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Ergonomically Designed and Developed “Go-Bag” For School Children: A Survival Kit

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Abstract

The study presents the design and development of emergency bag for school children. It has been noted that there is disaster awareness in most of us, as we saw and experienced several calamities occurred in the past few years. Several primary and secondary schools in the Philippines require their students to bring “Go-Bag” at the start of the semester and would be stored inside their classroom. “Go-Bag” is a term used for survival kit in which it contains items one would require to survive for the first seventy-two hours when evacuating from a disaster. The kit is a portable kit that was designed and developed using Engineering Tools and Techniques with inclusion of Ergonomics Principles. An actual product which is the “Go-Bag” was developed and presented in the paper.

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1. Introduction

The Philippines is one of the countries in the ASEAN region with the highest risk profile pertaining to disasters. Floods and storms were the most destructive among these courses of events, with an average of two (2) floods per year and seven (7) storms per year (both are very disastrous in scale). One of the most affected regions in the country would be Metro Manila and one of its cities is Quezon City. Quezon City has a total population of 3,085,786, 13.8% of this population would be pre-school and elementary school students (children and toddlers). There are efforts made by schools in the preparation in times of emergencies and disasters [1]. The problem here lies with the situation, where the children were considered helpless and dependent on these emergency situations.

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Many schools do not have guidelines in producing emergency kits or go bag for their students but guidelines in disaster preparedness such as earthquake drills and fire drills. This project aims to improve emergency survival kit into a disaster preparedness kit for children especially for grade school students ranging age 6 years old to 12 years old that could help them on these emergency situations, making them more reliable for themselves, aware and prepared on these kinds of events.

1.1 Project Objectives

This study aims to design a disaster preparedness kit or go bags for children at the age of 6 years old to 12 years old, to increase their chance of survival and improving their participation, awareness and preparedness on emergency situations. Specifically, the study aims to 1). Determine the objective, constraints, functions and specifications of the design, 2). Design a disaster preparedness kit using engineering tools and techniques such as house of quality and ergonomic principles for colour schemes, anthropometry and lifting loads. 3). Provide a prototype for the recommended disaster preparedness kit. 4). Evaluate the design using different design criteria (economic, environmental, safety & ergonomic factors). 5. Determine the best design according to this evaluation.

2. Design Inputs

The study considers the required items in the go bag survival kit [2,3] and analyze the volume of the load with respect to a child to carry the load. The recommended items inside the go bag are: 350 ml water, food: protein granola bar, crackers, identification card and medical information, whistle, flashlights, glow sticks, hand sanitizer or alcohol, betadine (antiseptic solution) adhesive strips, gauze bandage, dust masks. Approximately, all of these items will weigh around 1000 kilograms.

3. Project Development

The project development process is seen in Figure 1, the proponents identified the objectives, constraints, functions and specifications of the design by using House of Quality (HOQ). The second step is a designing a disaster preparedness kit using engineering tools and techniques, i.e. ergonomic principles (colour schemes, anthropometry and lifting load), and drawing illustrations. Taking the third step means providing a prototype for the recommended disaster preparedness kit, fourth is evaluating the design using different criteria (economic, environmental safety, and ergonomic factors) this part is the provision of manufacturing cost, considering of the life cycle and energy consumptions, safety factors of the materials and the lifting capacity of the product. Fifth is the last step in developing the project, it is the determining of the best design according to evaluations by basing on scores.

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