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Gestalt principles analysis on Green Fins infographics in communicating environmentally safe scuba diving and snorkeling activities

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ABSTRACT

The increasing development of marine tourism can be a threat to marine habitats. Green Fins is a conservation management approach with a mission to protect coral reefs by promoting sustainable diving and snorkeling. Green Fins provide counseling and free educational infographic material on how to practice environmentally friendly behavior in marine habitats. This infographic is crucial as it acts as the front line of its mission, thus an attractive and well-understood infographic is important. A total of 21 guideline materials were collected from the Green Fins conservation tools materials. Using Gestalt principles, we then analyze each visual element and the compositional structure to determine the effectiveness of the visual approach in delivering the message. We found some cases of lower gestalt principles application; thus, we believe could affect the perception of the message.

1. Introduction

Green Fins estimated one million new divers are certified each year and millions more snorkeling worldwide on coral reefs (Zainal B Rahman 2022). This expansion of global coral reef tourism can be a threat to marine habitats. Both diving and snorkeling activities can have negative impacts, especially on fragile ecosystems like coral reefs. Anchoring, direct diver damage, sunscreen use, and fish feeding are direct harmful practices and immediate threats to the coral reefs. Coral reefs act as the building blocks of marine ecosystems, it holds 25% of all marine life, providing food security and employment through fishing and tourism. Without healthy coral reefs, human life could be at risk. It is important to reduce the threats to coral reefs from diving and snorkeling activities through more sustainable practices for a more hopeful future. Green Fin is a conservation management approach by The Reef-World Foundation and the UN Environment Program. It aims to protect coral reefs by promoting sustainable diving and snorkeling (Zainal B Rahman 2022). Through its website, Green Fins promote how to be a responsible marine tourist by practicing environmentally friendly behavior in marine habitats, especially the coral reefs. Green Fin provides free educational infographics to help divers and snorkelers clearly and quickly understand the best practices of doing environmentally friendly diving and snorkeling. Inexperienced or/and unresponsible divers and snorkelers can easily damage the coral reefs. Through counseling and constant reminder during their diving and snorkeling activity, we can help to reduce the risk of

damaging the coral reefs. That's why Green Fins provide free educational material to be used and shared by the diving and snorkeler operators and the customers. Such as how to be a responsible underwater photographer; divers using a camera are more at risk of damaging the corals (Barker and Roberts 2004), and many other things that should be considered while doing diving and snorkeling activities.n Using infographics is a popular approach nowadays to communicate information. Infographics could deliver a message fast, attractive, informative, and appealing to the audience. In Infographics, the way the message is visually organized is an important step to create effective communication. Gestalt principle in visual design offers methods on how visual elements should be organized in creating specific visual perception. This paper aims to study the effectiveness of Green Fins' free educational infographic as a visual communication design product in communicating information using the Gestalt principle of the visual perception method.

Visual literacy is very relevant in nowadays learning and communication. Within this changing society, visuals become more and more pronounced in our life. It is an essential competency for today's generation across disciplines (Martix and Hodson 2014). Thinking visually become an important part of our daily life. Bicen and Bahesti stated visual literacy is the capability to think and learn from visuals, create meaning and communicate through visuals (Bicen and Beheshti 2017). One popular form of visual literacy for learning and communicating nowadays is the use of infographics. Infographic is a popular visual approach to communicating abstract, dense, and complex information. Infographic uses picture, illustration, symbol, diagram, and chart to transmit information understandably, correctly, and visually appealing. Visual is a universal language, using visuals can be very effective to reach out to a wider audience by providing an advantage over language barriers (McCrorie, Donnelly, and McGlade 2016). Infographics utilized the graphic to enhance the human visual system's ability to see patterns and trends (Naparin and Binti Saad 2017). By doing so it turned the information into a simple structure, well organized and 'size bite' information, manageable, and easily understood. Using graphics and text together creates a more efficient and effective learning process (Dunlap and Lowenthal 2016). It is a powerful learning tool in the teaching-learning process, it presents the whole structure to the audience and thus, creates a scheme in the mind (Ozdamlı et al. 2016).

Siricharoen and Siricharoen stated it is a representation of data and information that consists of three elements: visual elements (graphics, color, etc.), content (facts, text, statistics, etc.), and knowledge (the conclusion, the story) (Siricharoen and Siricharoen 2015). A good infographic should show a well-structured visual organization that enhanced the information and reveal the underlying story and at the same time express creativity and aesthetics. Furthermore, knowing and understanding the target audience can also contribute a big part to determining the success of the infographic (Miftah, Rizal, and Anwar 2016). Infographics could be built in many different structures depending on the content and the underlying story needed to be told. It can be broadly categorized into different following structures: comparison, chronologically (timeline, sequence), diagram, flowchart, hub and spoke, etc. The function of visual perception is to recognize and understand objects based on their shape, location, etc. (Van Eymeren 2016). Visual perception explains the relationship between the way we see and how we interpreted it as the whole visual experience. It is a psychological process that involves light, the eyes, the object, and our brain to understand the perceived image. Visual designers learned this visual processing and use it in the creative process.

Gestalt principles were proposed by German psychologists in the 1920s. It describes the different ways of the visual organization creates the meaning of objects. People tend to perceive not by individually interpreting the parts, but by grouping parts into one unified whole as one visual experience (Rodriguez et al. 2013). These tendencies are inborn not learned (Karana, Pedgley, and Rognoli 2013), in other words, is the relationship between the parts and the whole that create the perceived visual. These principles are claimed to be the universality of perceptual principles (Mennan 2009). The Gestalt principles are one of the

psychological theories that are heavily borrowed in design studies to explain visual experiences. In this paper, some of the Gestalt principles that are used to analyze the infographics are the principles of proximity, similarity, continuation, figure and ground, closure, pregnancy, and assimilation. All these principles state how people tend to group the visual elements to create visual unity and create meaning by taking considering different variables; (1) The principle of similarity states the tendency to group similar objects; (2) The principle of proximity states the tendency to group objects closer to each other; (3) The principle of continuity states the tendency to group objects that have the same directionality; (4) The principle of figure and ground states the tendency to identify an object by searching for its contour and edges, to separate the foreground from the background; (5) The principle of closure states the tendency to complete the visually incomplete object in the mind. To add the missing part or gaps create the complete picture; (6) The principle of Pragnanz states the tendency to simplify objects into basic shapes to be more easily understood; (7) The principle of Assimilation states to be understandable people tend to correspond with their experience and knowledge. In design studies, understanding the gestalt principles is an important process to create a good design. Gestalt principles can provide scientific validation of compositional structure. It helps us utilize pattern-seeking behavior to make sense of our perceptions (Graham 2008) or on the contrary, to create a bias in the pursuit of the creative process (Van Eymeren 2016). Combined with other art and design theories, it helps to create a good design that serves its function as both a communication and entertainment tool.

2. Method

Using qualitative methods, we observe all the visual elements in each Green Fins infographic. We then categorized the infographic based on its similar content and how its visual communication approach. We then analyze each visual element according to the application of the principles of Gestalt to determine the effectiveness of the visual approach in building the intended perception. A total of 21 guideline materials were collected from the Green Fins conservation tools materials. The guidelines were collected from the Green Fin website. These materials are specific for divers or snorkelers, and consist of 12 guidelines of diving best practices, 11 guidelines of snorkeling best practices, 7 guidelines about Marine life interaction, 6 information on plastic and trash, 2 guidelines of boat practices, 2 guidelines about hazardous chemicals, 2 guidelines about the use of sunscreen, and 1 material of the use of batteries, 1 material how to manage guest and 1 material of underwater photography. Of these 21 materials, there are eight materials in form of infographics. These eight infographics then were observed based on their visual elements (typography, icon/symbol, illustration, color, shape) and their compositional structure (layout). The eight infographics that will be examined in this paper are:

- No Gloves: Infographic about the harm of wearing gloves while diving
- Do Not Litter: Infographic about the harm of littering in the ocean
- Do Not touch the Coral: Infographic describes coral as fragile animals
- Environmental Best Practice for Underwater Photographers: Infographic explained how to take photographs without put harm on marine life and ecosystems
- Environmental Best Practice for Diver: Infographic on how to conduct scuba diving activities with care to protect fragile marine ecosystems.
- Why We Don't Feed Fish: Infographic on the harm of fish feeding for the marine ecosystems
- Why should we use Reef-safe Sunscreen: Infographic about the harm of sunscreen on the marine ecosystems

- How Long Does it take for our trash to break down? : Infographic about ocean trash and the impact on marine life and ecosystems

From the eight infographics mentioned above, we grouped them on several criteria regarding the similarities in visual style approach, visual presentation structure, and narrative. This is done to be later easily analyzed and discussed as each infographic's main visual approach implemented a different strategy and utilized different gestalt principles. See Table 1.

Table 1. Grouping of infographics

Group A Fig. 1	No Gloves Do Not Litter Do Not Touch the Coral	Grouping based on visual style (main visual: object illustration)
Group B Fig 2.	Environmental Best Practice for Underwater Photographers Environmental Best Practice for Diver	Grouping based on information structure - comparison
Group C	Why We Don't Feed Fish Why should we use Reef-safe Sunscreen	Grouping based on visual style (main visual: scene illustration)
Group D	How Long Does it take for our trash to break down	Grouping based on narrative structure (visual composition: linearity)

In Group A, the three infographics use the same visual style that places the main visual in the center of the layout and the textual information revolving around it, creating a weblike diagram to emphasize the connection.

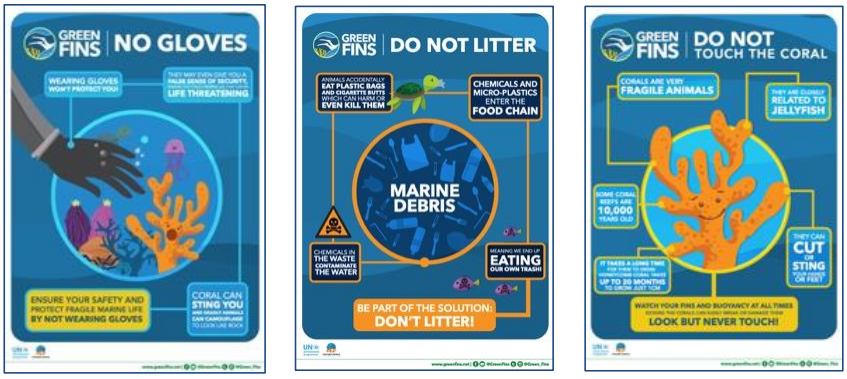

Fig 1. Pictures of Infographic group A

In Group B, the two infographics utilize the nature of the information, which is a comparison of two different things and reflect it in the composition showing two separate spaces, first infographic is on the vertical axis, and the other on its horizontal axis.

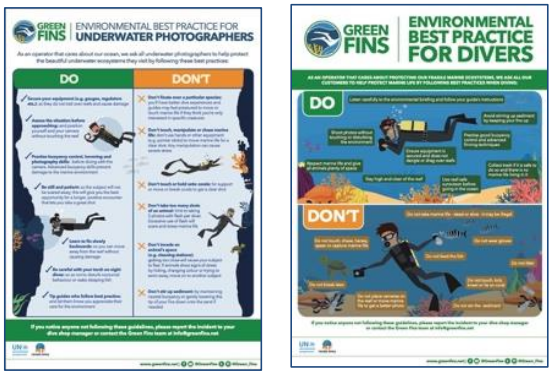

Fig 2. Pictures of Infographic group B

In Group C the two infographics use scene illustration as the main visual to narrate the information. The illustration shows snorkeling activity and its environment in a simplified manner and is easily recognizable as in real life.

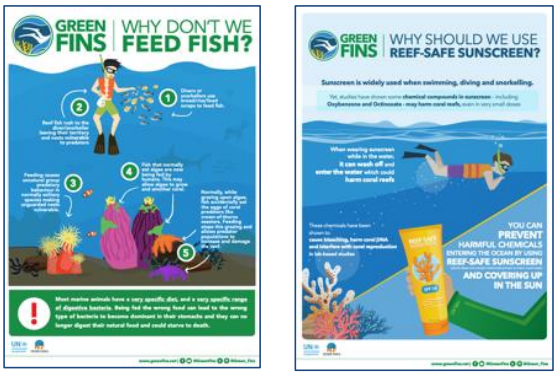

Fig 3. Pictures of Infographic group C

In Group D, the infographic emphasized the compositional structure to show the information narrative. Using a linear line as the main element visual, it visually presents a timeline or chronological narrative.

Fig 4. Picture of Infographic group D

3. Results and Discussion

Using the principle of gestalt, we analyze each element visual that correspondence to specific principles of gestalt. The result is listed below: Principle of Similarity

- In all groups, the placement of the Green Fin logo is always on the top left corner, followed by the title of the infographics on its right side. The placement of social media information, the UN logo, and the Reef world Foundation are also always put at the bottom part of the layout and with white background. This systemic visual approach makes the infographic easily recognizable as part of green fin media communication.
- In all groups, the social media information is using the same typography style, size, and color so we perceived it as one group of information.
- In Group A (Fig 1), the information is visually differentiated between the sub-head and the content. All the content is divided into small boxes but in the same visual style and color. Doing this helps group the information and give the perception of the same information hierarchy even with the seemingly scattered position in the layout.
- In Group B (Fig 2), the principle of similarity is achieved by using two main colors (green and orange) to distinguish between two groups of information. Although the way the layout was split into 2 parts was the first visual cue of the narrative, utilizing the color usage helps clarify the difference even more.

- In Group B (Fig 2), the use of repeated checklists and cross signs also stresses the difference between the two groups of information.

Principle of Proximity

- In all groups, the social media information was placed close next to each other, suggesting a cluster of the same type of information.
- In Group C (Fig 3), the principle of proximity is used by positioning the related information next to the object that is described. The same in group D, the way objects and numbers are placed side by side suggests the perception it is in the same group of information.

Principle of Continuity

- In Group A (Fig 1), the do not litter and no glove infographic uses a line from the center of the circle revolving clockwise and ended in the sub-head information to direct the audience's eyes into a continuous flow of information.
- In Group B (Fig 2), environmental best practice for underwater photographer infographic; the information is arranged on a vertical axis creating a top to down visual structure that is easily perceived as one group of information. The use of alignment on the right-side group of information also creates an invisible line to help the perception of one continuous structure.
- Like Group B (Fig 2), Group D (figure 4) also arranged its information on a vertical axis but utilized a guiding line to help create the perception of top-down visual structure as one group of information.

Principle of Figure Ground

- In Group A (Fig 1), they do not touch the coral infographic using shadow on the coral image to create a clear distinction between the figure and background. By implementing shadow, it creates the perception of depth, thus helping the audience easily separate an object from the background.
- In Group B (Fig 2), we see the principle of figure and ground in the use of the illustration of reef walls on both sides of environmental best practice for underwater photographers' infographics layout to frame the space.
- In Group C (Fig 3), in why don't we feed fish infographic the wave is rendered in a 2-dimensional manner creating a distinct contour. This contour line function as an indication of figure and ground, but also functions to separate the top space and the space below it, dividing the layout into several parts.

Principle of Closure

- In Group A (Fig 1), we perceived a full circle image although it is cut by the hand and coral image. The understanding is that the hand must be in front of the circle, thus blocking some parts of the circle.

Principle of Pragnanz

- The illustration in all Groups is somewhat a form of simplified style. A flat two-dimensional image yet still easily recognizable. The images use simple lines, curves, and shapes to capture the essential form of the real object.

Principle of Assimilation

- In Group B (Fig 2), environmental best practices for underwater photographer infographics use symbols to stress the information. The checklist and the cross mark are to indicate something correct and wrong that we all generally understood.
- In Group C (Fig 3), the why don't we feed fish infographic use arrows to link the object and the explanatory text. Arrows are something we generally understood as a sign of indication or direction and not to be misunderstood as something else.

4. Conclusion

All eight Green Fins Infographics implemented the Gestalt principles in their layout design. All eight infographics show well-organized information present in their visual. The infographics combined different Gestalt principles to assure they show the intended visual perception in communicating the message. For example, we see principles of similarity combined with the principle of proximity to amplify the visual grouping in Group B infographics. With that said, related to the principle of similarity, we still found some elements visual are not consistent between the infographics, thus could affect the visual recognition of Green Fin infographics to build a strong visual identity. For example, the use of different element design styles from Group A and the rest of the infographic group. While Gestalt principles can tackle the visual perception aspect, it is not enough to conclude whether it is a good design. Gestalt principles only show with a good understanding of the visual organization, the intended visual perception can be achieved and deliver the message effectively. In Green Fins infographics, there is still improvement that could be done to create a more visually appealing design. Consistent design guidelines, well and suitable illustration approach, and typographic treatment could be reconsidered to bring the best output for the infographics.

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