Validated

Preparing Questionnaires / Product Assessment Instruments

The researchers prepared a feasibility instrument of material and media in the form of a questionnaire check list for material experts, media experts, and student responses.

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Description The Results of Development Stage (Develop)

The results of expert validation in the form of validation values, corrections, criticisms, and suggestions are used to improve the media. The number of validation scores is the score value of each item statement of observation results calculated by the Likert scale formula. The calculation is each statement item has a score of 1,2,3,4, and 5. The highest score is said to be a maximum score of 5. In the material expert questionnaire, the total number of statement items is 13. The expected number of scores is the top score multiplied by the statement item, so 5 x 13 is 65. In the media expert questionnaire, the total statement item is 16 items. The expected number of scores is the maximum score multiplied by the statement item, so 5 x 16 is 80. The calculation of the feasibility percentage of the materials and media expert questionnaire uses the following formula:

$$P = \frac{\Sigma x}{N} \times 100\%$$

(**Arikunto *et al.*, 2021**)

The result of the assesment are then given the following criteria:

Table 1. Product feasibility level

Persentage (%)	Rating Score	Indicator
80% - 100%	5	Very Valid / Very Good/Very Feasible
70% – 79%	4	Valid / Good / Feasible
60% - 69%	3	Moderately Valid / Moderate
50% - 59%	2	Less Valid / Less Good
0% - 49%	1	Very Less Valid / Very Less Good

(**Arikunto *et al.*, 2021**)

Table 2. Validation Results of Material Experts

Indicator	No.	Rating Indicator	Rating Score	Description
The Importance of Consistency	1.	Material conformance with core competencies and basic competencies.	4	Feasible
	2.	The suitability of the material with learning	5	Very Feasible

		objectives		
	3.	Suitability of the presentation of the material with easy to understand	5	Very Feasible
	4.	Material depth	5	Very Feasible
	5.	Linkage of existing activities in the student worksheet feature with the material presented on the web	5	Very Feasible
	6.	Suitability of the image in favor of the material	4	Feasible
Language	1.	Compatibility of the language used with improved Indonesian Spelling	5	Very Feasible
	2.	Simplicity of sentence structure	4	Feasible
	3.	Clarity of instructions for use with E-SW features presented at web	5	Very Feasible
	4.	The language used is communicative (easy to understand language)	5	Very Feasible
Learning Materials	1.	The material contained in the web in accordance with the level of ability of learners	5	Very Feasible
	2.	The material contained in the web sorted and systematic	5	Very Feasible
	3.	The videos presented on the web are very decent	5	Very Feasible
Total Rating Score			62	
Percentage value results			95.39%	
Criteria			Very Valid /Very Feasible	

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Table 3. Validation Results of Media Experts

Indicator	No.	Rating Indicator	Rating Score	Description
Media Display	1.	Material conformance with core competencies and basic competencies.	5	Very Feasible
	2.	The suitability of the material with learning objectives	5	Very Feasible
	3.	Suitability of the presentation of the material with easy to understand	5	Very Feasible
	4.	Material depth	4	Feasible
	5.	Linkage of existing activities in the student worksheet feature with the material presented on the web	5	Very Feasible
	6.	Suitability of the image in favor of the material	5	Very Feasible
	7.	Clarity of media titles on the splash screen	4	Feasible
	8.	Ease of selecting media menu	4	Feasible
	9.	Understanding the structure of the button	5	Very Feasible
Language	1.	Compatibility of the language used with Improved spelling	4	Feasible
	2.	Simplicity of sentence structure	4	Feasible
	3.	Clarity of instructions for use with E-SW features presented at Web	4	Feasible
	4.	The language used is communicative (easy to	4	Feasible

		understand language)		
Media Operation	1.	Reusability (easy to use and simple in operation)	4	Feasible
	2.	Compatibility (media pembelajarn can be run on some other devices)	4	Feasible
	3.	Efficient use of media in terms of time	5	Very Feasible
Total Rating Score			71	
Percentage value results			88.75%	
Criteria			Very Valid /Very Feasible	

The Total assessment given by material expert value on teaching media products is 95%, and media expert value on teaching media products is 88%. The average gain of the assessment is included in the category of very valid and can be used so that it does not need to be revised.

Student response questionnaire was given to students to find out students ' opinions about teaching media at the end of the trial. Product trials are conducted to identify product deficiencies and student responses to products that have been developed. The trial was conducted on all students of Class XI of Baitul Aziz private high school with a total of 36 students, namely in Class XI-1 with a total of 11 students and in Class XI-2 with a total of 25 students. Teacher response questionnaire given to biology teachers Baitul Aziz private high school which aims to obtain information from teachers about the quality of learning materials developed on the web both criticism and suggestions that become the evaluation of web development. Good learning material design requires careful consideration of the design format, design elements, and layout that can be modified to meet the readers need. Apart from that, readability and clarity must be considered when designing a product (Salasiah, 2019)

The number of validation scores is the sum of the scores of each item of the statement of the results of student and teacher responses calculated by the Likert scale formula. The calculation is, each statement item has a score of 1,2,3, and 4. The highest score is said to be a maximum score of 4. The Total number of statements from the student response questionnaire is 20 and from the teacher response questionnaire there are 20. The number of expected scores on the questionnaire responses of students and teachers is the maximum score multiplied by the item statement, so that the result of questionnaire responses of students is 4 x 20 = 80 and the result of questionnaire responses of Teachers is 4 x 20 = 80.

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Table 4. The Percentage Score for Teacher

Persentage	Rating Score	Indicators
76% - 100%	4	Very Valid / Very Good
51% - 75%	3	Valid / Good
26% - 50%	2	Less Valid / Less Good
0% - 25%	1	Very Less Valid / Very Less Good

In summary, the results of the student response questionnaire sheet after using teaching media can be seen in Table 5:

Table 5. Student Response Questionnaire Assessment Results

No.	Statement	Average Score	Category
1.	The Web cover design is attractive (color selection, images, and writing are appropriate) so I am interested in being accessed	3.44	Good
2.	The design of the presentation of the material motivates students to read and work on the Web	3.42	Good
3.	The instructions on the Web for using E-SW are clear and sequential	3.53	Good
4.	The material displayed on the web in the reading materials menu is described in detail	3.42	Good
5.	The teacher explained about the web and its use clearly	3.64	Good
6.	The use of images makes it easier for me to understand the material	3.75	Good
7.	The use of Video provided on the web makes it easy for me to understand the tasks on E-SW	3.64	Good
8.	The theoretical basis contained in E-SW helped me understand the material	3.48	Good

9.	The web is equipped with learning videos to make it easier for students to understand the lesson	3.73	Good
10.	Web content fosters my curiosity	3.59	Good
11.	The web motivates me to do learning	3.64	Good
12.	The web with E-SW motivated me to do grouping	3.45	Good
13.	Web with reading materials, videos, E-SW motivates me to do interpretation	3.34	Good
14.	Web Learning Media motivates me to be more critical in learning	3.14	Good
15.	The web with E-SW motivated me to make inquiries	3.31	Good
16.	The web with E-SW motivates me to plan experiments or research	3.56	Good
17.	The web makes it easy for me to be able to repeat lessons flexibly without having to carry around textbooks	3.28	Good
18.	The web motivates me to use technology appropriately	3.42	Good
19.	The material displayed uses language that is easy to understand	3.51	Good
20.	Learning can be carried out practically	3.67	Good
Average Total of Each Student Response Statement		69.89	Valid / Good
Persentage		88%	Very good

The results of the student response questionnaire percentage are then qualified based on the following response categories (Auliya & Lazim, 2020):

Table 6. Student Response Level Qualifications

Persentage	Indicators
80% $\leq$ P < 100%	Very Good
60 % $\leq$ P < 80 %	Decent/Good

40 % ≤ P < 60%	Less Good
0% ≤ P < 40%	Unsuitable/Very Poor

Table 7. Teacher Response Questionnaire Assessment Results

No.	Statement	Rating Score	Category
1.	Suitability to the characteristics of the subject	4	Very good
2.	Fostering learners' curiosity	3	Good
3.	The given medium creates a pleasant atmosphere	4	Very good
4.	New, unique, useful, valuable and true	3	Good
5.	Media is more cost-effective in conducting learning activities	2	Less good
6.	The media provided uses facilities that support in schools and are conducive to learning	3	Good
7.	The media provided makes it easier for students to obtain information	4	Very good
8.	User-friendly learning media	2	Less good
9.	Instruction and exposure to information are helpful to students, including convenience	3	Good
10.	Media assists teachers in assignment	4	Very good
11.	Learning media does not depend or do not have to use other teaching materials	3	Good
12.	Questions according to theory and conProblems according to theory and concept	3	Good
13.	There is feedback on the evaluation results	2	Less good
14.	Media display attracts students to learn	3	Good
15.	The terms and questions used are appropriate and appropriate	4	Very good

16.	The Web cover design is attractive (color selection, images, and writing are appropriate) so students interested in being accessed	3	Good
17.	Web with reading materials, videos, E-SW motivates Students to do interpretation	2	Less good
18.	The web motivates students to use technology appropriately	2	Less good
19.	The material displayed uses language that is easy to understand	3	Good
20.	Learning can be carried out practically	3	Good
Total of Each Student Response Statement		60	Good
Persentage		75%	Valid / Good

The Total assessment of teachers' responses to web teaching media products was 75%, while the assessment obtained from respondents (students response) for web teaching media products was 88%. The average gain of the assessment is included in the category of very valid and feasible to use.

Description The Results of Implementation Stage

Implementation is a stage that is carried out after developing learning media. Learning Media that have been developed and approved by expert validators can be used in the field in accordance with the development goals. Implementation is the stage where the learning media is developed to be used in the field in the learning process. In addition to field trials, the attractiveness of Learning media also needs to be known.

The *Sitemaraf* application is a product that will be tested for feasibility. The product trial involved 36 Baitul Aziz Deli Serdang Private High School students. The trial was carried out by asking students to use the web application either during class or outside class. Product assessment is based on student response questionnaires so that we can conclude the suitability of the product used. The results of product trials show an average value of 88%. Calculations use a Likert scale. The calculation results can be seen in full in the attachment. The average value obtained using the Likert scale explains that the Sitemaraf application is suitable for application to grade 11 students at Baitul Aziz Private High School Deliserdang with very positive qualifications for levels 80%-100.

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Description The Results of Evaluate Stage

Media that have gone through the next stage of implementation are evaluated. The evaluation was conducted to determine the feasibility of media development in increasing student interest in learning. Increased student interest in learning can be seen from the measurement of interest in learning before and after learning by using a questionnaire with a Likert scale. The student response questionnaire contains 20 statements. The questionnaire has been validated. In the evaluation phase, the activities carried out are to evaluate matters related to web development Sitemaraf. Products that have been developed and tested are then revised against teaching media in accordance with the results of the needs evaluation, namely to determine the level of success in the development and implementation of teaching media that have been made.

After the validator evaluates the teaching media to determine its eligibility, the next step is a field test. By using classroom teaching media to determine the achievement of development goals, namely the feasibility of media, then media trials were conducted by students, and their responses were asked with questionnaires

Discussion

This research is a web-based learning media Development Research on nervous system materials using the *ADDIE* model. Technology is a learning medium that can be utilized in implementing learning, not only for delivering a lesson but also for developing student competencies. Through the web or e-learning, students actively observe, apply, and understand subject matter besides listening to the teacher teaching it (Pakpahan & Fitriani, 2020).

The most important aspect of using media in lectures is facilitating interaction between lecturers and students in the learning process, thus making studies better, more effective, and efficient and arousing student interest in learning (Daulay, 2021). Learning Media is a tool in the form of software and hardware that can be used to convey the contents of teaching materials from learning sources to learners (individuals or groups) that can stimulate the minds, feelings, attention, and interests of learners in such a way that the learning process (inside/outside the classroom) becomes more effective. Good teaching Media must meet the criteria of validity. Web-based learning media that allows learners to interact with web by internet in the virtual world (Ball et al., 2020)

The average achievement of the assessment is included in the valid category, and web-based learning media is feasible to use with some suggestions and improvements for evaluation. In his research, the conclusion is: (1) In general, web-based learning media are a viable media for additional learning resources for students and increase student interest in lessons. This can be seen from the results of student responses to questionnaires after using learning media. (2) Student interest in web-based learning media is good; it can be seen from the enthusiasm of students when using this learning

medium. When students learn in pleasant conditions, they can absorb and remember more of the material presented. Based on the results of the research analysis, it is proven true that web-based teaching media are feasible to apply in order to attract students learning interests. Information technology as an effort to increase the effectiveness of the learning process can be used for teaching (Sukardi,2019).

Conclusions

The result of validation carried out by material expert and media expert, and also student and teacher response is: (1) Web-based learning media product is feasible and valid for learning in Grade XI students of Baitul Aziz Private High School through assessment and validation from material and media experts. This conclusion was drawn based on the analysis of material experts, with a percentage score of 95%, which means very valid, the basis for asssessing the feasibility of the media in terms of material is the suitability of the material with the purpose of learning, the language used is communicative (easy to understand language) and lesson content presented on the web according to material experts worthy of being displayed and applied to students. (2) Media experts, with an average value of 88%, which means very accurate. Assesment is taken based on aspects of media display in terms of clarity of media titles on the opening creen in web, ease of selecting menu on media. By the linguistic aspect, the simplicity of sentence structure and language used are communicative. And by the media operation aspect, usability, compability end efficiency of media use in terms of time. (3) The results of the assessment of students response of 36 students, obtained a percentage of 88%, assesment aspect of one of the statements on the questionnaire is that the use of videos included on the web makes it easier for students to understand the tasks attached to an e-sw, the media makes it easier for students to an e-sw, the media makes it easier for students to repeat lessons flexibly, the material is displayed using easy to understand language, and lessons can be carried out practically.(4) Teaching materials are worth using. The results of the assessment of teacher response to the evaluation of web-based leaching media is 75%, so it meets the eligibility criteria of products and teaching materials already meet the indicators. Aspects of assesments one of them is conformity with the caracteristics of the subjects matter, the media provided creates a pleasant atmosphere because the web is facilitated in the form of videos and figures, and the medis helps teachers in giving assignments.

Increase the acquisition of student learning objectives, a teacher must be more inventive and creative in producing and using the selected media to make it easier for students to follow each class (Ulfaida & Pahlevi, 2021). The characteristics of the developed educational website have two-way communication with feedback on game keyword searches and quiz games, and content that is very suitable for students, namely content that is displayed in an interesting way, images or videos as additional learning resources. , and interactive multimedia. For example, the mechanism of

conscious movement through the brain would be difficult to imagine without multimedia which would show how complex the material is because we cannot see it directly with our eyes. Then the website will provide facilities in the form of pictures and videos as well as material as their learning resources. The more interesting the media will definitely make students motivated to like their lesson (Astuti, et al., 2020).

References

Amthari, W., Muhammad, D., & Anggereini, E. (2021). Pengembangan E-LKPD Berbasis Saintifik Materi Sistem Pernapasan pada Manusia Kelas XI SMA. *Jurnal Ilmiah Pendidikan Biologi*, 7(3):28-35.

Arikunto, S., Supardi, & Suhardjono. (2021). *Penelitian Tindakan Kelas: Edisi Revisi.* Jakarta: PT. Bumi Aksara.

Aspri, M., & Syahrani. (2022). Profesional Guru dalam MenghadapiI Tantangan Perkembangan Teknologi Pendidikan. *Journal of Education*, 2(1), 64-73.

Astuti, L., Wihardi, Y., & Rochintaniawati, D. (2020). The Development of Web-Based Learning using Interactive Media for Science Learning on Levers in Human Body Topic. *Journal of Science Learning*, 3(2): 89-98.

Auliya, L., & Lazim, N. (2020). Pengembangan Media Pembelajaran MISS PPL (Media Microsoft Power Point Lanjutan) di Sekolah Dasar. *Jurnal PAJAR: Pendidikan dan Pengajaran*, 4(4), 703-714.

Ball, C., Huang, K. T., Cotton, S, R., & Rikard, R. V. (2023). Gaming The System: The Relationship Between Video Games and The Digital and STEM divides. *Games and culture*, 15(5), 501-528.

Daulay, I. K., & Hasugian, K. B. (2021). The Effect of Using Guessing Game Media Themed Local Tourism on Students' Achievement in Writing Narrative Text. *Budapest International Research and Critics Institute-Journal*, 4(1): 1178-1185.

Fitriah, D., & Mirianda, M. U. (2019). Kesiapan Guru dalam Menghadapi Tantangan Pendidikan Berbasis Teknologi. *Prosiding Seminar Nasional Pendidikan Program Pascasarjana* (pp. 148-153). Palembang: Universitas PGRI Palembang.

Hamid, M. A., Ramadhani, R., Masrul, M., Juliana, J., Safitri, M., Munsarif, M., . . . Simarmata, J. (2020). *Media Pembelajaran.* Medan: Yayasan Kita Menulis.

Khasanah, P. U., Nirmalasari, R., Lestariningsih, N., & Ayatusaadah. (2023). Development of Guided Inquiry-Based E-Module on Class XI Islamic Integrated Human Reproductive System Material. *Bioeduscience*, 7(3), 317-325.

Lavtania, N., Nulhakim, L., & Utari, E. (2021). Pengembangan LKPD Digital Menggunakan Pendekatan Saintifik Berbasis Kreativitas Mata Pelajaran Kimia Materi Pembuatan Makanan Berupa Koloid. *Quantum: Jurnal Inovasi Pendidikan Sains*, 12(2), 172-184.

Magdalena, I., Shodikoh, A. F., & Pebrianti, A. R. (2021). Pentingnya Media Pembelajaran untuk Meningkatkan Minat Belajar Siswa SDN Meruya Selatan 06 Pagi. *Jurnal Edukasi dan Sains*, 3(2), 312-325.

Maulana, I., Harahap, R. D., & Safitri, I. (2022). Use of learning media through technology for biology education students. *Jurnal Biologi-Inovasi Pendidikan*, 4(3), 282-290.

Nuraida, N., & Astuti, A. (2019). Pengembangan Majalah Sebagai Bahan Ajar Biologi pada Materi Reproduksi untuk Siswa Sekolah Menengah Atas. *Journal of Education in Mathematics, Science, and Technology*, 2(1): 22-28.

Pakpahan, R., & Fitriani, Y. (2020). Analisa Pemanfaatan Teknologi Informasi dalam Pembelajaran Jarak Jauh di Tengah Pandemi Virus Corona Covid-19. *Journal of Information System, Applied, Management, Accounting and Researh*, 4(2): 30-36.

Salasiah. (2019). Pengembangan Modul Pembelajaran Terintegritas Keislaman Pada Mata Kuliah Botani Tumbuhan Tinggi Materi Angiospermae Kelas Magnoliopsida. Palangka Raya: IAIN Palangka Raya

Salsabila, U. H., Wati, R. R., Masturoh, S., & Rohmah, A. N. (2021). Peran Teknologi Pendidikan Dalam Internalisasi Nilai-Nilai Pendidikan Islam Di Masa Pandemi. *Jurnal Pendidikan Indonesia*, 2(1), 127-137.

Sukardi, S., & Rozi, F. (2019). Pengaruh Model Pembelajaran Online Dilengkapi dengan Tutorial Terhadap Hasil Belajar. *Jurnal Ilmiah Penelitian dan Pembelajaran Informatika (JIPI)*, 4(2): 97-102.

Triana, N. (2021). *Lkpd Berbasis Eksperimen : Tingkatkan Hasil Belajar Siswa.* Bogor: Guepedia.

Ulfaida, U., & Pahlevi, T. (2021). Pengaruh Penggunaan Media Pembelajaran Online Terhadap Hasil Belajar Melalui Minat Belajar Siswa Pada Kelas X OTKP di SMKN1 Lamongan. *Jurnal Edukasi*, 8(2): 25-31.

Wijayanto, M., & Fauziah, H. N. (2022). Pengembangan Media Pembelajaran Buletin Terintegrasi Materi Pelajaran IPA. *Jurnal Ilmiah Althifl*, 3(1), 277-291.

Ziden, V. (2023). Development and Implementation of Educational Games as Science Learning Media. *Bioeduscience*, 7(3), 333-338.