Infographic as a campaign for reducing the use of plastic packaging and cutlery in Surakarta

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Abstract. The Environment Agency of Surakarta City noted that the volume of waste in 2021 reached 92,436 tons. Plastic waste accounts for 13.39 percent of the total waste generated in Surakarta City. This threatens nature sustainability and bears negative impacts on human health. Using infographic media, the Visual Communication Design Department of Universitas Sebelas Maret held a campaign about the danger of using plastic packaging and cutlery as an effort to save the environment in Surakarta. Research and Development approach using ADDIE model was used in developing the media. The creation of infographics was carried out in five steps of analysis, design, development, implementation, and evaluation. After being disseminated, positive attention and response were received through social media from the younger generation. The results also encourage the emergence of community-based movements engaged in environmental conservation programs.

1. Introduction

An increase in population in the society will lead to an increase in basic needs. Based on the hierarchy of needs proposed by Abraham Maslow, physiological needs are the lower level needs that must be met or a priority before other needs. Physiological needs are the needs to maintain physical condition to survive, which makes it a basic need of every person [1]. Clothing, food, and shelter are included in physiological needs. Among the three basic needs, food or the need to eat and drink is one of the most important basic needs. Everyone eats and drinks to fulfill the energy intake needed for survival. Activities in producing food and beverages will never stop, because people constantly need to fulfill their daily energy intake. These activities also bear consequence on the waste problem from the food and beverage production and distribution process.

In line with the development of technology, food and beverage production activities are also evolving. Food and beverage production that used to be done traditionally is now done in a more modern and creative way. Food production using modern cooking equipment is carried out for its practicality and efficiency. The use of modern cooking utensils can increase production, improve quality, and extend shelf life. In addition, creative packaging presentation with various designs can increase consumer’s interest in food products.

Food production development does not only occur in how food is produced and packaged, but also in how it is distributed. Due to the short shelf life, food product distribution was not going well in the
past. It was impossible for food with short shelf life to be distributed over long distances. Today, this problem can be overcome with the development of distribution technology. Food packaging technology plays an important role in this regard. With more modern food packaging, food can survive longer distribution process to the consumers.

Plastic cutlery and packaging are the most commonly used means for food sales and distribution today. Plastic cutlery and food packaging can be found on the daily basis of people’s life. With the never-ending food production activities, the production of plastic cutlery and packaging does not stop either. As the population continues to grow, the demand for food and beverages also increases. This also bears impact on the increase in the production of plastic cutlery and food packaging. Consequently, the amount of plastic waste will also increase.

According to brand audit activities in 2016-2019, Greenpeace posted an article on greenpeace.com entitled "Food and Beverage Packaging Waste Dominates." The audit found that the highest contribution in branded waste category came from the waste of fast-moving consumer goods (FMCG) companies. Most of the waste contributors are brands from the food and beverage industry. Furthermore, food and beverage industry is a category that continues to grow every year, in line with the increasing population and people's purchasing power [2].

According to data from Surakarta City Environment Agency, the total volume of waste in Surakarta in 2013 was 92,436 tons. In other words, the average amount of waste produced daily is 253 tons [3]. According to the Regional Public Works Agency’s data published on the Central Java Provincial Statistics Agency website, plastic waste ranks second as the largest waste contributor. Plastic waste accounts for 13.39 percent of the total waste generated in Surakarta city [4].

The large amount of plastic waste bears impact on people’s life and the environment. Plastic waste in large quantities can threaten the preservation of nature and bear negative impact on human health [5]. Plastic-based materials are hard to decompose, thus the generated waste keeps increasing. These negative impacts are exacerbated by the lack of management, processing, and concern on the use of plastic, especially the use of disposable plastic cutlery and food packaging. Therefore, a campaign aimed at food industry and its consumers regarding the use of plastic cutlery and packaging is urgent [6, 7]. This can be done by making publications about the negative impacts of plastic waste from disposable plastic cutlery and food packaging. An infographics is a visually structured publication aimed at providing information that are effective and visually attractive. Infographics about the use of environmentally friendly cutlery and food packaging can be a means of campaign and education for the community. This might influence the public to participate in reducing the amount of plastic waste from disposable cutlery and food packaging.

Based on the description above, publication materials using infographic media is essential to build public awareness on the dangers of plastic waste. This research took the title “Infographic as a campaign for reducing the use of plastic packaging and cutlery in Surakarta region”. The problems formulated in this research are: (1) how to design the development of infographics using the ADDIE model? And, (2) can infographics be used as a means of campaign and generate a positive response from the audience? To solve these two problems, this study was carried out using research and development method with ADDIE model. The validation of the infographic was done through social media to gain responses from the audience.

2. Methods
The ADDIE (Analysis-Design-Development-Implementation-Evaluation) model is a design learning model that is generic in nature [8–10]. This model uses 5 stages of development (Figure 1), namely:

- Analysis
- Design
- Development
- Implementation
- Evaluation
The steps in developing a product, research, or model above is rational and complete. Therefore, this model can be used for various forms of product development, one of which is to develop a design of infographic as an educational material.

![ADDIE Model](image)

**Figure 1.** ADDIE model.

3. **Results and discussion**

Based on the stages in the ADDIE model, the steps on each stage of the infographic media are presented as follow:

3.1. **Analysis**

At this stage, the main activity was analysing the needed materials and information to develop the infographic. The analysis began with identification of problems caused by plastic cutlery and packaging waste and its impact on the environment. The next analysis was about the presentation. One problem that often occurs in publication media design is unattractive presentation due to poor selection of colours, fonts, layouts and other elements. Infographics has many elements that can be used to deliver messages such as illustrations, typography, vertical display orientation, and etc. An Infographic does not always have to include all of those elements. It can be as simple as a traffic sign showing a picture of a person holding a shovel to notify road users about construction activity ahead, or, it can also be as complex as a detailed visual analysis of the global economy [11].

The analysis is a stage of exploring problems, the audience characteristics, and the media being developed. Therefore, to determine what to present, several activities was carried out such as:

- Conducting needs analysis to determine what visual components to be applied and selecting effective media placement according to the target audience characteristics. It was done to deliver the message effectively to the audiences.
- Conducting performance analysis to determine and clarify whether the problems at hand require a solution in the form of infographics disseminated on social media.

The output produced was data in the form of audience characteristics based on their food and beverage consumption patterns. The problem analysis resulted in basic concepts in the design of the infographic media.

3.2. **Design**

From the analysis results, the strength of the design, which is a unique selling proposition, was identified. This is what makes the infographic design attractive and different. The infographic design of eco-friendly cutlery and packaging was made based on the consumer data. Although it is displayed in a simple and contemporary format, it conveys a lot of messages. The message being conveyed is mainly the environmental topic regarding eco-friendly cutlery and packaging. Such design is expected to serve as a simple, contemporary, and easy to understand material for the audience.
Positioning is a strategy to present a placement of a product, company brand, or individual to the target audience [12]. In this case, the design created is a campaign media for the use of environmentally friendly cutlery and packaging. The targeted audience is the general public aged 17-30 years, especially those who live in Surakarta City. The particular targets are individuals who buy takeaways of food and beverage products on the daily basis. The positioning of the visual and written elements was determined by considering the design theme, target audience, and the data from the analysis. This was done to make the infographic easy to understand and attractive to the audience [13–15].

In this design stage, the visual concept was positioned according to the verbal and nonverbal strategies (graphic components). The two components cannot be separated because they work as a unit in the design. The following is an explanation of the two strategies.

3.2.1. Verbal strategy

a. **Headline.** The headline used in this infographic was adjusted to the creative concept that had been determined. Headlines occupy the first position of attention, the first verbal element to be noticed and read by the audience. In this design, the selected headline was “Protect Your Food, Protect Your Earth”.

b. **Tagline.** The tagline in this design was formulated to promote the main message and make it easy to remember. A tagline should also provide an overview of the general message [16]. In this case, the tagline given was "Live a healthy life, be a nature's friend". The tagline conveys meaning that is in accordance with the predetermined creative goals. The message from the tagline is an invitation to use environmentally friendly packaging and cutlery to avoid plastic contamination that is potentially bad for health. In addition, the tagline also invites the audience to protect the environment because environmentally friendly packaging and cutlery can naturally be decomposed faster.

c. **Body copy.** The body copy in this design was made as an explanatory statement that conveys brief information about environmentally friendly packaging and cutlery. The words in the body copy were adjusted to the audience to make them easier to understand. Some adjustments were also made to make the infographics interesting and comfortable to look at. The body copy in this design contains information related to environmentally friendly cutlery and packaging. The information includes the reasons why people should use environmentally friendly packaging and cutlery. It also provides information about environmentally friendly cutlery and packaging alternatives that can be found and used easily.

d. **Baseline.** The baseline in this design consists of the names or logos of parties involved in the designing process. The Environmental Service Agency (DLH) of Surakarta City is one of the parties included in the baseline because they gave the information about the amount of plastic waste in Surakarta City.

3.2.2. Non-verbal visual strategy

a. **Logo**

- **Logo concept.** The logo concept used is an outline of growing plant shoots [17,18]. The plant shoots were combined with another element of the themes, namely environmentally friendly alternatives of cutlery and food packaging (Figure 2). The logo design was made by combining the two elements, a spoon figure as the leaves of the plant shoots. This represents the message of “what is eaten, how to get food, and how food is packaged and consumed should always be in harmony with nature.” All chains in human’s eating and drinking activities should avoid harming the nature.
• **Logo configuration + margin and clear space.** The designed logo used an established layout provision as its standard. There are three basic layouts configurations that can be used. The first is a stand-alone logo. The second is a logo and text laid out horizontally with the logo on the left. And the third is a logo that is placed above the text (Figure 3 and 4). These layouts are the basic standards. In the real applications, the placement of a logo can be adjusted as needed, as long as its functional and aesthetic features can still work properly.

b. **Mascot.** In designing the infographic, mascots were created to serve as the infographic’s identity and to attract the audience. The attractive mascots do not only attract the audiences and give interactive impression, but also help them understand and remember the messages conveyed in the infographic.

There are two mascots created in the design of this infographic. The objects selected as the mascot are land and water. Land and water were chosen as mascots because they are the support of human life and the source of the food that we consume. Land and water are also the place where humans and everything on earth return to. In other words, land and water symbolize the cycle of life. This can also serve as a reminder of the importance of protecting and preserving the environment from
the damage caused by human actions. For easier identification, the mascots of this design were also given names as their identity. The selected names were "Pilah" and "Pilih". The two mascots are the representations of land & water, and the "masculine" and "feminine" nature. These mascots were also chosen in a pair to represent the male and female audience. The names "Pilah" and "Pilih" also have a specific purpose. "Pilah" and "Pilih" were taken from Indonesian words which means “sort” and “select”. These names were selected to represent the joint attitude of the Indonesian people to care for and be aware of the environment. This can be done by performing a selective manner on the packaging and cutlery that they use.

c. **Typography.** The typography used in the design must be easy to read and clear. The selected typography must also be attractive and comfortable to look at when combined with the other elements in the infographic. There is more than one font style selected for the typography as shown in Figure 5 and 6. This is to provide emphasis or adjustment to the functions of written elements in the infographics. For example, the headline, as the first writing to be seen, should be written using fonts that more striking and placed on the first position. And in this design, the fonts used are:

- **Montserrat Font Family**

  ![Figure 5. Montserrat Font](https://fonts.google.com/specimen/Montserrat?query=Montserrat)

  Source: https://fonts.google.com/specimen/Montserrat?query=Mon.

- **Roboto Font Family**

  ![Figure 6. Roboto font. Source: https://fonts.google.com/specimen/Roboto.](https://fonts.google.com/specimen/Roboto)

d. **Colours.** The colours of the design were adjusted to the theme being promoted, namely environmentally friendly packaging and cutlery. Such theme is included in the environment and nature category. Because of this, the colours selected for the infographic were adjusted to give a fresh and natural impression. The colour variant example can be seen in Figure 7. The selected colours are expected to add to the appeal of the infographic and represent the message to be conveyed, especially regarding the use of environmentally friendly cutlery and packaging.
Illustration. Illustrations are one of the main elements that add to the appeal of the infographic design. In addition to drawing attention, the selected illustrations are also used to deliver the messages in an easier way. The illustrations were also created by adjusting to the theme. In this case, the illustrations chosen generally show objects related to the environment, nature, food, packaging, and cutlery. The illustration style chosen in this design was flat style design illustration using vector techniques. By using vector techniques and flat design styles, various kinds of objects that match the design theme can be created and changed easily as needed.

Layout. The layout of this infographic was arranged by paying attention to the size and placement of various elements. The appropriate layout of various elements in the infographic is crucial to make it attractive and able to convey the message clearly. An example of a layout setting is the arrangement of text elements and illustrations in the infographics. This was done according to the desired information flow to make the text easy to understand. The illustrations were laid out in such a way to serve it functions as a supporting element in terms of aesthetic and information.

3.3. Development
The development stage in the ADDIE model is the creation process of the infographic media. In the design stage, a conceptual framework for the application of design elements was determined. In this development stage, the conceptual framework was realized into infographic media with various visual alternatives that were ready to be implemented. In this stage, the message was combined with various layout settings to attract the audience and help them understand the infographics. Here are the alternative visualizations of the infographic media designs with various themes.

- Infographics 1 theme “Protect Your Food, Protect Your Earth”
- Infographics 2 theme “Plastic Waste in Indonesia is this Abundant”
- Infographics 3 theme “How Abundant is the Plastic Waste in Our Beloved City Surakarta?”
- Infographics 4 theme “The Danger of Plastic Waste for Our Life”
- Infographics 5 theme “Plastic Waste is also Threatening Our Sea”
- Infographics 6 theme “Plastic Straw; Small yet Dangerous”
- Infographics 7 theme “7 Numeric Symbols on Plastic Container”
- Infographics 8 theme “Tips to Reduce Plastic Waste”
- Infographics 9 theme “5R: Lifestyle to Reduce Plastic Waste”
- Infographics 10 theme “Alternatives of Environmentally Friendly Cutlery”
- Infographics 11 theme “Alternatives of Environmentally Friendly Packaging”

The development results of the infographic (Figure 8-18) designs with various themes were then adjusted with several social media platforms settings such as Facebook, Instagram, and Twitter. The social media platforms were selected because they are widely used by the public, especially those aged 17-30 years. With simple illustrations and casual language, the audience can easily understand the message of the infographics.
Figure 14. Infographics 7.

Figure 15. Infographics 8.

Figure 16. Infographics 9.

Figure 17. Infographics 10.

Figure 18. Infographics 11.
3.4. Implementation
At this stage, the infographics that had been developed were posted on various social media. The main objectives of the implementation phase are as follows:

• To provide education to the audience, especially the people of Surakarta City, about plastic waste danger to the environment.

• To ensure public awareness and concern as a solution to overcome the increase in plastic waste generated from households and restaurants.

• To generate output in the form of public awareness and concern which will have an impact on reduction of plastic cutlery and packaging use.

Based on the data of age in the audience’s demography, several supporting media were selected as tokens to remind the audience about the messages conveyed in the infographics. Some of these supporting media can be used for daily activity purposes, especially as food or beverage containers. The following are the supporting media to the campaign for protecting the environment from the dangers of plastic cutlery and packaging. The supporting media consist of enamel mugs, drinking bottles/tumblers, paper bags, notebooks, and stickers (Figure 19-23).

![Figure 19. Enamel mug.](image1)

![Figure 20. Metal water bottle.](image2)

![Figure 21. Paper bag.](image3)
3.5. Evaluation
The evaluation was carried out based on the audience's response to the publication of infographics on the social media. The evaluations were done weekly according to the audience's responses. One of the indicators of the evaluation was whether the publication was liked or shared with other social media users. Other evaluation that were used to measure audience awareness were in the form of likes, comments, or reports on the uploaded infographics. The evaluation results were used to provide feedback to future development of the infographic. Revisions were made to the new infographic based on the evaluation results.

4. Conclusion
Rather than focusing on the negative impacts of disposable plastic packaging and cutlery, the infographic developed in this study focuses more on creative strategies with an emphasis on education about environmentally friendly alternative for packaging and cutlery. The educational dissemination using infographic media was targeted on the audience from the consumer side. The infographic emphasizes the choices and actions to reduce the use of plastic packaging and disposable cutlery waste. This design is specifically aimed at the people of Surakarta City, especially those with an age range of 17-30 years. To make them attractive and easy to understand, the infographics were also designed by considering various aspects including audience data, educational information, and aesthetic elements. The infographic campaign is expected to improve awareness about the environment, especially
regarding the use of environmentally friendly packaging and cutlery, so that the waste from disposable plastic packaging and cutlery can be reduced.

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