Construction of a Disaster Prevention Education System for High School Students Based on WebGIS

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Frequent occurrences of natural disasters in recent years have caused major personnel and property losses, like the Wenchuan Earthquake in China in 2008 and the Great East Japan Earthquake in 2011. Residents should understand local disaster risks in ordinary times and to determine their evacuation behavior during a disaster event based on their knowledge and available information. Young students are knowledgeable and will contribute to future disaster prevention. Hence, it is important to introduce disaster prevention into high school education such as geography. Fast developing and widely applied geographic information systems (GIS) should be introduced to high school teaching. This study aims to construct an online education system for disaster prevention using GIS technology along with hazard information including maps for Japan and China. It compares differences between the two countries in terms of disaster types, geologic hazards, terrain, and social factors, and explain all features in an easy-to-handle system using representations from digital elevation models (DEMs) and ArcGIS API for JavaScript. The proposed system based on virtual earth provides an intuitive reference for hazard assessment, and helps decision making of common people including non-scientists. It also utilizes 3D and 2D descriptions of actual disasters for students to understand the characteristics of disasters and some simulation technology for dynamically educating disaster prevention.

Keywords: WebGIS, Disaster prevention, 3D representation, High school education