Implementation and Evaluation of the On-site Training Program Bura Hase Aimed at Developing Young Engineers

Yui Noichi[1*], Shuichi Hasegawa[2], and Junji Uchida[1]

[1]West Nippon Expressway Engineering Shikoku Co. Ltd
[2]Institute of Education, Research and Regional Cooperation for Crisis Management Shikoku, Kagawa University

(*Corresponding E-mail: yui64513@gmail.com)

Abstract: Various training programs have been conducted at the company with the aim of developing young engineers. However, conventional programs were primarily lecture-based, and participants often expressed negative opinions such as "not interesting," "sleep-inducing," and "difficult to understand." To address these issues, a new training format incorporating active learning elements was developed, combining on-site fieldwork with group discussions. This program, named Bura Hase, was designed and implemented as an on-site training program. This paper reports on the implementation and educational effects of Bura Hase, conducted to promote more effective development of young engineers.

Keywords: ***Development of young engineers, On-site training program, Bura Hase.***

Introduction

The company has implemented various training programs for the purpose of developing young engineers. However, since the previous programs were mostly lecture-based, participants often expressed dissatisfaction such as "not interesting," "sleepy," or "hard to understand." Therefore, as a new form of training incorporating active learning elements, an on-site and group work–based program called Bura Hase was designed and implemented. This paper describes the implementation of Bura Hase, an on-site training program aimed at fostering more effective development of young engineers and evaluates its educational impact.

Concept of the Training Program Bura Hase

The name Bura Hase was inspired by the popular NHK program Bura Tamori. It has been conducted once or twice a year since 2019 as an on-site field training program focused on learning topography and geology in the field. The program targets young engineers with up to ten years of experience, and twelve sessions have been conducted so far.

The instructor is Professor Hasegawa of Kagawa University, who serves as the company's advisor and has appeared four times as a guide on Bura Tamori. Bura Hase applies the program-making methods of Bura Tamori to field training in the form of a "geo-tour," which has been well received. The training follows a structured process for identifying and solving problems as outlined below.

1. Lecture (Teach): Provide the basic knowledge necessary to solve the assigned problems. The key is not to give away the solutions at this stage.
2. Fieldwork (Motivate): Since the participants are practitioners engaged in highway construction and maintenance, the fieldwork is designed to be relevant and motivating. The aim is to cultivate habits of questioning, forming hypotheses, and develop solutions through direct observation in the field.
3. Group Work (Facilitate): Support team-based problem solving and promote the "Four Cs" of 21st-century skills—Critical Thinking, Communication, Collaboration, and Creativity—through cooperative work and presentations.
4. Review and Coaching (Coach): Encourage participants to continue improving their skills through their daily work. The overall emphasis is on learning in an enjoyable manner and adopting a coaching style that participants will want to use when mentoring their juniors.

Program Design and Implementation

Selection of Field Sites and Themes

The fieldwork component of Bura Hase is conducted at sites along expressways in Shikoku where construction or maintenance issues have occurred. Because these highways run parallel to or intersect the Median Tectonic Line, Japan's most prominent fault zone, they provide rich examples of geotechnical challenges related to this major structure. Consequently, each training theme focuses mainly on landslides, examining predisposing and triggering factors based on topography and geology, and considering appropriate countermeasures and construction methods.

Training Schedule and Content

The program consists of two days (Table 1). On the first day, participants attend a foundational lecture followed by fieldwork. On the second day, they engage in group work and review sessions.

The lecture content is designed to be understandable even for participants who do not usually work with earthworks and cover basic knowledge of the Median Tectonic Line and related geology. Visual comprehension is enhanced using the Red Relief Image Map. After forming hypotheses regarding the assigned problem, participants take part in fieldwork (Figure 1), where they observe actual landforms and discuss solutions under the instructor's guidance.

Although not included in the official itinerary, a banquet is held on the first evening to foster team cohesion for the next day's group work and to provide an opportunity for informal consultation about daily work-related concerns. On the second day, participants share diverse perspectives through discussions and presentations, receiving feedback from the instructor. The program concludes with a review session reflecting on the two-day activities (Figure 2).

Table 1, Training schedule of Bura Hase.

Itinerary	Time	Content
Day 1	10:00 a.m.-12:00 p.m.	Basic lecture
	1:00 p.m.-5:00 p.m.	On-site training
Day 2	9:00 a.m.-10:30 a.m.	Group work
	10:30 a.m.-12:00 p.m.	Review

Figure 1, Fieldwork activities during the Bura Hase training.

Figure 2, Presentations after group work.

Evaluation and Educational Effects

Based on the questionnaire results, Bura Hase received significantly higher evaluations compared with traditional lecture-based programs. Participants reported that "learning on-site with real objects made it easier to understand," "thinking and presenting by oneself deepened understanding," and "group work allowed learning from multiple perspectives" (Figure 3 and 4). These positive responses quantitatively and qualitatively demonstrate the educational effectiveness of the program.

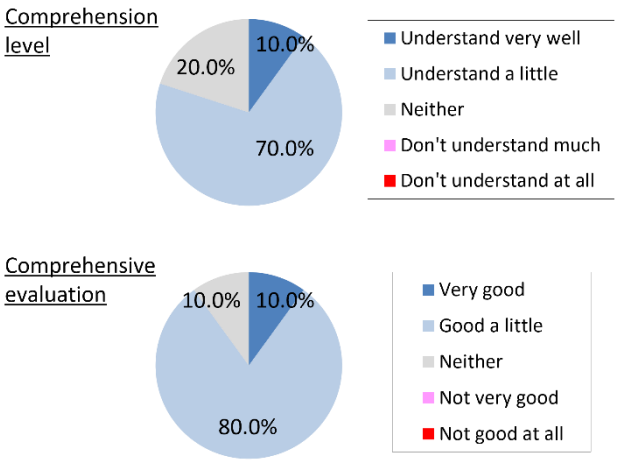

Figure 3, Excerpt for questionnaire results of lecture-based training.

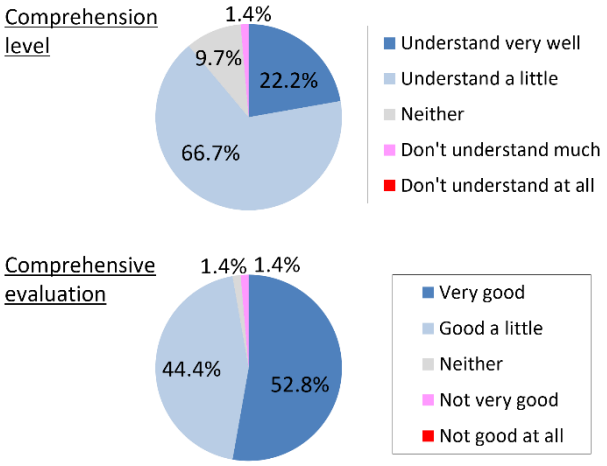

Figure 4, Excerpt for questionnaire results of on-site training.

Conclusion and Future Outlook

The Bura Hase program has achieved positive outcomes in line with its objective of developing young engineers. However, the questionnaire results showed that the "level of understanding" was slightly lower than the others. Future efforts will focus on further improving comprehension and strengthening technical knowledge transfer and human resource development.

Acknowledgement

We thank those who cooperated with Bera Hase seminar.