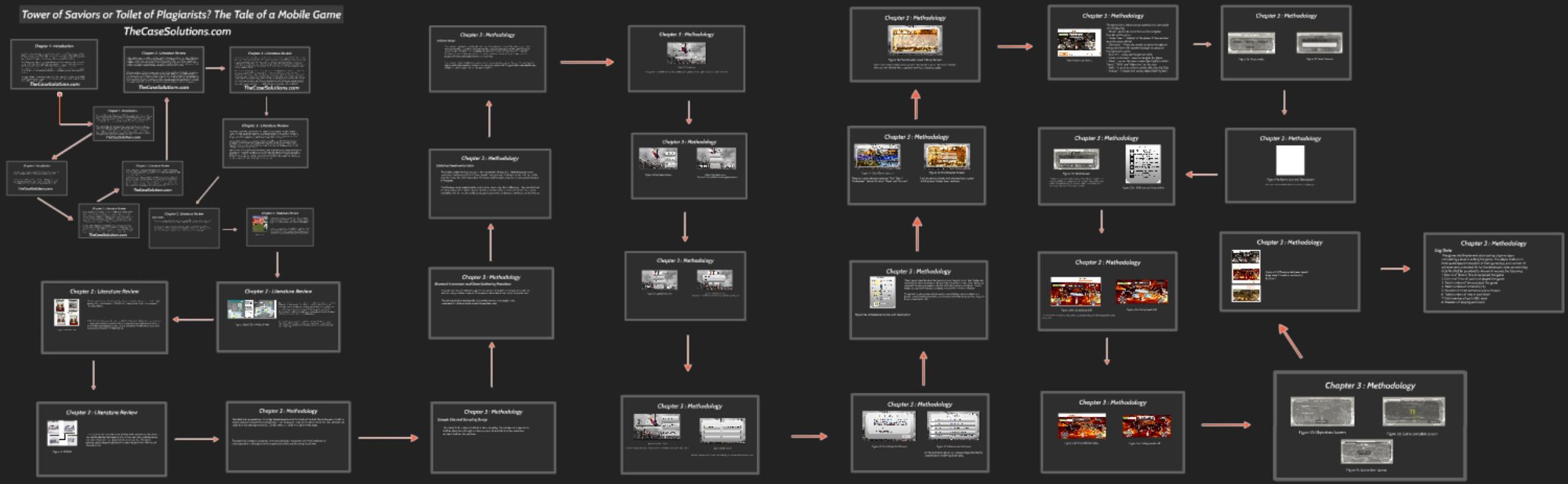
Tower of Saviors or Toilet of Plagiarists? The Tale of a Mobile Game
TheCaseSolutions.com
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Chapter 1 : Introduction

A natural disaster is a major adverse event resulting from natural processes of the Earth; examples include floods, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or property damage, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover (Bankoff et al., 2003).

The Philippines is no oblivious of these natural disasters. In fact, the country is an archipelago which is surrounded by bodies of water, which makes the country prone to tsunamis and storm surge. Also, being located along the Pacific "Ring of Fire" makes it more susceptible to earthquakes.

According to United States Geological Survey, on 2012, about 90% the world's earthquakes occur along the Ring of Fire. Also on the same survey, in 2013, about 81% of the world's largest earthquakes occur along the Ring of Fire.

According to Philippine Atmospheric, Geophysical and Astronomical Services Administration (2009), around 19 tropical cyclones or storms enter the Philippine Area of Responsibility in a typical year and of these usually 6 to 9 make landfall.

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This research is conceived to fulfill the gap which aims to develop a mobile game-based application to increase right decision making skill in natural disaster response. Furthermore, the research aims to contribute an alternative learning experience to existing programs related to disaster response.

Specifically, the research aims to answer the following question: (1) What are the profile of the respondents as to age and educational level (2) How do we manifest decision making of the respondents before and after using the software (3) Is there a significant difference in the decision making of the respondents before and after using the mobile game application?

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However, decisions made on a moral basis may have critical impacts on the societies. James Rest's in Lincoln (Lincoln, 2001) described that ethical decision making is a combination of four stages, including (a) Moral sensitivity (moral awareness) is aptitude to distinguish a moral issue in a situation. (b) Moral judgment is conveying and calculating moral reasoning when selecting possible solution on the moral problem. (c) Moral motivation (moral intention) is selecting a choice with high intention which representing a different value of moral decision. (d) Moral courage (moral action) is an ability respecting to a moral intention in personal act. However, process of making an ethical decision shall face to a failure if the decision maker did a failure at any step of these components.

Furthermore, Jones (Jones, 1991) explains six components of moral intensity influencing all stages of ethical decision making described by Rest's (Lincoln, 2001). These components are essential in the process of ethical decision making. (1) Magnitude of Consequence, which is defined as the sum of the harms (or benefits) affecting the victim by a moral act. (2) Social Consensus, which is defined as the degree of social agreement that a proposed act is ethical (or unethical). (3) Probability of Effect, which is defined as the probability of the harms or benefits caused by the act. (4) Temporal Immediacy, which is defined as a period between the ethical act and the effects of the action. (5) Proximity, which is defined as sense of closeness of social, cultural, psychological, or physical intimacy between the actor and victims. (6) Concentration of Effect, which is defined as the number of people affected by a given magnitude of harms or benefits.

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There are many researches that aim to utilize serious games in the domain of decision-making skills. For example, The Human Factors Integration Defence Technology Centre, Canfield University, UK, studied the system for training decision-making skill in the military using serious games on a PC (Carol-Daley et al., 2007). Serious games have been fostered in the education field for a long time, such as, in the domain of personal training in military, business and emergency. It is offer a situation with minimum cost that can impress learners to explore many choices in a virtual setting. PlayTrain, a virtual learning in second life environment, is a good example of training for management of disaster and emergency. Hewitt, Spencer, Mirliss, and Twal (2010) stated "virtual world can provide an engaging, learning-intensive alternative to face-to-face scenario exercises". Such game also delivers the direct advice affecting the learners can receive suggestion to change their action immediately (Carol-Daley, Harris, Ressel and Lowe 2007).

Game-based environment is a helpful and beneficial tool in enhancing the skills of an individual in various fields over the years. It is proven that using games the knowledge or skills learned and practiced in the environment are more likely to be retained in the memory and are automatized in applying on the real life situation. According to Gee (2003) as cited by Paraskeva, Mysirlaki & Papagianni (2009), Games seem to put the learner in the role of decision-maker, pushing players through a well-sequenced level of increasing difficulty, complexity, pace and even learning accomplished through trial and error. A discovery of the cognitive scientist in University of Rochester has strengthened the claim that playing video games trains people to make right decision faster (Green, S., et al., 2010). In the study of UR professor of brain and cognitive science Daphne Bavelier, C. Shawn Green, and Alexandre Pouget were able to determine that playing video games could be a great training tool for everyone to be a faster decision maker while having no unfavorable effect on accuracy. Researchers observed that during the test of group of non-players of video games ranging between 18-25 yrs old were able to develop a sharp sensitivity to what is going on around them and was able to improve in a variety of general skills in their daily activities after they have subjected under the study (Kaiser 2011).

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In the experimental study of Chuang and Chen (2009), they investigated the difference between the traditional computer-assisted instruction (CAI) and a computer-based video game. The developer created a text based instructional materials for CAI and a 3D game called Fire Department 2: Fire Captain for the computer-based video game. The result shows a major difference between CAI and computer based video game. Based on the outcome of the study, students playing video games improve the recall processes and stimulate problem-solving skills by identifying multiple solutions for problems.

Mobile technology on the other hand, has become common due to its affordability and availability (West-House et. al 2006 as cited by Baran E. 2014). Disaster volunteers can acquire non-technical skill regularly by using mobile-game based programs specialized for disaster management. It can be used not only during official class of disaster response training but also be played and practice in other places at all times. The steady rise of smartphones in the market makes it possible for everyone to practice their skill on disaster response everywhere they go.

There are numerous games that were designed as a simulation engine presenting some situation of emergency through serious game. In this system, they implemented real disaster data using techniques of geographical information system and dynamic modelling. Comprehensive trainings such as High Angle Rescue Technique, Jungle Rescue, Collapsed Structure Search and Rescue (CSSR) and Water Rescue (Sanubari 2009) were collaborated in one system. Prensky (2006) defined many genres that have the potential to support the learning of decision making skill. Based on his argument, the proposed game called Magnitude combines various genres that support learning these skills, including simulation, strategy, and role-playing.

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Related Studies

This section presents paradigms of successful systems being utilize in market, industry, school and etc., this describes the significant involvement of the mobile Game-Based on Natural Disaster Response.

One of the best parallel studies on disaster response is The Automated Remote Triage and Emergency Management Information System (ARTEMIS). This project shows the integration of a game-based simulations and prototype emergency response information system. As for SH McGrath & D. McGrath, ARTEMIS effectively demonstrates that emergency response can be combined with a game-based synthetic environment for experiments, exercises and studies (2003).

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Figure 1. ARTEMIS

ARTEMIS main goal is to provide a degree of medical situational awareness at all levels of commands that can speed up and improve the care of the wounded. The project is used to expand the medical information in the battlefield to the soldiers. It is also used to monitor the first responders and casualties in the civilian end. (McGrath, Grigg et al. 2003)

Also, in the research paper of Rumal and Van de Walle (2015), they have discussed how a summer school introduced a new approach of exercise on its participants who handles and deals with disaster management. Instead of using regular table-top scenarios to full-scale disaster simulations, they have deployed a game-based exercise that provides an effective emergency management to novice participants and experienced professionals.

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Based on the 2014 Emergency Events Database International (2014), in the country profile of the Philippines, in terms of casualties, typhoon Yolanda (Haiyan) caused massive devastation that killed 6,300 people. Typhoon Yolanda is one of the world's strongest and deadliest typhoons, prompting a rare public storm signal no. 4 in the Visayas. Also based on the same Disaster Database, one of the worst disaster occurrences in the Philippines in terms of casualties is the 1990 Luzon earthquake. With a magnitude of 7.8, it is considered as one of the strongest and most devastating earthquakes to hit the country. The 1990 tremor caused several buildings and hotels to collapse in the cities of Baguio, Dagupan and Cabanatuan –left 2,412 people dead.

Even the government and international institutions have implemented programs and studies to mitigate the number of casualties caused by natural disasters. Many researchers have recommended a number of development methods and game models for learning situated for disaster response. There is a study about the development of a holistic approach to disaster recovery operations and individual relationships (Coles and Zhuang, 2011). Another one is about the study on designing a mobile learning game that trains Basic Life Support and Cardiopulmonary Resuscitation (Schmitz et al., 2013). Further, there is also a study that develops a novel algorithm for rescue team coordination that embodies simulation of team coordination in disaster response settings (Ramchurn et al., 2014). However, there has not been a mobile game-based learning focused on improving ethical decision making skill in disaster response (Wahyudin et al., 2013).

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Decision making is define as a mental process which requires judgment of multiple options and selecting the most preferred alternative that will best fulfill a certain goal of the decision maker. The output of the procedure can be an action or an opinion of choice which makes the decision maker responsible for the consequences of the decision. (Bohanec 2009).

According to Withanaarachchi and Setunge (2014), The outcome of the decision changes depends on the complexity of the situation and may depends on the ability, character and approach of the decision maker on the certain situation. As they cited the works of Lahidji (2003), it is said that decision making differs between regular day decisions making to extreme-disaster-event such as natural weather events or even man-made disasters. During the disaster, each decision changes depending on the type of the events and its magnitude. In this situation, decision making must be flexible, responsive and capable of reacting to the unexpected in timely and effective manner.

During disaster response, Responders faced problems pertaining to social and humanitarian actions that many and frequently require them in selecting a choice between contrary options. Responders play an important role in triaging the victims of the catastrophe and ethical decision making must also be carefully consider in responding to a crisis situations. Ethical dilemma becomes a challenge to any situation faced by the crisis management team and to assist them in meeting this challenge, the ACA (American Counseling Association) ethics Committee has developed A Practitioner's Guide to Ethical Decision Making that tackles the guiding principles that are globally accepted in ethical decision making and a model that most professionals in any fields can utilize as they address ethical questions in their work (Forrester-Miller 1996).

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The decision making model consist of (1) Identify the problem. (2) Apply the ACA Code of Ethics. (3) Determine the nature and dimensions of the dilemma. (4) Generate potential courses of action. (5) Consider the potential consequences of all options, choose a course of action. (6) Evaluate the selected course of action. (7) Implement the course of action. According to Forrester-Miller and Davis (1996), there is seldom one right answer to a complex ethical dilemma. Nonetheless, following a systematic model can be assured to give a professional explanation of the action chosen.

The model shows the how the flow of decision making process should be but throughout the crisis situation itself, emergency response team often consider most of the three major events: Triage – identifying patients who can be saved; Allocation of resources, and Standards of care. Ethical principles include the Duty to maximize the greatest number of lives (utilitarianism), the Duty to do no harm (beneficence), the Duty to provide care to all – Justice. Triage has 2 components: 1) sorting patients and prioritizing their care based on the severity of their illnesses and 2) rationing resources to optimize their availability and direct them to the patients who are most likely to benefit from them. The primary goal of triage, as originally used in mass casualty incidents, was to do the greatest good for the greatest number. Resource limitations will force the emergency response team to decide how best to distribute the potentially life-saving care (Christian, Farmer & Young 2006).

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