St. Scholastica's College – Manila

School of Arts and Sciences

Ty-FUN: Learning Storm Safety through an Interactive Website

In Partial Fulfillment of the Requirements

in Capstone 1 (METRES)

MARIELLE AYNRAND G. TOLENTINO

BSIT – 304A

2015

TABLE OF CONTENTS

CHAPTER I. INTRODUCTION

Background of the Study

Natural disasters are major concerns everywhere. Some can be prepared for but some can give a huge shock to people when one disaster occurs. Every year one type of natural disaster occurs in the Philippines – not just once but an average of nine tropical storms make landfall plus ten more that only enters in Philippine waters (Brown, 2013).

Wingard and Brandin (2013) stated that the cause why the Philippines has suffered from a large number of typhoons every year is because of its location along the ring of fire which also called the typhoon belt.

There are lots of typhoon names that marked in the history of the Philippines. Typhoons that killed thousands of people caused high damages to the country, massive devastations and caused other disasters such as floods, storm surges and landslides. One example of a strong typhoon is Typhoon Haiyan or known as Typhoon Yolanda in the Philippines.

Dela Cruz (2014) stated:

> Typhoon Yolanda is one of the world's strongest and deadliest typhoons, prompting a rare public storm signal no. 4 in the Visayas. It caused massive devastation that killed 6,300 people. It also brought massive damage to the country; the estimated

> cost damage is around US$2 billion. Aside from the number of casualties and the massive damage brought by Typhoon Yolanda, the number of people it affected, around 16 million makes it the worst disaster to hit the Philippines (para.7).

There are some ways to reduce harmful effects of typhoon according to the International Federation of Red Cross and Red Crescent Society (n.d). One is early warnings from government agencies, for example PAGASA or Philippine Atmospheric, Geophysical & Astronomical Services Administration. Another is preparing before a disaster occur in one respective area.

Computer technology and the Internet are common to the people nowadays. Reuters (2009) stated that “The Internet was selected as the most reliable source of news by nearly 40% of adults, compared to 17% who opted for television and 16% who selected newspapers and 13% for listened to the radio.” With the use of technology, people can get information faster and easier.

The researcher will conduct this project that focuses on developing an interactive website named Ty-FUN. Having children ages 8 to 12 years old as the study’s target users. As a website for typhoon safety measures, Ty-FUN will consist of guidelines of what to do before, during and after a typhoon and animations demonstrating the guidelines.

Significance of the Study

The significance of this study is focused on awareness and what actions to do before, during and after a typhoon. Aside from the target users, the study will also be helpful to other users such as students, IT (Information Technology) students and other researchers.

1. Target users – The target users of the study are children ages 8 to 12 years old. The study can help the users learn storm safety through the website, Ty-FUN.
2. Students – The study can help the students in terms of searching basic information regarding typhoon.
3. IT students – IT students may see the process of how to develop or create a website of their own through the study and the website.
4. Other researchers – Having the same type of research, other researcher can gather information from the study and from the website.

Statement of the Problem

The study aims to answer the question:

1. How will the website, Ty-FUN, help the user know the importance of being prepared when typhoon occurs?

Objectives

The main objective of the study is to develop an interactive website about typhoon and helpful ways to be prepared when typhoon occurs. Other objective of the study is to include the following:

- Basic facts regarding typhoon
- Different typhoon signals
- Guidelines of what to do before, during and after typhoon

Another objective of the study is to present an animation demonstrating the listed guidelines of typhoon safety measures.

CHAPTER II. REVIEW OF RELATED LITERATURE

Typhoons are not new and strange in the Philippines for it happens in the country several times in a year. That is why the people need to know the importance of being prepared to lessen the number of damages that typhoon will bring.

Natural Disaster

Disasters occur almost on a daily basis all around the globe. According to Bradley (2010), disaster is “a calamitous event, especially one occurring suddenly and causing great loss of life, damage, or hardship, such as a flood, airplane crash, or business failure” (p. 7). He also defined natural disaster as an event that came from the nature of the universe and can cause extensive property damage and unbelievable loss of life.

Typhoon

Earthquake Forecasting and Hazard Analysis (2009) defined:

> A typhoon is a type of large storm system having a circular or spiral system of violent winds, typically hundreds of kilometers or miles in diameter. The winds spiral around a region of low atmospheric pressure. The energy that powers typhoons comes from the evaporation of warm ocean water. Warmer ocean water

produces more powerful typhoons, which can grow into super typhoons. (para. 1)

Typhoon, Cyclone and Hurricane

Typhoon, cyclone and hurricane are all the same weather phenomenon. The only difference is the name given depending on the place where it occurs. According to Than (2013), storms are called hurricanes in the Atlantic and northern Pacific while in the northwestern Pacific, storms are called typhoons. In Indian Ocean and southern Pacific, storms are labeled as tropical cyclones.

Classification of Typhoon

PAGASA (2014a) classified typhoon into four according to the strength of its wind:

1. Tropical disturbance: “a discrete weather system with an apparent circulation. It is characterized by a poorly developed wind circulation of weak velocities and with one or no closed isobars (isobars are lines of equal pressures)” (para. 2).
2. Tropical depression: “a weak low pressure disturbance with a definite surface circulation having maximum wind speed of up to 63 kilometers per hour (kph) or approximately less than 25 mile per hour (mph)” (para. 3).

3. Tropical Storm: “a moderate tropical cyclone with maximum wind speed of 64 to 118 kph (25 to 75 mph) and with closed isobars” (para. 4).
4. Typhoon: “an intense tropical cyclone with maximum wind speed exceeding 118 kph” (para. 5).

Public Storm Warning Signals

In the Philippines, there are four public storm warning signals according to PAGASA (2014b):

1. Signal no. 1: The weather disturbance is expected in 36 hours.
2. Signal no. 2: The weather disturbance is expected in 24 hours.
3. Signal no. 3: The weather disturbance is expected in 18 hours.
4. Signal no. 4: The weather disturbance is expected in 12 hours.

Philippine Daily Inquirer (2013) reported the guidelines on automatic suspension of classes: “Storm Signal No. 1 suspends classes in kindergarten, Signal No. 2 in elementary and high school, and Signal No. 3 in college, including graduate schools and government offices” (para. 5).

Typhoon Hazards

Typhoon may also cause different kinds of hazards. Central Weather Bureau (n. d.) listed typhoon hazards: strong wind, foehn, salt wind, waves, surge, heavy rain, flood, landslides, and infectious diseases.

Preparations for Typhoon

With typhoon happening every year in the Philippines, it is important to be prepared.

Varma (2013) listed the following guidelines in order to prepare before a typhoon:

- Store an adequate supply of food and clean water.
- Keep flashlights, candles and battery-powered radios within easy reach.
- Examine your house and repair its unstable parts.
- Be updated with the latest weather report.
- If need to evacuate, bring clothes, first aid kit, candles/flashlight, battery-powered radio and supply of food. (para. 1)

The Philippine Red Cross (2013) listed the following guidelines to do during a typhoon:

- Stay inside the house.
- Always be updated with the latest weather report.
- If safe drinking water is not available, boil water for at least 20 minutes. Place it in a container with cover.
- If there is a need to move to an evacuation center. Evacuate calmly. Close the windows and turn off the main power switch. Put important appliances in a high ground. (para. 8)

According to Weather Philippines (n. d.), here are some safety guidelines to follow after a typhoon:

- Check the house for damage caused by the typhoon and make necessary repairs. Make sure that the house is safe upon entering.
- Have a knowledgeable person inspect electrical connections before using electrical appliances.
- Watch out for live wires or outlet immersed in water.
- Report damaged electrical cables and fallen electric posts to the authorities.
- Avoid contaminated food resulting from the lack of electricity and refrigeration.
- Do not let water accumulate in tires, cans or pots to avoid creating a favorable condition for mosquito breeding that can cause dengue. (para. 3)

Using the Internet to Disseminate Information

The Internet is an obvious way of disseminating information due to its rapid growth and the advantages in communication formats in terms of flexibility, speed and reach (Duffy, 2000). The Internet has many uses but is mostly used as a source of information.

How the Internet Helps in Disaster Preparedness

According to Izadkhah and Hosseini (2004):

> The Internet can be used for educating communities on disaster preparedness, get information about upcoming hazards, and to warn the public and authorities about the consequences of a disaster. The use of the internet through the World Wide Web (WWW) has grown increasingly. In many countries where there is access to the internet, it has become a primary source of information for people working on risk reduction issues (p. 3).

Synthesis

Typhoon is a common disaster in the Philippines and not new to the people for it happens every year. Every typhoon that made landfall left devastating damages that gave shock and fear to the people. To reduce the number of risks, being prepared is important. The website, Ty-FUN, will contain different ways of how to prepare for a typhoon. In addition, the website will also include basic facts and what the user needs to know.

With the use of computer technology and the Internet, Information can easily deliver to other people. Ty-FUN will be a website that contributes information that concerns typhoon safety and preparedness. As long as the users have internet connection, they can access the website.

The website will also display an animation that shows the listed guidelines of what to do before, during and after typhoon. The target users of the study are children ages 8 to 12 years old. The researcher will design the website suitable not only for teenagers and adults but also for children to understand the information through the animation presented.

CHAPTER III. FRAMEWORK

The theories that will support this project are Information Theory and Network & Analysis Theory.

Information Theory

Information theory was founded by Claude Shannon that started in Mid-20th century when Shannon published his book “A Mathematical Theory of Communication” (Markowsky, 2013). Information Theory focuses on the transmission of information to other people and its technology. The theory can be connected to the study by using the theory’s elements : Source, Encoder, Channel, Decoder, Noise, and the Receiver of the information. Where the process of making the website will be shown, the different problems or noise that can affect the process, and how the information of the website will be delivered to the target users.

Network & Analysis Theory

Network & Analysis Theory can also be called Social Network Analysis(SNA) Theory. Georg Simmel was one of the significant people that influence the theory (Prell, 2011). The theory focuses on the relationship of people and forms of connection they make. Bloor and Wood (2006) stated that Social Network & Analysis(SNA) theory defines the kinds of relationship or connections between actors such as

individuals, groups or organizations. The theory can be connected to the study by using the elements Nodes and Ties. Where the nodes are the actors in the study and the ties are the relationship between the actors. In the study, the website will not stop from a few number of users. The first batch of user have connections that may share the website to other target users.

Figure 1: Theoretical Framework

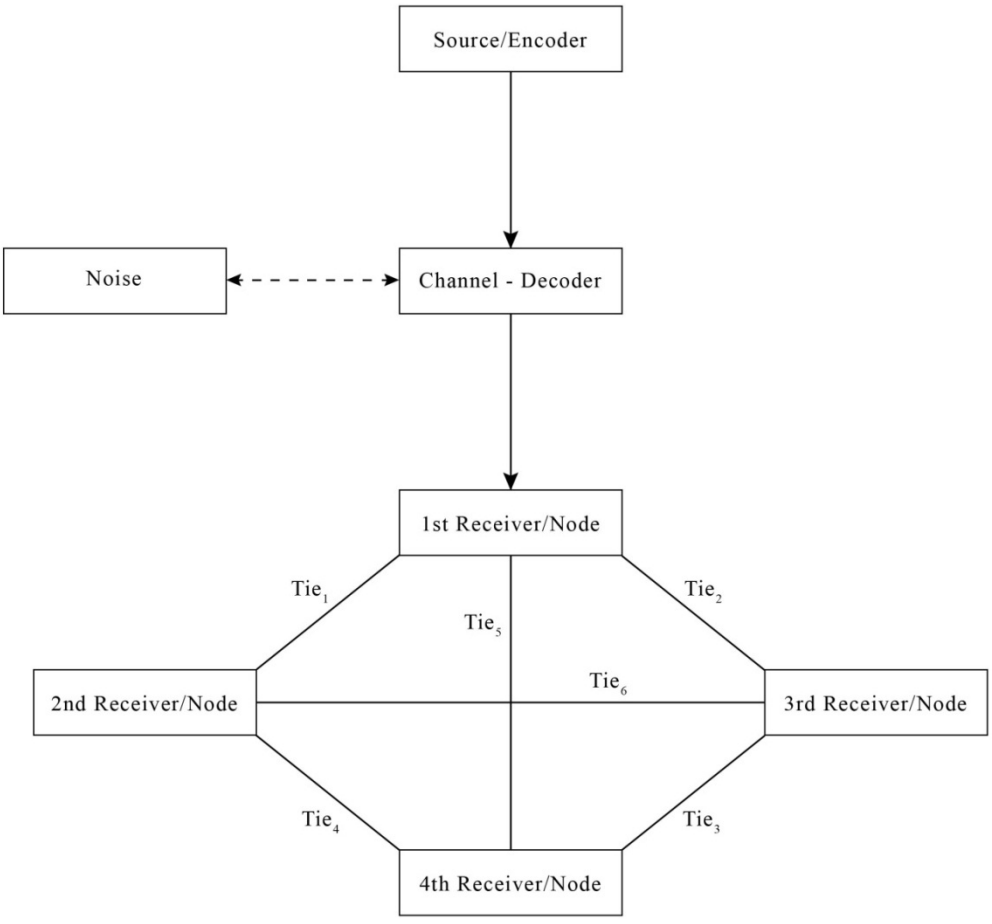

Figure 1 shows the combined diagram of the two discussed theories. Having the first or upper part of the diagram taken from Information Theory and the lower part with the blue lines or the links is taken from Network and Analysis Theory.

From the original diagram of Information Theory the Source is separated from the Encoder. But in Figure 1, the Source and the Encoder are in the same box. The information for this study will be coming from the Source. But, the Encoder can also be the Source of information.

The Channel and Decoder are also have different box but placed together in the final theoretical framework because of the Noise. The Noise may affect both Channel and Decoder. But, the broken lines represent that there may be Noise or none during the Channel-Decoder phase. The two arrows at both ends of the dashed line represent that the Noise doesn't stop from there. The Noise may return to the Channel-Decoder and vice versa before the process proceeds to the Receiver.

In Figure 1, the Receiver can also be the Node. The Receiver/Node phase connects the two discussed theories. Receiver is from the Information Theory who gets the message and Node is from the Network & Analysis Theory. The Node is the actor who shares the message to other actors suitable for the study. There are 6 ties in Figure 1 that represents the connections of the Receivers/Nodes. The arrow heads may be excluded since the ties connect the nodes in both ways (Bandyoppadhyay, Rao, & Sinha, 2011).

Figure 2: Conceptual Framework

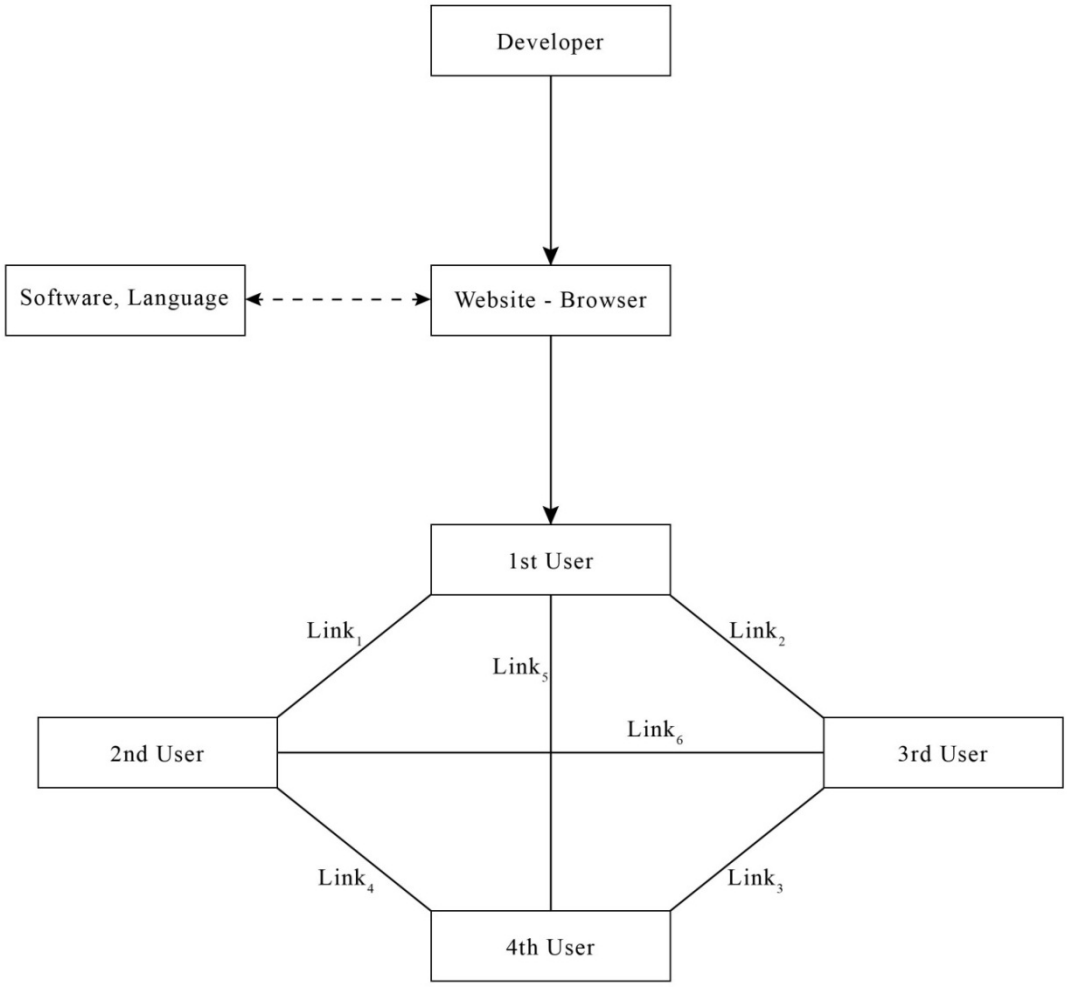

Figure 2 shows the Conceptual design of the study. Where the components of the two theories are changed to other names related to the website. The change of name helps to organize the diagram.

The Source or Encoder is changed to Developer. The Developer is the one who will start the process of making the website. Information may come from the Developer base from experience or opinion while doing the study.

The Channel is changed to Website. Website is the one that carries the message of the Developer. The Decoder is changed to Browser. The Browser is an object that changes the signal when the message is received to a form the receiver can appreciate. The Noise is changed to the different kinds of complication that the Developer face in the process such as the Softwares and Langauges.

The different Receivers or the Nodes are now the different Users. User 1 to 4 are the target user of the study. The User is the last one who gets the message of the Developer and shares it to other user that is applicaple to the study whom they share a connection. The Tie_1 to Tie_6 are now $Link_1$ to $Link_6$.

Figure 3: Operational Framework

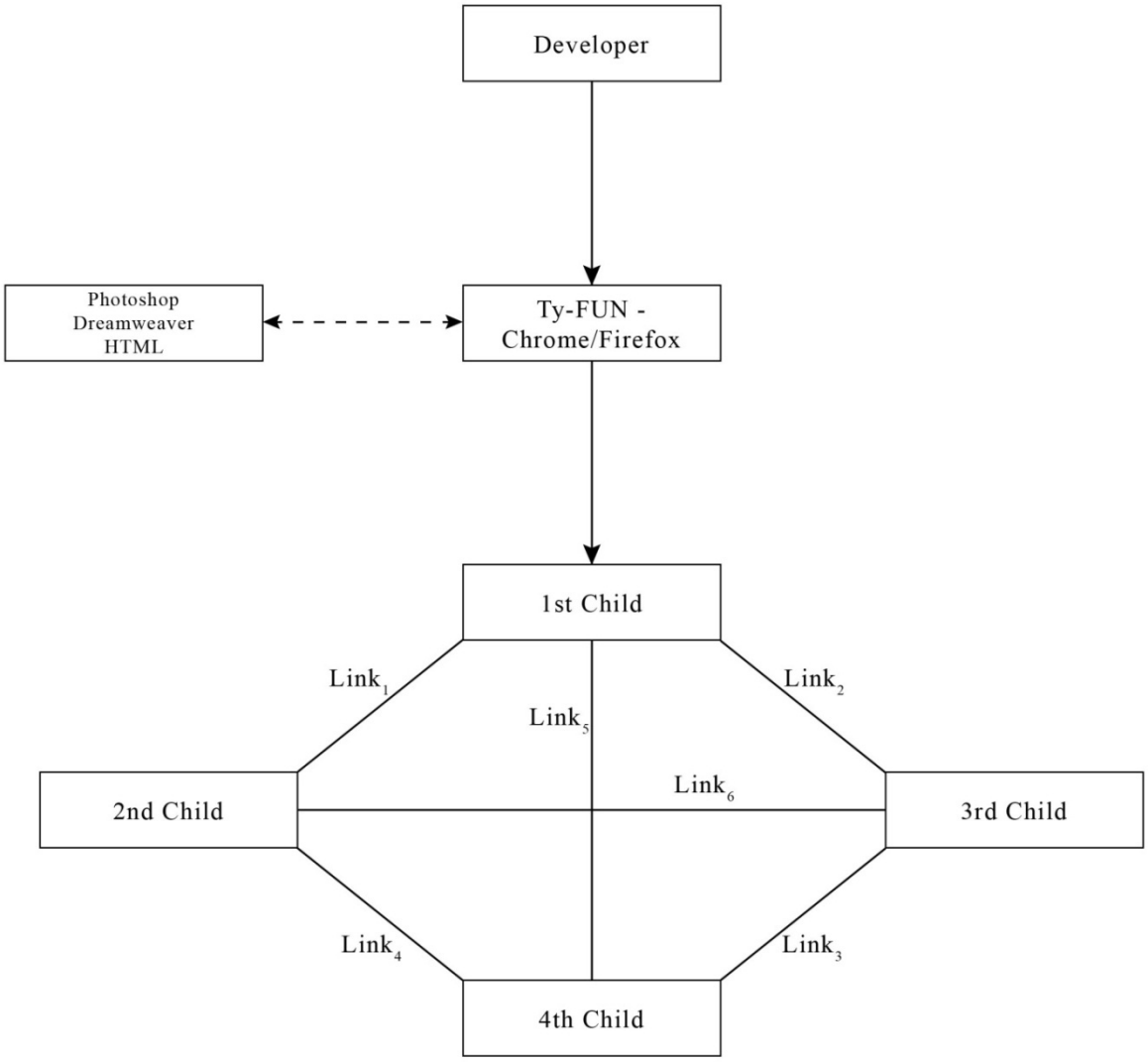

Figure 3 shows the last framework which is the Operational Framework. It is more specific than the Conceptual framework because the changed factor are replaced with more specific factor that can make the flow of the study easier.

The Developer did not change for there are no more specific name suitable for it. The Website is replaced by the title of the website itself which is ‘Ty-FUN’ website. The Browser is changed to different kinds of browser names such as Google Chrome and Mozilla Firefox. The study will choose two browsers applicable for the website because some computers have only one browser either Chrome or Firefox. The Software and Langauge are change into the different softwares to be used in the study such as Photoshop, Dreamweaver, and Hyper Text Mark-up Langauge(HTML). The said softwares can ba a noise to the study when the Developer experience difficulty using Photoshop and Dreamweaver, especially when it starts to malfunction. HTML is also a noise when the Developer is in the coding phase.

The Users are replaced with Child 1 to 4. The study’s target users are children in the age of 8 to 12. $Link_1$ to $Link_6$ did not change for there are no more specific name suitable for it.

CHAPTER IV. METHODOLOGY

The aim of the study is to develop a website to help the users know the importance of being prepared when typhoon occurs. To know the ways of how to present the website suitable for the users, the researcher will be selecting samples of the target users.

A. Research Methodology

Research Design and Methods

The researcher will be conducting a quantitative research method. Using the said method the researcher will get the users' opinions and feedbacks in order for the researcher to know what to place or what the users want to see in the website.

Variables and Measures

Age (variable)

Gender (variable)

Internet connection (variable)

Preference (variable)

8 – 12 years old (measure)

Both sexes (measure)

Has or has no internet connection (measure)

May prefer text, graphics or animation (measure)

Research Instruments

The research instrument of the study will be printed questionnaire for the survey. The questionnaire will be distributed to students and printed survey questionnaire will be more accessible to the respondents than using online survey. Using printed survey will also be easier for the researcher to get the questionnaire right after the respondents answered the questions.

Units of Analysis and Sampling

The unit of analysis of the study will be individuals. The target users of the website ranges from 8 to 12 years old and the researcher will choose thirty elementary students studying in St. Scholastica's college. The said school is near to the researcher and it will be convenient for the researcher to conduct the survey at the school. The researcher will be using purposive random sampling for the study for the said reason.

Data Gathering

The researcher will conduct the survey starting from September to November since between those months are most of the time the Philippines is experiencing typhoon landfalls. The researcher will collect once the respondents finish answering the questionnaires.

Data Analysis

The researcher will apply descriptive statistics to the data that the researcher will be gathering from the survey. The data and the answers for each question needed to be tabulated to get the percentage will be summed up by the researcher. The percentages of answers will help analyze and determine the interpretation of the result.

Scope and Limitations

The study will focus on storm safety and preparedness. The researcher will focus on relevant and important information to the website and will also focus on the result based from the survey to be conducted. The website, Ty-FUN, will be designed suitable for children ages 8 to 12 years old which will be colorful and more on graphics that the target users will appreciate.

The researcher will develop a website instead of a mobile application due to the researcher's lack of knowledge of making mobile application and only have skills of making a website. The researcher will use different kinds of software in making the website. Instead of using Adobe Illustrator, the researcher will be using Adobe Photoshop when making graphics for the website due to having more experience in Photoshop than in Illustrator. For the coding of Hyper Text Markup Language or HTML, the researcher will be using Adobe Dreamweaver instead of using a simple notepad for coding. Adobe Flash is the software

the researcher will use in terms of animation. As stated in the unit of analysis, the number of respondents in the study is only 30 student ages 8 to 12 years old.

B. Project Development Method

In making the website, there will be certain skills, hardware and software materials needed. A desktop computer or a personal laptop is needed as a workspace for the project to gather information and where the graphics, animations and coding will be processed. A flash drive or an external hard drive will also be important in storing back-up copies of files or data for the website. A use of pen tablet will help in order to illustrate or create design of the character and object for the animation.

Drawing skills are needed in order to illustrate the character, objects and the surroundings in the animation and also for the whole website. Artistic skills will help how to make the website pleasing to the eye of the users especially that the target users are children. Graphic editing or video editing will help in making the animations for the website.

As for the software, Experience in the following software will be needed: Adobe Photoshop, Adobe Dreamweaver, Adobe Flash, and Sony Vegas Pro or Adobe Premiere. Adobe Photoshop for editing of graphics. Adobe Dreamweaver for coding and web designing. Adobe Flash for the animation and Sony Vegas Pro and Adobe Premiere for video editing or video related process.

Basic information will be gathered by the researcher to put in the website, Ty-FUN. Basic information concerning typhoon, safety and preparedness tips from different sources and what to do before, during and after a typhoon occurs. After gathering information from different sources and adding the result from the survey, the researcher will focus on what should the output of the website will look like and polishing the content of the website that is suited for the target audience. The process of making the animation and the website will follow the result of the data gathering.

Lastly, checking and testing of the website will be need in order to see if there will be changes needed such as animation not working, disturbing combination of colors, layout of the website and typographical error.

References:

Bandyoppadhyay, S., Rao, A R., & Sinha, B. (2011). *Models for social networks with statistical applications*. USA: SAGE Publications, Inc.

Bloor, M. & Wood, F. (2006). *Social network analysis: SAGE research methods.* Retrieved February 27, 2015 from http://srmo.sagepub.com/view/keywords-in-qualitative methods/n84.xml

Bradley, A. (2010). *Handbook to practical disaster preparedness for the family*. USA: Arthur Bradley.

Brown, S. (2013). *The philippines is the most storm -exposed country on earth*. Retrieved from http://world.time.com/ 2013/11/11/the-philippines-is-the-most-storm-exposed-country-on earth/

Central Weather Bureau (n. d.). *Disaster caused by typhoon and its prevention: What disasters can typhoon cause?* Retrieved from http://www.cwb.gov.tw/V7e/knowledge /encyclopedia/ty023.htm

Dela Cruz, G. (2014). *Worst natural disasters in the philippines*. Retrieved from http://www.rappler.com/move-ph/issues/ disasters/64916-worst-natural-disasters-philippines

Duffy, M. (2000). *The Internet as a research and dissemination resource.* Retrieved from http://heapro.oxfordjournals.org /content/15/4/349.full

Earthquake Forecasting and Hazard Analysis (2009). *What is typhoon?* Retrieved from http://www.openhazards.com/faq /hurricanes-tropical-cyclones-and-typhoons/what-typhoon

Federation of Red Cross and Red Crescent Society (n.d). *Reducing risk*. Retrieved from http://www.ifrc.org/en/what-we do/disaster-management/preparing-for-disaster/risk-reduction

/reducing-disaster-risk/

Gretzel, U. (2001). *Social Network Analysis.* Retrieved February 27, 2015 from http://lrs.ed.uiuc.edu/tse-portal/analysis /social-network-analysis/

Markowsky, G. (2013). *Information theory*. Retrieved February 27, 2015 from http://www.britannica.com/EBchecked/topic /287907/information-theory

PAGASA (2014a). *Tropical cyclone: Classification of tropical cyclone*. Retrieved from http://pagasa.dost.gov.ph /learning-tools/tropical-cyclone-learning?showall=&start=4

PAGASA (2014b). *Philippine public storm warning signal*. Retrieved from http://pagasa.dost.gov.ph/learning-tools/public-storm -warning-signal

Philippine Daily Inquirer (2013). *In the know: Pagasa's public storm signals*. Retrieved from http://newsinfo.inquirer.net/521827 /in-the-know-pagasas-public-storm-signals

Philippine Red Cross (2013). *PRC gets ready for typhoon yolanda, issues survival tips.* Retrieved from http://www.redcross org.ph/press/news/item/517-prc-gets-ready-for-typhoon-yolanda-issues-survival-tips

Prell, C. (2011). *Social network analysis: History, theory and methodology*. London: SAGE Publications Ltd.

Reuters (2009). *Internet most popular information source*. Retrieved from http://www.reuters.com/article/2009/06/17 /us-media-internet-life-idUSTRE55G4XA20090617

Than, K. (2013). *What's a typhoon, anyway?* Retrieved from http://news.nationalgeographic.com/news/2013/11/131107 -typhoons-pacific-natural-disasters/

Varma, A. (2013). *Super typhoon yolanda survival tips: What to do before, during and after the impact*. Retrieved from www.ibtimes co.uk/yolanda-haiyan-typhoon-philippines-storm-520346

Weather Philippines (n. d.) *Typhoon preparedness guide*. Retrieved from http://weather.com.ph/typhoon/preparedness

Wingard, J. & Brändlin, A. (2013). *Philippines: A country prone to natural disasters*. Retrieved from http://www.dw.de/philippines-a-country-prone-to-natural-disasters/a-17217404