Al-Bidayah : jurnal pendidikan dasar Islam
Volume 16 Number 2, December 2024
ISSN: 2549-3388 (online)
Available online at https://ejournal.uin-suka.ac.id/tarbiyah/albidayah
Submitted: October 13, 2024, Accepted: December 31, 2024

Development of E-Module Ecosystem Material in Class V Science Learning in MI/SD

Zulfi Idayanti[1], Eriska Witantri Budiarti[2], Muh. Asharif Suleman[3]

UIN Sunan Kalijaga Yogyakarta, Indonesia[1,2,3]
E-mail: zulfidayanti1520@gmail.com[1], eriskawitantri@gmail.com[2], asharifmuhammad2000@gmail.com[3]

DOI: 10.14421/al-bidayah.v16i2.9770

Abstract

The development of e-modules has become an innovative solution in enhancing the quality of science learning, particularly in elementary and Islamic elementary schools (MI/SD). This study aims to produce an additional learning resource kind of e-module by using the software flip PDF professional which convert a PDF files become an interactive e-modules that contain an IPA material ecosystem. The e-modules integrates interactive multimedia, visual aids, and self-assessment tool, aligned with the class V curriculum to facilitate independent and active learning without having to wait for the help of educators. This study focuses on the development of an e-module for ecosystem materials in class V. The research employed the 4D model, through several stages, namely: (1) Definition stage: analyzing the 2013 curriculum KI and KD, analyzing questionnaires filled out by teachers from various regions, and problems in the field. (2) Planning stage: compiling the outline of the E-Module, compiling the E-Module framework, compiling the contents of the E-Module, preparing tools and materials, and compiling research instruments. (3) Development stage: validation carried out by material experts and media experts and practicality testing by educational practitioners and students. The E-Module quality assessment from material experts in the first stage received an average score of 3.80 and fell into the "good" category. After revision and assessment at stage 2, the average score was 4.28 and entered the "Very Good" category. The E-Module quality assessment from media experts received an average score of 4.05 and fell into the "good" category. Thus, this e-module is declared to have quality and can be used as an additional learning resource for students in class V MI/SD. The practicality test by educational practitioners obtained an average score of 4.40 and 4.52 by category. "Very good". Student responses received an average score of 4.74 in the "Very Good" category.
Keywords: ecosystem; e-module; science learning

Introduction

The advanced and sophisticated development of IPTEK can encourage an educator to create an atmosphere of lively and exciting learning activities (Anggraeni & Akbar, 2018). To do that, educators must be competent with providing learning media so that the learning level becomes interesting. Creating an exciting learning process using technology is a must for an educator today, teaching materials using technology as one of its alternatives (Mustafiyanti et al., 2023; Suripah & Susanti, 2022). Teachers are required to make teaching materials that can be pleasant when studied and the teaching material can be used easily and effectively (Magdalena et al., 2020). Teacher should also be able to prepare interactive, inspiring, enjoyable and encourage students to engage actively in-

the learning process so that they can fish up creativity and learning independence (Dian et al., 2023).

The teaching material is the unity of learning material that matches the curriculum used to the established standards of competence (Haristy et al., 2013). The teaching material facilitates the learning process so that the goal can be achieved. Over time, the teaching material offered was not limited to printed books, but electronic or digital (Afifulloh & Cahyanto, 2021). One form of electronic teaching material is E-Modules. E-modules can be accessed at any time by students so they are not limited by time (Redyoningrum et al., n.d.). The presence of E- Modules can make the learning activity more interesting, encourage the learning spirit of the student, and make the student learn on his own (Jilah Safitri, Rizky Sugiharta, 2021; Suryaningsih, 2020). In fact, both educators and students still use limited learning resources in schools, whereas thematic learning requires diverse learning resources to acquire extensive knowledge.

It is based on an interview conducted by a researcher with a teacher of class V at SDN Bangunsari, learning IPA especially on ecosystem materials still uses learning resources provided by the school alone, where the learning resources are limited to the student thematic books that are integrated with other lessons so that does not discuss the lessons IPA ecosystems materials in detail. He's been trying to make learning as interesting as possible with the available learning resources. Nevertheless, he hasn't gotten the maximum and yet attractive Students are also quite bored with learning resources that are just student books.

The researchers conducted a needs analysis by distributing a form filled by V-class teachers from different regions:

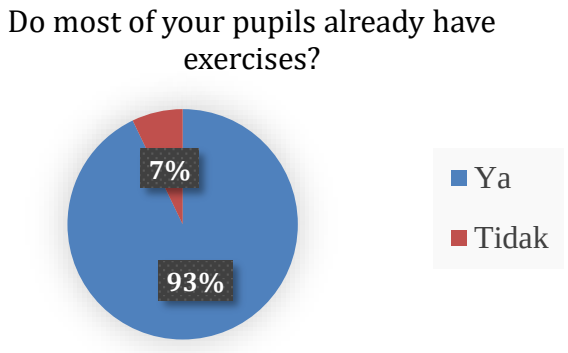

Figure 1
Graphic Property Gave Graduate Participants
Source: Personal Document

The results of the lift shared on the basis of the diagram showed that 93% of V-grade students already had the exercise and 7% of the students did not have the exercise. From the results obtained it strengthened researchers to create a learning resource by utilizing the advances of technology by using the exercise as a tool to access it. In addition, the researchers also hoped that the students can learn through the exercise they have so that the presence of the exercise provides something useful to the students.

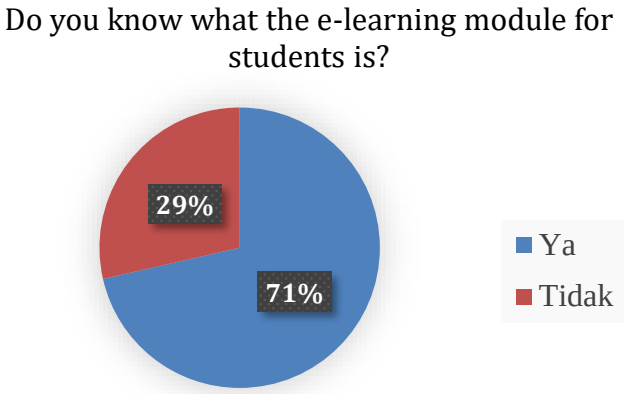

Figure 2
Chart Knowing E-Module
Source: Personal Document

The results obtained from the diagram show that as many as 71% of teachers already know what is E-Module and 29% have not yet known E-module. This encourages researchers to develop E-Module so that it can be used by educators and pupils as an additional learning resource to be able to provide a broader understanding and knowledge of the ecosystem material in the environment around the pupils.

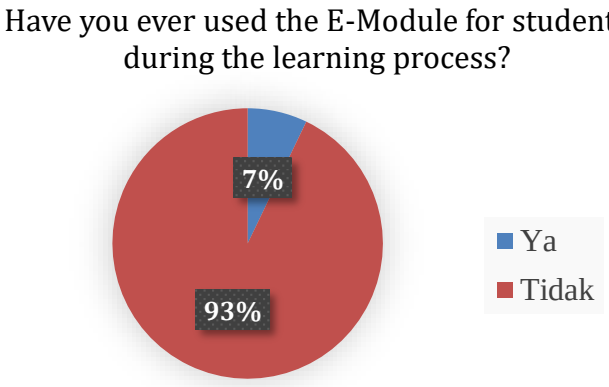

Figure 3
E-Module Usage Graph
Source: Personal Document

The results of the diagram show that 93% of teachers have not used the E-Module for their learning process and only 7% have already used it for their teaching and learning activities. Thus, it's very difficult for researchers to develop E-Modules because 71% of the teachers who know about E-modules only use 7% of them.

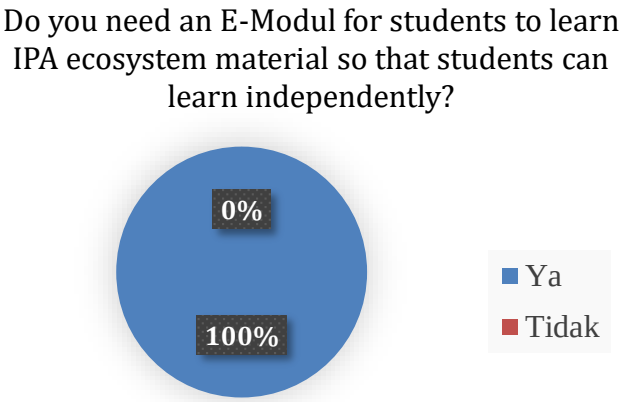

Figure 4
E-Module Requirements Graph
Source: Personal Document

The diagram shows that as much as 100% of teachers need an E-Module for students as a means of student self-learning. This self-learning is intended for pupils You can learn with the help of a little teacher and you don't have to be with friends who have different capabilities so that students acquire extensive knowledge.

Ecosystem material is chosen because the ecosystem is very close to the student. Material that is closer to the pupil is easier to understand independently because the student with the help of such learning resources can use the environment as a concrete medium (Redyoningrum et al., n.d.; Utari, 2021). Class V was chosen because class V was already able to learn independently with the help of teachers at least or without the assistance of a teacher (Novita et al., 2019; Nurrita, 2018). The ecosystem learning will be better when a lively and enjoyable learning is done using the E-Module.

This e-Module can help both educators and learners in enriching insight into the subject matter. The e- Module presents the material in a thorough and comprehensive manner and is accompanied by informative quizzes (Idayanti* et al., 2023). This E-Module can be used as an independent learning tool without waiting for a teacher or a friend with different capabilities (Aliyah & Widiyatmoko, 2022). Nowadays, according to Puspitasari, the use of electronic modules is the right choice to be used as a learning resource (Puspitasari et al., 2020). Electronic tools such as computers, exercises, tablets,

etc. are a tool for accessing the E-Module. The learning resources of E-Module are thought to be innovative because the e-Modul presents the material in an open-ended manner(Susanti & Sholihah, 2021). This makes the use of E-Modules recommended for today's age. So, the usage of evaluated E-modules could be a source of learning to solve such problems(Kuncahyono & Kumalasani, 2019).

Based on this background, it is interesting for researchers to produce an additional learning resource kind of E-Module by using the software Flip PDF Professional learning IPA material Ecosystem to encourage learners in the use of practice and can carry out learning without having to wait for the help of educators.

Research Methods

This study falls into the type of research "Research and Development (R&D)" where the study produces a specific product and is used to validate and develop the product (Vitrianingsih et al., 2021). Development research is not about testing theory, but development research is about trying to produce products that are useful for schools. This research adapted the development research methods of Sivasilam Thiagarajan, Dorothy S. Semmel, and Melyn Semmel as a 4D model (Four D Model).

The model has four stages: define, design, development, and disseminate. The stages can be simplified with the following picture.

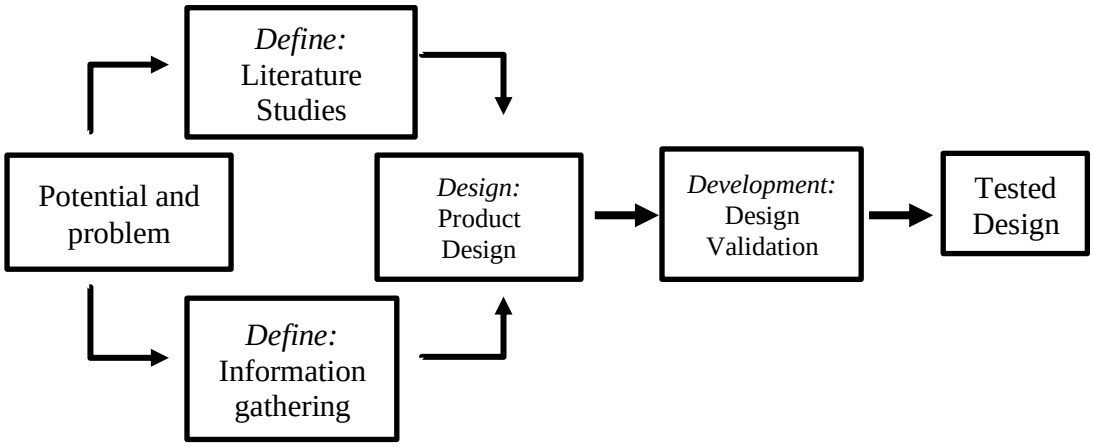

Figure 5
Development Steps
Source: Susanti, 2021

The models of 4D is: Definition Stage ("*Define"*) This definition phase includes initial analysis, student analysis, material analysis, goal formulation, and needs analysis. The researchers interviewed the SDN Bangunsari class teacher about the reality of the

books used as a learning resource. Then the researchers performed material analysis whileining material loaded with Core Competence and Basic Competence for class V theme 5 ecosystem material. The researchers also distributed a lift to analyze the needs of E-Modules filled by some teachers from different areas regarding the ownership of pupil exercises and the teacher's knowledge related to E-Modules.

The second step is Planning phase ("*Design"*). At this stage, the researchers undertake the entire planning from cover making, footer making, header making, material making, evaluation, practicum, font color selection, image drawing, and learning video search. The layout design of the E-Module is done in Microsoft Word 2016.

The third step is Stage of development ("*Development"*). Any design design is really worth continuing, then the product will go into the development process with validation of material experts and media experts. After that, the E-Module evaluation also involved 2 educational practitioners namely teachers of V grade MI/SD and also 10 pupils for the practicality test of E-Module.

Table 1
Subject Try

No.	Subject Description	Name Initials
1	A matter expert.	IK
2	Media expert	AE
3	Educational practitioners	MW
4	Educational practitioners	T
5	Students of the fifth grade	10 class pupils

Source: Personal Document

And the last step is Distribution stage ("*Disseminate"*). Once the design is done and the product is ready for use. The spread was limited in two different assessments. The first evaluation involved 10 pupils for the E-Modul practicality test. The second assessment was made in one of the Ibtidaiyah Madrasahs located on Cendrawasi Street no.001, Pringwulung, Condong Chatur, Depok district of Sleman District of Istimewah Yogyakarta. The second assessment included an efficiency test with Quasi Experimental Research from February 26th to March 4th, 2023.

Result

E-modules developed for teaching ecosystem material in Class V science learning, created using Flip PDF Professional, which is can be a simulates a real book with page-flipping animations for a more natural reading experience and Includes interactive

navigation tools (e.g., clickable menus, next/back buttons). E-modules contains videos that demonstrations of ecosystem concepts such as food chains or biodiversity, animations that visualizations of dynamic processes like energy flow and ecological balance., And self-exercise that can measure their own learning ability.

How to make e-modules with flip PDF Professional is Step 1: Prepare the Content; Step 2: Import the PDF into Flip PDF Professional 1) Open Flip PDF Professional, 2) Click "Create New Project" and select the PDF file of your module, 3) The software will automatically convert the PDF into a flipbook format; Step 3: Customize the E-Module Design, we can add: Choose a Template, Add Branding, Adjust Navigation Features; Step 4: Integrate Interactive Elements: Add Multimedia, Create Links and Buttons, Incorporate Assessments; Step 5: Preview and Test; Step 6: Publish the E-Module

Ecosystem education is crucial in building students' understanding of environmental interdependence and sustainability. It provides foundational knowledge about how living organisms interact with each other and their environment. However, the abstract nature of these concepts often requires creative and effective teaching strategies to ensure comprehension. E-modules are electronic learning resources designed to facilitate independent, flexible, and interactive learning. Their multimedia-rich content accommodates various learning styles, making them particularly effective in engaging students. Features such as videos, animations, and self-assessment quizzes make e-modules a valuable tool in modern education. Flip PDF Professional is a digital publishing tool that allows users to create interactive flipbooks. Its features, including multimedia integration, clickable navigation, and customizable templates, make it an ideal platform for developing e-modules.

The development of an e-module for ecosystem material in Class V science learning in MI/SD serves several key purposes there are 1) Facilitating effective learning that's e-modules can provide an engaging and interactive medium for teaching ecosystem concepts such as food chains, food webs, biodiversity, and human impacts on ecosystems. E-modules also can enhance students' understanding of scientific principles through the use of multimedia, visual aids, and interactive content. 2) Improving student engagement that's e-modules capture students' interest and motivation in learning science by incorporating animations, videos, and interactive tasks and making learning more enjoyable and less reliant on traditional, text-heavy methods. 3) Encouraging independent

and flexible learning that's e-modules enable students to learn at their own pace by providing self-guided modules that cater to different learning styles and foster critical thinking and problem-solving skills through activities like self-assessment quizzes and interactive exercises. 4) Empowering teachers, provide teachers with a ready-to-use, technology-enhanced teaching tool that complements their lesson plans and reduce preparation time and support the integration of digital technology into classroom instruction.

Result part contains the correct and complete quantitative and/or qualitative research results of the problem that can utilize information in forms of figures/graphics/tables/explanation. They are put on the below or above part of the page to simplify the visualization. The result which is presented in this part is the "net" result. The data analysis processes such as statistical calculation and hypothesis testing do not have to be presented. Only analysis and hypothesis testing results that should be reported.

In the development research carried out by adapting the development model of Thiagarajan is 4D, "defining (definition), design (planning), development (development), and dissemination (distribution)". Users can use it on exercise, laptop, computer, PC and so on.

Figure 6
E-Module View
Source: Personal Document

At the beginning of the E-Module shows pictures of some animals living in an environment. A bunch of horses, an elephant, a giraffe showing examples of animals that can live in a particular ecosystem. You can also see a duck swimming in the pool. The green color is chosen as the dominant color because the nature is identical to the green

color. The material in the E-Module contains about ecosystem components that contain about biotic and abiotic components (Fitri et al., 2021). After that, the students will learn about the grouping of animals according to the type of food they eat. These animals are herbivores, carnivores, and omnivores.

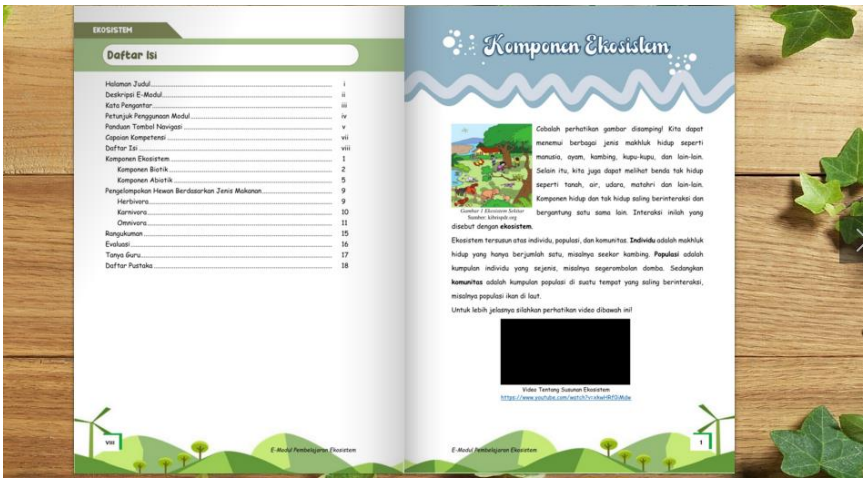

Figure 7
E-Module Material View Equipped with Videos and Images
Source: Personal Document

As for the E-Module that was created, it contained images, videos, games, and evaluations. Figure VI.7 shows that the e-Modul was equipped with animated images and learning videos. This is designed to make it easier for the user to understand the submitted material. It is in line with the principle of the module that allows the use of multimedia to stimulate the student in thinking(Devi et al., 2021).

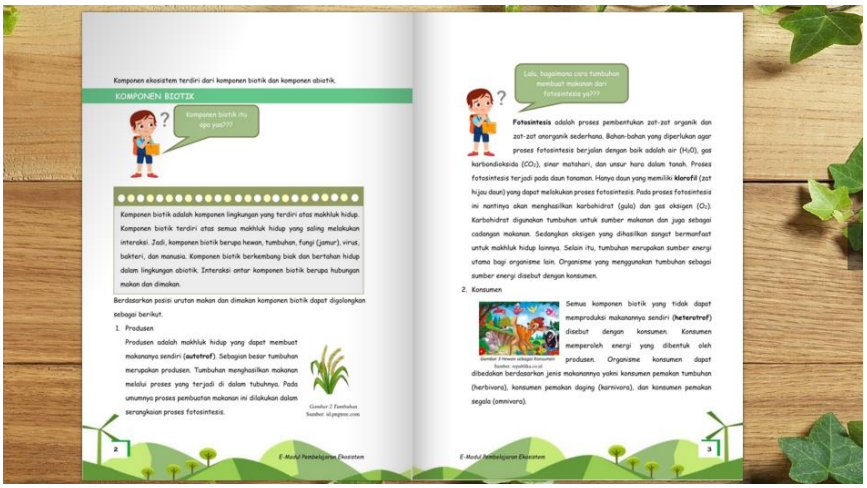

Figure 8
E-Module View with Icons
Source: Personal Document

The E-Module is equipped with icons that can make the student unfilled in using the E-Module by inserting the cartoon icon asking and knowing the answers. Thus then the E-Modul can make the student want to access the e-Module longer and not feel saturated (Christian et al., 2014).

Figure 9
Game View in E-Module
Source: Personal Document

The E-Module is also equipped with educational games created on the worldwall online site. With the presence of this game, students can play at the same time learning. Learning using the game can attract the attention of students so that the E-Module is accompanied by games (Pratama et al., 2019).

Figure 10
Activity View in E-Module
Source: Personal Document

The e-Module covers student activities related to the residential environment. The activities consist of observing the environment to find biotic and abiotic components,

observing environment to know producers, consumers, and mowers, observing the habitat to know herbivore, carnivore, and omnivore animals, and creating conceptual maps of eating and eating events between producer, consumer and mower.

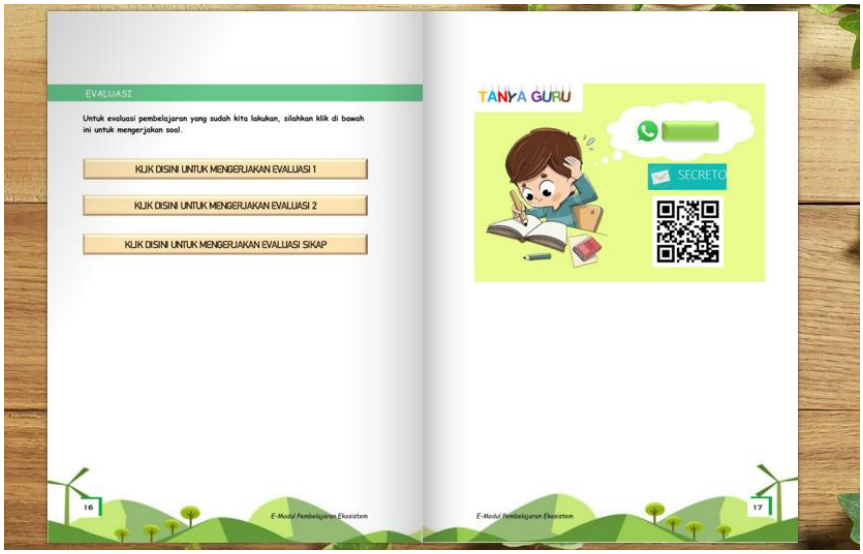

Figure 11
Teacher's Question View
Source: Personal Document

Besides, the E-Module also includes contact teachers that can be contacted. Students can ask them through secreto anonymously or can via Whatsapp. This is because even though students learn independently, cannot be denied frequent questions in the process of creation or use of E-Module. Besides, the communication between the teacher and the student must keep going so that the learning process goes smoothly (Prayudha & Malik, 2021).

Discussion

E-Module product evaluation is carried out by material experts who are competent in the field of Natural Sciences by filling in the evaluation instrument in the form of a cc-list sheet. The instrument contains 3 aspects and 25 indicators. The quantitative value obtained will be converted into qualitative data in accordance with the category received. The calculation of the assessment of the material expert is as follows:

Table 2
Acquisition of Value Per Aspect of Expert Materials

No.	Aspect	Stage 1 Score Average	Category	Stage 2 Score Average	Category
1	Content	3,75	Good	4,25	Very Good
2	Language	3,83	Good	4,00	Good
3	Presentation	3,86	Good	4,57	Very Good

Source: Personal Document

Based on the results of the validation carried out by the stage 1 material expert, it is known that the E-Modul product developed obtained the following rating: content aspects obtain an average rating of 3.75 with category "Good", language receive an average of 3.83 with category "Good", and presentation get an average value of 3.86 with category „Good". The researchers then performed the revision according to the instructions of the material expert. After completion of the review, a stage 2 evaluation was performed and received the following score: the content aspect obtains an average score of 4.25 with the category "Very Good", language get a average of 4.00 with the categories "Well", and the presentation average of 4.57 with the category "Much Good".

Table 3
Acquisition of Total Value of Expert Materials

Stage 1		Stage 2	
Number of scores ($\sum X$)	= 95	Number of scores ($\sum X$)	= 107
Number of items (n)	= 25	Number of items (n)	= 25
Average (X)	= 3,80	Average (X)	= 4,28

Source: Personal Document

Based on the above table, the assessment of the stage 1 material expert obtained a total score of 95 and the average value was 3.80. Based upon the classification table of the category E-Module is in the category "Good". Thus, follow-up was made to revise the E- Module in accordance with the instructions of the validator to obtain better results. The assessment at stage 2 showed an improvement in the number of scores of 107 with an average score of 4.28 and into the category of "Very Good".

Table 4
Value Acquisition Per Media Expert Aspect

No.	Aspect	Average Score	Category
1	Screen Design View	4,00	Good
2	Ease of use	4,17	Very Good
3	Consistency	4,00	Good
4	Graphic	4,00	Good
5	Screen Design View	4,00	Good

Source: Personal Document

Based on the evaluation by the media experts, it can be seen that the E-Modul product developed obtained the following rating: the display aspect of the design obtains an average rating of 4.00 with the category “Good”, the aspect of ease of use obtaining an average score of 4.17 with the categories “Very Good”, the consistency aspect obtain an average value of 4.0 with the Category “Okay”, and the graphics aspect obtain an average of 4.00, with the Categories “Okay”. The researchers then work on the revision according to the instructions of the media expert. For the overall assessment obtain the following values:

Number of scores ($\sum X$) = 81

Number of items (n) = 20

Average (X) = 4,05

Overall, the ratings from media experts get the total score of 81 and the average score is 4.05. Based on the classification tables, the E-Modules are classified in the category "Good". Thus, follow-up is carried out to revise E-Modules in accordance with the instructions of the validator to obtain better results.

Table 5
Acquisition of Value Per Aspect of Educational Practitioners

No.	Aspect	Practitioner 1	Practitioner 2	Average Value	Category
1	Content	4,50	4,50	4,50	Very Good
2	Language	4,00	4,33	4,17	Very Good
3	Presentation	4,00	5,00	4,50	Very Good
4	Screen Design View	4,50	5,00	4,75	Very Good
5	Ease Of Use	4,40	4,60	4,50	Very Good
6	Graphic	4,67	4,00	4,43	Very Good

Source: Personal Document

Based on the evaluation of 2 educational practitioners, it is known that the E-Ecosystem Material Module on the learning of grade V at MI/SD obtained the following rating: the content aspect obtains an average rating of 4.50 entering the category “Very

Good". The utility aspect gets an average score of 4.17 entering "Very good". The dosage aspect receives an average value of 4.50. The display design aspect gets the average rating Of 4.75 enters the category "Various Good". The ease of use aspect gets a average score Of 4.50 into the category "Very Well".

Table 6
Total Value Achievement of Educational Practitioners

Practitioner 1		**Practitioner 2**	
Number of scores ($\sum X$)	= 110	Number of scores ($\sum X$)	= 113
Number of items (n)	= 25	Number of items (n)	= 25
Average (X)	= 4,40	Average (X)	= 4,52

Source: Personal Document

The overall score of the educational practitioner 1 gets a total score of 110 with an average score of 4.40 and falls into the category "Very Good". The overall rating of educational Practitioners 2 obtains a total number of scores of 113 with a average of 4.52 and goes into the Category "Various Good".

Students responded by distributing an angket in the form of a google form. The students responded to seeing the practicality of the E-Module of ecosystem material on the learning of IPA class V in MI/SD. The angket was filled by 10 students.

Table 7
Students' Response

Criteria	**Score**	**Average**	**Category**
1	48	4,80	Very Good
2	48	4,80	Very Good
3	49	4,90	Very Good
4	47	4,70	Very Good
5	48	4,80	Very Good
6	47	4,70	Very Good
7	48	4,80	Very Good
8	44	4,40	Very Good
Amount	379	4,74	Very Good

Source: Personal Document

On the first aspect of ease of use, the material presented received an average rating of 4.80 for the category "Very Good". The language aspect used received an averaging rating of 4,80 for category "very good". The letter aspect used obtained an average score of 4.70 for category "Very good". The aspect of writing in the E-Module received a averaging score of 4,70 for the categories "Verificated". The clarity aspect of the module's

instructions for use received an mean rating of 4.0 for the "Verified" category. The display aspect of images and colours used got an average value of 4. 70 for the kategories "Variable Good". The evaluation aspect received an annual average of 4.80. The systematic aspect of a module obtains an average grade of 4.40 for the “Vérificated” category. Students' responses can be seen from the following graph:

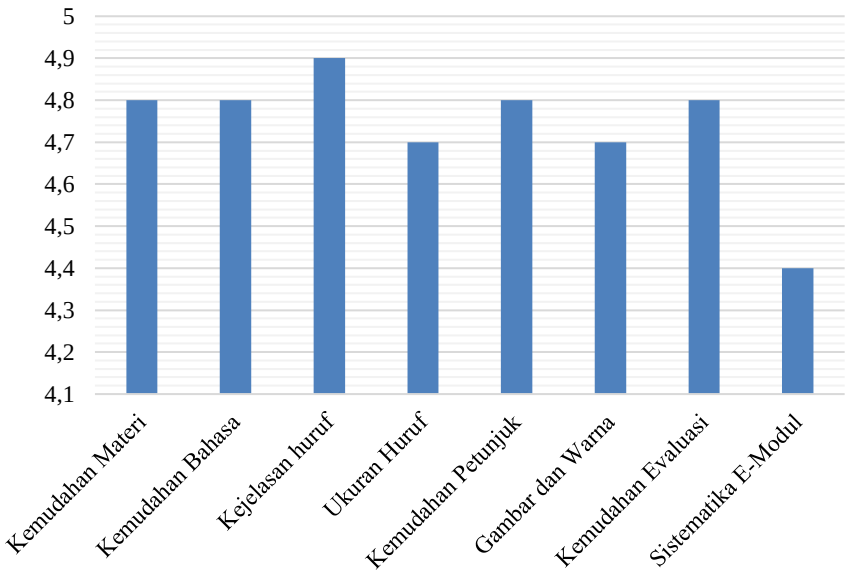

Figure 12
Students' Response
Source: Personal Document

The results of the analysis of the E-Modul efficiency testing with the Quasi Experiment method with the help of the JASP application version 0.17.0.0 found differences in the control class and the experiment class as follows.

Table 8
Independent Samples T-Test

	Test	Statistic	df	p	Effect Size	SE Effect Size
Pretest	Student	2.663	34	0.012	0.888	0.365
	Mann-Whitney	249.000		0.006	0.537	0.193
Postest	Student	3.391	34	0.002	1.130	0.383
	Mann-Whitney	249.500		0.005	0.540	0.193

Note. For the Student t-test, effect size is given by Cohen's d. For the Mann-Whitney test, effect size is given by the rank biserial correlation.
Source: Personal Document

Based on the data shown in the table above, it is known that the sig. (p) indicates more than 0.01. It means the data is less significant. However, if the data is analyzed in non-parametric form, it shows that there is an effect size on the use of e-modules between

pretest and posttest in the experiment class and control class. The results of the research show that the presence of e-modules as educational materials developed effectively improve the learning outcomes of pupils (Zhafirah et al., 2021). It's not regardless of how this teaching material was developed. The effectiveness of the use of teaching materials in the experimental class is more effective than in the control group that does not use the e-module (Fatmawati & Sujatmika, 2018; Naimi et al., 2023; Sanisah & Darmurtika, 2023). The use of the teaching material in the experimental class exceeds the alpha value (0,05), whereas in the controlled group it does not exceed the alfa value. (0,05).

Some of the advantages of this E-Module are material that is presented not only in text or paragraphs, but also in video, images, illustrations, and interactive exercises. This e-Modul can be used by students anywhere and at any time with unlimited access only through a shared link. The limitation of this e- Module is that it can only be accessed online or using an Internet network. Offline access can be done only using a laptop/PC.

Based on the above description, it can be concluded that the E-Module Ecosystem material is of quality and can be used as an additional teaching material for the V SD/MI class with revisions carried out in accordance with the instructions of the expert. Thus, it is expected that this E- Module will be able to be an additional reference for the learners by taking advantage of technological advances at the present time.

Conclusion

E-Module of ecosystem material on learning IPA grade V at MI/SD has been developed by adapting the research model from Thiagarajan to the defining, planning, and development stages. E-Module of Ecosystem Material on Learning IPA class V at MI/SD is an electronic module presented in the form of a flip book that has an attractive appearance like a print book in general. This e-Module is equipped with learning videos, images and illustrations, interactive games, and interactive evaluation topics.

Quality E-Module of ecosystem material on learning IPA grade V in MI/SD was reviewed by a material expert at the first stage obtaining an average rating of 3.80 and entering the “Good” category. After the revision and evaluation at the 2nd stage obtained an average score of 4.28 and entered the “Very Good” group. The rating of the media expert obtains an average grade of 4.05 and enters the “Well” class. The practicality test by the educational practitioner obtained an average of 4.40 and 4.52 with the category

"Victory Good". The results of the research show that the presence of e-modules as educational materials developed effectively improve the learning outcomes of pupils and can be concluded that the E-Module Ecosystem material is of quality and can be used as an additional teaching material for the V SD/MI class with revisions carried out in accordance with the instructions of the expert.

Acknowledgment

-

Declaration of Conflicting Interests

-

Funding

-

Orcid iD

Zulfi Idayanti -
Eriska Witantri Budiarti -
Muh. Asharif Suleman -

References

Afifulloh, M., & Cahyanto, B. (2021). Analisis kebutuhan pengembangan bahan ajar elektronik di era pandemi covid-19.

Aliyah, S., & Widiyatmoko, A. (2022). Entrepreneurship-Based Biotechnology E-Module Development to Improve Critical and Creative Thinking Skills. Biosaintifika, 14(3), 454–462. https://doi.org/10.15294/biosaintifika.v14i3.43299

Anggraeni, P., & Akbar, A. (2018). Kesesuaian rencana pelaksanaan pembelajaran dan proses pembelajaran. Pesona Dasar: Jurnal Pendidikan Dasar Dan Humaniora, 6(2).

Christian, A., Ariani, F., & Rizal, K. (2014). Animasi Interaktif Peningkatan Kemampuan Mengenal Huruf Untuk Anak Usia Dini. Simnasiptek 2014, 1(1), 179–183.

Devi, W., Sukiman, S., & Firdaus, M. Z. (2021). Pengembangan Media Pembelajaran Memahami Cerita Fantasi Berbasis Power Point Untuk Siswa Smp. Karangan: Jurnal Bidang Kependidikan, Pembelajaran, Dan Pengembangan, 3(2), 73–78.

Dian, D., Ahmad, C. F., Arsal, F. R., & Mahmudah, S. (2023). Implication And Application MBKM's Curriculum In Education (Madrasah And Universities). At-Ta'dib, 18(1), 106–122. https://doi.org/10.21111/attadib.v18i1.9910

Fatmawati, E. T., & Sujatmika, S. (2018). Efektivitas Pembelajaran Problem Based Learning Terhadap Hasil Belajar IPA Ditinjau Dari Kemampuan Berpikir Kritis. WACANA AKADEMIKA: Majalah Ilmiah Kependidikan, 2(2), 163. https://doi.org/10.30738/wa.v2i2.2786

Fitri, F. N., Minarti, I. B., & Rachmawati, R. C. (2021). Analisis Interaksi Antar Komponen Dalam Ekosistem Hutan Mangrove Sebagai Sumber Belajar Materi Ekosistem. Seminar Nasional Sains & Entrepreneurship, 1(1).

Haristy, D. R., Enawaty, E., & Lestari, I. (2013). Pembelajaran berbasis literasi sains pada materi larutan elektrolit dan non elektrolit di sma negeri 1 pontianak. Jurnal Pendidikan Dan Pembelajaran Khatulistiwa (JPPK), 2(12).

Idayanti*, Z., Suleman, M. A., & Maemonah, M. (2023). Increasing Student Learning Activities Through the Implementation of Interactive E-Modules in Science Tutorial Models on Elementary School Ecosystem Materials. Jurnal IPA & Pembelajaran IPA, 7(3), 259–268. https://doi.org/10.24815/jipi.v7i3.32522

Jilah Safitri, Rizky Sugiharta, K. R. (2021). Upaya Guru Dalammeningkatkan Hasil Belajar Siswa Sekolah Dasar Denganmenggunakan Pendekatan Tpack. Upaya Guru Dalammeningkatkan Hasil Belajar Siswa Sekolah Dasar Denganmenggunakan Pendekatan Tpack, 1(1), 287.

Kuncahyono, K., & Kumalasani, M. P. (2019). Pengembangan Softskill Teknologi Pembelajaran Melalui Pembuatan E-Modul Bagi Guru Sekolah Dasar. TERAMPIL: Jurnal Pendidikan Dan Pembelajaran Dasar, 6(2), 128–139.

Magdalena, I., Prabandani, R. O., Rini, E. S., Fitriani, M. A., & Putri, A. A. (2020). Analisis pengembangan bahan ajar. Nusantara, 2(2), 180–187.

Mustafiyanti, M., Putri, M. P., Muyassaroh, M., Noviani, D., & Dylan, M. (2023). A Form of Independent Curriculum, an Overview of Independent Learning at State Elementary School 05 Gelumbang Muaraenim. Pengabdian: Jurnal Abdimas, 1(2), 82–96. https://doi.org/10.55849/abdimas.v1i2.185

Naimi, N., Azizah, A., Pendit, S. S. D., Zunaedi, K. R., Isman, M., & Sitepu, M. S. (2023). Efektivitas E-Modul Dilan Berbasis Android (DIDROID) Terhadap Hasil Belajar IPA Siswa Sekolah Dasar. Jurnal Paedagogy, 10(2), 536–543.

Novita, L., Sukmanasa, E., & Pratama, M. Y. (2019). Penggunaan Media Pembelajaran Video terhadap Hasil Belajar Siswa SD. Indonesian Journal of Primary Education Penggunaan, 3(2), 64.

Nurrita, T. (2018). Pengembangan Media Pembelajaran Untuk Meningkatkan Hasil Belajar Siswa. Journal MISYKAT, 3(1), 171–187. https://doi.org/10.1088/1742-6596/1321/2/022099

Pratama, L. D., Lestari, W., & Bahauddin, A. (2019). Game Edukasi: Apakah membuat belajar lebih menarik? At-Ta'lim: Jurnal Pendidikan, 5(1), 39–50.

Prayudha, J., & Malik, A. A. (2021). Efektivitas komunikasi terhadap proses belajar dalam pembelajaran online. DAWUH: Islamic Communication Journal, 2(1), 33–40.

Puspitasari, R., Hamdani, D., & Risdianto, E. (2020). Pengembangan e-modul berbasis HOTS berbantuan flipbook marker sebagai bahan ajar alternatif siswa SMA. Jurnal Kumparan Fisika, 3(3), 247–254.

Redyoningrum, T. Y., Suryandari, K. C., & Susiani, T. S. (n.d.). Hubungan Disiplin dan Motivasi Belajar Terhadap Hasil Belajar IPA Peserta Didik Kelas IV SDN Sekecamatan Kebumen Tahun Ajaran 2020/2021. Kalam Cendekia: Jurnal Ilmiah Kependidikan, 9(2).

Sanisah, S., & Darmurtika, L. A. (2023). Pendampingan Implementasi Pendekatan TaRL (Teaching at The Right Level) Untuk Meningkatkan Kemampuan Literasi Murid. JCES (Journal of Character Education Society), 6(2), 440–453.

Suripah, S., & Susanti, W. D. (2022). Alternative learning during a pandemic: Use of the website as a mathematics learning media for student motivation. Infinity Journal, 11(1), 17–32.

Suryaningsih, A. (2020). Peningkatan Motivasi Belajar Siswa Secara Online Pada Pelajaran Animasi 2D Melalui Strategi Komunikasi Persuasif. Ideguru: Jurnal Karya Ilmiah Guru, 5(1), 9–15. https://doi.org/10.51169/ideguru.v5i1.143

Susanti, E. D., & Sholihah, U. (2021). Pengembangan e-modul berbasis flip pdf corporate pada materi luas dan volume bola. RANGE: Jurnal Pendidikan Matematika, 3(1), 37–46.

Utari, D. W. (2021). Penerapan Model Pembelajaran Problem Based Learning untuk Meningkatkan Belajar IPA Siswa Sekolah Menengah Pertama Negeri 2 Tungkal Ulu. Universitas Islam Negeri Sulthan Thaha Saifuddin Jambi.

Vitrianingsih, D., Aulianingsih, I., & Yuliani, H. (2021). Analisis kebutuhan pengembangan modul elektronik (e-module) ipa terintegrasi islam. Jurnal Ilmiah Pendidikan Fisika, 5(1), 27–37.

Zhafirah, T., Erna, M., & Rery, R. U. (2021). Efektivitas penggunaan e-modul hidrokarbon berbasis problem based learning untuk meningkatkan kemampuan pemecahan masalah peserta didik. Prosiding Penelitian Pendidikan Dan Pengabdian 2021, 1(1), 206–216.

This page is intentionally left blank