Development of a Plastic Waste Management Guideline Book at the Baitul Hikmah Islamic Boarding School, Tempurejo, Jember

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ABSTRACT

This research is motivated by the lack of media in managing plastic waste at the Baitul Hikmah Islamic Boarding School. So far, in handling plastic waste, only folding the waste has been implemented and is only valid for a few months. This research was conducted to overcome plastic waste in the Islamic Boarding School's Surrounding. The subject of assessment in this guideline book media is for validators of material experts and media experts as well as student responses questionnaires. The type of research used is research and development which refers to the 4-D model which consists of 4 stages, namely: Define, Design, Develop and Disseminate. The results of the consultation are used to improve before being validated by expert's media and material. Based on the test results from the expert validator's material, it can be concluded that this media obtained a value of 91.66% with a feasible category, and the test results from the expert validator's media obtained a value of 87.5% with a feasible category. Then continued to the last stage, namely the distribution of the guidebook, by conducting a response test to students and administrators of the cleaning section with an overall value of 100% with a category of strongly agree. As well as the socialization of the guidebook and duplicated as many as 10 books to members of Bersih Lingkungan (BERLIN) and administrators of Ikatan Santti Baitul Hikmah (ISBAH) for the cleaning section. Based on this description, it can be concluded that this guidebook media is very feasible to be used as a learning medium in handling waste at the Baitul Hikmah Islamic Boarding School, especially plastic waste.

Key word: Guideline book, Development, Waste management

I. INTRODUCTION

Indonesia contributes to the problem of waste accumulation, even Indonesia is in the top 10 countries in the world with the most waste accumulation. Waste is a substance or object produced from human activities, which requires serious handling because it can have a negative impact on the lives of living things such as ecological damage, the spread of disease, causes flooding, an unpleasant-smelling environment, and can damage the beauty of the area (Rachmat, 2021).

Waste is divided into 2 types, namely organic and non-organic waste. Organic waste examples include vegetables, meat, fish, rice, grass, leaves, and twigs. Non-organic waste examples include glass, plastic, plastic bags, cans, Styrofoam and metal. Waste management can be done by 3R, namely, reduce is an

attitude expected from the community not to use plastic bags as food wrappers or purchased goods, reuse is an effort to utilize waste to reuse such as using mineral water bottles by refilling water to drink, recycle is recycling items that can be recycled, for example processing paper waste or plastic waste into crafts. One of the place that experiences garbage accumulation and gets difficulties in waste management, especially plastic waste, is in the Islamic boarding school institution (Rachmat, 2021).

Islamic boarding schools are educational institutions that have strong foundation in Indonesian Muslim Society. In its journey, Islamic boarding schools have been able to maintain and preserve their sustainability, and have a multi-aspect education model. Islamic boarding schools are places that have a unique life system (Usman, 2013). As an institution that has the unique life system, Islamic boarding schools have a different life pattern from the life pattern of society in general. It can be seen from its external appearance, the physical symbol of the Islamic boarding school consisting of a mosque, a boarding house or dormitory, and a kiai's residence, shows a distinctive life pattern as a religious community consisting of students with the kiai as its main leader (Setiawan, A. R., & Velasufah, 2019).

The amount of plastic waste at the Baitul Hikmah Islamic Boarding School is increasing every year because many students consume food that use plastic packaging. Plastic waste is waste that is not easily decomposed even though it has been buried for a long time in the soil. So one of the methods used is to burn it, but burning waste is not an effective way to reduce plastic waste because the results of burning waste can cause air pollution for the surroundings. The results of article the observations that have been carried out, that the waste problem at the Baitul Hikmah Islamic Boarding School has not been fully resolved, and the lack of understanding and awareness of article the students about the importance of the waste management. In addition, the lack of media in waste management, especially plastic waste.

II. RESEARCH METHOD

The research and development model of the plastic waste management guideline book used in this research and development refers to the 4-D model which consists of 4 stages, namely the Define, Design, Develop and Disseminate stages. The reason for choosing the 4-D model is because the development stages are divided in detail and systematically so that they are carried out properly in their implementation. The samples in this study were female students at the Baitul Hikmah Islamic Boarding School, Tempurejo, Jember in the 2022/2023 academic year. The sample was carried out on female sanitation administrators with a total of 4 female students and members of BERLIN with a total of 16 female students. The total is 20 female students.

Data collection in this study consists of 1) Observations conducted by conducting observations at the Baitul Hikmah Islamic Boarding School to find

out about waste problems, especially plastic waste in the boarding school, 2) Interviews with the cleaning department administrators and BERLIN members to find out about plastic waste in the Baitul Hikmah Islamic Boarding School, 3) Questionnaires conducted by collecting data for the feasibility validation analysis activities from material experts and media experts who will be tested by UIJ Lecturers, namely Mrs. Dr. Siti Roudlotul Hikamah, M.Kes., for the validation analysis of the experts' material, namely Mrs. Haning Hasbiyati, S.Pd., M.Si for the validation analysis of media experts and student response questionnaires.

The instruments in this study interviews to the cleaning staff, the experts media and material validation sheets, and student response questionnaire sheets. The data analysis method in this study consisted of 1) Analysis of the needs of the media guideline book for students who have the criteria listed in the Table 1:

Table 1. Scoring of Analysis of Media Needs for Guideline Books for Students

Pertanyaan	
Jawaban	**Nilai**
Perlu	1
Tidak Perlu	0

Table 2. Interpretation of Student Response Questionnaire Scores

Skor Presentasi	Interprestasi
51% - 100%	Perlu
0% - 50%	Tidak Perlu

Table 3. Scoring of Media Experts and Material Experts

Jawaban	Skor
Layak	2
Tidak Layak	1

Table 4. Categories of Assessment and Interpretation of Book Suitability by Media Experts and Material Experts

Kategori	Interpretasi	Skor (%)
Layak	Ahli media dan ahli materi menyatakan buku layak digunakan sebagai panduan dalam pengelolaan sampah plastik.	< 50%
Tidak Layak	Ahli media dan ahli materi menyatakan buku tidak layak digunakan sebagai panduan dalam pengelolaan sampah plastik.	51 – 100%

Table 5. Scoring of Student Response Questionnaire

Pertanyaan	
Jawaban	**Nilai**
Sangat Setuju	1
Setuju	1
Kurang Setuju	0
Tidak Setuju	0

Table 6. Interpretation of Student Response Questionnaire Scores

Skor Presentasi	Interprestasi
76% - 100%	Sangat Setuju
51% - 75%	Setuju
26% - 50%	Kurang Setuju
1% - 25%	Tidak Setuju

Source: adapted from (Uus Rusmawan, 2019)

III. RESULT AND DISCUSSION
A. Definition Stage

Based on the results of interviews at the Baitul Hikmah Tempurejo Islamic Boarding School, students at the Baitul Hikmah Islamic Boarding School is very lacking in understanding about waste and lack of awareness of students in waste management, especially plastic waste and really need a guideline book media. The use of this media is considered to be able to help students in dealing with plastic waste in the Islamic Boarding School environment because students are not allowed to use cellular phone or other electronics connected to the internet. Based on the results of interviews with the cleaning department administrators and BERLIN members, it shows that students really need a guidebook media in dealing with waste, especially plastic waste. The

percentage value of the student needs test can be seen in the Table 7.

Table 7. Percentage Value of Student Needs Test

Pertanyaan	Nilai rata-rata	Kriteria
Apakah di Pondok Pesantren Baitul Hikmah perlu dibuatkan Buku Panduan dalam pengelolaan sampah plastik?	100%	Perlu
Total	100%	Perlu

B. Design Stage

This design stage begins with the researcher making a design in compiling the guidebook based on the references obtained. This stage consists of determining the theme, determining the basic idea, making mind mapping, making a framework of thought, providing data and references, describing each chapter, and the process of writing the guideline book.

C. Development Stage

This stage is the development stage, namely producing a plastic waste management guidebook. This guidebook was developed in consultation with the DPU and DPA, the results of the consultation and revisions were carried out to improve the learning media for the guidebook that had been prepared. The results of the consultation were carried out to complement the shortcomings of this media so that a plastic waste management guidebook could be produced, then a validation test would be carried out which was ready to be tested for its validity and practicality. Based on the results of the consultation with the DPU, DPA, media validator, and material validator, there were several revisions, namely: front cover, the content of material, and article the text background.

D. Results of Material Expert Validation Test

The media that has been consulted by DPU and DPA is then tested for validation by material experts. The results can be seen in the Table 8.

Table 8. Material Expert Validation Values

No.	Aspek	Nilai rata-rata	Kriteria
1.	Fungsi dan Manfaat Buku Panduan	91,66%	Layak
	Total	91,66%	Layak

Based on the results of the expert validation test conducted by the validator, the results of 1 aspect were found where the function and benefits aspect of the guideline book obtained a percentage value of 91.66% with feasible criteria, thus indicating the category of feasible to be used as a learning media. Comments on the content of the material from the experts validity on the plastic waste management guideline book are by adding citations from the references listed and the citations are written in the theory of Chapters I - IV.

Table 9. Comments and Suggestions by Material Expert Validators

Bagian materi yang direvisi	Komentar dan Saran Validator	Hasil Revisi
Isi Materi	Perlu memasukkan sitasi dari referensi yang tercantum, dan sitasi dituliskan pada teori Bab I – IV.	Sudah direvisi dengan menambahkan sitasi pada isi materi tiap Bab-nya.

E. Media Expert Validation Test Results

The guideline book that has been approved by DPU and DPA, in addition to being tested for material validation, is also tested for media validation. The results of the media expert validation can be seen in the Table 10.

Table 10. Media Expert Validation Test Values

No.	Aspek	Nilai rata-rata	Kriteria
1.	Tampilan Buku Panduan	75%	Layak
2.	Kepraktisan Buku Panduan	12,5%	Tidak layak
	Total	87,5%	Layak

Based on the Table 10, the

validation results by the media expert validator obtained a percentage of 75% in the aspect of the appearance of the guidebook with the criteria of being feasible and a percentage of 12.5% in the aspect of the practicality of the guidebook with the criteria of being unfeasible, from both aspects a percentage value of 87.5% was obtained, indicating that the guidebook media is feasible to be used as a learning medium.

As for the comments and suggestions from the media expert validator on the text background in each chapter, that the background is not smooth enough so that it interferes with the reading text. Therefore, the validator's suggestion for the text background is better removed or smoothed so as not to interfere with the reading text. The results of the revision from the media expert validation is in the Table 11.

Table 11. Comments and Suggestions by Media Expert Validators

Bagian materi yang direvisi	Komentar dan Saran Validator	Hasil Revisi
Background Teks	Background teks lebih baik dihilangkan atau diperhalus agar tidak mengganggu teks bacaan.	Sudah direvisi dengan memperhalus background teksnya sehingga materinya bias terbaca dengan jelas.

F. Student Response Test Results

This stage was conducted to determine the students' responses in the practicality test conducted by 20 students, consisting of 4 students from the cleaning committee and 16 students from BERLIN members. Based on the calculation of the results of the student response questionnaire to the guidebook media, the overall value or average value was 100% with the criteria of strongly agreeing.

G. Deployment Stage

This stage is the final stage, namely the dissemination of the guideline book which is carried out to promote the product development results so that they can be accepted by users either individually, in groups, or in systems. At this stage there are 3 main stages in the dissemination stage, namely Product Socialization by distributing books to the cleaning section administrators and BERLIN members.

In the validation testing stage, the revised product in the development stage is then applied to the actual students or targets and the measurement of the achievement of the objectives is carried out to determine the effectiveness of the product developed by the researcher using a student response questionnaire. In the packaging and diffusion and adoption stages, product packaging is carried out by printing 10 guideline books, the implementation of which is then distributed to 20 students consisting of 4 students who are administrators of the cleaning section and 16 students who are members of BERLIN so that they can be understood and used both individually and in groups.

This research refers to the 4-D model, the development of this guidebook media is carried out in stages to produce a product that is feasible and good for use in handling plastic waste. In its implementation, it consists of 4 stages, namely: the define, design, develop, and disseminate.

The initial stage of development was carried out by observing and analyzing the needs of students through interviews by giving several questions to the cleaning department administrators

and BERLIN members at the Baitul Hikmah Islamic Boarding School. The results of the observations and interviews conducted by researchers found several problems that were found, namely the difficulty in handling waste which is increasing day by day, especially plastic waste, the lack of understanding of students about waste and awareness of students in handling plastic waste.

The researcher developed this guidebook produced from the documentation of the research site and supported by sources from journals, articles and theses. The book that was developed also has advantages, namely some of its own documentation such as several photos taken by the researcher at the research site so that students do not get bored in studying the book. This is also stated in the study that to overcome boredom and saturation of students, teachers should use image media so that students can be more motivated and not bored in participating in learning (Almeida, 2016). Before the validation test of the material, media validation, analysis of student needs, and analysis of student responses.

This guideline book was developed and consulted with the DPU and DPA to find out what shortcomings there are in this media. The results of the revision or evaluation from the DPU and DPA are used to improve it so that it is better and more appropriate and ready to be used in the next stage. Also stated that whatever type of learning media is developed, be it simple or sophisticated learning media, it needs to be evaluated. This means that whatever type of learning media is created

or developed, whether audio, video, multi-media, or image media, it needs to be evaluated first before being widely used. Evaluation is an effort made to ensure that the learning media being developed is guaranteed to be of good quality (Warsita, 2019).

The media that has been developed will be validated by the material validator and the media expert validator. The validation test stage is carried out before the research stage at the Islamic Boarding School. The validation stage is carried out to determine the validity of the guidebook media. The results of the material expert validator obtained showed that this guideline book media received a value of 91.66% with a feasible criterion. So it can be concluded that this media is suitable for use as a learning medium for students. Researcher also stated that the developed guidebook media is suitable to be a learning medium, and according to learning media is divided into several types, namely: visual media, audio media and audio visual media (Tina, 2020; Ummah, 2022). In addition, there is an inadequate assessment from the material expert validator, including: 1) There is an explanation of plastic waste management, 2) Clarity of instructions for using the manual. Comments and suggestions from the material validator include improvements in the content of the material, namely the need to include citations from the references listed and citations are written in the theory of Chapters I - IV. Citation can be defined as an intellectual reference to published or unpublished sources by citing existing books, authors or publications to support a fact (Zainul,

2019). Citation is an important element in writing a scientific paper (Nurhayati, Yopy Ratna Dewanti, Herry Syafrial, 2023) in addition to appreciating the scientific work of others, citation also has the following purposes: 1). Conveying to the reader where the sources of sentences, ideas and facts contained in the scientific work are, 2). Not all references are in accordance with the desired research idea, it is possible that the research carried out is a better idea, by conducting citations it provides a comparison of the research ideas expressed with research ideas that have been carried out previously, 3). Research ideas will be strong by conducting citations, 4). Citations provide an overview of the quality of scientific work produced, relevant and recent sources show the quality and ideas of research (Sari, M., Sudiar, N., & H, 2022).

In addition to being tested by expert material validators, the media guideline book was also tested by expert media validators. The results of the expert media validator obtained a value of 87.5% with a feasible criteria. From this value, it can be concluded that the media guideline book is feasible for use in Islamic boarding schools and for students to study both in general and independently. Stated that books have advantages in learning media, namely: 1) Books actively help the learning process in general and independently, 2) Books are easier to carry and produce, 3) Books can cover a wider field of knowledge and can follow the development of science, 4) Books increase understanding and reasoning so that readers can think and review in ways that are not possible with time-bound programs (Supriyo, 2015).

Comments and suggestions from the media validator include improvements in the text background section, namely by removing the text background or smoothing it so that it does not interfere with the reading text. And there are unworthy assessments including in the assessment; 1) The appearance of the guidebook, namely: a) The placement of images that interfere with the text, b) The design and layout of the writing on the cover, and 2) The practicality of the guideline book, namely a) Practical and easy to use anytime and anywhere.

After the validation of the material and media and has been revised by the researcher and the media, the guideline book was declared suitable for use by the material and media validator. Then the next thing to do is the practicality test of the students' responses. The results of the practicality test of the students' responses obtained an overall score of 100% with a category of strongly agree. This value was obtained based on the score on the student questionnaire sheet. Then the book was distributed as many as 10 books and given free of charge to 20 students including, 4 administrators of ISBAH for cleanliness and 16 members of BERLIN, and the researcher also received several comments from several students including: the guideline book is very good, not boring because there are several pictures in the book and the students gave very good responses such as "happy smiles" when they got the guideline book. And got a question from one of the students about making the book, which the book was made by the researcher himself, and the students also gave comments such as "very

good, Ustadzah".

In addition to being disseminated, researchers collaborate with the cleaning department administrators by providing work programs, including: 1) Routine tasks, namely sorting organic and inorganic waste and providing organic and inorganic waste bins, 2) Non-routine tasks, namely making crafts from inorganic waste and can be seen in attachment 10. So it can be concluded that the media is suitable for use as a guidebook in dealing with inorganic waste, especially plastic waste at the Baitul Hikmah Islamic Boarding School.

The use of this mixed book media is very easy to use for learning and is equipped with various pictures and languages that is easy to understand.

IV. CONCLUSION

From the results of this study, the media expert validation percentage was 87.5% with the category of being suitable for use as a guidebook media in plastic waste management and the material expert validation was 91.66% with the category of being suitable for use as a learning media.

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