

Developing educational materials for simulating dilemmas in flood evacuation and its evaluation by the Typhoon No.19

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Large scale disasters related to human life such as storm and flood damage by guerrilla rainstorm and enormous typhoon, etc. occur frequently. Unlike earthquake disasters, storm and flood disasters can be predicted to some extent, but there are some cases observed in which evacuation is delayed as a result of waiting for further information.

The demand for disaster prevention education materials which can be coped with such situations increases, and teaching materials on the theme of the evacuation dilemma from the flood disaster was made three years ago, and they are practiced in various places. At present, in this educational material, there are two patterns for elementary school students and one pattern for junior high school students and university students, but the basic concept is the same, and it simulates the difficulty in deciding the timing of evacuation. Teaching materials for elementary and junior high school students are practiced in elementary schools in Nagano, Ehime, Kochi, and Saitama Prefectures, and in junior high schools in Saitama Prefecture. Here we will explain the elementary school version of the educational materials. Teaching materials are developed like picture-story shows. The story begins when four primary school children are playing in the park when it starts raining and they move to their home. At home, when the 4 children are playing games, they notice that warning level 4 has been announced in the upstream of xx river (Include the names of nearby rivers) from TV and warning level 3 has been announced in the area of this 4 children. However, there has been no major change outside the window, and no one has been evacuated. At the same time, this material asks the children in the classroom, "If you were in this situation, would you evacuate now?". Who answered "yes", evacuees will be asked to move to 'shelter' which is installed in the classroom or at the back of gymnasiums, while students who do not evacuate will be asked to stay where they are.

Even after that, the situation of the main characters in the teaching material changed from moment to moment, and the warning level of the area was raised to level 4, and the neighbors who evacuated in the heavy rain started to be seen from the window. Once again, children in the classroom are asked whether they want to evacuate or not, and only those who want to evacuate move to 'shelter'. In the story of the teaching material, the rain gets heavier and heavier, and the house had blackout.

Three cases are presented to children about the ending of the story. The first case is to greet the next morning without any incident. The second case is to be flooded above floor level, and the final case is to be flooded up to the second floor and wait for rescue. After showing all of these different cases, this teaching material will tell the children in the classroom that "No one knows which of these three endings will come to you in a real life situation. If you can go back in time, when do you want to evacuate?" and then go back to the beginning of the story of the material once again and ask each person, when would they want to go to the 'shelter'.

In class, whenever a decision is made whether or not to evacuate, students are asked "Why did you evacuate?" and "Why did we decide not to evacuate?". Some student say that the reason for their evacuation was "I thought the sooner the better." but as far as we can see, they seem to have moved to 'shelter' following the evacuation of someone else, and thus there are few children who can clearly state the reason why they choose to evacuate. On the other hand, children who did not evacuate seem to be clear about the reasons such as "the evacuation route may be flooded" "My parents might come back." and "found evacuating choice rather dangerous than remaining at the same place".

Some of the school districts which carried out this teaching material were damaged by the typhoon No.19 in 2019, and the effect of the teaching material was unexpectedly majored. Especially, in the elementary school in Nagano prefecture, the parents also experienced this teaching material, since it was carried out on the class observation day. Also, the communication with us is still continued, even if the positioning as a disaster prevention education model school is finished. In this district, although inundation above floor level did not occur, but an evacuation order was finally issued, and both parents and children at that time experienced the same dilemma as the main character of this teaching material. In this presentation, we report what was effective about the educational material, and what was insufficient for the actual evacuation, based on the interviews carried out to the parents in the region.

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