

Three-Stage Design of a Question-Making Activity for Preparation in a Blended Training Program

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Abstract In this paper, we discuss improvements made and their effect on the design of pre-training preparation in a blended instructional design (ID) workshop. Through practice research, the design was refined to comprise three stages of a question-making activity for pre-training preparation: 1) submitting questions during the application process for the ID workshop, 2) completing an assignment on how to use the ID model in participants' educational situations, 3) reflecting on the questions submitted during the first phase and resubmitting questions at the end of the pre-training preparation. As a result of the effect verification, this design is shown to encourage motivation for learning in such areas as participants' confidence, satisfaction, and familiarity with learning content.

Keywords: Question-making activity, Pre-training preparation, Blended learning

Background

Kumamoto University has held a blended training program of instructional design called "Introductory Class of Instructional Design (ID workshop)" since 2015 as a part of lifelong learning activities. The ID workshop consisted of a preparation phase of one month (online), a face-to-face, one-day program, and one month of a post-learning (online) phase.

In order to meet the needs each participant had, we introduced a task to create questions for lecturers as part of the application process for the ID workshop as a pre-training preparation. Then, in the face-to-face workshop, the lecturer answered the questions that had been submitted by the participants. This Q&A activity received positive evaluation from participants as they were motivated to learn (Amano

et al., 2016). However, there were some challenges in designing this aspect of the ID workshop. First, although the ID workshop consisted mainly of this Q&A activity, the percentage of those who wrote questions at the time of the application for the ID workshop dropped from 68% in 2015 to 49% in 2016. In addition, only 56% of the participants submitted the entire assignment, which was required as preparation for the face-to-face workshop in 2015. Thus, we needed to improve the design and support for preparation before the face-to-face workshop so as to encourage participants' motivation to learn in the workshop.

In this paper, we describe improvements made to the pre-training preparation using design-based research (based on Reeves, 2006). To solve the problems in the ID workshop, we developed three stages of the question-making activity for preparation in the blended workshop and improved the support for participants when it comes to the assignment in the pre-training preparation. We further discuss whether the problem we faced in the ID workshop was solved and what improvements were made with regards to learning motivation.

Methods

Context

Blended ID workshops – workshops that combine face-to-face seminars with online and at-home preparations - were held in several districts both in 2015 (Tokyo, Osaka, Nagoya, Fukuoka) and 2016 (Tokyo, Osaka, Nagoya, Fukuoka, Kumamoto). Although the places of workshops varied, each workshop followed the same program and all participants took part in and discussed in the same e-learning course. The goal of this workshop was to enable participants to analyze education cases and present proposals for their improvement using an ID model.

Design Based Research

This study employed a design-based research (DBR) approach. The purpose of design-based research is to develop an optimal, research-based solution for the problem in a given context (Reeves, 1999). The process of design-based research includes multiple cycles of development, testing, and refinement (Reeves, 2006). Based on this process, we saw improvement in the ID workshop from 2015 to 2016. As described above, the problem we faced was that there was incomplete participation in the submission of the assignment during the pre-training preparation for the 2015 ID workshop and the questioning period in 2016, although the ID workshop consisted mainly of this Q&A activity. Our

purpose of using DBR was to solve these problems and to refine the design of the pre-training preparation in the blended workshop.

Development of Solutions

Improvement of Design in the Pre-training Preparation

Although the face-to-face workshop was composed based on answers from the lecturer to the questions submitted during the application for the ID workshop, participants did not submit many questions in 2016. As Miyake and Norman (1979) pointed out, one cannot form a question unless he sufficiently understands the learning content; this problem seemed to be caused by a lack of understanding about the content. With this in mind, we decided to add one more question-making activity after testing and reporting the assignment, and thus redesigned the activity to include three stages where application practices of knowledge are interposed by question making like hamburgers (Figure 1). This activity was as follows: 1) Participants were required to review the syllabus of the training program and submit questions. 2) They were then required to read papers about ID and, to test their understanding of the concept of the ID model, post a short report about how to use the ID model for the improvement of their particular educational situations, which also let participants clarify their needs. 3) Participants were required to review the questions they submitted and determine whether or not they received an answer for it during phase 1) and 2). Based on this reflection, participants were required to resubmit questions they would like to ask to lecturer. By adapting this process, our goal was to let participants feel the relevance of learning using the blended training program, and to use their training in their own educational situations. This further increased their confidence in their own learning by allowing them to recognize how their questions had changed since the time of application, and thus realizing growth.

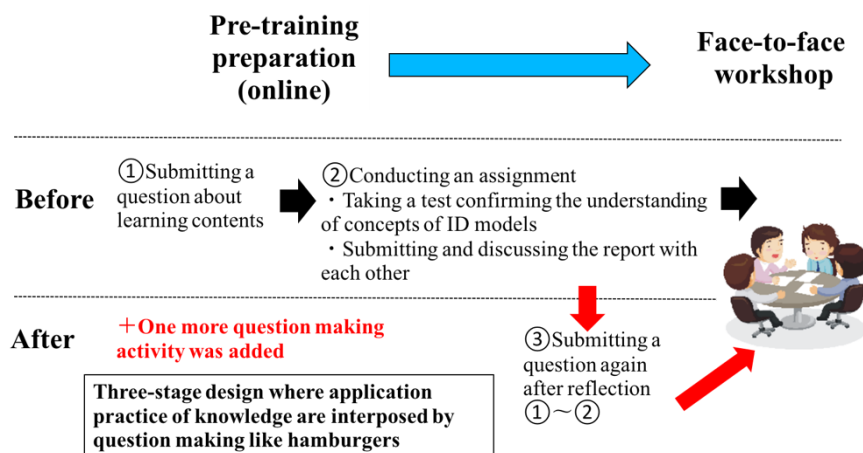


Figure 1. Improvements to the three stages of question-making activities**Improvement of Participants' Support in the Pre-training Preparation**

The problem we faced was that only 56% of the participants submitted the entire assignment required as preparation for the face-to-face workshop in 2015. According to the evaluative questionnaire, many participants did not submit the entire assignment because some of them were embarrassed to register an e-learning account and did not realize that this was required preparation for the face-to-face workshop. For learners unfamiliar with e-learning, it is important to promote dialogue between the teaching side and the learning side by using feedback and messages of support, and structure the design of the training program by showing the participants the learning objectives and learning strategies (Moore, 1993). Based on this idea, we improved the design and support of the pre-training preparation and verified its effect. Before the workshop, the support we provided to participants as they prepared for the workshop using e-learning was as follows: 1) preparing the participant for self-registration on Moodle with whichever social networking account each participant had, 2) sending a reminder letter to inform participants about the task deadline, and 3) providing some readings that explained the ID model. To make this process smoother and to clarify preparation requests for participants, we modified these steps and added some supporting materials (Table 1).

**Table 1. Improvement of increased support for participants
conducting pre-training preparation using e-learning**

Type of Improvement	Items	Aim	Improvement content
Modify	Teaching Materials	To provide examples of ID application and make it easy to understand how to utilize the ID model	We changed the teaching materials from a readings that explained the ID model that was aimed at researchers to excerpts of books that described ID models along with cases that were written for beginners.
	Registration of e-learning account	To prevent confusion of participants who are not accustomed to e-learning	We changed the method of account registration from the self-registration by the participant through an existing social networking account to the way the operator issues ID and password.
	Reminder mail	To increase motivation for preparation	<ul style="list-style-type: none"> • In the message of the e-mail, we described the objectives of learning, the method of evaluation, and the structure of the program and explained why the pre-training preparation is necessary. • We stated that questions submitted by the deadline would be addressed during the face-to-face workshop.
Add		To let participants confirm their learning progress	We sent individual e-mails to students who were behind on submitting assignments to urge them to participate.

	Supporting material	To prevent confusion of participants who are not accustomed to e-learning	We distributed a .pdf file in advance that explained how to prepare, step-by-step , with e-learning screenshots.
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Testing Solutions in Practice

Completion Rates and Evaluations of Impressions of the Entire ID Workshop

We examined the completion rates and evaluations of impressions using the ARCS model (Keller, 2010) in the 2015-2016 ID workshop. The completion rates were 33% (63 out of 179 participants submitted questions) in 2015 and 71% (144 out of 200 participants submitted questions) in 2016. Evaluations of impressions for the blended workshop were conducted after the face-to-face workshop. There were seven levels for the evaluation, with 1 being negative and 7 being positive for each item of the ARCS model. The results are shown in Table 2. There was no significant difference in the mean of all items (Attention; $t(333.35) = 0.5645$, *n.s.*, Relevance; $t(321.92) = 0.8572$, *n.s.*, Confidence; $t(353.46) = 0.7285$, *n.s.*, Satisfaction; $t(367.67) = 0.2503$, *n.s.*). Although the evaluations of impressions for the blended training program did not change from 2015 to 2016, the completion rates improved. Considering that the pre-training preparation load was increased in 2016, it can be inferred that the blended training was improved as a whole. Of course, this effect cannot be considered to be solely due to the improvement of the pre-training preparations; other factors would contribute to it.

Table 2. Evaluations showing the average impressions for the blended workshop

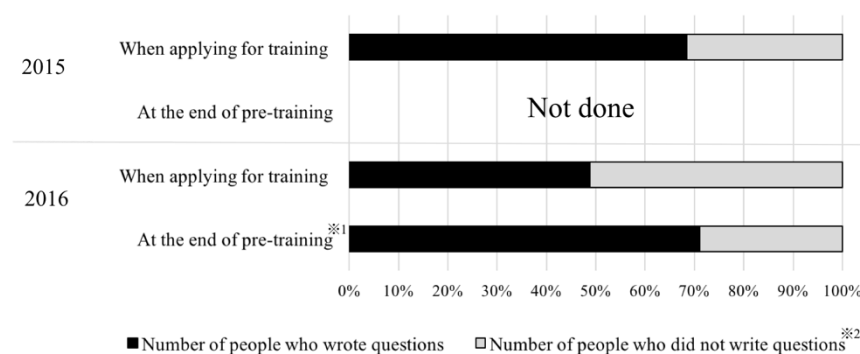
Year	Attention	Relevance	Confidence	Satisfaction
2015 (N=169)	6.30 (0.93)	6.05 (1.00)	5.01 (1.10)	6.36 (0.93)
2016 (N=201)	6.35 (0.80)	6.13 (0.81)	5.10 (1.07)	6.33 (1.13)

※ Numerical values are an average and the numbers within the parentheses in the lower row indicate standard deviation.

Comparison of Changes after Improvement of the Design and Support

To examine the influence of the improvement of the design of the question-making activity in the pre-training preparation, we compared the number of questions submitted at the time of application in 2015 to those submitted in 2016, as well as to questions submitted at the end of the pre-training preparation in 2016. Figure 2 shows the difference. Although the percentage of those who submitted questions during the application process for participation in the ID workshop dropped from 68% (119 out of 174 participants) in 2015 to 49% (98 out of 201 participants) in 2016, it then increased to 71% (143 out of 201 participants) by adding one more question-making activity.

Moreover, the submission rates of the pre-training assignment were increased from 56% (95 out of 169 participants) in 2015 to 90% (181 out of 201 participants) in 2016. The e-learning records illustrated that almost all of the participants registered an account (unfortunately, one participant was unable to receive the e-mail about the pre-training preparation, so she was not able to register her account). It was also confirmed that participants understood the necessity of the pre-training preparation, as one participant commented, “In the beginning, I was worried about a workshop that has so many assignments, but I was able to fully understand that it is a necessary step to learn,” in the questionnaire after the blended workshop. The ongoing problem of submission rates of the pre-training assignment might be solved by further improvement of the support in the pre-training preparation.



※1: 20 out of 57 participants did not submit the assignment.

※2: The participants who did not submit questions included comments that did not clearly ask questions, such as “Please take care of us.”

Figure 2. Comparison of submitted questions

Final Report: Advantages of Using Three Stages for the Question-Making Activity

In the final report, which showed how participants critically analyzed the ID workshop using the ARCS model, some participants pointed out that the added question-making activity motivated them to learn. One participant described that this activity made him feel confident and satisfied as follows: “As for me, reviewing the question at the time of the application was where I learned the most. At the time of the application, I did not understand the content enough to ask questions, so I could only write a comment about my passion for participating in the workshop. However, with regard to the contents learned through prior-learning, it became clear that my understanding had advanced enough to ask questions to the lecturer.” Another participant described how thinking about the questions made him feel more familiar with the learning content and its relevance as follows: “By reconsidering my own question, my awareness of participation in the ID workshop increased. At the same time, I gained familiarity with the content.”

Thus, it appears that the design improvement of adding questions encouraged motivation for learning by way of such means as participants' confidence, satisfaction, and familiarity with the learning content.

Concluding Remarks

In this paper, we discussed design improvement to the pre-training preparation of the workshop and its effect on participants. We were able to improve the pre-training preparation and refine the design to include three stages of the question-making activity.

In educational practice research, researchers cannot control the research fields or the participants; all we can do is make changes over time to improve upon our work. The problem we faced with our 2016 workshop was mitigated with some pre-workshop preparation support. Our future work is to continue educational improvement research to refine the design of the ID workshop to solve any problems that we will face in the future.

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