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Infographics Effectiveness in Creating Environmental Awareness to Readers

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ABSTRACT

This paper is a collation of research methods and findings from academic papers that report on empirical research concerning the impact of infographics on readers. Research is taken from a range of disciplines; infographics, environmental and awareness. Over the past decade, environmental issues and environmental awareness have gained media attention. It gets coverage of various types and forms of media and our society is increasingly aware of the impact of our activities on the environment. The purpose of this paper is to see how visual media such as infographics can have an effective impact on the target audience on the importance of environmental awareness. Thus, the media has a huge role in influencing and making people aware of environmental issues.

INTRODUCTION

In our transient world, high-speed communication has become the feature that defines the way we connect with each other. As van Dijk (2020) outlines, science communicators in our society of "the instant" where traveling to a distant country takes only a few hours, where finding shelter, clothes or food takes just minutes, and where even to develop "meaningful" relationships can take but seconds, we need to reconsider how we connect with audiences. Our 21st-century society, which is becoming increasingly ruled by multinational corporations, cyberspace, and consumerism, relies on fast access to information. Due to this reason, science communicators need to find ways to connect at the same fast pace and to spread our messages over wide areas that go beyond the limitations of traditional media.

To this end, as reported by Wan et al. (2023), "science communicators have already been using a variety of channels, such as blogs, websites, posters, magazines, video games, billboards, television, apps, and movies. Though each of these media has its own particular interface; either digital or printed; they all have something in common that makes them potentially powerful tools with which to communicate: they share a language the visual language. Ironically, however, much of the theory on which the practice of science

communication is based does not embrace such visual speak". We live in an environment shaped by images, which surround us all the time, telling us how to think, feel, and talk.

In such an atmosphere soaked with visual elements, communication in society has become much more visually focused (Wan et al., 2023). We are now likely to encounter complex texts that contain elaborate visual images complex design elements, and unique formats. In order to understand such multimodal texts and construct meaning from them, individuals must be able to process the images and elements of design simultaneously with the written text. When communicating science, graphic representations have become important means for improving explanations and understanding of scientific matters (Riggs et. al., 2022). Awareness, attitude, and intention It seems that in many discussions or reviews on environmental 'awareness', results can be described under a range of terms that include; attitude, opinion and concern helps shed light on their relative meanings to each other when he points out that in the 25 years after 1965, opinion surveys showed that environmental 'concerns' had manifested themselves to become an environmental 'attitude' which formed as a result of temporary 'opinions' (Riggs et. al., 2022).

The new media users want to consume much more information within very short time and here Infographics play a major role. The same infographics can be used on both the medium. Infographics in real sense is an example of media convergence and widely used in print medium, web sites, television, mobiles and iPods with the same intensity.

WHAT IS INFOGRAPHICS? WHAT IS DATA VISUALIZATION?

As part of the process of gathering and synthesizing information from literature, infographics have emerged as a widely used tool for transforming text, numbers, charts, graphs, and illustrations into visually accessible arguments. Infographics, short for "information graphics", are designed to combine data visualizations, icons, illustrations, and explanatory text into cohesive visual narratives that help convey complex information clearly and effectively. They use visual cues and structured layouts to guide the viewer through data-driven stories. Common forms of data visualization, such as bar charts, pie charts, line graphs, and maps—are often integrated into infographics to enhance clarity and engagement. For science communicators and designers alike, this approach provides a powerful means of communicating key messages in a concise and visually compelling format. Infographics, which is short for information graphics, are graphic visual representations of information, data, or knowledge designed to communicate complex or sophisticated topics clearly and quickly. "They typically incorporate charts, maps, text, images, and narrative elements to tell a cohesive, explanatory story. Infographics appear across media and publications, ranging from scientific journals to general public channels." (Hanna K.T., 2023; Ocampo et al., 2018; Smith, J., & Doe, A., 2022)

THE HISTORY OF INFOGRAPHICS

Infographics actually been around since the 17th century. In the 20th century, printed graphic information have come to popularity, especially with the widespread availability of the press. In addition, a data visualization expert, Tufte, E. (2001) has written a series of books on infographics. He mentioned that switching to the graphic information in digital format has been started at the beginning of the 21st century. Many historical examples, teachings, and the emergence of the Internet, information graphics seamlessly switch to online. It was around 2010 that they became what we know today-digital graphics designed to present complex information, usually posted on a blog or in an article on the website, sometimes spreading virally. According to Ghode, R. (2013), infographics is a representation of data and information using graphics. Effective use of infographics attracts the attention of users and explains complex information quickly and clearly. There are ample software applications and tools available to create attractive and informative info graphics. Infographics are widely used in educational content, web site portals, News Channels and Newspapers. The new media users want to consume much more information

within very short time and here Infographics play a major role. The same infographics can be used on both the medium. Infographics in real sense is an example of media convergence and widely used in print medium, web sites, television, mobiles and iPods with the same intensity.

ENVIRONMENTAL ISSUES AND AWARENESS

Climate changes, temperature increases, glacier changes and changes in the nature and natural vegetation caused countries to take joint action in the international area and these environment-threatening issues were accepted to be global issues as well as international issues. According to Hülya & Baykal, T. (2008), "when the research, publications and observations concerning the environment are examined, it is possible to collect the environmental issues under certain headings". While Macdonald (2000) wrote that "experiment on the role of brand awareness in the consumer choice process showed that brand awareness was a dominant choice heuristic among awareness-group subjects. Subjects with no brand awareness tended to sample more brands and selected the high-quality brand on the final choice significantly more often than those with brand awareness. Building brand awareness is a viable strategy for advertising aimed at increasing brand-choice probabilities."

RESEARCH PROBLEM

The climate change is a complex problem without clear scientific and political solutions. It's an issue with major political, economic, socio-cultural, psychological, and ethical implications. People who receive formal education, having media access, personal or family experiences of environmental problems are more concerned group and are more likely to develop proper environmental attitudes. Media is playing vital role informing mass population about climate change. Though most of the people are having pro environmental attitude. Environmental problems are becoming important aspects of our lives as industries grow apace with populations throughout the world. While environmental concerns are increasingly reflected in sectoral policies, public awareness of environmental issues and individual responsibilities are poor in both urban and individual societies. We wanted to see if this alarming concern is conveyed better with infographics.

LITERATURE REVIEW

Infographics

Infographics are defined as a form of storytelling that people can use to visualize data in a way that illustrates knowledge, experiences, or events (Greco, J., & Groff, R. (Eds.), 2012). One of the defining characteristics of infographics is that they are a visual tactic that can be created and curated to reveal insights about an individual or brand.

According to HRD Connect (2024), one way infographics can be used is to frame a story, which could be about various topics, such as a product, process, fundraising initiative, legislative bill, social issue, or research study. In this way, infographics are a form of strategic storytelling, a practice that occurs when an employee shares an organization's story to advance an organization's goals with one or more key audiences. The systematic study by Borkin, M. A., et al. (2013), he reviewed 1721 infographics from visual.ly.com and found the following graphic pictorial /data elements within them: bars graphs, line graphs, points, areas, circles, trees and networks and thus these provide the focal point from the studies.

According to a researcher, today there exist many different methods for visual transferring of knowledge and information, including textual and numeric systems (letters and numbers, glyphs, hieroglyphs, data and codes, symbols), pictures and graphic systems as photos, pictograms, schemes, diagrams, tables, 3D models, graphs, maps) and multimedia systems (as video, animations, complex simulations, films, games and virtual models, data streams, interactive dashboards, and other complex graphic solutions (Antonova, A., 2016).

Audience

According to an article published in Middle European Scientific Bulletin (2022), titled "Infographics as an Effective Means of Information Visualization in the Learning Process", it stated that when designing visual communications, science communicators need to understand to whom they are communicating: they need to know their audience. Until recently, in the field of science communication, the deficit model was the main means favored for communicating science to no specialists. It mentioned that assumption was that if members of the general public were provided with knowledge about scientific matters, their interest and understanding of science would increase.

Environmental

Environmental problems (air pollution, water pollution, deforestation, noise pollution etc.) are causes of environmental degradation. Environmental degradation refers to the deterioration in its physical component brought by human activities to such an extent that it cannot be set right by the self-regulatory mechanism or homeostic mechanism of the environment (Ahmad, M., & Islam, N., 2021). Climate change is a complex problem without clear scientific and political solutions. It's an issue with major political, economic, socio-cultural, psychological, and ethical implications, which must be understood by the policy makers and wider society in order to respond effectively (Hasan, Z. & Akhter, S., 2011).

National Environmental Performance Index (EPI) is evaluated every two years to examine the environmental performance in Malaysia concerning different indicators such as climate change and water quality. Environmental problems are becoming important aspects of our lives as industries grow apace with populations throughout the world (Yale Center for Environmental Law & Policy, 2024).

METHODOLOGY

This chapter is going to cover four components of survey methods. The survey research method has been chosen to determine the factors effectiveness of infographics in creating environmental awareness to reader. Evaluation of infographics developed for creating awareness will be significant in term of using in environmental issues.

The survey instrument has been designed using Likert scales to measure respondents' responds towards the factors that contribute to that sentiment. According to researcher surveys can do a good job of describing a large population, getting good, reliable answers to the same set of questions by all respondents. They can also be artificial, and in some cases can fall foul of the observer effect.

The Population and Sample

The target population for this study is people who was related in creative's industry field. Researchers conducted research studies with respondents using an online media such as social networks; email and other online resources and also distribute the survey questions during the field surveys. This process will continue until the researcher has at least 150 respondents who are willing to participate in this study (Creswell, J. W., & Creswell, J. D., 2022). E-mail was sent to each respondent with a letter explaining the purpose of

the research. Researchers had selected a random sample based on knowledge, connection and researchers' judgment in knowledge and experience. According to Ozdamli, F., et. al. (2016), evaluation studies about infographics are very rare in the literature even though they have a wide audience on the internet media.

Instruments

Researchers had designed the instrument for this research and conducted two steps to measure responses from respondents. In addition, instruments are being increasingly designed for online surveys. An online survey tool such as Survey Monkey (surveymonkey.com and Google Form) are commercial product available since 1999. Researcher has been used this service and quickly created the survey then posted them on web sites and email for participants to complete. Researcher also used this online survey tools to generate results and report as descripted statistic with graphed information.

Pilot sample was used to test the data-gathering mechanisms and to get preliminary information for planning the main sampling scheme. A pilot test survey has been conducted to 20 participants/respondents who met the selection criteria. They were surveyed by questionnaires and respondents were selected based on the target group from (creative industries) and also are randomly selected. The understanding, awareness and participation are related terms; so understand the level of respondents' awareness, understanding of environmental issues and participation patterns is important. So the data has been presented based on the three headings; infographics, environmental and awareness.

STUDY FINDINGS

Data Analysis and Interpretation

This section explains about a fundamental activities of inference - data analysis and interpretation. According to Kritzer, H. M. (1996), a "reconstructed logic" of the interpretation process involved in quantitative data analysis presenting. Researchers have chosen a quantitative research method that uses data and measures it to summarize facts and expose this research pattern. The quantitative data collection methods used by researchers are in the form of surveys - online surveys, surveys, mobile surveys, face-to-face surveys and website shortcuts.

The data has been recorded and updated simultaneously as responses are received. The results have been organized in the Microsoft Excel spreadsheet with the code sheet that has been developed to measure the outlooks from the data of the survey results. The data is organized into separate rows and columns with the assigned attitudinal score and percentage as mentioned previously in this chapter. The responses of each question have been assigned with numerical values for the data analysis.

The analysis of the survey data was processed using Microsoft Excel with calculation formula. The statistical analyses that have been conducted include; overall constructs measurement towards each factor, statistics, pilot test, and final respondent's survey. The data is categorized into descriptive statistical analysis based on number of respondents and percentage to provide for the ease of comparison between different categories. The tabulation is used for the connection between the element construct measurement towards each factor and the actual answered percentage of survey from respondents.

CONCLUSION

Data and visual communication have become essential mediums for amplifying messages originally broadcast through traditional media sources such as radio, television, and print. These tools effectively reach demographics that are moving away from conventional broadcast technologies like telephones and television, while also offering innovative ways to collaborate and co-create content with target audiences. In the context of environmental awareness, researchers often find that related concepts, such as attitude, opinion, and concern, are used interchangeably in discussions and reviews. Through descriptive analysis, researchers ensure that the collected data is both reliable and accurate. Importantly, findings consistently highlight that infographics stand out as the most effective tool for conveying awareness on urgent and alarming issues, thanks to their ability to simplify complex information into clear, compelling visual narratives that resonate widely with audiences.

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