

DEVELOPMENT OF BIOMAGZ BASED ON INTEGRATION OF ISLAM AND SCIENCE AS TEACHING MATERIALS IN RESPIRATORY SYSTEM FOR CLASS XI MA/SMA

Bella Maya Triana¹⁾, Muhamad Jalil²⁾

¹Institut Agama Islam Negeri Kudus, Indonesia

bellamayatriana@gmail.com

ABSTRAK

Tujuan penelitian ini adalah untuk mengembangkan *Biomagz* berbasis integrasi islam dan sains sebagai bahan ajar pada materi sistem pernapasan kelas XI MIPA MA/SMA. Penelitian terdiri dari: 1) Bagaimana pengembangan *Biomagz* berbasis integrasi islam dan sains sebagai bahan ajar pada materi sistem pernapasan kelas XI MA/SMA. 2) Bagaimana respon terhadap *Biomagz* berbasis integrasi islam dan sains sebagai bahan ajar pada materi sistem pernapasan kelas XI MA/SMA. Jenis penelitian yang digunakan dalam penelitian ini adalah penelitian pengembangan dengan model 4D yang dimodifikasi menjadi tahapan 3D diantaranya yaitu: *define* (*pendefinisian*), *design* (*perancangan*), dan *develop* (*pengembangan*). Penelitian ini diuji cobakan di salah satu Sekolah menengah Atas di Kabupaten Kudus. Subyek dalam penelitian ini adalah guru mata pelajaran Biologi dan 27 peserta didik kelas XI MIPA 1. Data penelitian terdiri dari pengembangan, kelayakan, dan respon. Data proses pengembangan diambil dengan melakukan wawancara terhadap responden kemudian diidentifikasi. Sedangkan, kelayakan dan respon diambil dengan angket. Teknik analisis data secara deskriptif persentase. Hasil penelitian menunjukkan bahwa *Biomagz* berbasis integrasi islam dan sains yang dikembangkan berbantuan aplikasi Canva. *Biomagz* didalamnya memuat materi, gambar, evaluasi, dan informasi terkini dan menarik yang mampu mendorong peserta didik untuk meningkatkan minat belajar dan memahami materi pelajaran. *Biomagz* diuji cobakan kepada guru mata pelajaran Biologi dan peserta didik kelas XI MIPA. Hasil respon guru menunjukkan bahwa persentase skor sebesar 92,70% dengan kategori “Sangat Baik”. Sedangkan hasil penilaian respon peserta didik sebesar 92,76% termasuk ke dalam kategori “Sangat Baik”. Hal ini menunjukkan bahwa *Biomagz* berbasis integrasi islam dan sains sebagai bahan ajar pada materi sistem pernapasan kelas XI MIPA SMA/MA layak digunakan untuk proses pembelajaran.

Kata kunci: *Biomagz*, Integrasi Islam dan Sains, Bahan Ajar, Sistem Pernapasan

ABSTRACT

The purpose of this study was to develop Biomagz based on the integration of Islam and science as teaching material on the respiratory system material for class XI MIPA MA/SMA. The research consists of: 1) How is the development of Biomagz based on the integration of Islam and science as teaching material on respiratory system material for class XI MA/SMA. 2) How is the response to Biomagz based on the integration of Islam and science as teaching material on respiratory system material for class XI MA/SMA. The type of research used in

this research is development research with a 4D model modified into 3D stages including: define, design, and develop. This research was tried out in one of the senior high schools in Kudus Regency. The subjects in this study were Biology teachers and 27 students in class XI MIPA 1. The research data consisted of development, feasibility, and response. Development process data was taken by conducting interviews with respondents and then identified. Meanwhile, feasibility and responses were taken by questionnaire. Data analysis technique is descriptive percentage. The results of the research show that Biomagz is based on the integration of Islam and science which was developed with the help of the Canva application. Biomagz contains the latest and interesting materials, pictures, evaluations, and information that can encourage students to increase their interest in learning and understand the subject matter. Biomagz was tested on Biology subject teachers and class XI MIPA students. The results of the teacher's response showed that the percentage score was 92.70% in the "Very Good" category. While the results of the student response assessment were 92.76% included in the "Very Good" category. This shows that Biomagz based on the integration of Islam and science as a teaching material on respiratory system material for class XI MIPA SMA/MA is feasible to use for the learning process.

Keywords: *Biomagz, Integration of Islam and Science, Teaching Materials, Respiratory System*

INTRODUCTION

The learning process can run optimally, one of the factors that influence it is the existence of teaching materials in the form of teaching materials for educators and students. (Magdalena, 2020). Teaching materials are media that contain a set of materials arranged or designed according to the concept to be used in order to create a pleasant learning atmosphere in teaching and learning activities (Lestari, 2010). Teaching materials have a very important role in all subjects, one of which is Biology because many students think that Biology is a difficult category. In addition to the use of Latin and materials that are difficult to understand, the use of teaching materials in the learning process is one of the factors that affect students having difficulty understanding Biology subjects. Some of these difficulties affect the achievement, results, and learning motivation of students (Nisak, 2021).

Based on interviews with Biology subject teachers, it is known that the teaching materials used in Biology teaching and learning activities are in the form of worksheets and textbooks. There are several students' biology scores that are still below the KKM. The use of teaching materials when learning activities only contain or are based on knowledge, has not been synergized with Islamic values because teaching materials that integrate Islamic

values have not been obtained. In addition, there are problems, namely the reduced interest of students with handbooks that seem less attractive so that interest in reading the teaching materials in learning decreases. If students are not interested in the teaching materials provided, it will affect the learning process. Students feel that the material on the respiratory system is included in material that is difficult to understand. Comprehension in understanding the subject matter will be affected if students' interest in teaching materials is reduced because teaching materials are one of the supports in learning activities. Therefore, students need something that can encourage them to increase their interest in continuing to learn. One of them is the learning innovation in the form of Biomagz.

Biology Magazine (Biomagz) is one of the teaching materials that can be applied or used because it contains information and pictures so that it can encourage students' interest. Scientific magazines that are developing in society, for example health magazines, economics, science and technology, culture, and so on (Elsa Ferella, 2022). This prompted the creation of a Biology magazine (Biomagz) because this magazine was expected to be able to improve the quality of education.

In accordance with KI 1 and the objectives of the Biology learning curriculum, learning must be able to integrate Biology with Islamic values and science. Integration is a method used in combining two things that are contradictory or have the same nature. The truth in the Koran can be proven by scientific explanations in Biology. The dichotomy of knowledge does not need to be debated anymore, because many sciences (Biology) are contained in the hadiths or verses of the Qur'an so that they are related (Jalil, 2022). There are many descriptions of Islamic values in Biology, one of which is the material on the Respiratory System which is part of Biology. The Respiratory System is a series of organ tissues created to carry out the breathing process. Humans were created by Allah SWT as the best creatures and it is appropriate for us as humans to be grateful for all the creations of Allah SWT (Fenti Nurjanah, 2019).

Integrating Islamic values and science in the Biology learning process aims so that students are able to deepen the knowledge provided by educators not only about science but also Islamic values. Integrating religious values in learning is an effort to achieve educational goals and shape the character of students who are intelligent and have good morals (Permadi,

2018). Never before has anyone conducted research on Biology magazine (Biomagz), educators feel very much in agreement with the creation of teaching materials in the form of Biology magazines that this can be developed.

METHOD

This research is a research development or Research and Development (R&D) with a 4D model. The 4D model has 4 stages, namely define, design, develop, and disseminate. However, this research only reached the define, design, and develop stages. Product trials in this study were carried out in Class XI MIPA at a high school (SMA) in Kudus Regency with a total of 27 students. The product developed is Biomagz based on the integration of Islam and science as a teaching material on the respiratory system. This study aims to develop teaching materials in the form of Biomagz based on the integration of Islam and science on respiratory system material so that it can make it easier for teachers and participants in the learning process, able to encourage students to increase their interest in learning and understand the subject matter. The steps of the 3D research and development model are as follows:

1. Define

The stages aim to identify problems in the Biology learning process. Observation and needs analysis were carried out by giving questionnaires to find out the problems that occurred, until an analysis was carried out to develop teaching materials in the form of Biomagz.

2. Design (Design)

This stage has the goal of preparing materials by designing and developing products that will later be made. Several steps in the design stage include selecting the media, selecting the format, and making the initial design.

3. Develop (Development)

This stage has the goal of creating a product in the form of Biomagz which has been revised according to the suggestions of experts and can then be tested. Validation is carried out by researchers to get directions from the validator on the teaching materials that have been developed. In knowing the feasibility of the product that has been

developed before it is disseminated or carried out trials on students by asking for help from experts. Before distributing it to students, it is better if they have passed the validation stages, both material expert validators and media experts. After conducting revisions according to input and suggestions. Furthermore, a pilot test was carried out to find out the response of teachers and students. In analyzing the response of teachers and students to Biomagz in a descriptive form, percentages can use the formula below.

$$\% = \frac{\text{score obtained}}{\text{Maximum score}} \times 100\%$$

The results obtained from the practical aspect can be categorized as follows:

Table 1. Response Intervals for Biomagz

Achievement Level	Weight Score	Criteria
82% - 100%	4	Very Good
63% - 81%	3	Good
44% - 62%	2	Not Good
25% - 43%	1	Very Poor

(Rusimamto, 2020)

RESULTS AND DISCUSSION

The development of Biomagz based on the integration of Islam and science on the respiratory system material uses the 4D development model which has been modified into 3 stages, namely the define, design and develop stages. This define stage is carried out to obtain an overview of the problems in the Biology learning process. Observation and needs analysis were carried out by giving questionnaires to find out the problems that occurred. Based on the results of the analysis of problems in the Biology learning process at one of the High Schools (SMA) in Kudus, researchers felt interested in developing and producing teaching materials that could be adapted to needs. The researcher chose to develop a product, namely Biomagz based on the integration of Islam and science as a teaching material on the respiratory system material, which is a teaching material which contains material to be

studied, especially the respiratory system and combined with Islamic values. Based on the analysis of students' needs for Biology teaching materials, it can be concluded that there is no Biology teaching material based on the integration of Islam and science. So that students need teaching materials that synergize with Islamic values. This encourages researchers to develop in the hope of being able to support the learning process so that it is interesting and students' understanding can increase.

The define is carried out by observing the initial conditions or problems in the learning process, the characteristics of students, and the school (Hanifah Hanifah, 2020). Based on the define stage, the results obtained require the existence of Biomagz based on the integration of Islam and science as teaching material on respiratory system material with several problems that occur, such as the handbook that is owned is only given by the school, increases understanding of the material, and there are no teaching materials in schools Biology integrated with Islamic values.

At the design begins with the selection of media. The selection of this media chose to develop a product, namely Biomagz based on the integration of Islam and science as a teaching material on respiratory system material because students have a handbook which only contains material descriptions so it is boring and less interesting. Teaching materials that are liked by students contain pictures and colors so that they are more attractive and students can easily understand them. This is in accordance with research by Gregorian Trijulensius which states that biology magazine is one of the teaching materials that contains some of the latest pictures and information so that students are able to understand the material and feel happy when studying Biology (Gregorian Trijulensius, 2021). Biomagz is designed by the Canva application, A4 (29.7 x 21 cm) which the researchers chose for the paper size. Art paper, a type of paper that complies with Biomagz. Next is the selection of formats, namely preface, table of contents, instructions for use, core competencies, basic competencies, learning indicators, highlights, lets learn, bio info, brain teasers, apply, bibliography, and author biography. After selecting the next format is to make an initial design, the purpose of this initial design is to find out the initial design of the product. Meanwhile, the development stage is carried out by compiling Biomagz according to the design. The Biomagz design can be seen in Figure 1.

Figure 1. The Biomagz Design



In the development stage, validation was carried out by experts including material experts and media experts. This validation aims to determine the feasibility and quality of Biomagz based on the integration of Islam and science as a teaching material on respiratory system material before being tested or disseminated to schools. After validating the expert validators, improvements were made in accordance with input and suggestions for the products that had been developed. After revising Biomagz, it can then be tested. This trial was conducted on class students. The aim is to find out students' responses to Biomagz based on the integration of Islam and science as teaching materials on respiratory system material. This stage is to obtain opinions from respondents about the Biomagz that has been developed. The analysis of the calculation of the results of the teacher's response can be seen in Table 2.

Table 2. Teacher's Response to Biomagz Based on the Integration of Islam and Science as Teaching Material on Respiratory System Material

No	Aspect	No Item	Score Per Item
1	Presentation	1	4
2		2	3
3		3	4
4		4	3
5		5	4
6		6	4
7		7	4

8		8	4
9		9	4
10	Ease of Use	10	3
11		11	4
12		12	4
13		13	4
14		14	4
15	Legability	15	3
16		16	4
17		17	4
18		18	3
19		19	3
20	Time	20	3
21	Integration of Islam and Science	21	4
22		22	4
23		23	4
24		24	4
Amount			89
Max Score			96
Percentage of Score Value			92,70%
Criteria			Very worth it

Based on table 2, the teacher's assessment of Biomagz based on the integration of Islam and science as a teaching material on respiratory system material is carried out to determine whether the products that have been developed are practical or appropriate for use in the learning process. assessing the teacher's response to Biomagz based on the integration of Islam and science as a teaching material on the respiratory system material seen from each aspect obtained a result with a total of 89 and a maximum score of 96. The percentage score obtained was 92.70% so it was concluded that Biomagz was categorized as very good and suitable for use, Biomagz is designed according to the needs and criteria that exist in schools with the aim that teaching materials can improve and have quality.

The results show that the teacher's response to the product that has been developed in terms of several aspects, namely presentation, ease of use, readability, time, and the integration of Islam and science is included in the very good category.

The results of the proportions of several aspects show various results. First, the presentation aspect is included in the very good category. Second, the aspect of ease of use is included in the very good category. Third, the readability aspect is included in the very good category. Fourth, the time aspect is included in the very good category. Fifth, the aspect of integration of Islam and science into the very good category. Based on the results of the data and getting responses from the teacher that Biomagz is based on the integration of Islam and science on the respiratory system material is very interesting because the reading tends to be concise but contains complete material, encouraging students to tend to be curious, Biomagz which contains pictures and some attractive colors so that encourage students to be more interested in teaching materials, and good for development. The results of responses from students can be seen in table 3.

Table 3. Student Responses to Biomagz Based on the Integration of Islam and Science as Teaching Materials on Respiratory System Material

No	Aspect	No Item	Score Per Item
1	Appearance	1	95
2		2	103
3		3	97
4		4	102
5		5	101
6		6	104
7		7	102
8		8	98
9		9	101
10		10	104
11	Material	11	100
12		12	102
13		13	97
14		14	99
15		15	99
16		16	101
17		17	96
18		18	98
19		19	99
20		20	100
21	Benefit	21	102
22		22	100

23	23	98	
24	24	105	
25	25	96	
26	26	100	
27	Integration of Islam and Science	27	99
28	28	101	
29	29	98	
30	30	104	
31	31	101	
32	32	104	
Amount		3206	
Max Score		3456	
Percentage of Score Value		92,76%	
Criteria		Very good	

Based on table 3, the trial was carried out to find out the responses or responses of students to Biomagz based on the integration of Islam and science as teaching material on respiratory system material involving 27 students in class XI MIPA 1. Student responses were obtained from each aspect getting results with a total score of 3206 and the maximum score is 3456. It is 92.76 and the percentage score is 92.76% on average obtained based on student responses. The results in this study, in terms of students' responses, found that Biomagz based on the integration of Islam and science as teaching materials on respiratory system material was seen as very well categorized.

The responses or responses of students were reviewed from several aspects, namely the appearance aspect, the content or material aspect, the benefits aspect, and the integration aspect of Islam and science. First, the display aspect belongs to the very good responses given. Second, the content or material aspect is included in the very good category. Third, the benefit aspect is included in the very good category. Fourth, the aspect of integration of Islam and science is included in the very good category. Based on the results of student response data, it can be concluded that Biomagz based on the integration of Islam and science as a teaching material on respiratory system material is very well used in the learning process.

Based on research conducted by researchers, the result is a product in the form of Biomagz based on the integration of Islam and science on respiratory system material which has gone through several revisions, finally the product that has been developed gets responses and responses from teachers and students with very good criteria for use teaching and learning activities, facilitating teachers and students, media to obtain information, and assisting teachers in conveying material as well as making it easier for students to understand the material.

CONCLUSIONS

Research and development produces a product, namely Biomagz based on the integration of Islam and science as a teaching material on the respiratory system. The stages of this research using 3D models include the stages of define, design, and develop. The trial was carried out to find out the response or response of the teacher and students. The results of the recapitulation of the teacher's response to Biomagz showed the percentage of scores as many as using 27 students. The results of the teacher's response data show that the percentage of the teacher's response score is 92.70%. This shows that the teacher's response is very practical to use in teaching and learning activities. While the results of the student response assessment were 92.76% and included in the very practical category. Biomagz based on the integration of Islam and science is very suitable for use in the learning process because it can make it easier for teachers and students in teaching and learning activities.

REFERENCES

- Elsa Ferella, T. T. (2022). Kelayakan Majalah Biologi Sebagai Media Pembelajaran Submateri Interaksi Dalam Ekosistem Kelas X SMA/MA. *EduNaturalia: Jurnal Biologi Dan Kependidikan Biologi* , 1.
- Fenti Nurjanah, R. T. (2019). Pengembangan Bahan Ajar Tematik Terintegrasi Nilai-Nilai Islam Dan Sains Untuk Meningkatkan Karakter Religius Siswa. *Jurnal Ilmiah Pendidikan Dasar*, 178-180.
- Gregorian Trijulensius, M. T. (2021). Pengembangan Biomagz Sebagai Sumber Belajar Biologi Siswa SMA. *Biology Teaching and Learning*.

- Hanifah Hanifah, T. A. (2020). Pengembangan Media Ajar E-Booklet Materi Plantae Untuk Meningkatkan Hasil Belajar Biologi Siswa. *Journal Of Biology Education Research (JBER)* , 10-16.
- Jalil, M. (2022). Development of Basic Biology Textbook Based Integration of Science and Islam. *Journal Of Biology Education*, 47.
- Lestari, K. A. (2010). Pengembangan Bahan Ajar Perkembangan Anak Usia SD Sebagai Sarana Belajar Mandiri Mahasiswa. *Jurnal Perspektif Ilmu Pendidikan*, 183-193.
- Magdalena, I. (2020). Analisis Bahan Ajar. *Jurnal Pendidikan dan Ilmu Sosial*, 311.
- Nisak, N. Z. (2021). Analisis Kebutuhan Bahan Ajar Biologi Untuk Siswa SMA Ditinjau Dari Tingkat Kesulitan Materi, Keterampilan Berpikir Tingkat Tinggi, Dan Keaktifan Belajar Siswa. *EduBiologia: Biological Science and Education* , 128.
- Permadi, e. A. (2018). Pengembangan Modul IPA Berbasis Integrasi Islam Dan Sains Untuk Meningkatkan Hasil Belajar Siswa Kelas VI MIN 2 Mojokerto. *Nazhruna: Jurnal Pendidikan Islam*.
- Rusimamto, R. S. (2020). Validitas dan Kepraktisan Modul Pembelajaran Human Machine Interface pada Mata Pelajaran Instansi Motor Listrik di SMK Negeri 3 Jombang. 399.
- Sugiyono. (2012). *Metode Penelitian Pendidikan : Pendekatan Kuantitatif, Kualitatif, Dan R&D*. Bandung : Alfabeta.