



Title	Practical Disaster Preparedness Education through the “Do-HUG” Shelter Management Game : A Case Study from Noboribetsu City, Hokkaido
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Description	本報告は、2025年度に北海道登別市で実施された「Do-HUG（避難所運営ゲーム北海道版）」を活用した防災教育の実践について、その背景、過程、及び成果を考察し報告する。このゲームは、真冬の大地震で避難所を運営する状況を想定し、カードに書かれた多様な課題についてチームで議論しながら解決していく防災教育ゲームである。本取り組みでは、計 3 回にわたって実施され、第 1. 第 2 回は日本工学院北海道専門学校公務員科 1 年生を対象に、第 3 回は地元 の小学生を対象に、1DAY 防災キャンプの一環として行われた。登別市の専門学生と小学生が参加し、Do-HUG を使用し避難所運営を疑似体験することを通じて、災害対応に必要な判断力や協働の重要性を学ぶとともに、世代を超えた学び合いの可能性を探った。実践後には、登別市防災課対策官による講評や、各チームの成果を共有する振り返りを行い、より実践的で多角的な学びの促進を図った。Do-HUG の教育的効果と課題を整理し、寒冷地特有の避難所運営における課題解決への応用可能性を考察する。さらに、教育機関と自治体が連携し、地域特性に根ざした防災教育や「理想的な避難所空間」デザインへの展開の可能性が期待される。また、厳冬期の災害発生が懸念される中、寒冷な気候風土を踏まえた疑似体験型の学びの機会は極めて重要であり、寒冷地における防災意識の向上に大きく寄与するものである。
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Practical Disaster Preparedness Education through the “Do-HUG” Shelter Management Game: A Case Study from Noboribetsu City, Hokkaido

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Abstract

This paper reports and discusses the background, process, and outcomes of a disaster preparedness education initiative conducted in Noboribetsu City, Hokkaido, in 2025, using the Do-HUG Hokkaido version shelter management game. The practice involved both vocational college students and elementary school students who participated in simulated shelter management exercises. Through this experience, participants developed an understanding of the importance of decision-making and collaboration in disaster response, while exploring the potential of intergenerational learning. This paper discusses the educational effects and challenges of the Do-HUG program and explores its applicability to addressing issues specific to shelter management in cold regions. Furthermore, it highlights the potential for collaboration between educational institutions and local governments to promote disaster education and to design ideal evacuation shelters that reflect regional characteristics.

Key words: Hokkaido, Noboribetsu City, Disaster Preparedness Education, Do-HUG, Shelter management game

1. Introduction

In recent years, the frequent occurrence of natural disasters across Japan has brought to light significant challenges in the maintenance and management of evacuation shelters. In particular, ensuring privacy, maintaining sanitation, and facilitating rapid information sharing have become essential components of shelter operations that must accommodate the diverse needs of evacuees. Furthermore, in cold regions such as Hokkaido, there are unique and serious challenges arising from geographical and climatic conditions, including the risk of hypothermia during winter evacuations, insufficient heating facilities, and mobility difficulties caused by heavy snowfall.

This paper presents a disaster preparedness education practice conducted in Noboribetsu City, Hokkaido, using the Do-HUG Shelter Management Game Hokkaido Version 2025. The practice engaged both vocational college students and elementary school students in experiential learning activities designed to simulate shelter management during disasters. The author participated as an instructor, aiming to foster disaster awareness through intergenerational collaboration and to promote understanding of essential considerations in shelter operations. Building on the insights and reflections gained from this practice, future efforts will explore the potential to develop community-driven designs for ideal evacuation shelters that reflect regional characteristics and encourage the active participation of local residents.

2. Overview of the Practice

2.1 Noboribetsu city's geographic risks and disaster preparedness

Noboribetsu city is located in southwestern Hokkaido, with its southern boundary facing a long stretch of the Pacific Ocean. A defining geographical feature of the city is that its central urban functions including the city hall, major railway stations, and residential areas are concentrated on low-lying coastal plains.

Due to these geographical conditions, the city is expected to suffer catastrophic tsunami damage in the event of a massive earthquake along the Kuril Trench. Specifically, tsunami waves as high as 12 meters are predicted to reach the coast within approximately 40 minutes after the earthquake occurs (Hokkaido Government, 2022).

In light of these risks, Noboribetsu city conducts comprehensive disaster prevention drills twice a year, in both summer and winter season (City of Noboribetsu, 2025). In addition, the city actively hosts disaster management seminars for local neighborhood associations to enhance residents' disaster preparedness and strengthen community resilience. In 2024, a total of 30 training sessions were conducted, with an accumulated participation of 1,810 people (City of Noboribetsu, 2025).

2.2 Do-HUG (Shelter Management Game)

The Do-HUG (Pic.1) is a card-based disaster education tool adapted from the original shelter management game developed in Shizuoka Prefecture in 2007 (Shizuoka Prefecture, 2024). It has been modified to address the specific conditions of Hokkaido, such as severe cold

weather, heavy snowfall, and infection control measures. Participants discuss how to prioritize responses and arrange spaces based on cards that describe residents' attributes and various incidents that may occur in a shelter. Through this process, they develop a deeper understanding of the challenges and necessary considerations in shelter management.

The Do-HUG educational kit is available for free rental through the Crisis Management Offices of each regional development bureau in Hokkaido. In addition, instructor training workshops for Do-HUG facilitators are held regularly.



Pic.1 Do-HUG (Shelter Management Game) Kit
Photo source: Hokkaido Government

2.3 Participants and their roles

This practice was conducted in collaboration with Nippon Engineering College of Hokkaido and a local elementary school in Noboribetsu city. The participants included 26 first-year students from the Public Service Course. This two-year course is designed for students aspiring to careers in the public sector, such as national and local government officials, firefighters, and police officers.

The Do-HUG practice was implemented as part of the Public Affairs Practice I class. In this class, students deepen their understanding of disaster management through lectures by municipal officials, study of disaster-related laws and systems, and team-based inquiry projects. Each team selects its own theme related to disaster response and engages in practical learning throughout the course. As a final project, the students planned and conducted a one-day disaster preparedness camp for elementary school student (City of Noboribetsu, 2025) and prepared a policy proposal report based on their learning outcomes.

In this practice, the first stage involved vocational students using Do-HUG to simulate shelter management and learn the basic principles of disaster response. In the second stage, the students took on leadership roles and conducted the Do-HUG program for elementary school pupils, facilitating intergenerational collaboration and hands-on disaster preparedness learning.

3. Implementation and Key Approaches

In this practice, several instructional and organizational strategies were introduced to ensure smooth

collaboration between vocational college students and elementary school pupils of different age groups.

For the vocational college students, the Do-HUG simulation was conducted over two class sessions.

The first session (July 1, 2025) aimed to familiarize the students with the materials. Each team engaged in the activity while focusing on their assigned disaster-related research theme (e.g., “support for children in shelters,” “information sharing,” or “comfort in shelters”). A total of six teams were formed, each consisting of four to five students. (Pic.2~3)

The assumed scenario for Do-HUG was a large inland earthquake occurring on a winter Sunday afternoon in Hokkaido, under the condition that an elementary school would serve as an evacuation shelter. Many students were originally from outside Noboribetsu city or even outside Hokkaido, and some were therefore unfamiliar with the local geography and disaster management context of the area.

Do-HUG is a simulation-based game that requires participants to make complex decisions in situations without clear answers. During the exercise, students recorded points of confusion or difficulty on worksheets while exchanging ideas within their teams. Many struggled particularly with issues such as securing space for infected evacuees, accepting pets, and providing care for infants. After the game, the students received feedback from Mr. Miyabayashi, Disaster Management Officer of the Noboribetsu City Crisis Management Division, who explained actual disaster response decisions based on real-world examples (Pic.4). This process provided a valuable opportunity for students to connect their learning through the simulation with real-life disaster management practices.

The second session (July 8, 2025) focused on preparing students to take a leadership role when facilitating the game for elementary school pupils. Having already learned the rules, flow, and key decision points during the first session, the students were able to conduct the second session more smoothly. Within each team, students discussed the placement of evacuee cards carefully, working toward consensus while considering multiple perspectives. The students in leadership roles were observed actively synthesizing team opinions and encouraging further discussion



Pic.2 Do-HUG practice with vocational college student



Pic.3 Completed evacuation shelter layout by student



Pic.4 Comments by Mr. Miyabayashi, the Disaster Management Officer of Noboribetsu City.

The Do-HUG activity for elementary school pupils was conducted as part of a one-day disaster preparedness camp held on August 22, 2025 (Pic.5).

In this session, the vocational college students served as team leaders, facilitating gameplay and encouraging discussion among the children. Eight students from three elementary schools in Noboribetsu city participated and were divided into 6 teams. To make the game more accessible and engaging for the younger participants, visual aids such as miniature figures and toy cars were used to represent evacuees, helping children better visualize the shelter layout (Pic.6~7). During the activity, the vocational students explained difficult terms and complex situations in simplified language to support the



Pic.5 Do-HUG with elementary school student

pupils' understanding. After the activity, a reflection session was held in which each group presented and compared their shelter layouts, discussing differences and creative approaches among the teams. This process encouraged participants to reflect objectively on their own plans and gain a multifaceted understanding through exposure to others' ideas.



Pic.6 Using toy cars to visualize shelter layouts for elementary school student



Pic.7 Completed evacuation shelter layout by elementary school student

4. Results and Discussion

Through this practice, both the vocational college students and the elementary school students demonstrated clear learning outcomes and growth. The vocational students grasped the rules and facilitation methods of Do-HUG over the course of two sessions. By serving as leaders, they contributed to the smooth progression of activities and the creation of a supportive environment during their collaboration with the children. For these students, the experience of communicating disaster prevention knowledge alongside their practical understanding is thought to have fostered a sense of responsibility and self-awareness as future disaster management practitioners. Notably, it provided them with an opportunity to realize the difficulty of making decisions in situations without clear answers and the importance of flexible responsiveness.

Although the program was initially intended for upper-grade elementary students, the scope was expanded due to interest from lower-grade elementary student. The

activities varied by grade level: younger children utilized dolls and toys to arrange the space with free imagination, while older students used sticky notes and colored pencils to map out pathways and flow lines based on card prompts. Furthermore, prior experiences such as the exhibition of cardboard tents and makeshift toilets, disaster prevention quizzes, and evacuation drills helped children form concrete mental images, encouraging them to consider real-life scenarios during the Do-HUG activity. These preliminary learning sessions served as a foundation for deeper engagement. Additionally, the fact that many participating children already possessed a high interest in and basic knowledge of disaster prevention, thanks to regular evacuation drills and education in Noboribetsu city, significantly supported the smooth implementation of the activities.

5. Challenges and Future Prospects

This practice revealed several challenges, including the limitation of time and the need for more individualized support according to each participant's grade level and level of understanding.

In particular, while visual aids proved effective for lower-grade elementary student, the progress of the activity often required additional time, indicating the necessity of adapting teaching materials and facilitation methods to different ages and knowledge levels. Some of the scenarios presented in Do-HUG also required a basic understanding of disaster preparedness, which made it difficult for participants without prior knowledge to respond appropriately. Therefore, it is desirable to provide participants with a certain level of disaster-related knowledge in advance.

In the future, it will be necessary to introduce academic evaluation methods, such as post-activity questionnaires, to objectively assess the educational impact of the program. Furthermore, based on the insights gained through Do-HUG, there is potential to expand this initiative into community-led discussions and designs of ideal evacuation shelter spaces.

By combining the perspectives of vocational college students, the creativity of elementary pupils, and the expertise of disaster management professionals, this approach may contribute to developing realistic and empathetic shelters that meet community needs.

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Summary in Japanese

北海道登別市における避難所運営ゲーム「Do はぐ」を活用した防災教育の実践

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本報告は、2025 年度に北海道登別市で実施された「Do-HUG (避難所運営ゲーム北海道版)」を活用した防災教育の実践について、その背景、過程、及び成果を考察し報告する。このゲームは、真冬の大地震で避難所を運営する状況を想定し、カードに書かれた多様な課題についてチームで議論しながら解決していく防災教育ゲームである。本取り組みでは、計3回にわたって実施され、第1・第2回は日本工学院北海道専門学校公務員科1年生を対象に、第3回は地元の小学生を対象に、1DAY 防災キャンプの一環として行われた。登別市の専門学生と小学生が参加し、Do-HUG を使用し避難所運営を疑似体験することを通じて、災害対応に必要な判断力や協働の重要性を学ぶとともに、世代を超えた学び合いの可能性を探った。実践後には、登別市防災課対策官による講評や、各チームの成果を共有する振り返りを行い、より実践的で多角的な学びの促進を図った。Do-HUG の教育的効果と課題を整理し、寒冷地特有の避難所運営における課題解決への応用可能性を考察する。さらに、教育機関と自治体が連携し、地域特性に根ざした防災教育や「理想的な避難所空間」デザインへの展開の可能性が期待される。また、厳冬の災害発生が懸念される中、寒冷な気候風土を踏まえた疑似体験型の学びの機会は極めて重要であり、寒冷地における防災意識の向上に大きく寄与するものである。

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