

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

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- (1) **Motivation:** Frequent occurrences of natural disasters in recent years have caused major personnel and property losses. 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. Furthermore, young students are knowledgeable and will contribute to future disaster prevention (Yoshioka et al., 2016). Therefore, it is important to introduce disaster prevention into high school education such as courses of geography. This study aims to construct an online education system for disaster prevention using Geographic Information Systems (GIS) technology along with hazard information including maps for Japan and China. The system compares differences between the two countries in terms of terrain, and allows analysis of hazardous areas using hazard maps in an easy-to-handle application.
- (2) **Methodology:** First, we made a virtual application using the HTML language and JavaScript. Then the ArcGIS API for JavaScript was used to call base maps from the web site of ESRI and display some hazard information. Figure1 shows one of the pages in the application. Second, paper hazard maps (Figure2) and electronic hazard maps were compared and together used as samples for analysis. The questionnaire survey was designed to evaluate differences in the status of students before and after

the application. The constructed system was used by high school students at an event funded by the Japan Society for the Promotion of Science.

- (3) **Results:** The results of questionnaire surveys at that time were analyzed, and some positive aspects of the system for high school education were indicated.
- (4) **Future directions:** We will further improve the system considering requirements of students. For example, more disaster types and functions need to be added to the system.
- (5) **Data:** Map data for Japan were collected from the web sites of the Geospatial Information Authority of Japan, National Land Numerical Information and ESRI Japan. Map data for China were collected from the web site of ESRI and:
Some base maps from TIANDITU (www.tianditu.gov.cn);
30-m Digital Elevation Model (DEM) for Jilin Province from the Geospatial Data Cloud (www.gscloud.cn);
Population in 2015 from the Geographical Information Monitoring Cloud Platform;
Shelter data for Jilin City from the Jilin City Seismological Bureau.
- (6) **Reference:**
Yoshioka, M. (2016) Suggestions for support of geography education and concrete measures. Geographical Geography Education Study Group.

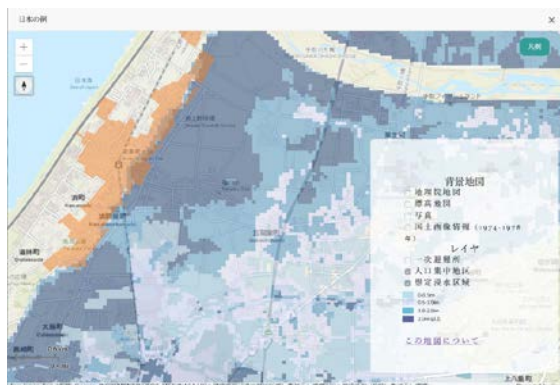


Figure 1: One of the pages in this application



Figure2: Example of paper hazard maps. © Hakusan city