

## Illustrated Book Design as Waste Education for Children Aged 7-9 Years in Semarang City

Zahra Luthfi Karunia Afanin<sup>1</sup> and Sayid Mataram<sup>2</sup>

<sup>1,2</sup> Visual Communication Design, Faculty of Art and Design, Sebelas Maret University, Jl. Ir Sutami No.36A, Jebres, Kota Surakarta, Jawa Tengah, 57126, Indonesia

<sup>1</sup>E-mail: [zahraluthfi@student.uns.ac.id](mailto:zahraluthfi@student.uns.ac.id)

### Abstract

Garbage problems are common in Indonesia. The amount of waste disposed of in landfills is increasing every year. The waste problem is caused by a lack of public awareness regarding waste management. Therefore, it is necessary to educate the public to increase awareness of the environment. Education about environmental care given early on can prevent bad things that might happen in the future. The problem in this research is how to educate children to increase awareness of the environment using the educational media of illustrated books. This descriptive qualitative research refers to the ADDIE research model to create illustrated book media as an educational solution to waste problems. With educational media illustrated books that have been designed, children can understand the types of waste and get an education about waste. Waste that is disposed of is properly and correctly segregated for each type. Illustrated books have proven effective as educational media for children aged 7-9 years as evidenced by the ease with which children understand the types and sorting of waste.

**Keywords:** *Education, Waste Management, Children, Illustrated Books*

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## INTRODUCTION

The increase in amount of waste continues to increase along with population growth and technological developments (Ningsih, 2017). Household activities produce a variety of waste, namely in the form of organic, inorganic, and B3 waste (hazardous and toxic materials) which generally people still dispose of this waste mixed in, even though waste that is disposed of without management has the potential to cause adverse impacts on the environment and human health (Agustina et al., 2020). Disposal of waste that is carried out carelessly by mixing all types of waste will cause an increase in the residue of waste that is wasted in landfills increasing. The government continues to make waste management efforts using the 3R concept, namely reduce which means reducing waste or not allowing excessive piles of waste, reuse which means reusing waste that can be used, and recycle or recycle waste to be reused after experiencing a processing process (Sekarsari & Trianti, 2020).

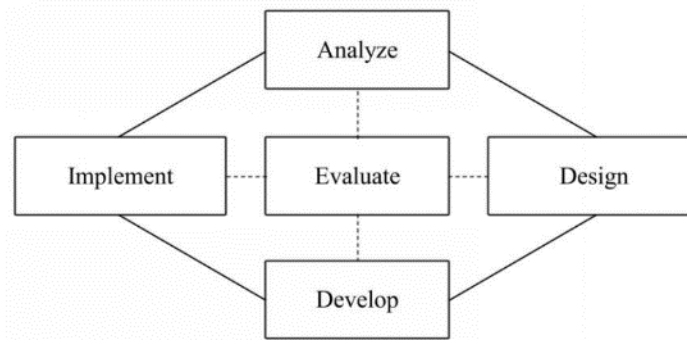
Limited campaign and education programs on waste as a means of awareness, active involvement of the community and the private sector in waste management, and lack of public awareness in handling waste properly and correctly from the source in the 3R (reduce, reuse, recycle) waste management system (Ernawati et al., 2012). The public needs to be educated about the importance of keeping the environment clean, starting from the simplest example is for not littering (Darmawan, 2020). Community education regarding complex environmental problems due to waste generation is needed to form public awareness (Asteria & Heruman, 2016).

Children should receive waste education as early as possible so they care more about the environment (Putra, 2016). Knowledge about the differences between organic and inorganic waste is important to teach children (Pranungsari et al., 2019). Providing education to children about waste sorting has great potential in reducing accumulated waste. This can be an opportunity to change the environment to be cleaner and healthier. Books are one of the best learning resources for children (Utami et al., 2018). Storybook media has the advantage of having a good storyline and attractive colors, this certainly allows most children to understand the information conveyed easily (Luawo & Maulidya, 2019). Illustrated book is a medium for conveying messages that have written and graphic components that reinforce the message you want to convey (Ardiansyah & Mataram, 2021).

Much research has been done on waste education for children, but there are still few studies targeting children aged 7-9 years. This study hopes that children aged 7-9 years can sort waste properly based on its type, namely inorganic, organic, and B3 (hazardous and toxic materials) as a form of effort to reduce waste residue wasted in landfills. Educational media in the form of illustrated books is one of the most effective media in educating children about waste. Based on this background, illustrated books are the right choice as a medium for children to learn and understand the 3R (reduce, reuse, recycle) waste so that they can play a role in keeping the surrounding environment clean and healthy while reducing the residual waste that is generated. polluting the environment.

## METHODS

The qualitative descriptive research method concerning the ADDIE model is used because it is suitable for research related to the design of educational media. One of the designs for the development of instructional material that is often used is the ADDIE Model through 5 stages; Analysis, Design, Development, Implementation and Evaluation, this is a learning system design model that shows the basic stages of a learning system that is easy to do (Mataram, et.al., 2022; Cahyadi, 2019).



**Chart 1.** ADDIE Model  
 (Source : Tegeh & Kirna, 2013 dalam Kurnia et al., n.d., 519)

In designing an illustrated book, several stages are carried out. Limiting the age of children 7-9 years as the target audience for illustration books. Then determine the location of the research, which includes the area of Semarang City, Central Java Province which has a problem of increasing waste. Based on the ADDIE method the authors carried out the following research steps:

a. Analysis

After the problem of waste, location, and age restrictions for children is found, the analysis stage is carried out by collecting data through:

1. Interviews

Researchers conducted interviews with several sources including teachers and parents of students. This is done to find out the knowledge and behavior of childrens about waste.

2. Observation

At this stage an analysis of environmental cleanliness is carried out. This stage is carried out by observing the level of environmental cleanliness. In addition, it also observes the waste that has been disposed of in the trash in the observed environment to find out whether the sorting has been carried out properly.

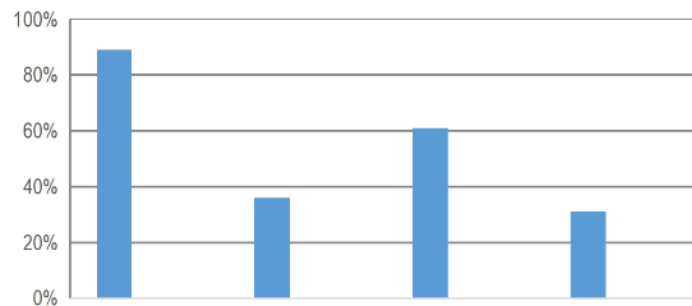
3. Questionnaires

At this stage the authors conducted an understanding test by giving questionnaires to the children to find out whether they were able to sort waste properly. The author also observes children's behavior towards the garbage around them.

Researchers surveyed by distributing questionnaires offline to respondents to find out and get facts about children's knowledge of waste. The target respondents for this research questionnaire were children who were still at the basic education level, especially those aged 7-9 years. This age range was chosen because according to Professor of Psychology at the University of California, Ross A. Thompson (2020), there are normal variations in many areas of learning for children so it is difficult to conclude that if children experience learning difficulties, then children experience growth and development problems, but in reality, children who can read at the age of 4 years do not necessarily have better intellectual abilities than children who can only read at the age of 6 years. Besides that, they can also read simple books by themselves. At this age, children start to be able to count single-digit numbers, for example, 1 + 1, and 4 - 1.

**Table 1.** Children's Knowledge of Garbage

Pengetahuan Anak mengenai Sampah	Presentase	Anak
Pengertian Sampah	89%	115
Sampah B3	39%	50
Sampah Organik dan Anorganik	61%	79
Prinsip 3R ( <i>reduce, reuse, recycle</i> )	36%	46



Based on data from a questionnaire that was filled out by 129 children ranging in age from 6 to 11 years, it was found that 65% of respondents had received education about waste sorting. As many as 89% of the total respondents understand the meaning of waste. As many as 61% know organic and inorganic waste. However, only 36% of respondents know the 3R principles in minimizing waste that is disposed of. From the data obtained, it was also found that only 39% of children knew about the types of B3 waste (hazardous and toxic materials).

#### 4. Literature Review

Observing various waste sorting educational media in the city of Semarang. This is done by the author to compare and strengthen the narrative design that will be made so that it is more easily understood by the target audience, namely children aged 7-9 years.

##### b. Design

Activities at the design or planning stage consist of:

##### 1. Pre Production

This stage includes the design of concepts, scripts, storyboards, and sketches.

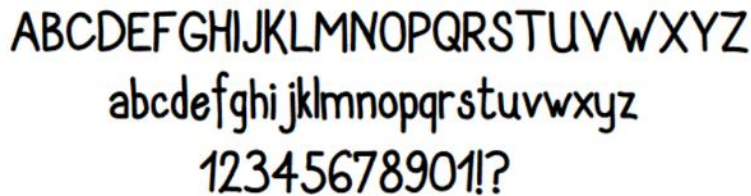


**Picture 3.** Children's Drawing Style Preferences  
(Source : d.furaffinity.net)

This “Tikus Satu Malam” illustration book uses visual standards that have been determined based on the results of a questionnaire survey regarding children's preferences for the style of drawing they like. This is done to maximize the effectiveness of the designed educational media. As many as 68% of respondents chose images using linear. It can be concluded that the style of drawing chosen by most children is an image using contrasting colors and line art.



Picture 4. Font Antelope H (100% free)  
 (Source : Dafont.com)

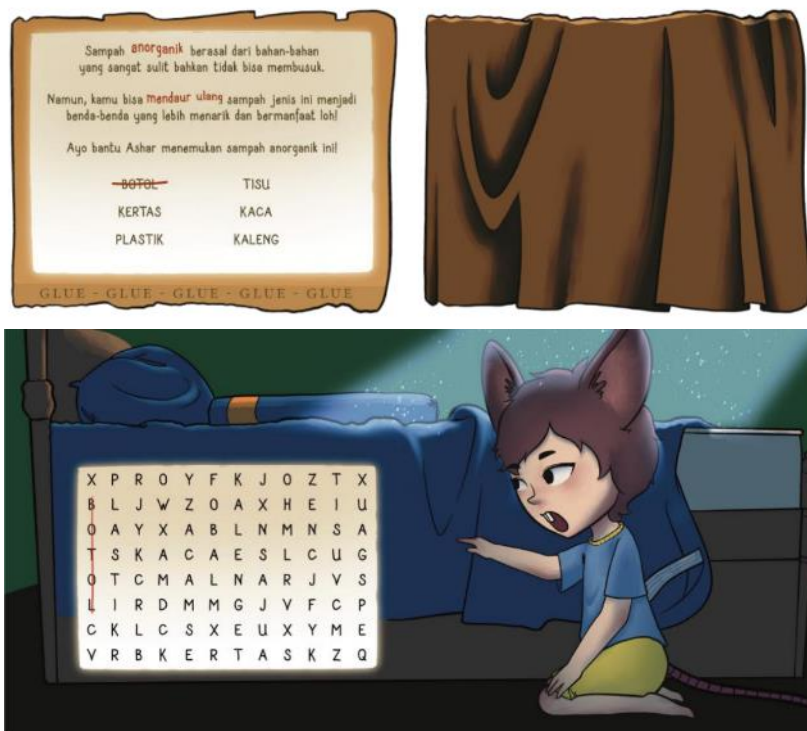


Picture 5. Font Sanlabello (100% free)  
 (Source : Dafont.com)

The typography chosen for the design of the illustration book "Tikus Satu Malam" is the Sanlabello font for the contents of the book, while the title on the cover of the book uses the Antelope H font. The Sanlabello font was chosen as the main font in the book because it has a simple shape and can be easily read. Meanwhile, the Antelope H font was chosen for the book title text because it has a unique shape and is thicker, and has a playful impression, making it suitable for use on illustrated book covers for children.

2. Production

This stage includes the process of making illustrations as the main component of educational media.



Picture 5. Flap Part Design and Illustration of The "Tikus Satu Malam" Book

### c. Develop

The development stage includes:

#### 1. Post-production

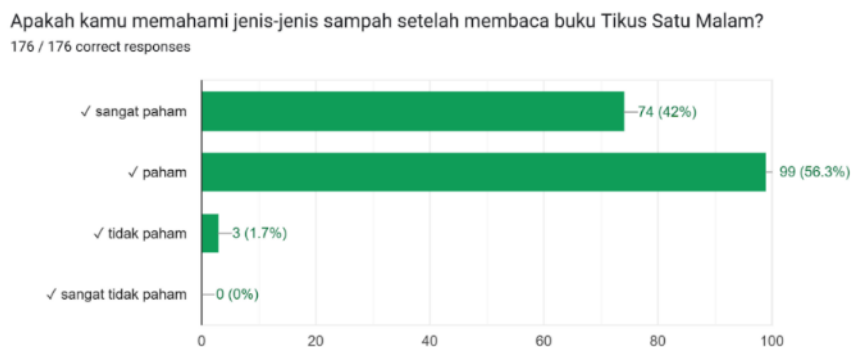
The post-production stage is the stage where the book that has been designed and finished as a whole is tested on the target audience. The target audience is children aged 7-9 years old. At this stage the author makes a video reading aloud of the book "Tikus Satu Malam" which can be listened to and watched by the target audience.

### d. Implementation

The researcher conducted an online beta test using the video read-aloud of the book "Tikus Satu Malam" which had been compiled and animated according to the actual book. After the target audience watches the video, they will fill out the beta test questionnaire that has been provided. The results of the questionnaire will be evidence of whether or not the objectives of the research conducted are achieved.

### e. Evaluate

At the evaluation stage, a re-test was carried out regarding the understanding of waste sorting to children who had read illustration books. The researcher conducted an online beta test using the video read-aloud of the book "Tikus Satu Malam" which had been compiled and animated according to the actual book. This is done to get facts about children's understanding of waste after knowing the contents of the book "Tikus Satu Malam". The intended target respondents are children in the age range of 7 to 9 years in Semarang City. The results of the beta test that has been carried out are as follows:



**Picture 2.** Beta Test Result of The "Tikus Satu Malam" Book

From the results of the beta test, it was found that 42% of respondents understood the types of waste, 56.3% understood and only 1.7% did not understand the types of waste that must be sorted after reading the educational media book "Tikus Satu Malam".

## RESULT AND DISCUSSION

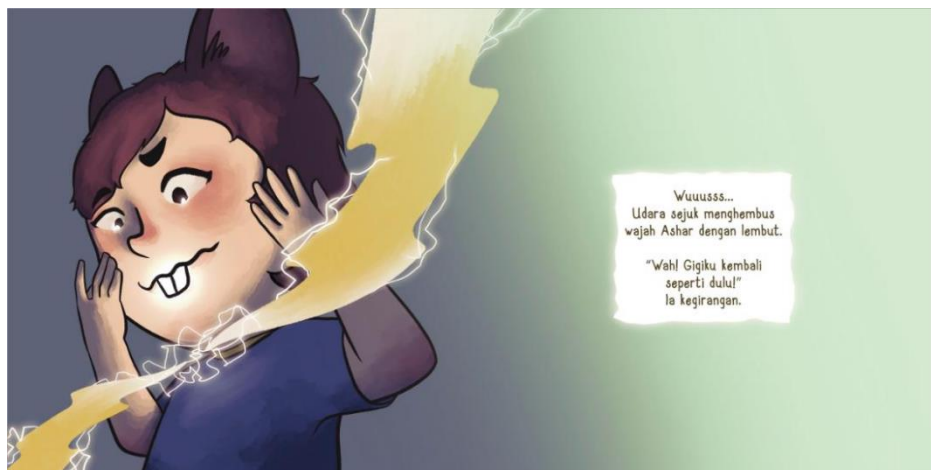
The design of an illustrated book as an educational medium for waste sorting for children aged 7-9 years in the city of Semarang entitled "Tikus Satu Malam" aims to provide knowledge about the importance of caring for the environment. With this book, learning about the types of waste, disposing of waste in its place, and sorting waste will be more fun for children so that they can remember and carry out these activities in their daily lives.

The first process carried out in this design is to search for the required data. Data search was carried out by distributing questionnaires, conducting interviews with several informants, observing the research environment, and also conducting a literature review. A questionnaire containing 30 short questions was given to 129 children from three elementary schools in Mijen District, Semarang City. Interviews were conducted with various sources including teachers and parents of students. Observations in elementary schools were carried out to find out the actual environmental conditions, especially those related to waste sorting. Researchers also conducted a literature review to obtain more reliable information as research supporting data.

In the next stage, the author designed educational media about waste starting from writing story scripts, and making storyboards, and also sketches. Then proceed with making the necessary illustrations for the content and cover of the book based on the sketches and storyboards that have been made to the finishing process such as doing the layout of the text and images on the book before it is printed. The beta test for this educational media was also carried out by giving a questionnaire to the target audience which was carried out to test the feasibility of the designed waste learning media.



Picture 6. The “Tikus Satu Malam” Book Cover





Picture 7. Sample of The “Tikus Satu Malam” Book Illustration



Picture 8. Sample of Challenge in “Tikus Satu Malam” Book

The results of the design of the illustration book "Tikus Satu Malam" uses a pictorial style concerning children's preferences. Clear line art and contrasting colors are preferred by children compared to images without line art. Shadows and lighting in a highlighted illustration can create the impression of contrasting colors and make an illustration more vibrant.

The beta test results on children who completed the questionnaire earlier revealed an increase in children's understanding of the importance of waste sorting. With the beta test carried out in this study, data was generated showing that children as the audience for this study could distinguish organic, inorganic, and B3 (hazardous and toxic materials) waste. They also understand which types of waste are the easiest to decompose and which are the most difficult to decompose. In addition, they understand that the B3 waste is dangerous if disposed of directly into the environment. They agree that waste must be sorted before being disposed of so that it can be easily recycled. The most important thing is that children understand that disposing of trash according to its type is something that must be used to it.



## CONCLUSION

Illustrated books as educational media for children aged 7-9 years are designed to increase awareness of the environment. In designing the illustrated book, appropriate concepts and strategies are needed by taking into account the characteristics of the intended target audience. Before designing, research, and data analysis are carried out to get to know the characters of the target audience, so that the message from the designed illustrated book can be conveyed properly and can have a positive impact on children, the environment, and society so that a younger generation is more concerned with the environment.

Providing education to children with an age range of 7-9 years regarding waste knowledge through the media of illustrated books can increase children's awareness of cleanliness in their surrounding environment as evidenced by the results of the beta test which showed the children agreed that after reading the book "Rat One Night" they throw trash in the appropriate bins and remind their friends when littering or not in the right place. From the beta test, it was found that the children were able to understand the types of organic, inorganic, and B3 waste (hazardous and toxic materials) after reading educational media illustrated books.

Children as the next generation of the nation deserve education about waste because it has various urgencies, including reducing the potential for additional residual waste in the future. This will spur increased environmental cleanliness. Providing education to children can be done by using educational media in the form of illustrated books because children like learning media that has attractive visuals.

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