Analysis of accidents from human factors in elementary school

Shuntaro KASHIMURA (Graduate School of Nihon University), Takashi TORIIZUKA (Nihon University)

Abstract
Many accidents occur every year in the elementary school. Every time accidents occur at elementary school, surveys and analysis are carried out. However, quantitatively analysis alone is insufficient to take accident measures. Because only superficial gain sufficient information from. In order to take concrete measures of accidents, qualitative analysis that can extract factors lurk behind the accident is necessary. In this research, accident analysis of elementary school was carried out using human factor analysis method as a method to extract to the behind factors of accident. As a result, it became clear that the characteristics of the surrounding situation and environmental factors greatly affect the students' internal factors, thereby inducing errors. By coping with clear factors, we can reduce student accidents at elementary school.

Keywords: Elementary school, school accident, Human error, PSF

1. Introduction
Many accidents occur each year in the elementary school. Analysis will be done each time an accident occurs. However, the center of the accident analysis of the current elementary school is the occurrence number of accidents, probability of occurrence, etc. In these analyzes, you can understand the surface information such as the general situation of the accident, but you cannot know the factor that influenced the accident, that is, the background factor. To clarify behind factors is important for planning measures. Accidents can be reduced if appropriate countermeasures are taken against the extracted behind factors. For that purpose, it is desirable to use a method to comprehensively extract background factors from the direct cause of the accident.

Based on these goals, the purpose of this research is to clarify what type of accident occurred and what kind of factor occurred.

2. Elementary school accidents
An example of an elementary school accident is summarized and announced as "Disaster under the control of the school" of the Japan Sports Council. Cases are summarized on a time basis, and each student error behavior and factors are not summarized. Therefore, when taking measures, it is essential to deal with each case.

It is concretely summarized as shown in Table 1.

3. Object
Collect cases of "Disaster under the control of the school" and cover cases where 301 deaths and aftereffects from 2010 to 2012 remain. However, in schools where teachers' eyes hard to reach, 27 accidents are excluded from the target. In this research, cases that occurred in places managed by faculty are the subjects. 10 cases suddenly died. This time it is not included this time because it is necessary to analyze sudden death from another viewpoint this time. The remaining 264 cases were targeted.

Table 1. School accident case (2012)

| School lunch (Suffocation)                                                                 |
| Lunch in the classroom. I ate the quail eggs for cooking. I drank eggs without chewing.   |
| During class (Disgusting disorder)                                                         |
| Dodgeball at the gym. I chase the ball which was rolling on the door of the gymnasium.    |
| The moment I lifted my face, my forehead hit the door. I got bloodshed from my face.       |

4. How to analyze data
In this study, analyzed the causes of accidents occurred in elementary school based on the mechanism of accident occurrence as shown in Fig.1.

5. Case analysis
In analyzing accidents in elementary school, ① what kind of accident happened, ② classification of whether the accident was due to the action of the accident party, the behavior of others, or the surrounding environment. ③ Parties and other acts are classified according to the intention or not. If it is intentional, it is classified as adventurous act or rule violation. If it is not intentional, classify it based on
6. Result

As a basic content, I analyzed what kind of student's mistakes caused an accident in elementary school. The results are shown in Fig.3. The most frequent errors were 74 (30%) for action error, followed by Unnoticed and Risky Attempt 48 (19%), both intended were 21 (8%).

7. Background factor analysis

Analysis was made from the behind factors shown in Table 2 on the factors behind the errors of the student analyzed in the previous chapter and how they are affecting. The results are shown in Table 3. Here, it is assumed that the ◎ is 20% or more, ◯ is 10% or more, and Δ is 5% or more.

Based on the results, the Personality and Mental status of the parties and other student have greatly influenced all error behavior. These factors are thought to be greatly affected by the physical and mental development of the student. Also, due to the influence of circumstance characteristics and surrounding environment, it can be said that it is necessary to prepare the environment surrounding student and surroundings and the surroundings of the physical environment.

8. Conclusion and subject

In this research, we clarified what kind of abnormality occurred in student accident at elementary school, what is behind it. As a result, it turned out that the characteristics and environmental factors of the surrounding situation had a great influence on the internal factors of the students. Accidents have been triggered by being influenced by these factors. These factors cannot be dealt with just safety guidance and safety education alone. Teachers need to deal with factors that students cannot deal with, but measures are also needed to ensure that students can recognize these factors. We need to incorporate the human factor perspective into safety education so that students themselves can recognize the danger.

Further consideration will be needed to yield any findings about in order to prevent accidents that children cannot respond in the future, I would like to consider how the teacher actually finds such situation and can deal with it.