

# Development of a Gamified Application to Enhance Flood Disaster Education among Children and Youth.



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Disasters, whether natural or man-made, pose a serious threat to the security and well-being of people everywhere. One in every 100 years floods directly damage 23 percent of the world's population, or 1.81 billion people. Out of that 1.24 billion people live in South and East Asia, which 16% - 23% of them are Sri Lankans [1]. In Sri Lanka, flood-related losses and damages were over USD 2 billion between 1990 and 2018 [2]. It's critical to manage and prevent disasters using proactive strategies in order to reduce the possible hazards to people and infrastructure. As a result, it is impossible to overestimate the significance of disaster awareness as a preventative strategy for disaster management.

It is crucial to provide disaster education, especially in areas that are vulnerable to flooding [3],[4]. Since floods have the ability to seriously harm both persons and property, it is crucial to dis-

seminate information and draw lessons from the unfavorable experiences of past disasters. Since childhood education largely shapes people's perspectives, disaster education needs to start with basic education for the younger age [5]. "Gamification," or the application of game-like elements in non-gaming, real-world contexts like disasters, has gained popularity among vulnerable populations and schoolchildren as a cutting-edge method to improve disaster education [6]. At first, the main focus was on using board and dice games to improve public education about disasters. However, as technology has advanced, online game-based learning has recently become more prevalent in disaster education.

As a result, the study's main goal is to create a gamified application that will improve Sri Lankan schools' education on flood disasters. The gami-

fied application, "Disaster Defenders," is presently under development. Consequently, the game has constructed a fictional area along the river where the player can customize their ideal town to their exact specifications. Since flooding occurs frequently in the area, the town should be constructed with the least amount of harm to its residents in mind. There are seven building options available to the player, including trees and roadways. It is up to the player to decide whether or not to use the building options. The research team is shown in the pictures below leading a demo session with sixth-grade students at C.W.W. Kannangara Central College in Mathugama. This was done to serve as the primary case study for the game, which was created with Kalutara, Sri Lanka, as the flood footprint in mind.



Figure 1: Grade 6 children of C.W.W Kannangara Central College, Mathugama playing Disaster Defenders Game

In Sri Lanka, the curriculum presently incorporates disaster education, with a focus on children who are 12 years of age and older. As per the survey, children who are younger than 12 have not



Figure 2: Research Team of University of Moratuwa with Coordinators of C.W.W Kannangara Central College, Mathugama

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been adequately educated about disasters, unless they have learned it from news articles and other publicly available resources. If they're lucky, they might have attended a couple of the workshops that non-governmental organizations hosted. It is, nevertheless, incredibly rare and sporadic. Children under 12 may now research how susceptible they are to flood disasters thanks to this gamified

application. It was planned for a discussion with the ministry of education about incorporating the game into the curriculum to raise awareness of flood disasters after the gamified application was released. In terms of generating kids' curiosity about disaster prevention and encouraging them to take part in disaster prevention activities, the developed game seems to be quite promising.

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Article by

Rifat Mahamood, Nayomi Kankanamge, Chathura De Silva, Daneesha Ranasinghe, Nuwani Kangana  
Department of Town and Country Planning, Faculty of Architecture, University of Moratuwa, Sri Lanka