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## PENGEMBANGAN BAHAN AJAR ILMU PENGETAHUAN ALAM DAN SOSIAL (IPAS) BERBASIS RELIGI DI MADRASAH IBTIDAIYAH DI NURUL ISLAM 02 BALUNGKULON

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**Abstrak:** Tujuan dalam penelitian ini yaitu untuk mengembangkan bahan ajar yang sesuai dan relevan dengan kurikulum serta kebutuhan siswa Madrasah Ibtidaiyah di Nurul Islam 02 Balungkulon, yang mengintegrasikan aspek agama Islam dalam pembelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS). Mata pelajaran Ilmu pengetahuan alam dan sosial yang sekarang ini disebut dengan IPAS merupakan bentuk dari kreatifitas kurikulum baru yang berada dalam kurikulum merdeka, dimana kurikulum ini mempelajari tentang ilmu alam dan sosial yang didisain menjadi satu buku. Pembelajaran berbasis religi merupakan pembelajaran yang terintegrasi dengan nilai-nilai agama yang bertujuan untuk membantu siswa memahami dan menerapkan aspek-aspek keagamaan dalam kehidupan mereka, serta untuk memperdalam pemahaman tentang keyakinan dan nilai-nilai agama. Metode penelitian yang digunakan dalam Pengembangan bahan pembelajaran ilmu pengetahuan alam dan sosial yang berbasis religi kelas 4 adalah metode Research and Development (R&D). Metode Research and Development (R&D) adalah metode penelitian yang digunakan untuk menghasilkan produk tertentu, untuk menguji keefektifan produk tersebut Pada penelitian ini menggunakan model pengembangan ASSURE yang terdiri dari analyze learners, state objectives, select strategies, methods, materials, utilize technology and media, require learner participation, evaluate and revise. Hasil dari penelitian spesifikasi modul bahwa modul tematik yang berbasis islam berbetuk media cetak. Kedua yaitu validasi, efektifitas, dan kemenarikan. Berdasarkan dari validasi ahli desain 79%, validasi ahli materi 75%, validasi ahli pembelajaran 80%, berdasarkan uji lapangan siswa dalam mencari kemenarikan memperoleh hasil 88%, berdasarkan rata-rata hasil pre tes dan post tes yaitu 61,45 dan 91,79 yang dapat memberikan penilaian keefektifan modul. Berdasarkan hasil maka modul yang dibuat peneliti efektif, valid dan menarik.

**Kata-kata Kunci:** Bahan ajar; IPAS; Religi.

## DEVELOPMENT OF RELIGIOUS-BASED NATURAL AND SOCIAL SCIENCE (IPAS) TEACHING MATERIALS AT NURUL ISLAM 02 BALUNGKULON ISLAMIC ELEMENTARY SCHOOL

**Abstract:** The aim of this research is to develop teaching materials that are appropriate and relevant to the curriculum and needs of Madrasah Ibtidaiyah students at Nurul Islam 02 Balungkulon, which integrate aspects of the Islamic religion in the learning of Natural and Social Sciences (IPAS). The natural and social sciences subjects which are currently called IPAS are a form of creative new curriculum in the independent curriculum, where this curriculum studies natural and social sciences which are designed into one book. Religion-based

learning is learning that is integrated with religious values which aims to help students understand and apply religious aspects in their lives, as well as to deepen their understanding of religious beliefs and values. The research method used in developing natural and social science learning materials based on religion for class 4 is the Research and Development (R&D) method. The Research and Development (R&D) method is a research method used to produce certain products, to test the effectiveness of these products. This research uses the ASSURE development model which consists of Analyze learners, State Objectives, Select Strategies, methods, materials, Utilize Technology and Media, Require Learner Participation, Evaluate and Revise. The results of the module specification research show that the Islamic-based thematic module takes the form of print media. Second, namely validation, effectiveness and attractiveness. Based on design expert validation 79%, material expert validation 75%, learning expert validation 80%, based on field tests students in finding attractiveness obtained 88% results, based on the average pre-test and post-test results, namely 61.45 and 91.79 which can provide an assessment of the effectiveness of the module. Based on the results, the module created by the researcher is effective, valid and interesting.

**Keywords:** Teaching materials; IPAS; Religion.

## INTRODUCTION

In learning an independent curriculum, teachers foster an understanding of literacy, numeracy and the ability to think in an inquiry manner in students, so the Natural Science (IPA) and Social Science (IPS) subjects are combined into one under the name of the Natural and Social Science (IPAS) subject. A good understanding of the term will essentially make it easier to understand what and how the independent curriculum is implemented in the teaching and learning process in the world of education (Leu, 2022). Allah SWT describes this teaching concept in the Al-Quran Surat Al-Baqarah verse 31:

وَعَلَّمَ آدَمَ الْأَسْمَاءَ كُلَّهَا ثُمَّ عَرَضَهُمْ عَلَى الْمَلَائِكَةِ فَقَالَ أَتُبْتُونِي بِأَسْمَاءِ  
هَؤُلَاءِ إِنْ كُنْتُمْ صَادِقِينَ ﴿٣١﴾

Meaning: "And He taught Adam the names (of things) in their entirety, then revealed them to the Angels and said: "Tell Me the names of these things if you are indeed the true ones!"

Based on this verse, it explains that Allah SWT did not teach and educate Prophet Adam like humans teach each other, but by giving him potential. Later, this potential can develop and allow Prophet Adam to know all the names that are in front of him (Saihu, 2022). This is in line with the hopes of researchers that students are expected to grow and develop according to their potential and abilities with the introduction of science based on religious values or religion as the foundation and basis of the science itself. The use of teaching materials at MI Nurul Islam 02 Balungkulon has not been religiously based, namely books that present learning general material only. Based on the results of interviews with IPAS subject teachers, it was revealed that religious-based natural and social science or IPAS teaching materials were not yet available at MI Nurul Islam 02 Balungkulon, so this is where it is necessary to develop religious-based teaching materials as a guide to everyday life, because the teaching materials will combine or connect learning materials with the arguments of the Al-Quran and Hadith, as well as supporting Islamic images with the aim of increasing student religiosity and Islamic values, with the hope that they can be implemented in everyday life.

Based on the background found above, it is important for the author to support the effectiveness of learning in class five, as well as improve student learning outcomes and instill an understanding of faith and piety towards God. Through application in the environment around them. Therefore the author raised the thesis title "Development of Teaching Materials for Religion-Based Natural and Social Sciences for Grade 4 at Madrasah Ibtidaiyah Nurul Islam 02 Balungkulon".

The formulation of the problem in this study is, how is the material validity and media validity of the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul Islam 02 Balungkulon, how do students respond to the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul Islam 02 Balungkulon? How is the effectiveness of the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul Islam 02 Balungkulon.

The objectives in this study are, Knowing the material validity and media validity of the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul

Islam 02 Balungkulon, Knowing the student response to the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul Islam 02 Balungkulon, Knowing the effectiveness of the development of religious-based natural and social science teaching materials for grade 4 at MI Nurul Islam 02 Balungkulon.

The results of Diena Shulhu Asyiyifa et al., (2016) in the form of science teaching materials based on the complementation of Quranic science verses on Solar System material for class VIII SMP / MTs. The quality of teaching materials is very feasible, namely 4.00 material aspects, 3.56 methodological aspects, 3.78 philosophical aspects and 3.67 strategic aspects. The readability test of teaching materials is easily understood by students with a score of 63.85%. Student understanding gain test 0.55 and attitude 0.61 in moderate criteria. Assessment of student skills in the good category. Student responses to teaching materials in small-scale tests and large-scale tests were positive with scores of 77.15% and 84.43%.

The results of Fardiana (2015) shows that, developing natural sciences learning media based on science and Islam integration are able to increase fourth grade students' comprehension on natural science material at Madrasah Ibtidaiyah Mamba'ul Huda Ngabar Ponorogo. It can be seen from the mean of posttest result 85.8, while in the pre-test the mean 76.8. Therefore, it can be concluded that the students get better score after using the media.

And research from Aflah (2022) shows that inquiry-based science teaching materials and Islamic values obtain a media feasibility value of 82% and feasibility from material experts 78% with a decent category, and the results of feasibility from religious experts 81% with a very feasible category. The response of students is 94% with a very feasible category. And the results of the response obtained from teachers to inquiry-based science teaching materials and Islamic values are 84% with a very feasible category.

This research is different from previous studies, especially in terms of focus and coverage of materials and integration of religious values. In this study, teaching materials covering Natural Science and Social Science were developed, specifically designed for Integrated Islamic Primary Schools. This shows a more comprehensive approach in integrating religious values into two different fields of study. Meanwhile, Diena's research is more specific, focusing on the development of science teaching materials related to science verses in the Quran for solar system material, offering a unique and in-depth approach to one scientific aspect. Aflah's research (2022) carries the development of inquiry-based science teaching materials and Islamic values on environmental pollution material for junior high school, using the inquiry method to explore environmental issues in the context of Islamic values. Finally, Fardiana's research concentrates on the development of science learning media that integrates science and Islam at the madrasah ibtidaiyah level, focusing on creating effective learning media that combines these two aspects.

Developing religious-based teaching materials involves the process of designing, creating, and adapting educational materials that incorporate religious principles, values, or concepts into learning. The aim is to help students understand and apply religious aspects in their lives, as well as to deepen their understanding of certain religious beliefs and values contained in natural and social science (IPAS) teaching materials in grade 4 SD/MI which will be we are thorough.

## RESEARCH METHODOLOGY

The research used in this study is the research and development (R&D) method (Sugiyono, 2020). This research is devoted to research that aims to produce an educational product that can be accounted for. In this study using the ASSURE development model. which consists of Analyze learners, State Objectives, Select Strategies, methods, materials, Utilize Technology and Media, Require Learner Participation, Evaluate and Revise (Darllis et al., 2020).

This research uses the ASSURE development model. which consists of Analyze learners, State Objectives, Select Strategies, methods, materials, Utilize Technology and Media, Require Learner Participation, Evaluate and Revise. One model that is widely referred to for developing and utilizing learning media is the ASSURE model or the model developed by Smaldino, Russell, Heinich, and Molenda (Yaumi, 2015). One model that is widely referred to for developing and utilizing learning media is the ASSURE model or the model developed by Smaldino, Russell, Heinich, and Molenda. ASSURE is an acronym for:

a. Analyze Learners characteristics

In the Analyze learner characteristics stage, researchers carried out analysis activities by coming directly to the madrasah, namely at MI Nurul Islam 02 Balungkulon as a place for research and observing the

environment and the learning process being carried out. At the analysis stage, it was found that the science learning activities in class 4, the material presented by the teacher, had not integrated religious or religious-based values. Therefore, researchers came up with the idea of developing science and science teaching materials with a religious basis in class 4. If there is something new in the form of developing general material teaching materials on a religious basis, this adds uniqueness to our school, because students can find out more about religion through general learning integrated with religious values.

b. Select Objectives

The second stage, namely State Objectives, is the stage where researchers must determine the learning objectives to be achieved. In this way, it is hoped that students can gain certain abilities and competencies from learning. From the results of the learning analysis that has been carried out, the next stage is to develop objectives regarding the use of teaching materials. The aim of using teaching materials is that students can find out the sources of knowledge obtained from learning science. And students can find out the basic science knowledge they study, namely from the Al-Quran and Al-Hadith.

c. Select Media & Materials

The third stage in planning effective learning is choosing appropriate methods, media and learning materials. The learning model that the researchers chose is student-centered using religious-based teaching materials in order to attract the interest and sympathy of Grade 4 MI students. And then determine a good learning strategy or method for delivering material to students, determine the learning strategy of course looking at the learning objectives you want to achieve. Researchers can also see the learning styles of most students to support good learning strategies. And finally, the researcher determines learning materials that are appropriate to what will be taught to students. The material that the researcher will attach is science learning material 1 Plants as a Source of Life with sub-material A Plant body parts and their functions, sub-material B Photosynthesis Process in plants, sub-material C Plant Reproduction for class IV at Madrasah Ibtidaiyah.

d. Utilize Media & Materials

The fourth stage is to utilize media, technology and teaching materials, in this case the researcher uses computer technology media to design the teaching materials to be developed, namely the paper size is A4 (21x29.7 cm), the cover page uses ivory 230 paper, the type of paper for the contents is HVS, using 18th Century Gothic font for the title and 12 contents, 50 pp. This section of teaching materials includes (1) subject identity, including title, material, competencies, indicators, objectives (2) learning instructions, including instructions for students and teachers, (3) content of learning materials that are integrated with religious values (4) supporting information, (5) exercises, worksheets, (6) assessment, (7) response/feedback/reflection. This teaching material is packaged with attractive colors and appearance so that it can arouse students' enthusiasm in studying the material. The presentation of the material is equipped with pictures to make it clearer for students to understand the content. The presentation is adapted to the characteristics of MI students so that it is easy for students to understand.

e. Require Learner Participation

At this stage the researcher will apply the media that has been developed in the classroom by involving students. In using book media, students will be involved in using media in the form of books, so that these teaching materials can be used by students to study independently or guided by teachers and learning in teaching materials is packaged in accordance with the applicable curriculum.

f. Evaluate & Revise

At the evaluation and revision stage, product development is always evaluated at every stage of its development. This stage is carried out to find out how much influence the product being developed has on the goals that have been set, and to find out whether the product needs to be improved or not. The product in the form of religion-based science and science teaching materials for class 4 that was developed was evaluated using data collected by researchers based on criticism and suggestions from experts and students which were used as media improvement material. Evaluation activities are also carried out after product development activities have been completed. The evaluation results will be used by researchers to make improvements to the product. This was done to test and see the feasibility of the product developed by the researcher. A product that is declared worthy will make the product usable and beneficial for teachers and students as targets for teaching material development services. It is also hoped that this product will attract the attention of students who have not been aware of the sources of knowledge that come from the Al-Qur'an

## RESULTS AND DISCUSSION

Based on the guidelines for writing postgraduate scientific papers from UIN KHAS Jember, research and development method consists of three main elements, namely, (1) research and development model, (2) research and development procedures, (3) product trials.

The research method used in the development of printed IPAS teaching materials for grade 4 based on religion is the Research and Development (R&D) method. The Research and Development (R&D) method is used to produce specific products and test the effectiveness of these products (Saadah, et al., 2015). To produce specific products, research is conducted, namely needs analysis, and to test the effectiveness of these products to function in the wider community, research is needed to test the effectiveness of these products. This type of research uses the Research and Development (R&D) method consisting of qualitative and quantitative data. Qualitative data are the results of feasibility testing by subject matter experts, media experts, and the audience. Data obtained from subject matter experts include aspects of discussion content, language, learning material quality, media writing, and evaluation. Data obtained from instructional media experts include aspects of the accuracy of graphic use, attractiveness of appearance, and font usage suitability. Data obtained from the audience include aspects of media attractiveness and ease of understanding the material.

The development model used in this study is ASSURE, which consists of Analyze learners, State Objectives, Select Strategies, methods, materials, Utilize Technology and Media, Require Learner Participation, Evaluate and Revise. One of the models commonly referred to for developing and utilizing instructional media is the ASSURE model or the model developed by Smaldino, Russell, Heinich, and Molenda.

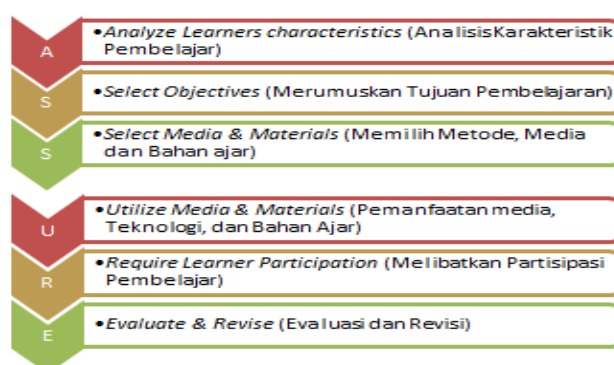


Figure 1. ASSURE Research Method

The Assure research has several stages:

a. Analyze Learners characteristics

In this stage, the researcher conducts an analysis by visiting directly to the madrasah, specifically MI Nurul Islam 02 Balungkulon, as the research location, to observe the environment and the learning process. During the analysis phase, it was found that the science learning activities in grade 4, the material delivered by teachers, did not integrate religious values. Therefore, the researcher came up with the idea to develop religious-based IPAS teaching materials for grade 4. This development of general subject matter based on religion adds uniqueness to our school, as students can gain deeper knowledge about religion through integrated learning with religious values.

b. Select Objectives

The second stage, which is State Objectives, is where the researcher must determine the learning objectives to be achieved. Thus, it is expected that students can acquire certain abilities and competencies from learning. Based on the analysis of the learning activities conducted, the next step is to formulate objectives regarding the use of teaching materials. The objectives of using teaching materials are that students can understand the sources of knowledge obtained from science learning, and students can understand the basic science learned, which is derived from the Quran and Hadith.

c. Select Media & Materials

The third stage in planning effective learning is to select suitable methods, media, and teaching materials. The learning model chosen by the researcher is student-centered using religious-based teaching

materials to attract the interest and sympathy of 4th grade MI students. Then, determining good teaching strategies or methods to deliver the material to students, determining the learning strategy, of course, considering the learning objectives to be achieved. The researcher also looks at the learning styles of most students to support good teaching strategies. Finally, the researcher determines teaching materials that are suitable for what will be taught to students. The material that the researcher will attach includes the science learning material "Plants as a Source of Life" with sub-topics: A. Parts of a plant and their functions, B. Photosynthesis process in plants, C. Plant reproduction, for grade IV in Madrasah Ibtidaiyah.

d. Utilize Media & Materials

The fourth stage is to utilize media, technology, and teaching materials. In this case, the researcher utilizes computer technology to design the teaching materials that will be developed, with paper size being A4 (21x29.7 cm), cover pages using ivory paper 230, paper type for the content is HVS, using Century Gothic 18 font for titles and 12 for content, totaling 50 pages. The sections in these teaching materials include (1) subject identity, including title, material, competencies, indicators, objectives, (2) learning instructions, including instructions for students and teachers, (3) integrated learning material with religious values, (4) supporting information, (5) exercises, worksheets, (6) assessment, (7) feedback/reflection. These teaching materials are packaged with attractive colors and appearance to stimulate students' enthusiasm for learning the material. The presentation of the material is supplemented with pictures to clarify students' understanding of the content. The presentation is tailored to the characteristics of the students so that it is easily understood by them.

e. Require Learner Participation

In this stage, the researcher will implement the developed media in the classroom by involving the learners. In using the student book media, students will be involved in the use of media in the form of books so that these teaching materials can be used for independent or guided learning by teachers, and the learning in teaching materials is packaged according to the applicable curriculum.

f. Evaluate & Revise

In the evaluation and revision stage, product development is constantly evaluated at each stage of its development. This stage is carried out to determine the extent of the influence of the developed product on the established objectives and to determine whether the product needs improvement or not. The product, in the form of religious-based IPAS teaching materials for grade 4, developed is evaluated with data collected by the researcher based on the criticisms and suggestions of experts and students, which are used as material for media improvement. Evaluation activities are also carried out after the product development activities are completed. The evaluation results will be used by the researcher to improve the product. This is done to test and assess the feasibility of the product developed by the researcher. The product that is declared feasible will enable the product to be used and felt beneficial by teachers and students as the target of teaching materials development services. This product is also expected to attract the attention of students who have not yet known the sources of knowledge originating from the Quran and Hadith.

Based on the conclusion from the data analysis, it is shown that after conducting teaching material trials using the ASSURE model, assessments from expert validators in content, language, media, and practitioners indicate that religious-based natural and social science teaching materials are highly effective and engaging. However, the researcher made a series of revisions based on the suggestions of expert validators before the teaching materials could be used. Product revisions were made as follows:

1. Expert media validators suggested:

- a. The initial design of the product begins with the cover, preface, book usage instructions, learning objectives, and table of contents.

Changes to the product can be seen in the following table of contents image

## Daftar Isi

Kata Pengantar.....	ii
Capaian Pembelajaran.....	iii
Petunjuk Pengguna Buku Siswa.....	iv
Daftar Isi.....	vii
<b>Pembelajaran 1 Tumbuhan Sebagai Sumber Kehidupan.....</b>	
Submateri A Bagian-Bagian Tubuh Tumbuhan dan Fungsinya.....	3
Submateri B Proses Fotosintesis pada Tumbuhan.....	15
Submateri C Perkembangbiakan Tumbuhan.....	25
Proyek Belajar.....	38
Peta Konsep.....	42
Uji Pemahaman.....	43
Daftar pustaka.....	44

## Daftar Isi

Kata Pengantar.....	ii
Petunjuk Penggunaan Buku Siswa.....	iii
Capaian Pembelajaran Fase B Kelas IV.....	vi
Daftar Isi.....	vii
<b>Tumbuhan Sebagai Sumber Kehidupan.....</b>	
Pembelajaran 1: Bagian-bagian Tubuh Tumbuhan dan Fungsinya.....	1
Pembelajaran 2: Fotosintesis Proses Paling Penting di Bumi.....	4
Pembelajaran 3: Perkembangbiakan Tumbuhan.....	33
Proyek Belajar.....	49
Uji Pemahaman.....	50
Daftar Pustaka.....	52

Figure 2. Before

Figure 3. After

b. Concepts must be present and clear

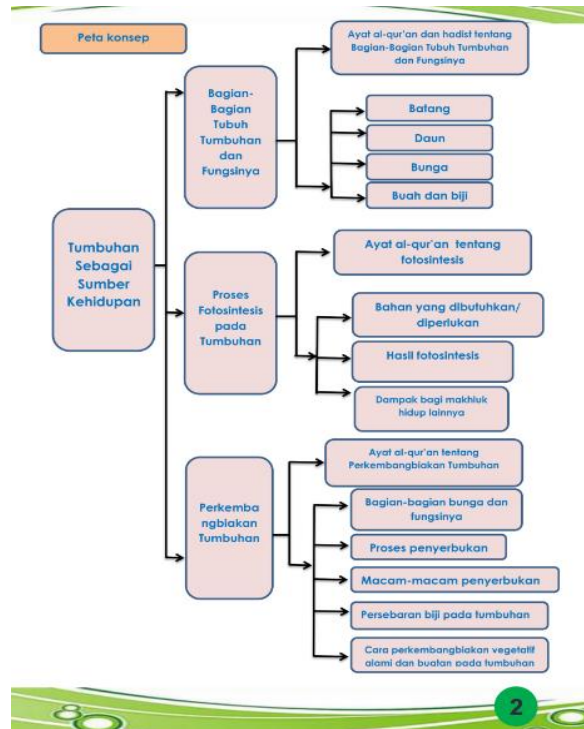


Figure 4. Concept

c. The images presented in each material must be interesting and in accordance with the material presented, for example in the root material

- Akar gantung ini dijumpai pada tumbuhan tertentu yang tumbuh dari batang, dan keadaannya menggantung di udara, memanjang ke arah tanah (bergerak sesuai dengan arah gaya gravitasi bumi).
- Akar perekat atau akar tempel merupakan jenis akar yang muncul pada tumbuhan yang berperan agar tumbuhan mampu menempel pada berbagai benda atau objek seperti: kayu, tembok, bahkan pada tumbuhan lain serta mampu bergerak ke tempat yang lebih tinggi.
- Akar tunjang lahir dari bagian bawah dari akar yang berfungsi untuk menunjang batang agar posisi batang tetap berdiri tegak.
- Akar napas biasanya terdapat pada tumbuhan yang sering tergenang air, muncul dari permukaan tanah berlumpur atau air serta tumbuh tegak lurus keatas. Akar napas berfungsi sebagai pintu masuknya udara.



Akar juga bisa menjadi tempat menyimpan cadangan makanan bagi tumbuhan seperti wortel. Tanaman wortel memiliki jenis akar tunggang. Tanaman ini menyimpan cadangan makanannya di dalam akar. Jadi jika kalian memakan wortel, sebenarnya kalian memakan akar lho!

Figure 5. Before



Figure 6. After

2. Suggestions from the linguist validator

The language used has words that are not quite right, such as the use of the word "I" in the preface, it should use the word "author".

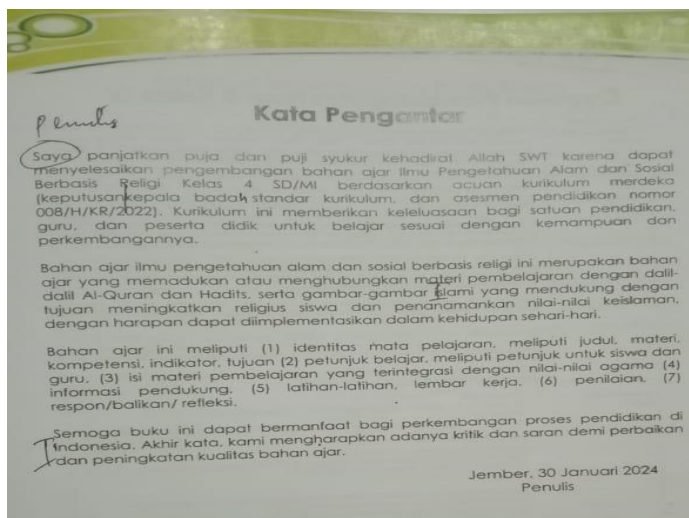


Figure 7. Before

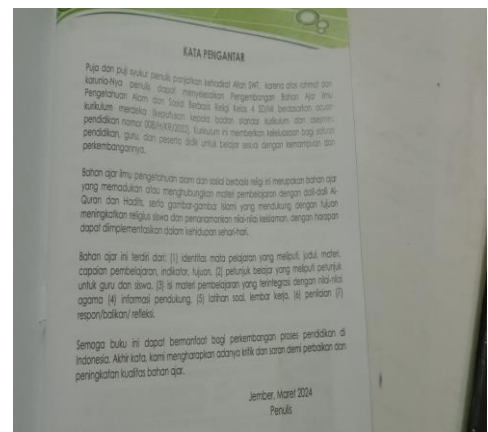


Figure 8. After

3. Suggestions from material expert validators

a. In learning 1, namely the parts of plants, the



c. Batang bahan muatan dipotong, batangnya baik keras dan berat. Tumbuhan dengan batang bahan umumnya pendek, baik sebagai pohon kayu. Contohnya: pohon pisang, bayam, kacang air, kangkung. Kegunaan batang adalah sebagai berikut:

- 1) Pengangkut air dan mineral dari akar ke daun, buah, dan bunga.
- 2) Pengangkut zat makanan dari daun ke akar.
- 3) Tempat tumbuhnya daun, bunga, dan buah.
- 4) Tempat menyimpan cadangan makanan (seperti pada kentang dan tebu).

**3. MENGENAL DAUN**

Sumber: <https://www.gurupendidikan.co.id/news/3457704/>

Daun merupakan bagian tumbuhan yang berbentuk lebaran dan tumbuh pada cabang-cabang batang. Bagian daun terdapat atas tangkai, helai daun, dan tulang daun. Helai daun umumnya berwarna hijau, tetapi ada juga yang baik berwarna hijau. Daun tumbuhan umumnya berwarna hijau karena di dalamnya terdapat zat warna hijau daun atau klorofil. Zat warna hijau daun ini yang menyebabkan daun dapat mengabsorpsi energi cahaya dan menghasilkan gula dalam proses fotosintesis. Jadi, tumbuhan yang mengandung zat hijau daun dapat membuat makanan sendiri.

Berdasarkan bentuknya tulang daun, dibagi menjadi empat, yaitu:

a. Tulang daun menyirip. Tulang daun menyirip biasanya dapat kita lihat pada tumbuhan-tumbuhan yang mempunyai biji dikotil (dicotyledoneae). Adapun tumbuhan biji dikotil, seperti daun mangga, daun jambu biji, dan rambutan, daun durian, daun melinjo, daun nangka, dan lain-lain.

Gambar 1.24 Tulang daun menyirip

Tulang daun menjadi bagian tulang daun yang mempunyai bentuk yang cukup besar. Sama seperti dengan namanya, maka tulang daun ini berbentuk seperti jari tangan yang ditentangkan atau dilebarkan. Tumbuhan-tumbuhan yang memiliki tulang daun menyirip, seperti daun singkong, daun pepaya, dan sejenisnya.

Gambar 1.25 Tulang daun menyirip

b. Tulang daun melengkung adalah tulang daun yang bila dikatakan memiliki beberapa tulang besar yang berada di tengah-tengah daun. Tulang besar tersebut akan membuka atau membuat jalur di tepian daun. Jika dilihat secara sekilas dengan mata kita, maka tulang daun ini membentuk garis lengkung atau ujung-ujungnya terlihat seperti menyatu. Contohnya pada tumbuhan daun waru, daun genjer, daun sirih, daun gadung, dan sejenisnya.

Gambar 1.26 Tulang daun melengkung

c. Tulang daun sejajar adalah tulang daun yang bentuknya lurus seperti paralel. Bentuk yang sejajar ini membuat bentuk daun terlihat seperti menyatu. Tulang-tulang daun sejajar bisa dikatakan bentuknya lurus, tetapi panjang.

Gambar 1.27 Tulang daun sejajar

Figure 10. After

b. In learning 2, namely photosynthesis material, there are pictures that are less clear

namun sama seperti semua makhluk hidup lainnya, tumbuhan juga memerlukan makanan. Caranya melalui proses fotosintesis. Yuk, kita pelajari proses ini bersama.

Bagaimana tumbuhan mendapatkan makanannya ?

**Fotosintesis**

Ketika lapar, maka kita akan pergi ke dapur, kamin, atau mesin di buatkan makan. Manusia dan hewan mendapatkan energi melalui makanan. Lalu bagaimana dengan tanaman?

Tanaman menggunakan energi cahaya dari matahari untuk memproduksi makanannya sendiri agar tetap bertahan hidup. Prosesnya dinamakan fotosintesis.

**Bahan:**

- energi cahaya
- Air
- Karbon dioksida
- Klorofil

**1. Energi Cahaya**  
Energi cahaya dari matahari diserap oleh daun.

**2. Klorofil**  
Pada daun terdapat klorofil sebagai zat warna hijau. Bahan ini yang menjadi katalisator untuk memulai proses fotosintesis. Klorofil berwarna hijau dan menyerap energi matahari.

**3. Air**  
Air yang dibutuhkan tumbuhan untuk melakukan fotosintesis diambil dari tanah melalui akar.

**4. Karbon Dioksida**  
Karbon dioksida yang dibutuhkan tumbuhan untuk melakukan fotosintesis diambil dari udara melalui stomata pada daun.

**5. Proses Fotosintesis**  
Berikutnya semua bahan tersebut akan diolah dalam proses fotosintesis. Proses ini dilakukan di bagian daun yang disebut kloroplas. Hasilnya adalah glukosa dan oksigen.

**6. Hasil Akhir**  
- Karbohidrat/makanan: Makanan yang dihasilkan di kloroplas akan dikirim ke seluruh bagian tumbuhan untuk bertahan hidup. Karbohidrat makanan ini disimpan dalam bentuk pati atau lemak.  
- Oksigen: Oksigen ini menggunakan gas oksigen yang digunakan oleh semua makhluk hidup. Gas ini dipakai oleh makhluk hidup untuk bernafas.

Cahaya matahari + Air + Karbon dioksida → Klorofil → Karbohidrat + Oksigen

Sumber: <https://www.ruangguru.com/blog/mengenal-fotosintesis>

Figure 11. Before

**2. Proses Fotosintesis**

Perhatikan proses fotosintesis pada tumbuhan berikut:

**1. Daun akan menangkap energi dari cahaya matahari melalui klorofil.**

**2. Air yang tersimpan di dalam daun dibawa oleh akar dan digunakan oleh batang menuju ke daun.**

**3. Gas karbondioksida di lingkungan sekitar tumbuhan akan diserap oleh daun melalui mulut daun.**

**4. Daun akan melakukan proses memasak makanan atau fotosintesis di bagian daun yang dinamakan kloroplas.**

Hasil fotosintesis setelah semua proses selesai tumbuhan akan menghasilkan karbohidrat dan gas oksigen.

Cahaya matahari + Air + Karbon dioksida → Klorofil → karbohidrat + oksigen

Dari alam dari tumbuhan

Gambar 2.3 proses fotosintesis  
Sumber: <https://www.ruangguru.com/blog/mengenal-fotosintesis>

Figure 12. After

c. In learning 3, the material on plant reproduction needs to be added and equipped with pictures.

sama seperti proses penyerbukan, tumbuhan pun membutuhkan bantuan untuk menyebarkan bijinya. Lalu, apa saja yang bisa membantu tumbuhan menyebarkan bijinya?

Ada beberapa cara tumbuhan menyebarkan biji yang penting diketahui.

- 1. Terbawa angin**  
Cara tumbuhan menyebarkan bijinya yang pertama ialah dengan dibawa oleh angin. Umumnya tumbuhan memiliki biji yang ringan sehingga mudah terbawa angin. Biji tersebut akan terbawa angin ke udara, sehingga benih akan semakin luas juga penyebarannya.
- 2. Terbawa air laut**  
Cara tumbuhan menyebarkan biji yang kedua adalah dengan memanfaatkan air laut seperti tanaman bakau atau mangrove. Tanaman bakau akan menjatuhkan biji ke air laut. Umumnya biji bakau sangat berat sehingga kuat di dalam air laut dengan jangka waktu yang lama. Ketika biji bakau terbawa air laut maka akan tersebar dan berkembang biak di seluruh pantai. Kids.
- 3. Dibuang atau dikubur oleh hewan**  
Cara tumbuhan menyebarkan bijinya yang ketiga yaitu dengan dibuang atau dikubur oleh hewan. Umumnya hewan akan mengambil buah untuk dimakan dan akan membuang bijinya ke tanah. Biji tersebut akan berkecambah dan tumbuh besar.
- 4. Terbawa oleh bulu binatang**  
Biji tumbuhan juga bisa tersebar dengan cara terbawa oleh bulu binatang. Sejumlah buah dan biji memiliki kait atau duri sehingga strukturnya sangat lengket dan membuat menempel pada bulu.

Figure 13. Before



Figure 14. After

From these revisions, the teaching materials developed are more perfect and ready to be used as teaching materials in learning activities in Madrasah Ibtidaiyah.

The results of the development are described into three including the specifications of religious-based IPAS teaching materials, the use of religious-based IPAS teaching materials, the attractiveness, effectiveness and validity of religious-based IPAS teaching materials on student learning outcomes.

1. Specifications of religious-based IPAS teaching materials on learning 1 plants as a source of life. In terms of the form of products that have been developed, namely in the form of printed media in the form of teaching materials. This teaching material was developed using the arguments of the Qur'an. This teaching material has objectives including to achieve the Learning Outcomes in the independent curriculum and as a means to strengthen faith in the power of Allah SWT. Through integration with the postulates of the Qur'an that are in accordance with the material in the teaching materials. The teaching materials are in the form of printed media which are arranged based on color, layout, writing provisions based on the National Education Standards Agency (BSNP). In the module there is a student activity sheet in the form of exercises that aim to learn the concept of material that has been studied.
2. The use of religious-based IPAS teaching materials has several stages including;
  - a. The teacher gives an overview of the lesson.
  - b. The teacher conveys the learning objectives to the students.
  - c. The teacher explains the teaching materials used in the next week's learning, namely thematic modules based on Islam.
  - d. Before starting to enter the material, the teacher and students read together about the descriptive teaching materials and instructions for using the module as an introduction to understanding the contents of the module in students.
  - e. Furthermore, the teacher guides students to read the Quran related to the material with the aim of increasing students' knowledge related to the power of Allah SWT.
  - f. Furthermore, students understand the content of the material in the module by reading alone, discussing, and with explanations from the teacher.
  - g. Next, students work on the summative.
  - h. Next, students summarize the results of the exercises performed.
  - i. The teacher and students reflect on the material with the help of the teacher by asking students to read the muntiaru words with the aim that students are always grateful for what Allah has given us.
  - j. Next, the teacher asks students to do the questions in the let's practice activity at the end of each discussion of material in the module with the aim of measuring the mastery of the material contained in the module.
3. Attractiveness, effectiveness and validity of Islamic-based theme modules on student learning outcomes. The attractiveness, effectiveness and validity will be presented in 8 data including (1) Design Validation, (2) Material Validation (3) Material expert validation, (4) Individual Trial (5) Small Group Trial (6) Field Trial (7) Pre-test and Post-test results, (8) Analysis of the Attractiveness and Effectiveness of thematic modules on learning outcomes
  - (1) Assessment of design validation results

The results of the design expert validation obtained a score of 75%, which means that religious-based IPAS teaching materials can be used with minor revisions.

(2) Assessment of Material validation results

The results of the material expert validation obtained a score of 80%, which means that the religious-based IPAS teaching materials can be used with minor revisions.

(3) Assessment of language validation results

The results of the validation of the fifth grade thematic learning practitioner expert who obtained a score of 80% which means that the religious-based IPAS teaching materials can be used with minor revisions.

(4) Assessment of individual trial results

The results of the individual trial obtained a score of 85%, which means that the IPAS teaching materials based on religious revision are small.

(5) Assessment of small group trial results

The results of the small group trial obtained a score of 88%, which means that the religious-based IPAS teaching materials were not revised.

(6) Assessment of the results of the field trial The results of the field trial obtained a score of 88% which means that the religious-based IPAS teaching materials are not revised.

(7) Assessment of Pre-test and Post-test results The results of the Pre-test and Post-test sequentially include 61.45 to 91.67.

(8) Analysis of the attractiveness, effectiveness and validity of religious-based IPAS teaching materials on learning outcomes.

a. Attractiveness, Attractiveness obtained through field trials obtained a fairly good percentage, where the percentage indirectly stated that the teaching materials were attractive to students. it can be proven that it is related to the results of the field trial which obtained 88%. Which means that the teaching material is very interesting.

b. Effectiveness, The effectiveness of a module can be seen from the results of pre and post tests. Where the average obtained at the beginning is 61.45 to 91.67, from this it can be seen that there is an increase in learning outcomes after treatment of teaching materials so it can be said that the module is effective.

c. Validity, The validity of the module is obtained through the assessment of each validation, including the validation of the material expert obtaining 80% of the validity assessment from the design expert obtaining 75% and the validity assessment from the learning expert obtaining 80%. From some of these things it can be said that the final product in the form of religious-based IPAS teaching materials is valid

## CONCLUSION

Based on the results of the product development carried out by researchers, it can be concluded. Products resulting from research and development using the ASSURE model which has five stages in its completion. The product is in the form of printed teaching materials. The teaching material is a combination of thematic learning and verses of the Koran and hadiths that are still related to Islam. according to the assessment, the module has been valid by obtaining results from material validation, namely 80%, while the design expert obtained 75%, while the language design expert 80%. In addition, the teaching materials are effective because there is an increase in scores from pretests and post tests. The pretest value obtained 61.45 while the post-test was 91.67 from these results it can be said that the module is effective. Meanwhile, from the aspect of attractiveness obtained from the field test, the results obtained were 88%, from these results it can be said that the teaching materials are valid, effective and interesting to use.

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