

# Sustainable Animation Production: Alternative Material Exploration in Puppet and Set Making for Environmental Stop Motion Animation

Dominika A. Purwaningsih<sup>1,\*</sup> Bharoto Yekti<sup>2</sup>

<sup>1</sup> Universitas Multimedia Nusantara

<sup>2</sup> Universitas Multimedia Nusantara

\*Corresponding author. Email: dominika@umn.ac.id

## ABSTRACT

Traditional stop motion animation along with its distinctive visual uniqueness has a lot of enthusiasts but the number of stop motion filmmakers are pale in comparison. It is understandable because compared to other animation techniques that are done digitally, stop motion seems impractical due to the fact that it requires more time, higher production cost, a lot more tools and materials. This paper discusses explorations and utilization of alternative materials for already known conventional materials in the making of puppet and set of stop motion animation using used items, inorganic household waste, and other reusable materials while still considering the function and aesthetic, thereby contributing to waste recycling. This is in line with the theme of the film which raises the issue of environmental pollution, in which the results of this research are applied. This qualitative research is project-based and uses literature study, observation, and experiment method to collect data.

**Keywords:** *Stop motion animation, Alternative materials, Recycling, Puppet, Set.*

## 1. INTRODUCTION

Nowadays we are familiar with the issue of environmental pollution. As severe as the impacts on land, in the oceans the impacts have been felt both for the survival of marine life and for ourselves. Research shows that each year around 12.7 million tons of waste enter the sea [1]. There have been many efforts to reduce waste entering the sea through material recycling in various industrial sectors such as fashion, handicrafts, construction, and so on, but it seems that the effort is still minimal in the animation industry. This inspires author to make a short animated film that raised the issue of environmental pollution both through the story and the production process.

Animation was chosen as the medium of delivery because apart from being able to be done in a small team, this media also has unlimited possibilities to convey messages in an unusual story and visual approach. Especially when talking about marine debris or sea pollution, the most appropriate technique for conveying messages is through animation techniques that involve physical materials as well, namely stop motion animation. This can be applied in the use of material for

puppets and sets in the animated film (stop motion). Alternative materials to be explored will take advantage of unused items (used goods), waste, and other reusable items (inorganic) while still paying attention to aesthetics and functions.

All this time, the production of stop motion animation is less desirable than other animation techniques which are done completely digitally because it seems impractical and requires more costs, materials, and tools. Through the research of exploring alternative materials for stop motion animation production, this stigma can be pushed aside. Therefore, author decided to discuss the exploration of alternative materials in making puppets and sets for environmental-themed stop motion animation short film.

## 2. LITERATURE REVIEW

### 2.1. Prior Research

The research that becomes the author's reference in conducting this research is a scientific paper written by

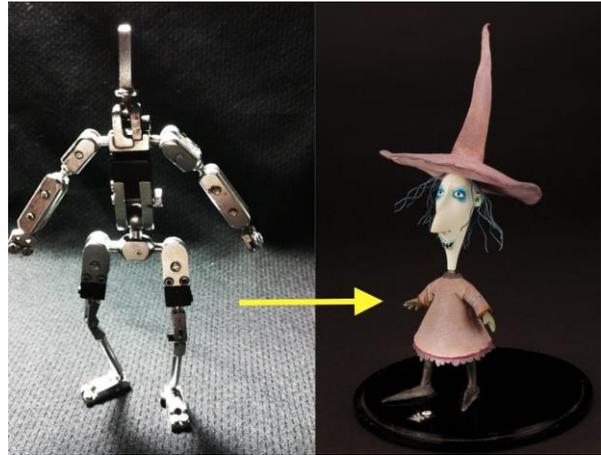
Ece Gure from Izmir University of Economics titled "Alternative Materials for Stop-Motion Animation". In this paper, the author briefly describes the process of making stop motion animation and conventional materials commonly used by filmmakers [2]. Then he mentioned some of the materials used were not sustainable and suggested the use of materials that were more environmentally friendly. Another reason is that stop motion animation is a good educational tool because it has a complete and systematic process for making films. The direction of Gure's paper is to suggest the use of slow-motion as a medium for education on sustainability. Slow-motion itself is a simplified version of the stop motion that we know because it uses materials that are easy to find and a lower frame rate.

### 2.2. Stop Motion Animation

Stop motion is an animation technique in which objects are physically manipulated and photographed image by image so that they appear to be moving by themselves when the photo is sequenced at a certain speed [3]. Stop motion itself is divided into several types based on the main material used. For example, Claymation is a term for stop motion that uses clay (plasticine / wax). The type of stop motion that is most commonly known to the public and has penetrated the international market is puppet stop motion which uses puppets and miniatures as sets because it has more complex mechanism so that it can convey more compelling stories and visuals.

### 2.3. Puppet

A puppet is a doll that has a movable frame which is commonly referred to as an armature [4]. Puppet in a stop motion animation film acts as an actor who drives the story. Even though puppet has a variety of shapes and materials, puppet will not be able to replicate the movements of live action film actors or the visual perfection of animated movie characters using CGI. However, puppets can still convey emotions and stories with simple physical materials such as cloth, wire, wood and so on. This is the charm of puppets in stop motion animation.



**Figure 1** Armature of the puppet of a witch character in the film "The Nightmare Before Christmas" (Tim Burton, 1993). (<https://www.ikitmovie.com/wp-content/uploads/2018/09/Witch-from-Nightmare-before-Christmas-Puppet-Sotp-Motion-1024x788.jpg>)

### 2.4. Set

Set is a world where the characters live. Set must be designed in such a way that it is not just a setting for the film but must consider the composition in the camera frame and how the set affects the characters. Particularly in stop motion animation, the set not only has to be designed according to the concept and stage of the scene but must also take into account the animator's access when animating the puppet [5].



**Figure 2** One of the sets in the animated film "Kubo & The Two Strings" (Laika, 2016). (<https://arc-anglerfish-washpost-prod-washpost.s3.amazonaws.com/public/WPH7PEVQTA4ZRBLN3OMCV32NBI.jpg>)

## 3. RESEARCH METHOD

This is a project-based research which uses qualitative methods. One of the basic characteristics of qualitative research is the use of multiple sources of data, in which researcher collects multiple forms of data such as interviews, observations, documents, and audiovisual information to be reviewed, comprehended, and organized into categories which traverse all data sources

[6]. In this research, the data collections are in the form of literature studies, observational studies, and experiments. Literature studies are carried out by collecting articles on stop motion animation (specifically puppet stop motion) in the form of books, journals, and articles found online. Observational studies were carried out by observing stop motion animated films and behind the scene videos regarding the manufacturing process to find out what materials were used conventionally to make puppets and sets. After obtaining these data, author will conduct experiments by exploring what materials can be used as alternatives. This process can be carried out after the preproduction stage of the film has been completed so that research can be limited to objects that are relevant. Overall, the stages of this research are:

1. Research preparation

The preparatory stage begins by examining the background by looking at the problems and phenomena that exist through news articles, then conducting a literature study on similar research that has been carried out.

2. Preproduction Stage

This research applies the results in a short animated film work, so the preproduction stage of the film is very important as a foundation. This stage includes making story ideas, scripts, storyboards, character designs, and set designs.

3. Data Collection

At this stage, based on the character and set designs that have been made, author collects references from existing stop motion animated films and behind-the-scene videos, as well as articles that discuss puppet making and stop motion sets.

4. Research Implementation

This stage is carried out by exploring and experimenting with alternative materials from materials that are no longer used, waste, and other reusable items.

5. Data Analysis

The findings from this exploration are then used to create puppets and animated film sets. Conventional materials are compared with alternative materials and then analyzed.

6. Testing and Evaluation of Results

This stage is done by testing puppets and sets made by utilizing these alternative materials in animation (production stage of stop motion animation). The test results are evaluated by looking at their strengths and weaknesses. Success indicators are achieved by the ability of these alternative materials to function as puppets and stop motion animated film sets optimally.

**4. PROCESS**

By the time this paper is written, stage 5 and 6 are still on progress. The puppets and sets are still work in progress. This chapter will focus on explaining the preproduction stage and research implementation.

1. Story

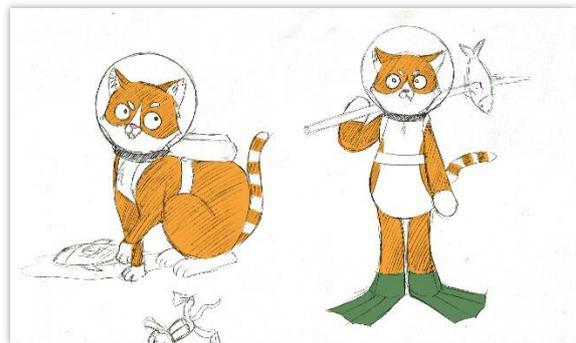
The film tells a story about a cat who dives into the sea to find fish for lunch. Due to the polluted water, the cat several times mistaken fish with trash. After a while the cat finally catches the fish. When boarding his fishing boat, unexpectedly he is mugged by a shark wearing a helmet filled with water who's already waiting on the boat. But the victory was not on anyone's side because the contested fish was full of trash.

2. Character Design

There are only 2 characters in this film which are the cat and the shark. Cat's armature will use conventional material while shark's armature will use materials from used item for comparison. The design for shark character is still a work-in-progress.



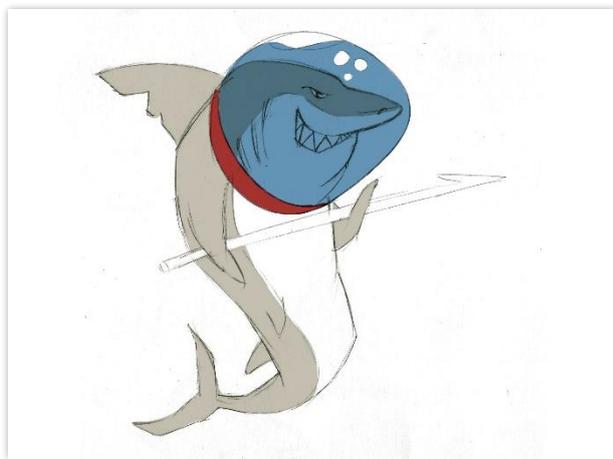
**Figure 3** Reference for Cat's puppet (Bo & To's Family, Comma Studio, 2018)



**Figure 4** Character design for "Scuba Cat" by author



**Figure 5** Reference for Shark Character  
(<https://i1.wp.com/www.thegulfindiains.com/wp-content/uploads/2020/10/Shark.jpg?fit=800%2C400&ssl=1>)



**Figure 6** Character Design for “Sharkuza” by author

3. Set Design

The film takes place in two sets. The first one is underwater and the second one is on a fishing boat. Here are the references for the sets along with the sketches for the concept. The concept for the underwater set is a polluted ocean where there are trash everywhere and the water is not clear. In the final design, marine debris and trash will be added.



**Figure 7** Photo reference for polluted ocean (earthmag.org)



**Figure 8** References for Underwater set  
([https://www.hdwallpapers.in/trine\\_underwater\\_scene-wallpapers.html](https://www.hdwallpapers.in/trine_underwater_scene-wallpapers.html))  
(<https://www.behance.net/gallery/24903073/Game-art-for-MURKA>)



**Figure 9** Sketches for Underwater Set Concept by Team Member



**Figure 10** Reference for fishing boat set  
(<https://www.iied.org/three-things-i-learnt-small-scale-fisherman-albania>)



**Figure 11** Sketch of Fishing Boat Set Concept by Team Member

4. Research Implementation

As explained in the previous chapter, in this stage author started to collect potential materials that can be used to make puppets and set for the film which are used items, inorganic household waste, and other reusable materials. These materials will be sorted according to their characteristics.



**Figure 12** Some of the household inorganic waste collected by author to be used in the research

5. Data Analysis

Puppets and sets are build according to the character and set design using the materials collected in the previous stage.



**Figure 13** Initial Sketch and Armature Progress for Scuba Cat by Team Member

Scuba Cat puppet is made using conventional materials for stop motion puppet, while Sharkuza is made using alternative materials. By doing so although it's not ideal, the effectiveness of each materials can be tested in the animation process.



**Figure 14** Process of Underwater Set made from styrofoam and cardboards from packagings



**Figure 15** Process of Fishing Boat Set made from used cotton buds, chopsticks, and cardboards from packagings

## 5. CONCLUSION

At this stage, it can be concluded that without us realizing it, we produce large amount of waste every day and more than half of it is very difficult to decompose. It's easy not to be aware because we are used to throw away every garbage. This research helps to develop a mindset to be mindful of every waste before throwing it away and rethink the potential. Although it's true that the more waste materials we collect, the more possibilities they hold, we have to choose carefully and avoid hoarding waste. That's why in making stop motion puppets and sets using alternative materials, it's important to have a clear design to help determine what kind of waste to be kept and which one to let go.

Using alternative materials from inorganic waste and used items may significantly lower the cost of production in stop motion animation but there are some materials that can't be obtained from alternative materials such as paint, glue, and green screen backdrop.

This method of using alternative materials for stop motion production is applicable in small-scale production only because there are rooms for improvisations in the design and flexibility of time and pipeline.

## REFERENCES

- [1] S. Mambra, How is plastic totally ruining the oceans in the worst way possible? Marine Insight, 2020, <https://www.marineinsight.com/environment/how-is-plastic-ruining-the-ocean/>
- [2] E. Gure, Alternative Materials for Stop-motion Animation, n.d., Retrieved 7th February 2020 from: [https://www.academia.edu/9969425/Alternative\\_Materials\\_for\\_Stop-Motion\\_Animation](https://www.academia.edu/9969425/Alternative_Materials_for_Stop-Motion_Animation)
- [3] R. Harryhausen, T. Dalton, A Century of Stop-motion Animation: from Melies to Aardman, Watson-Guption Publications, 2008.
- [4] B. Purves, Basic Animation 04: Stop-motion, Ava Publishing, 2010.
- [5] B. Purves, Stop motion: Passion, process, and performance, Focal Press, 2008.
- [6] J.W. Creswell, Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th Edition, Sage Publications, Inc, 2014.