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THE DEVELOPMENT OF LEARNING MEDIA FOR CIRCULATORY SYSTEM SUBMATERIAL USING MICROSOFT SWAY BASED ON INQUIRY TO IMPROVE SCIENTIFIC LITERACY

Pengembangan Media Pembelajaran Submateri Sistem Sirkulasi Menggunakan Microsoft Sway Berbasis Inkuiri untuk Meningkatkan Literasi Sains

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Abstract

Scientific literacy is one of the most important skills that learners must have to apply science appropriately. The inquiry approach is a learning strategy that can improve scientific literacy. This research aims to produce learning media for circulatory system submaterial using Microsoft Sway based on inquiry to improve scientific literacy based on validity, practicality, and effectiveness. This learning media was developed using the ASSURE model, namely analyze learner, state performance objectives, select methods, media, and materials, utilize media and materials, requires learner participation, evaluate and revise. This learning media was tested on 20 students of class XI at Labschool Unesa 1 Surabaya High School. These research parameters include validity based on the validation results of validators, practicality based on the results of students' responses, and effectiveness based on the results of N-Gain scores, sensitivity index, and achievement of scientific literacy of students. The research data analysis method was quantitative descriptive. The results of the analysis showed that this learning media obtained a validity score of 98.02% (very valid), a practicality score of 97.81% (very practical), and effectiveness scores from the N-Gain of 0.8 (high) sensitivity index of 0.39 (sensitive), as well as the achievement of scientific literacy indicators, namely describing phenomena scientifically 80%, formulating questions that can be investigated scientifically 85%, conducting scientific investigations 90%, evaluating the results of scientific investigations 85%, analysing data tables scientifically 90%, and producing conclusions based on data and scientific evidence 90%. Thus, this learning media is suitable for use to improve students' scientific literacy.

Keywords: Microsoft Sway, inquiry, scientific literacy, circulatory system

Abstrak

Literasi sains adalah salah satu keterampilan terpenting yang harus dimiliki peserta didik agar dapat menerapkan sains dengan cara yang tepat. Pendekatan inkuiri merupakan strategi pembelajaran yang dapat meningkatkan literasi sains. Tujuan penelitian ini untuk menghasilkan media pembelajaran submateri sistem sirkulasi menggunakan Microsoft Sway berbasis inkuiri untuk meningkatkan literasi sains yang layak berdasarkan validitas, kepraktisan, dan keefektifan. Media pembelajaran ini dikembangkan menggunakan model ASSURE yaitu analyze learner, state performance objectives, select methods, media, and materials, utilize media and materials, requires learner participation, evaluate and revise. Media pembelajaran diujicobakan kepada 20 peserta didik kelas XI di SMA Labschool Unesa 1 Surabaya. Parameter dalam penelitian ini meliputi validitas berdasarkan hasil validasi para validator, kepraktisan berdasarkan hasil respon peserta didik terhadap penggunaan media pembelajaran, dan keefektifan berdasarkan hasil skor N-Gain, indeks sensitivitas dan ketercapaian literasi sains peserta didik sesudah menggunakan media pembelajaran. Metode analisis data penelitian yaitu deskriptif kuantitatif. Hasil analisis menunjukkan bahwa media pembelajaran yang telah dikembangkan memperoleh skor validitas sebesar 98,02% (sangat valid), skor kepraktisan sebesar 97,81% (sangat praktis), dan skor keefektifan yang diperoleh dari N-Gain sebesar 0,8 (tinggi) indeks sensitivitas sebesar 0,39 (sensitif), serta ketercapaian indikator literasi sains yaitu mendeskripsikan fenomena secara ilmiah 80%, merumuskan pertanyaan yang dapat diselidiki secara ilmiah 85%, melakukan penyelidikan ilmiah 90%, mengevaluasi hasil penyelidikan ilmiah 85%, menganalisis tabel data secara ilmiah 90%, dan menghasilkan kesimpulan berdasarkan data dan bukti ilmiah 90%. Dengan demikian, media pembelajaran ini layak digunakan dalam pembelajaran untuk meningkatkan literasi sains peserta didik.

Kata Kunci: *Microsoft Sway, inkuiri, literasi sains, sistem sirkulasi*

INTRODUCTION

Scientific literacy is one of the most important skills that learners must have to apply science appropriately. Scientific literacy includes understanding science concepts and principles by utilizing science-related knowledge, attitudes, and skills to critically analyze, solve problems, and make decisions needed in dealing with science-based issues (Sutrisna, 2021). Scientific literacy consists of three aspects, namely context, knowledge, and competence. The competency aspects of scientific literacy include explaining phenomena scientifically, evaluating and designing scientific enquiry, and interpreting data and evidence scientifically (OECD, 2019).

The three competencies are needed to assess students' scientific literacy skills in describing phenomena scientifically, using inquiry understanding to formulating questions that can be investigated scientifically, conducting scientific investigations, evaluating the results of scientific investigations, analysing data tables scientifically, and producing conclusions based on data and scientific evidence. The scientific literacy skills of Indonesian students are still relatively low, as seen from the PISA score which reached 383 below the global average of 483 based on 2022 achievement data (OECD, 2023).

Sutrisna (2021) stated that low scientific literacy skills are generally caused by learning methods that are less effective in developing scientific literacy. Based on research by Fuadi et al. (2020) found several factors that resulted in low scientific literacy, such as inadequate textbooks used, incorrect understanding of concepts, irrelevant learning, difficulty understanding reading, and an unfavorable learning environment. The average value of 51.67 obtained from the Azizah & Budijastuti (2022) instrument trial at Labschool Unesa High School shows that there is still room to increase students' scientific literacy in the circulatory system submaterial.

The results of researcher observations at Labschool Unesa 1 High School obtained information that in Biology learning activities, especially circulatory system material, XI class teacher only provided an understanding of the material using videos from YouTube. The learning media has not been able to improve scientific literacy skills, causing students to be less active in developing their knowledge. In addition, the assessment designed by the teacher has not measured the extent to which students master scientific literacy. Information obtained through interviews with XI class students revealed that most students only focus on memorizing material.

In reality, students still find it difficult to understand the workings and interactions of organs in blood circulation. This difficulty is caused by the abstract nature of the material, the high complexity, and the interconnected processes in the circulatory system (Khairaty et al., 2018). Scientific literacy is needed in learning circulatory system material to strengthen understanding of content knowledge and help learners explaining phenomena scientifically related to disorders or abnormalities in the human circulatory system.

In the research of Fidiantara et al. (2020) scientific literacy can be improved through inquiry learning because it involves students in scientific activities through the use of teaching materials specifically designed to encourage investigation, as well as through the application of science in the context of real life. Broadly speaking, the inquiry approach strategy according to Sanjaya (2008) includes orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses, and formulating conclusions.

The application of inquiry in learning is based on the constructivism learning theory that encourages learners to develop their understanding through exploration, reflection, and construction of their knowledge (Pramana et al., 2024). The inquiry learning process involves students in the process of finding answers to solve problems encountered through practicum activities can strengthen scientific literacy skills, especially in designing scientific investigations and interpreting data scientifically (Merta et al., 2020).

Millennial generation students tend to be more interested in web-based learning than conventional learning (Harefa et al., 2019). The number of discoveries requires educators to be able to visualize and convey learning in a way that is easier for students to understand (Ardelia & Juanengsih, 2021). The use of ICT-based learning media aims to deliver learning materials more effectively and interestingly for students so that the learning atmosphere is more enjoyable. One of the utilizations of technology to produce effective learning media is by using Microsoft Sway.

Microsoft Sway is one of the features of Microsoft Office in the form of a presentation media application that is created and broadcast online (Suherman, 2019). Microsoft Sway provides flexible access to various learning resources by involving the active participation of students in science learning through inquiry-based

features developed to hone scientific literacy skills. Not all concepts in the circulatory system submaterial can be demonstrated through laboratory practice. The use of Microsoft Sway can provide the right visualization with excellent design features in its ease of uploading various multimedia content (Markamah & Nugrahani, 2022).

Based on the conditions and problems that have been described, this research aims to produce learning media for the circulatory system submaterial using Microsoft Sway based on an inquiry approach to improve students' scientific literacy that is valid, practical, and effective. The development of learning media is presented attractively and equipped with several inquiry-based features such as Bio-Literacy, Bio-Activity, and Bio-Analysis according to scientific literacy indicators.

METHOD

This research used the ASSURE development model which has six stages, namely analyze learner, state performance objectives, select methods, media, and materials, utilize media and materials, require learner participation, evaluate and revise (Smaldino et al., 2018). Development of this learning media was carried out from December 2023 to June 2024. Media testing and data collection activities were carried out at Labschool Unesa 1 Surabaya High School in June 2024 even semester of the 2023/2024 school year. The research data analysis used a quantitative descriptive method.

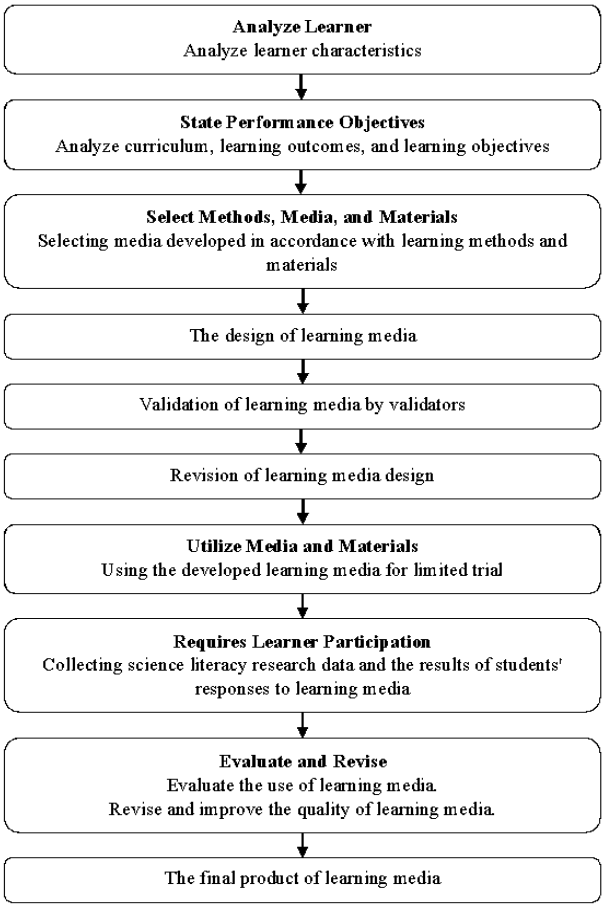


Figure 1. Development Model of ASSURE

The analyze learner stage is identifying the characteristics of learners by observing learning activities and interviewing students. The state performance objectives stage is formulating learning objectives consisting of curriculum analysis and analysis of learning outcomes. The select methods, media, and materials stage is developing learning media by selecting media, methods, and learning materials. The draft learning media contains features based on the inquiry approach and scientific literacy indicators. The learning media draft is validated by validators using the validation sheet instrument. After validation, the learning media draft is improved according to the validator's notes and suggestions. The utilize media and materials stage involves using the developed learning media for a limited trial on students. The requires learner participation stage involves students' responses after using the learning media and the results of the scientific literacy achievement test. The evaluate and revise stage is analyzing the data from the trial results and revising the learning media improvements.

Research data collection using validation technique, test technique, and questionnaire technique. The

validation technique uses the validation sheet instrument to determine validity. The validation sheet refers to the Likert scale according to Riduwan (2013).

Validity scores are averaged using the following formula:

Average score = x100%.....(1)

The validity results are interpreted based on the criteria according to Riduwan (2013).

Table 2. Validity Interpretation Criteria
(Riduwan, 2013)

The test technique uses pretest and posttest question sheet instruments to determine effectiveness. Data analysis of pretest and posttest results through the following N-Gain formula:

N-Gain = ...(2)

The results of the N-Gain score are interpreted based on the criteria according to Hake & Reece (1999).

Table 3. N-Gain Interpretation Criteria
(Hake & Reece, 1999)

The Sensitivity index (S) is calculated using the formula suggested by Norman E. Gronlund (1982), as follows:

S = ...(3)

Note:
S = Sensitivity of the items
Ra = Number of learners who answered correctly in the posttest
Rb = Number of learners who answered correctly in the pretest
T = Number of all learners who answered pretest and posttest

The questionnaire technique uses a learner-response questionnaire sheet instrument to determine practicality. The learner response questionnaire sheet refers to the Guttman scale (Riduwan, 2013).

Table 4. Guttman Scale Criteria
(Riduwan, 2013)

Practicality scores are averaged using the following formula:

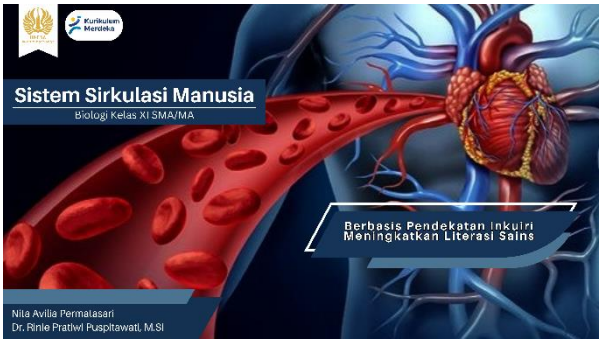
Average Score (%) = x100%.....(4)

Practicality result is interpreted based on criteria according to Riduwan (2013).

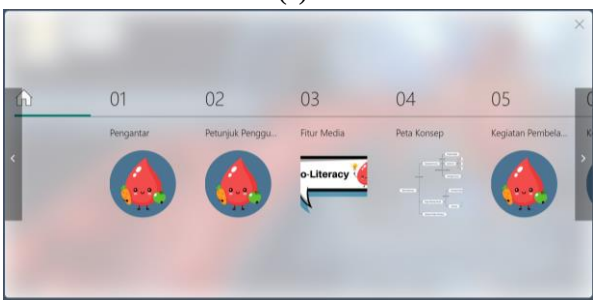
Table 5. Practicality Interpretation Criteria
(Riduwan, 2013)

RESULT AND DISCUSSION

This research produced learning media for the circulatory system submaterial using Microsoft Sway based on an inquiry approach to improve scientific literacy that is valid, practical, and effective. Learning media developed using the Microsoft Sway website can be accessed easily online through various electronic devices such as smartphones, tablets, laptops, or computers. Learning using this media is carried out with an allocation of 4x45 minutes consisting of learning activity 1 topic of "Blood Components" and learning activity 2 topic of "Circulatory Organs". The display of the developed learning media is presented in Figure 2.



(a)



(b)

Figure 2. Learning media display; (a) Learning media cover; (b) Media navigation menu

The learning media developed was unique in that it can train and improve students' scientific literacy skills through inquiry-based inquiry activities including orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses, and formulating conclusions in facilitating the achievement of scientific literacy indicators. The inquiry activities are contained in three media features: (1) Bio-Literacy trains students to describing phenomena scientifically, (2) Bio-

Activity trains students to formulating questions that can be investigated scientifically and conducting scientific investigations, and (3) Bio-Analysis trains students to evaluating the results of scientific investigations, analysing data tables scientifically, and producing conclusions based on data and scientific evidence. The features of the learning media for the circulatory system submaterial using Microsoft Sway based on the inquiry approach to improve scientific literacy are presented in Table 6.

Table 6. Features of Learning Media

No.	Features	Information
1		The Bio-Literacy feature contains scientific journals related to circulatory system disorders in humans.
2		The Bio-Activity feature contains investigation activities based on the problem formulation that has been made.
3		The Bio-Analysis feature includes questions to analyze the results of the investigation and make conclusions.

The learning media that has been produced is then assessed from the aspect of validity based on the results of media validation by validators, practicality based on the results of student response questionnaires, and effectiveness based on the results of N-Gain pretest and posttest, sensitivity index, and achievement of scientific literacy indicators. The validation data is in the form of a feasibility score which is interpreted as the validity of the learning media. The validity score is obtained from the learning media validation sheet which includes two assessment criteria, namely feasibility of media and feasibility of material. The result of the validation score recapitulation is presented in Table 7.

Table 7. Learning Media Validation Result

No.	Assessment Aspects	Percentage (%)
A	Feasibility of Media	
1	Aspects of software engineering	100
2	Aspects of media introduction	100
3	Aspects of visual communication	100
4	Aspects of language use quality	91,25
5	Aspects of the suitability of media features with the inquiry approach indicators: a) Describing phenomena scientifically b) Formulating questions that can be investigated scientifically c) Conducting scientific investigations d) Evaluating the results of scientific investigations e) Analysing data tables scientifically f) Producing conclusions based on data and scientific evidence	100
6	Aspects of the suitability of media features with scientific literacy indicators	100
B	Feasibility of Material	
7	Aspects of material suitability with the curriculum	100
8	Aspects of material suitability	95
9	Aspects of image suitability with material	100
10	Aspects of video suitability with material	95
Average Percentage of Media Feasibility		98,54
Average Percentage of Material Feasibility		97,50
Overall Average		98,02

The learning media for the circulatory system submaterial using Microsoft Sway based on an inquiry approach to improve scientific literacy validated by two validators obtained a validity score of 98.02% which was declared as very valid media. The media was declared very valid if it meets the average percentage score of 61% - 100% (Riduwan, 2013). The validation sheet has two assessment criteria, namely media feasibility and material feasibility. The validation result of media feasibility obtained an average of 98.54% with very valid validity interpretation criteria. The validation result of the material feasibility obtained an average of 97.50% with very valid validity interpretation criteria. The learning media used must pay attention to the media selection criteria. Fitriyah et al. (2020) explain the criteria that must be considered in selecting learning media, namely: (1) Compatibility with the learning objectives to be achieved, (2) Supporting capacity for learning content and materials, (3) Ease of media acquisition and access, (4) Media compatibility with learner characteristics, (5) Compatibility with educators' abilities, and (6) Effectiveness of media use.

The validation result of Table 7. on media feasibility criteria consists of six aspects. In the aspects of software engineering, media introduction, visual communication, suitability of media features with the inquiry approach, and suitability of media features with scientific literacy indicators obtained validity score of 100%. In the aspects of language use quality, it obtained a validity score of

91.25% because it still had shortcomings in the selection of words that were still difficult for students to understand and the writing of foreign terms/scientific names that are still not with the correct rules or have not been italicized. One of the factors that need to be considered in choosing learning media is the use of language. The use of language in the media must be adjusted to the level of understanding of students and delivered clearly and understandably (Alti et al., 2022).

The validation result of Table 7. on the material feasibility criteria consists of four aspects. In the aspects of the suitability of the material with the independent curriculum and the suitability of the image with the material obtained validity score of 100%. In the aspects of material suitability, the validity score is 95% because the material presented was still incomplete to add insight into the knowledge of students. Various displays of content or material contained in multimedia programs can motivate users to explore or explore the content of the material that needs to be learned (Pribadi, 2019). In the learning media using Microsoft Sway developed there are e-journals, articles, virtual laboratories, videos, and images. In addition, in the aspect of video suitability with the material obtained a validity score of 95% because there were videos that only displayed animation without any material information. A variety of video media can be used to support learning accompanied by a realistic display of information and knowledge (Pribadi, 2019).

Based on the validation result, the learning media for the circulatory system submaterial using Microsoft Sway based on the inquiry approach was considered to be able to improve students' scientific literacy. Increasing students' scientific literacy skills can be done with learner-centered learning, thus training students to use scientific knowledge, identify questions, and draw conclusions based on facts. Inquiry learning involves students in the learning process, both observation, experimentation, and investigation activities (Haerani et al., 2020). According to the learning theory of constructivism by Piaget and Vygotsky, students acquire knowledge by building or constructing it themselves either through physical activity or mental processes (Harefa et al., 2024).

Learning media that has obtained a validity score with very valid criteria is then carried out in a limited trial to 20 students of class XI at Labschool Unesa 1 High School. Data collection using a questionnaire technique was filled in by students after using learning media with Microsoft Sway. The results of the recapitulation of the response questionnaire from 20 students to the learning media that has been developed are presented in Table 8.

Table 8. Student Responses Result

No.	Assessment Aspects	Answer Percentage (%)	
		Yes	No
1	Ease of access to various devices	100	0
2	Ease of screen display customization	100	0
3	Ease of media use	100	0
4	Attractive design look	90	10
5	Increased interest in learning	100	0
6	Language use	85	15
7	Comprehension of image display	100	0
8	Comprehension of video display	90	10
9	Use of virtual labs	100	0
10	Comprehension of the material	100	0
11	Practicing the scientific literacy indicator of describing phenomena scientifically	100	0
12	Practicing the scientific literacy indicator of formulating questions that can be investigated scientifically	100	0
13	Practicing the scientific literacy indicator of conducting scientific investigations	100	0
14	Practicing the scientific literacy indicator of evaluating the results of scientific investigations	100	0
15	Practicing the scientific literacy indicator of analysing data tables scientifically	100	0
16	Practicing the scientific literacy indicator of producing conclusions based on data and scientific evidence	100	0
Overall Average of Positive Responses		97,81	

The results of students' responses show that the learning media for the circulatory system submaterial using Microsoft Sway based on inquiry to improve scientific literacy was declared as a very practical media with a practicality score of 97.81% can increase students' interest in learning and scientific literacy. The media is declared very practical if it meets the average percentage score of 61% - 100% (Riduwan, 2013). These results are obtained from students' responses to the media such as ease of media operation and attractive media displays that can increase interest in learning. In addition, the function of learning media can train scientific literacy in inquiry-based practicum activities so that students' scientific literacy skills have increased based on posttest results and the achievement of each scientific literacy indicator.

Overall, students did not experience difficulties in using Microsoft Sway learning media. However, the response question related to the use of language only obtained a percentage of 85% by giving suggestions to shorten the reading so that it is easy to understand. This is following the validation results on the quality aspects of language use which scored lower than other aspects. So it is necessary to improve word processing so that students can understand. In addition, some students are less interested in the color display of the media. Learning media must be arranged interestingly and practically so that students can easily adapt to recognize and understand Microsoft Sway as the media used (Rahmah & Gunansyah, 2022). Learning media must attract attention and increase students' interest in learning. Learning media can be said to be a stimulus for students' minds to increase learning motivation (Amalia & Sulistiyono, 2021).

The effectiveness of learning media was reviewed from the pretest and posttest N-Gain scores on the achievement of scientific literacy indicators. The average pretest was 47.46 with moderate criteria and the average posttest was 73.29 with high criteria. Achievement of scientific literacy skills with high criteria if you get a score of 66.6 - 100 (Hasan et al., 2018). The N-Gain calculation obtained a score of 0.8 declared as effective media. Learning media is said to be effective if it obtains an N-Gain score of > 0.7 (Hake & Reece, 1999). The N-Gain test is a method used to measure the effectiveness of learning or the relative change between the level of understanding of students before and after learning (Sukarelawan et al., 2024).

The effectiveness of a lesson can be analyzed through the item sensitivity of the pretest and posttest. Sensitive items are items that are answered correctly by more students after learning than before learning. The results of the recapitulation of the sensitivity index of pretest and posttest items are presented in Table 9.

Table 9. Sensitivity Index of Pretest and Posttest

Scientific literacy Indicators	Ra	Rb	S
Describing phenomena scientifically	16	7	0,45
Formulating questions that can be investigated scientifically	17	9	0,40
Conducting scientific investigations	18	10	0,40
Evaluating the results of scientific investigation	17	8	0,45
Analysing data tables scientifically	18	9	0,45
Producing conclusions based on data and scientific evidence	18	14	0,20
Average Sensitivity Index			0,39

The average sensitivity index of all questions tested on students is 0.39 with an effective interpretation. Question items that have a sensitivity of ≥ 0.30 have sufficient sensitivity to the learning effect. This shows that the learning carried out by researchers using learning media for the circulatory system submaterial with Microsoft Sway based on inquiry is included in the effective category of increasing students' scientific literacy. The effectiveness results are also obtained from the achievement of each scientific literacy indicator on the pretest and posttest which can be seen in Figure 3.

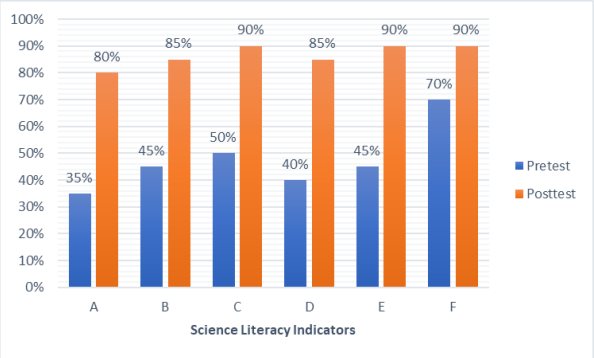


Figure 3. Percentage achievement of students' scientific literacy indicators

Note of Scientific literacy Indicators:

A. Describing phenomena scientifically
B. Formulating questions that can be investigated scientifically
C. Conducting scientific investigations
D. Evaluating the results of scientific investigations
E. Analysing data tables scientifically
F. Producing conclusions based on data and scientific evidence

The pretest results on the indicator of describing scientific phenomena obtained a percentage of achievement of 35%. After using the developed learning media, the posttest results have increased with a percentage of indicator achievement of 80%. In the pretest and posttest questions, students are given readings sourced from scientific journals related to phenomena relevant to circulatory system disorders, namely coronary heart disease, then asked to provide an explanation based on the contents of the journal reading. The scientific literacy questions given must have the ability not only to remember and use theory but also require an understanding of how knowledge is obtained and what the level of confidence in that knowledge is (Abidin et al., 2017). In line with the theory of constructivism which emphasizes that knowledge is built internally by learners with the interaction of learning

materials through exploration in the literature (Pramana et al., 2024). Learners are better able to answer questions because they have practiced reading research journals related to the material and answering questions scientifically in the Bio-Literacy media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Literacy directs learners to describing phenomena scientifically.

The pretest results on the indicator of formulating questions that can be investigated scientifically obtained a percentage of achievement of 45%. After using the developed learning media, the posttest results have increased with a percentage of indicator achievement of 85%. In the pretest and posttest questions, students are given readings sourced from scientific journals related to phenomena relevant to circulatory system disorders, namely coronary heart disease, then asked to determine the right problem formulation to be used in scientific investigations. Learners must be able to determine the research variables used in formulating scientific questions or identify relevant keywords in the given situation related to the phenomenon to be investigated scientifically (Rini et al., 2021). In line with the objectives of constructivism theory in the classroom, namely developing the ability of students to ask questions and find their answers (Mulyadi, 2022). Learners are better able to answer questions because they have practiced formulating questions scientifically in the investigation of the topic of the circulatory system on the Bio-Activity media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Activity directs learners to formulating questions that can be investigated scientifically.

The pretest results on the indicator of conducting scientific investigations obtained a percentage of achievement of 50%. After using the developed learning media, the posttest results have increased with a percentage of indicator achievement of 90%. In the pretest and posttest questions, students are asked to determine the procedures and data from scientific investigations. Procedural knowledge can be taught through the application of learning methods that involve the science process in it (Niate & Djulia, 2022). In line with the principle of constructivism reaction in the context of scientific literacy, learners must be actively involved during the learning process and participate in various exploration activities to build their understanding of scientific concepts (Abbas et al., 2023). Learners are better able to answer questions because they have practiced conducting investigations according to scientific procedures in practicum activities on the topic of the circulatory system on the Bio-Activity media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Activity directs learners to conducting scientific investigations.

The pretest results on the indicator of evaluating the results of scientific investigations obtained a percentage of achievement of 40%. After using the developed learning media, the posttest results have increased with a percentage of indicator achievement of 85%. In the pretest and posttest questions, students are given a scientific investigation and then asked to examine it carefully based on their understanding of previously learned theories. Epistemic knowledge is also needed to know the accuracy of the procedures used and how the procedures used can complete a study appropriately (Niate & Djulia, 2022). In line with the theory of constructivism, learners are not only directed to develop their knowledge but also to understand the relationship between concepts through active exploration and discussion in groups (Pramana et al., 2024). Learners are better able to answer questions because they have practiced evaluating the results of scientific investigation data associated with their understanding of the theory previously owned on the Bio-Analysis media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Analysis directs learners to evaluating the results of scientific investigations.

The pretest results on the indicator of analysing data tables scientifically obtained a percentage of achievement of 45%. After using the developed learning media, the posttest results have increased with a percentage of indicator achievement of 90%. In the pretest and posttest questions, students are given a table of data from the investigation and then asked to interpret the data table into information that is easy to understand. Monotonous classroom learning and the absence of presentation of scientific evidence by educators result in students not being able to develop scientific literacy skills (Utama et al., 2019). In line with the principle of constructivism reaction in the context of scientific literacy, namely knowledge and understanding of learners is built through complex cognitive processes when learners organize, compile, and connect new information with existing knowledge (Abbas et al., 2023). Learners are better able to answer questions because they have practiced analysing data tables from

scientific investigations into information that is easy to understand and conveyed in the Bio-Analysis media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Analysis directs learners to analysing data tables scientifically.

The pretest results on the indicator of producing conclusions based on data and scientific evidence obtained a percentage of achievement of 70%. After using the developed learning media, the posttest results of students have increased with a percentage of indicator achievement of 90%. In the pretest and posttest questions, students are given data from the investigation or observation and then asked to provide conclusions related to the data generated according to the information provided. This shows that students have been able to provide conclusions based on data and scientific evidence. In line with the implementation of constructivism learning theory by Tytler related to providing opportunities for students to express thoughts related to the knowledge that students already have (Mulyadi, 2022). The indicator of producing conclusions based on data and scientific evidence is also trained in the Bio-Analysis media feature. This is related to the validation results on the aspect of suitability of media features with highly valid scientific literacy indicators, proving that Bio-Analysis directs students to producing conclusions based on data and scientific evidence.

CLOSING

Conclusion

The learning media for circulatory system submaterial using Microsoft Sway based on inquiry to improve scientific literacy was declared valid and can be used in learning with a validity score of 98.02%. The learning media was declared practical with a practicality score of 97.81%. The learning media was declared effective with an N-Gain score of 0.8, a sensitivity index of 0.39 and obtained score of achievement of scientific literacy indicators, including describing phenomena scientifically 80%, formulating questions that can be investigated scientifically 85%, conducting scientific investigations 90%, evaluating the results of scientific investigations 85%, Analysing data tables scientifically 90%, and producing conclusions based on data and scientific evidence 90%.

Suggestion

Microsoft Sway learning media is a website-based that is connected to the internet so it is ensured that the school provides Wi-Fi so that it can be used smoothly. The development of learning media must study graphic design by utilizing editing applications so that the resulting appearance can be more attractive and innovative.

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