Emergency Drill Using Online Visual System

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ABSTRACT

This paper reports the emergency drill using online visual system to build ability against unexpected situations between giant earthquake and tsunami. The emergency drill was held at Tokushima university, and the trainees was the teachers mainly at primary school and junior high school. They walked with the students in the video to a nearby hill to avoid danger. Some unexpected situations happened along the way in the video, and they had to make quick responses for reaching safe location. After experiment, trainees and trainer discussed whether the responses were appropriate.

1 Introduction

Almost all training against earthquake and tsunami, is simple-scenario-based training now, and does not provide training for actual disasters, especially when unexpected situations occur. The urgent issue is to train the ability of responding quickly and flexibly to unexpected situations.

Our group has developed a visual-disaster-generation and response-capacity-training online visual system, where the main system is located at Kagawa university and the local system is at Tokushima university as shown in Fig. 1 (hereafter, KT system) [1].

In addition, we have prepared scenarios to train the ability. Exactly speaking, KT system is very flexible and can switch the small scenario (hereafter, scene) during training duration by trainer’s intension easily [2].

2 Questionary before/after Emergency Drill.

We prepared questionary for trainees to answer before drill (Table 1) and after drill (Table 2). The purpose of questionary was to find out the change of mind by drill.

3 Emergency Drill

The emergency drill was conducted on the following order:

(1) Questionary before Drill
(2) Drill (exact drill part in emergency drill)
(3) Questionary after Drill
(4) Discussion

Two groups had the emergency drill, and each group consisted of five participants. Both groups were elementary and junior high school teachers in Tokushima city.

3.1 Questionary before Drill

Before the drill, we conducted questionary as shown on Table 1. Some representative answers were on Table 3.

Fig. 1 KT system
3.2 Drill

At first, trainer at Tokushima gave the opening address to share the background of emergency drill. After that, the trainer selected a scene, asked the operator at Kagawa to transfer the scene, described the current scene situation briefly to trainees, and prompted the trainees to act on what to do. For example, scene showed the classroom when earthquake occurred, the trainer asked trainee to act the best, and trainee considered and acted something.

After the scene, trainer selected next another scene from the prepared scenes according to his intention with reference to the trainee behavior. In addition, the trainer selected the viewpoint, zoom-in/out for the rendering if he/she wanted. Trainees were trained by the next scene.

After trainees were trained some scenes, the drill was finished.

The atmosphere of drill was depicted on Fig. 2.

3.3 Questionary after Drill and Discussion

After the drill, we conducted questionary as shown on Table 2. Some representative answers were on Table 4. In addition to that, trainer and trainees discussed the training. Some representative discussions were as follows.

- The drill provided specific disaster situations using video images to help the trainees think through specific responses. The responses were more specific comments after the drill than in the pre-drill questionnaire. We were able to provide support for considering concrete measures rather than vague measures.
- The drill was effective in that the trainees were able to recognize the trade-offs between time and safety in secondary evacuation. If an unexpected situation is encountered during evacuation, a detour may be taken to select a safer route. However, given the threat of a tsunami, they must evacuate to higher ground as quickly as possible. The trainees were able to experience both dilemmas through the drill.
4 Discussions
According to the discussion after drill and comparison of questionaries before and after the drill, we understood the following issues.

- The drill was effective in considering different situations in the event of an earthquake disaster.
- Map information should be presented to the trainees during the secondary evacuation. Although paper maps were presented during the drill, digital maps also would be effective. For example, the current location of evacuees and the estimated time of arrival of the tsunami can be displayed.
- Some schools have adopted tsunami evacuation policy that involves evacuation to the upper floors of school buildings. Vertical evacuation scenarios are also required.
- The challenges in implementing the drill at the school site include the size of screen equipment for displaying the images and the need to ensure a high-speed communication environment at the school. The current system sends three images on three screens, but it is conceivable to send images through a single projector.

5 Conclusions
In this paper, we reported the emergency drill using online visual system. The questionary and the discussion after drill revealed that this drill is effective in concretizing the disaster images and considering both evacuation time and safety in secondary evacuation.

Now, we are planning to update our system and scenes to become more effective drill to build ability against unexpected situations.

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References
Fig.2 Atmosphere of drill