

Development of an Integrated Biology Learning Module with Al-Qur'an Verses on Ecosystem Subject for Grade X at MAN 1 Banyumas

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ABSTRACT

This study aims to develop an integrated biology learning module incorporating Al Qur'an verses on the ecosystem subject for grade X and to determine the module's feasibility. The research is of the Research and Development (RD) type, using the 4-D research model (Define, Design, Develop, and Disseminate). Data collection methods used questionnaires. The questionnaires used in the research were validation, practicality, and module readability questionnaires. Data analysis was done using the Gregory formula and supported by percentage techniques. The results of the validation test by subject-matter and religious experts yielded an overall average of 97.77%, a very high validity rating, and were deemed appropriate for use. The results of the practicality test by teachers had an overall average of 83%, indicating that the test was considered very practical. The suggestions from the expert validators and teachers included changes in font color, the addition of Al Qur'an verses, modifications to images, and the addition of questions. The results of the module readability test showed that students obtained an average of 93%, placing them in the very good category. The research concludes that the biology learning module on the ecosystem subject can be developed by integrating Al Qur'an verses and is highly feasible for experts, very practical for teachers, and easily readable for students

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Keywords: Biology Learning Module, Development, Ecosystem Subject, Al Qur'an Verses

Introduction

Education has an important meaning, namely, placing education at the highest level of human needs. A country's progress can be seen in its educational level. Article 20 of Law Number 2003 concerning the National Education System states that the aims of education include, among other things, providing students with opportunities to become faithful and devout human beings who possess self-control, personality, intelligence, noble character, and skills. necessary for oneself, society, nation, and state. Therefore, education is a barometer of a nation's progress and civilization. According to [Yusuf \(2018\)](#), the human need for education is a basic one, preparing everyone to a level where they can demonstrate independence and be responsible for themselves and their environment. In this context, education trains humans to adapt well to their interactions with the environment (the social environment with fellow humans and the biotic and abiotic natural environment).

Studying biology means learning to systematically explore and understand nature. Biology is a process of discovery and the acquisition of knowledge in the form of facts and concepts to train critical thinking ([Tanjung, 2016](#)). In fact, science education in Indonesia, especially in biology, generally focuses only on knowledge, social attitudes, and skills. According to [Qiftiyah & Yuli \(2018\)](#), the integration of the Al-Qur'an in biology learning is still rarely done either orally through teacher delivery or in writing in teaching materials. The paradigm that separates science from the Al Qur'an leads to the idea that science and the Al Qur'an are two distinct things with nothing to do with each other. In fact, science, in this case biology, and the Al Qur'an are interrelated, so both can be integrated in learning.

One of several learning tools that can be used to integrate Al-Qur'an verses with material is a module. A module is a presentation of material arranged and illustrated on sheets of paper that is presented in such a way as to be absorbed by the reader. The required material is a biology learning module that includes verses from the Qur'an to study and understand the relationship between the biology material and the Qur'an, enabling students to understand the benefits and to admire the Oneness of Allah as the Creator ([Yunita et al., 2019](#)).

Teaching aids and learning devices are an important part of providing education. One of the educational materials used to carry out learning is a module ([Magdalena et al., 2020](#)). A module is a detailed learning tool that contains a series of learning experiences designed to help students achieve their learning goals ([Daryanto, 2023](#)). Modules are important learning tools and are prepared by teachers. In compiling learning modules, teachers improve their ability to think innovatively. The designed learning module can be further developed based on the conditions of the learning activities. Training materials need to be developed to make learning more effective, efficient, and aligned with the competencies to be achieved.

To obtain information to identify problems that occurred at MAN 1 Banyumas, researchers conducted a field survey on October 9, 2022. The activity carried out during field practice was an interview with a biology teacher. Based on the interview results, it is known that MAN 1 Banyumas is one of the State Ibtidaiyah Madrasahs in the Banyumas area. This is also seen in the school's vision and mission. The vision of MAN 1 Banyumas is 'to realize excellence, independence and difference'. MAN 1 Banyumas' duties include (1) being devoted to Allah SWT, (2) having a noble character towards the natural environment and society, and (3) improving the quality of the teaching and learning process. To achieve this vision and mission, supporting organizations are needed. However, the school's facilities, especially its learning equipment, still do not align with its vision and mission. Learning tools, such as modules commonly used in schools' teaching and learning processes, are only science-oriented and do not support the realization of the school's vision and mission. Therefore, it is necessary to develop an integrated Al-Qur'an verse module that serves as a means of the learning process and helps realize the school's vision and mission.

Given the module's nature, it was chosen as a suitable tool to facilitate student learning. According to [Directorate General of PMPTK \(2008\)](#), the five characteristics of module consists of: Self Instruction (students can learn independently), Self-contained (the material delivered

through modules has been arranged according to competency units), Stand Alone (not dependent on other environments), Adaptive (adaptive regarding technological development or new knowledge) and User-friendly (owner friendly, that is, it can help provide knowledge). The module to be developed is a biology learning module integrated with Al-Qur'an verses related to ecosystem problems.

Modules are one of several learning tools that can be used to integrate verses from the Al Qur'an with material. A module is a presentation of material, organized and illustrated on paper, that readers can understand. The material needed to study and understand the relationship between biology learning materials and the Al-Qur'an is a biology learning module that contains verses from the Al-Qur'an. This will enable students to know, understand and appreciate the specialness of the oneness of Allah SWT: the creator ([Yunita et al., 2019](#)). According to Dermana (cited from [Dewi, 2017](#)), presenting various aspects of religiosity does not reduce the importance of science. It can even provide access to a comprehensive understanding of the nature of science. One of the presentations of spiritual aspects based on Al-Qur'an knowledge is the improvement of teaching materials, which is expected to be another option for teachers in providing them, thereby making the teaching and learning process more optimal.

Based on the background explained above, researchers are interested in conducting research to develop a learning tool in the form of an integrated biology teaching module with verses from the Al Qur'an on ecosystem material. Ecosystems were chosen as module material because they are mentioned frequently in the Al-Qur'an. The title of this research is "Development of an Integrated Biology Learning Module for Al-Qur'an Verses on Ecosystem Material for Grade X at MAN 1 Banyumas". This research aims to determine the process of developing an integrated biology learning module based on verses from the Quran on ecosystem materials. The second objective of this research is to determine the feasibility, suitability, and readability of the module to be developed.

Methods

The type of research carried out is the Research and Development (R&D). R&D is a research method used to develop certain products and test their effectiveness ([Sugiyono, 2010](#)). The product developed in this research is an integrated biology learning module containing verses from the Al Qur'an on the theme of ecosystems. The process for this R&D study is designed to develop a 4D cycle model or to study the four stages of development. According to [Thiagarajan \(1974\)](#), the 4D development model comprises four stages: definition, design, development, and dissemination. The definition stage includes literature research and field studies to identify problems; the design stage includes initial design activities for the product to be developed; and the development stage includes product validation activities carried out by experts, product evaluation, and product design activities, including development tests. The dissemination phase involves spreading the product under development. In this research, questionnaires are used as a research tool for data collection. It consists of three questionnaires: a validation questionnaire, a practicality questionnaire, and a student module readability questionnaire. The validation and feasibility questionnaires for this research include Likert-scale evaluations (1-4) as well as opinions and suggestions for the module to be developed. The student readability questionnaire for the module uses the Guttman scale with yes/no answer options.

The data obtained were analyzed using data analysis techniques. The data analysis stage is a crucial step in research because it allows researchers to formulate their findings. The data analysis technique in this research is qualitative. Data analysis is presented in tabular form, and percentages are calculated and reported in the narrative.

The validation questionnaire is written in a Likert scale format, with scores ranging from 1 to 4. The feasibility analysis of the module developed in this research is based on

validation data from two material and religious experts using Gregory's formal content validation analysis. The verification formula is as follows:

$$\text{Content Validity} = \frac{D}{A + B + C + D}$$

Table 1. Gregory's validity test crossover classification

Validator II	Validator I	
	Weak relevance (item 1 or 2)	Strong relevance (item 3 or 4)
Weak relevance (item 1 or 2)	A	B
Strong relevance (item 3 or 4)	C	D

Explanation:

A = Number of items that are less relevant according to both validators

B = Number of items that are less relevant according to validator II but are relevant according to validator I

C = Number of items that are relevant according to validator II but less relevant according to validator I

D = Number of relevant items according to both validators.

Table 2. Gregory test validity criteria

No.	Value Range	Criteria
1	0.80 - 1.00	Very high validity
2	0.60 - 0.79	High validity
3	0.40 - 0.59	Middling validity
4	0.20 - 0.39	Low validity
5	0.00 - 0.19	Very low validity

Table 3. Module feasible criteria

Assessment Percentage	Category
< 21%	Very Less Feasible
21% - 40%	Less Feasible
41% - 60%	Feasible Enough
61% - 80%	Feasible
81% - 100%	Very Feasible

The feasibility questionnaire was designed as a Likert scale with ratings ranging from 1 to 4. A feasibility analysis was carried out by analyzing questionnaire data completed by two biology teachers, using Gregory analysis to calculate the percentage for each aspect, following the formula:

$$\text{Percentage} = \frac{\text{Total Score}}{\text{Maximum Score}} \times 100\%$$

Explanation:

Total Score = Total Score Obtained

Maximum Score = Highest score on the scale x Number of questions

Table 4. Practicability outcome criteria

Assessment Percentage	Category
76% - 100%	Very Practical
51% - 75%	Practical
26% - 50%	Less Practical
< 26%	Not Practical

(Arikunto, 2014)

The module-readiness questionnaire for students is constructed as a Guttman scale with Yes/No responses. Analysis of the questionnaire data was tabulated into Ms. Excel and analyzed using the percentage technique using the following formula:

Table 5. Module readability category

Assessment Percentage	Category
80% - 100%	Very Easy
70% - 79%	Easy
60% - 69%	Middling
50% - 59%	Less
0% - 49%	Very Less

(Modification of [Arikunto, 2014](#))

Results and Discussion

This research began by conducting a field survey at the research location and conducting interviews with Biology teachers so that researchers could obtain information which could then be used to identify existing problems in schools which were explained in detail in introduction. Based on the problem formulation found, research was conducted to develop an integrated biology learning module with verses from the Al Qur'an on Ecosystem material and test the feasibility level of the module. This research uses the Research & Development (R&D) method with a 4-D research model, namely Define, Design, Develop, and Disseminate ([Thiagarajan et al., 1974](#)).

1. Define

The definition stage is the first step in finding and collecting information and identifying problems. The stages of this research process are based on 4-D, namely: 1) Needs Analysis. As an Islamic-based school, MAN 1 Banyumas has a Vision and Mission that align with its Islamic foundation. The vision of MAN 1 Banyumas is "Excellent in Achievement, Independent and Characteristic". The missions of MAN 1 Banyumas include: (1) Taqwa towards Allah SWT, (2) Noble Morals towards the Natural Environment and Society, (3) Improving Quality in the Teaching and Learning Process, and so on. To achieve this vision and mission, supporting facilities are needed, such as learning tools in the form of teaching modules used in the learning process in schools, which are only science-oriented and do not support the school's vision and mission. Therefore, it is necessary to develop modules that integrate Al-Qur'an verses to facilitate learning and align with the school's vision and mission. 2) Curriculum Analysis. Curriculum analysis is carried out to determine the materials that will be used in developing an integrated module of Al-Qur'an verses. The curriculum used at MAN 1 Banyumas class X already uses the independent curriculum. In the independent curriculum, grade 10 is included in Phase E. One of the materials studied in Phase E (grade 10) is the Ecosystem material. Ecosystem material was chosen for presentation in module development because it has not been widely developed. 3) Analysis of Learning Achievements. There is a change in terms from the curriculum 13 to the Merdeka curriculum. In the independent curriculum, there is no term KI-KD, because it has been changed to Learning achievements. Before determining learning objectives, conduct a learning achievement analysis. Based on the Analysis of Learning Outcomes, ecosystem material is studied in the second semester. Learning units studied in the scope of ecosystem material include: Ecosystem Components, Interactions between Ecosystem Components, Ecological Pyramids, Ecosystem Productivity, Biogeochemical Cycles, and Ecosystem Change. 4) Material Concept Analysis: The concept of ecosystem material content presented in the module development does not only focus on cognitive aspects but also on religious aspects, so that the ecosystem material content is integrated with the verses of the Al Qur'an. As for the ecosystem, not everything is integrated with the verses of the Al Qur'an.

2. Design

At the design stage, it is necessary to define the modules to be developed. The module design was prepared based on the module preparation technique guide by Rakhdiyanta (2012), but with slight modifications. The integrated biology module framework of Al-Qur'anic verses on ecosystem material prepared by researchers includes: 1) Cover: The cover is the first page that readers see. The module cover usually contains important information such as title, author, and logo. In addition to providing information, the cover also protects the module from physical damage. 2) Foreword: The foreword contains information about the role of the module in the learning process. 3) Table of contents. The table of contents contains the module outline and includes page numbers to make it easier for readers to navigate. 4) Introduction: The introduction contains a brief explanation of the scope of the module. 5) Learning Activities contain learning objectives and an explanation of the material studied in the module. 6) Evaluation: Evaluation is a method used to assess the success of learning indicators. 7) Glossary: A glossary is an alphabetical list of terms from a domain of knowledge with appropriate explanations. 8) Reference, References/libraries used as references in compiling modules.

3. Develop

The development stage (Develop) in this research was conducted in two phases. The first stage is module development, followed by module feasibility testing. (1) Module Development Stage: The type of module developed is a printed module. The module preparation was carried out using Canva and Microsoft Word applications. The module uses Comic Sans MS with different font sizes. To write topics, use font size 14, sub-topics use font size 12, and content explanations use font size 11. Verses from the Al-Qur'an are set in a traditional Arabic font with a 20-point font size for easy reading. The verses and translations of the Qur'an are written manually using a keyboard set to Arabic. The writing of Al-Qur'an verses comes from the Mushaf of the Al-Qur'an and the internet. The Al-Qur'an verses presented in the module include surah names, surah numbers, and surah verses. Al-Qur'an verses written in the module are selected that are appropriate or relevant to the material. Explanations of Al-Qur'an verses are written below the translation and accompanied by the source. The following are the components of developing an integrated biology learning module in Al-Qur'an verses on Ecosystem material carried out by researchers as follows: a) Content Development in the form of: Cover, Foreword, Table of Contents, Introduction, Learning Activities, Evaluation, Glossary, Bibliography. (2) Module Feasibility Test Stage: Based on the research results, the integrated biology learning module with Al-Qur'an verses on ecosystem material is very suitable for use based on expert assessments. The module was declared very easy to read by students. The product resulting from this research is a Biology Learning Module Integrated with Al-Qur'an Verses on Ecosystem Material.

The following are the components of developing an integrated biology teaching module based on Al-Qur'an verses on ecosystem material carried out by researchers as follows: (1) Cover, which contains the title, material, institution, year, author's name, and class information. Cover design in Canva. The cover color chosen is predominantly green. The reason for using green is that it is a natural color identical to biological color (Rinasih et al., 2023). The cover also includes an illustration depicting an ecosystem. (2) Foreword: The foreword contains a general view of the role of the module being developed. Apart from that, it contains the author thanks to the parties who helped in completing the module. (3) Contents: the table of contents lists the module chapters and subsections, as well as page numbers. (4) Introduction, the introduction contains a complete description of the ecosystem material, instructions for teachers and students on how to use the module, learning outcomes which include explanations of understanding biology and technological skills, as well as teaching materials presented in the form of concept maps. (5) Educational activities: Learning activities contain learning objectives, material descriptions, summaries, assignments, and practice questions, as well as answer keys. Learning activities include

illustrative images to explain the material, discussions to deepen students' understanding, and integration of Al-Qur'an verses with the material and its explanations. Reference sources for written material/content are the 2020 Ministry of Education and Culture Senior Biology Study Module, Printed Biology Books for Senior X/MSc, and the *Ruangguru* online learning platform. Links for writing Al-Qur'an verses and explanations are online Tafsir Al-Qur'an sites such as *Tafsir.web* and *TafsirQ*. (6) Evaluation and assessment are carried out after completing learning activities. The purpose of assessment is to obtain student learning outcomes and measure their understanding of the material being taught. The assessment is presented as multiple-choice questions. (7) Glossary: The glossary contains a list of module terms accompanied by explanations so that the terms are easier for readers to understand. The glossary is written alphabetically. (8) References, the last page of the developed module is equipped with a bibliography. The bibliography is written alphabetically. Module development product with Integrated biology on Al-Qur'an verses on ecosystem material shown in Figure 1.

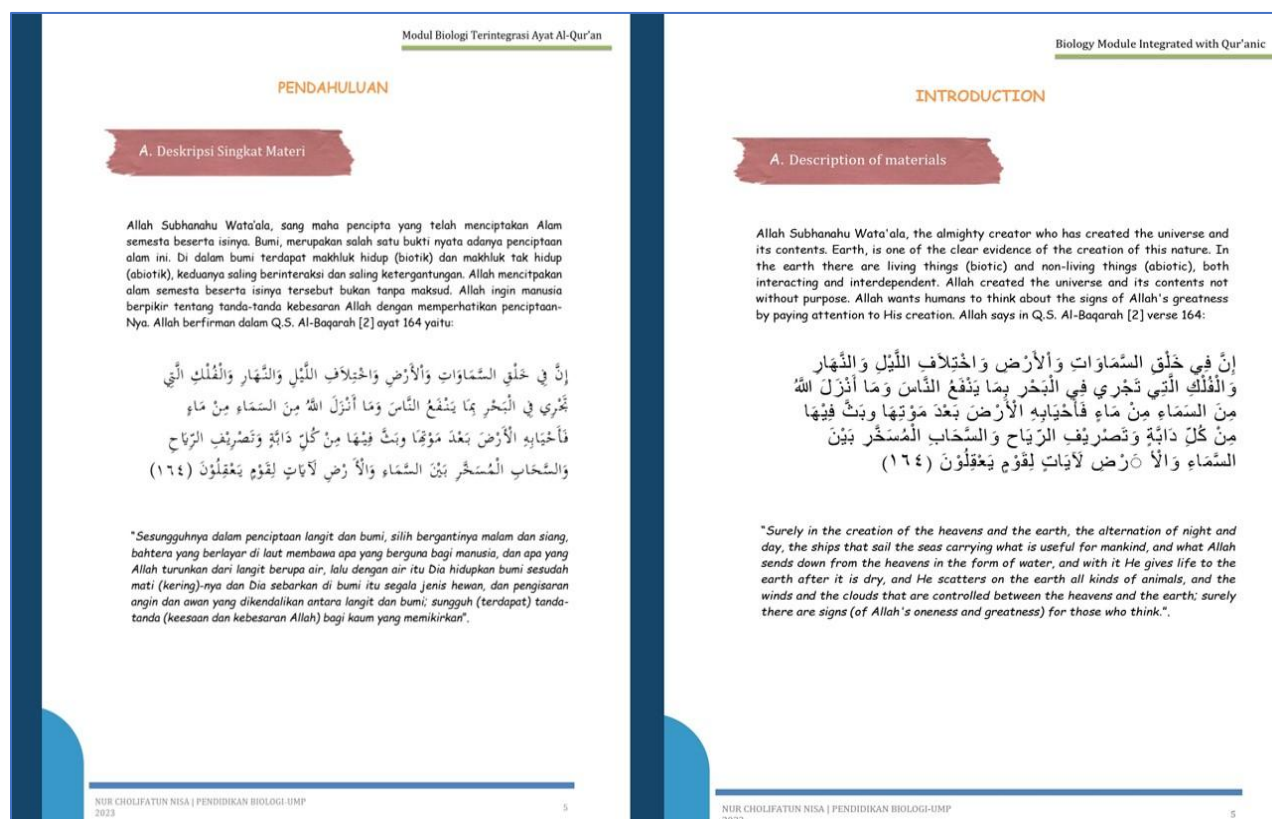


Figure 1. Module development with integrated biology on Al-Qur'an verses on ecosystem material

4. Disseminate

Dissemination refers to the process of sharing research findings with stakeholders and wider audiences ([Bailin & Grafstein, 2010](#)). It is a general phrase that encompasses a wide range of academic and non-academic endeavors that exchange scientific knowledge. At this stage, the module has been developed and is deemed suitable for use based on validation, practicability, and student readability tests. The researcher then disseminates or promotes the final product's results to the general public. In this research, before the module is widely distributed, legal protection for the ownership of intellectual works is provided through IPR (Intellectual Property Rights). After that, researchers promoted the modules developed through international seminar activities at the 2023 International Student Conference of Education (ISCE).

The validation test was carried out on the following days: Friday-Monday, 19-22 May 2023. The validation test was conducted by completing a validation questionnaire. The validation questionnaire data were then tabulated and analyzed using the Gregory formula. Based on the tabulation results of the material aspect module validation questionnaire, it is known that the number of A= 0, B= 0, C= 0, D= 14, so that if calculated using the content validation formula, V is 1, so it can be said that the material aspect module can be categorized as having very high validity. In addition to using the Gregory formula, you can assess the module's feasibility using a percentage calculation.

Based on the tabulation of the material aspect questionnaire, Gregory's analysis yielded a value of 1, indicating that the module has very high validity. Apart from that, it is reinforced by the results of the percentage calculation per aspect as follows:

Table 6. Module feasibility percentage results in material aspects

Aspects	Total Score Validator I	Total Score Validator II	Average	Criteria
Material Feasibility	90,63%	93,75%	92,19%	Very Valid
Integration of Al-Qur'an verses with material	100%	88%	94%	Very Valid

Based on the table above, the percentages for each aspect are: the material/content feasibility aspect by Validator I is 90.63%, by Validator II is 93.75%, so the average is 92.19%. The aspect of integrating Al-Qur'an verses with material: Validator I obtained 100%, Validator II obtained 88%, so the average was 94%. Based on these results, the module on the material aspect is considered highly valid.

Based on the tabulation results in the presentation aspect, it is known that the number of A= 0, B= 0, C= 0, D= 19, so that if calculated using the content validation formula is 1, so it can be said that the module in the presentation aspect can be categorized as having very high validity. In addition to using the Gregory formula, you can assess the module's feasibility using a percentage calculation.

Table 7. Result of module feasibility percentage in presentation aspect

Aspects	Total Score Validator I	Total Score Validator II	Average	Criteria
Module Presentation	100%	99%	99,5%	Very Valid

Based on the table above, the percentage of module presentation validation questionnaires completed by Validator I was 100%, and by Validator II was 99%, yielding an average of 99.5%. Therefore, the module in the presentation aspect is very suitable for use. According to the validation test results, Validator I stated that the module was suitable for use without revision. In contrast, Validator II stated that it was suitable for use but needed minor revisions. Therefore, researchers made improvements based on suggestions from Validator II. After the module is revised, it is returned to Validator II until it is deemed suitable for use without revision.

The module practicability test was carried out on May 31, 2023. The practicability test was conducted by the teacher, who completed the questionnaire provided by the researcher. The practicability test results are then tabulated using the Gregory formula. To find out the practicality of the module, the percentage can be calculated. Based on the table above, Gregory's analysis of the material aspect yielded a value of 1, indicating that the module has very high validity. Apart from that, it is reinforced by the results of the percentage calculation per aspect as follows:

Table 8. Result of percentage

Aspects	Total Score Validator I	Total Score Validator II	Average	Criteria
Material Feasibility	91%	75%	83%	Very Practical
Integration of Al-Qur'an verses with material	100%	75%	88%	Very Practical

Based on the results of calculating the percentage of practicability of the module in the material aspect, the feasibility aspect of the material/content was obtained by teacher I at 91% and teacher II at 75%, with an average of 83%, so that it can be categorized as very practical. The integration of Al-Qur'an verses with the material by teacher I is 100%, and teacher II is 75%, with an average of 88%, indicating it is very practical.

Based on the tabulation results, it is known that the numbers A= 3, B= 0, C= 1, D= 18, so that if calculated using the content validation formula, V is obtained at 0.81, so it can be said that the module in the presentation aspect is categorized as having very high validity. In addition to using the Gregory formula, you can assess the module's feasibility using a percentage calculation.

Table 9. Results of module in presentation aspect

Aspects	Total Score Teacher I	Total Score Teacher II	Percentage	Criteria
Module Feasibility	75%	64.28%	69,64%	Practical
Module Presentation	73%	100%	86,50%	Very Practical
Module benefits	75%	100%	87,50%	Very Practical

The results of the Module Percentage in the Presentation Aspect were calculated per aspect, based on the obtained scores: in the module feasibility aspect, teacher I, I was 75%, and by teacher II, I was 64.28%, with an average of 69.64%, so that it could be categorized as practical. The aspect of presenting the module by teacher I was 73%, and teacher II was 100%, with an average of 86.50%, so that it can be categorized as very practical. The useful aspect of the module is 75% by teacher I and 100% by teacher II, with an average of 87.50%, indicating it is very practical.

The student readability test was carried out on June 3, 2023. The chosen class was X-1, with a total of 30 students. Before students fill out the questionnaire, the researcher distributes the developed module and asks students to read and observe it first to make it easier for them to complete the module readability questionnaire. The results of calculating the percentage of module readability tests by students are presented in the following table:

Table 10. Results of module readability questionnaire calculations by students

Aspects	Percentage	Criteria
Use of Modul	85%	Very readable
Module Presentation	96,7%	Very readable
Modul Benefits	97,5%	Very readable

Based on the table above, the module readability percentage for students is 85% in the module feasibility aspect, 96.7% in the module presentation aspect, and 97.5% in the module benefits aspect.

A module is a learning tool structured systematically, using language easily understood by students. Students can use the module to learn independently while still being guided by the teacher. According to Hamdani (2011: 220), the module has benefits for students and teachers. The benefits of the module for students include: (1) students have the opportunity to learn independently, (2) learning becomes more interesting because it can be studied outside

of class and outside class hours, (3) students have the opportunity to express how to learn according to their abilities and interests, (4) students have the opportunity to test themselves by working on the practice questions presented in the module, (5) develop students' abilities to interact directly with the environment. The benefits are to broaden horizons, increase knowledge and experience in writing, and reduce dependence on textbooks.

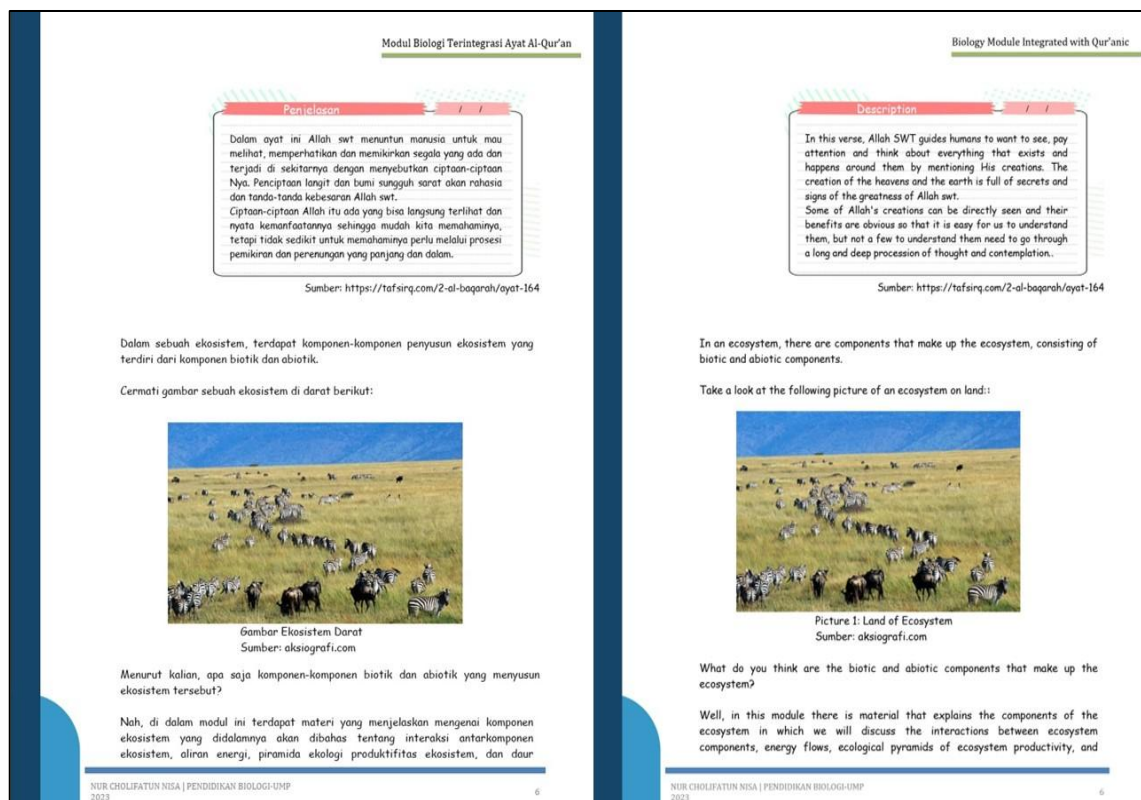


Figure 2. Content of ecosystem material in the integrated biology module on Al-Qur'an verses

The module developed by the researchers integrates verses from the Al Qur'an, ensuring that the material is not only oriented towards science but also reflects the values of the Al Qur'an. The integration referred to, according to [Fadhila \(2021\)](#), is the combination of knowledge (science) with the values of the Al Qur'an without eliminating elements of either. The combination of science and the Al Qur'an in the world of education will provide students with a complete understanding, enabling them not only to gain knowledge but also to develop spiritual values. The advantages of the integrated module of Al-Qur'an verses include: (1) The module is not only oriented towards science, but also oriented towards religion (religiosity), (2) Students can interpret the verses of the Al-Qur'an with scientific cues in the material. ecosystem. [Latifah & Ratnasari \(2016\)](#) also added that the integrated module on Al-Qur'an verses has several advantages as follows: (1) The integrated module on Al-Qur'an verses can provide new learning experiences for students regarding the relationship between the material and the verses. Al-Qur'an, (2) learning becomes more interesting because the module with integrated Al-Qur'an verses is new for students, (3) the integrated module with Al-Qur'an verses is interactive, so that it can be used independently.

The results of module validation by experts were 97.77%, with the category very suitable for use without revision. The validation results also include suggestions and input from the validator regarding the module being developed. The suggestion was to change the font color from red to blue because he thought red was not suitable, so he suggested another color, such as blue. According to [Zainudin \(2021\)](#), color theory in design indicates that red conveys an impression of emergency and appears contrasting. Meanwhile, blue is a color that tends to be

liked by all genders. Other suggestions include adding relevant Al-Qur'an verses to the food chain sub-material in the development module.

The module's practicability, as assessed by teachers, had an average of 83% in the very practical category. The aspects assessed for practicability by the teacher include the suitability of the material and its integration with Al-Qur'an verses, the suitability of the module, the module's presentation, and the module's benefits. Indicators for the appropriateness aspect of the material/content include the suitability of the material with respect to Learning Achievements (CP) and its correctness. The indicator in the integration of Al-Qur'an verses with the material is the suitability of the Al-Qur'an verses to the material. Indicators for the module's feasibility are ease of use and efficiency of use. Indicators in the module presentation aspect are the attractiveness of the module presentation and the integration of Al-Qur'an verses with ecosystem material. The indicator of the module's benefit aspect is the benefit of using the module.

During the practicability test, the teacher provided comments and suggestions on the module under development. Teachers really appreciate research on the development of modules integrated with Al-Qur'an verses. Teachers assess that this module is very suitable for use in schools, especially Islamic-based schools. Teachers also support the view that the module does not stop at the feasibility test stage but can also be implemented in the learning process. The teacher said that he had the same ideas as the researcher because he was also interested in developing a module that was integrated with the Al-Qur'an, so it cannot be denied that, in the future, there would likely be collaborative research to develop a biology learning module that was integrated with the Al-Qur'an on different materials.

The teacher's suggestion regarding the module being developed is that, in preparing it, more attention should be paid to the curriculum analysis because the curriculum used in class involves collaboration, problem-solving, communication, and digital literacy. This can be realized in the learning process by adding trigger questions from the module to hone students' critical thinking skills and provide opportunities for them to explore and find answers themselves. The form of the question is intended to have a Higher Order Thinking Skill (HOTS) weight. According to [Ahrash & Paula \(2006\)](#), Higher Order Thinking Skills (HOTS) are divided into four groups: Problem Solving and Decision Making, Creating, Critical Thinking, and Creative Thinking. Education researchers explain learning: Critical thinking is not about learning content; it is about learning how to connect critical thinking effectively. This means that all critical thinking skills related to problem solving are used ([Sagala & Andriani, 2019](#)).

The results of students' readability tests for the modules developed were generally positive. Some say this module is new because it differs from the modules usually used in schools. According to them, the module developed is interesting and uses language that is easy to understand, making it useful for assisting in the learning process. Students also find this module very useful because it integrates verses from the Qur'an, thereby deepening their understanding of the relationship between science and the Qur'an.

Conclusion

The research produced an Integrated Biology Learning Module with Al-Qur'an Verses on Ecosystem Material. The module is categorized as having very high validity by experts, with an average validation test result score of 97.77%. The module was declared very practical by the teacher, with an average score of 83% on the practicability test. Then, the results of the module readability test by students showed an average score of 93%, indicating that the module is very readable.

Suggestions for future researchers include conducting an effectiveness test of integrated biology learning modules based on Al-Qur'an verses on ecosystems in the classroom.

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