Development and Evaluation of Distance Learning Courses for Professional Development of Teachers: Effects of Web-Based Learning Using Prior Inference Tasks

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Abstract
In this study, a new type of Web-Based Learning (WBL) courses for professional development of teachers was developed. We set up “inference tasks” as the core of our WBL courses. These tasks were expected to be effective in reflecting learners’ various experience on learning process and in keeping learners’ highly-motivated learning. The developed test courses were generally evaluated as useful by subjects. However, it was also suggested that inference activity was more effective in the case of presenting simple information than that of complicated one.

1. Introduction
Distance learning programs on the WWW are very useful for professional development of teachers as off-campus training systems. However, it is pointed that the quality of learning contents and courses highly matters for effective learning in such programs. In this paper, we report a new type of distance learning courses that we developed for professional development of teachers.

2. Development
In distance learning environments, the positive participation in learning courses of learners is indispensable to effective learning. Therefore, it is important to facilitate the interaction between learners and the instructor or among learners in learning process. In order to encourage such interaction and maintain strong motivation of learners, we included the following points as necessary conditions in designing the courses of WBL.

1) As learning contents material, concrete practical cases collected in several schools as a result of our field study (e.g., Mashiko & Kagawa, 1999 [1]; Mashiko et al., 2001 [2]) are used.

2) The learning courses show definite practical skills that teachers can apply at their school.

3) The learning courses show theoretical and universal knowledge linking with practical skills.

4) Instructors are well acquainted with those contents.

Further, we set up “inference tasks” in process of WBL. In this task, learners are presented a practical case that is the solution of a problem in a certain school (e.g., a photo of learning material developed by one teacher with some intentions), and are requested to reason about the meaning or effect of the case and to present a short report about it. Those inference tasks were expected to be effective in reflecting learners’ various experience on learning process and in keeping learners’ highly-motivated learning. Each of learners’ reports is evaluated by the instructor and the result of evaluation is informed to each learner. After the evaluation and feedback of reports, the instructor explains the practical meaning and theoretical knowledge linking with that case. Finally, learners verify the acquired knowledge by applying it to their class in school.

In learning process, learners can interact each other and with the instructor on the occasion of reading other learner’s report, asking the instructor about his/her explanation and discussing about the new knowledge and the application of it on on-line forum. Figure 1 shows the process of WBL courses that we developed.

3. Evaluation

3.1 Method

Test courses: We designed three types of courses (A, B, and C) according to three different cases collected in our field study. Each theme of course A, B, and C is “the developing process of learning materials”, “the designing
of learning environment”, and “the promoting of active learning”, respectively.

Subjects: 11 subjects (8 teachers and 3 graduate students) were participated in this test.

Procedure: The test was conducted as a part of on-campus lecture. On each test course, subjects were presented the inference task one week in advance of the on-campus lecture and provided the feedback of evaluation of his/her report before the lecture. The instructor gave his lecture with pictures in the WBL course. After that, subjects and the instructor had a discussion about the case and theoretical knowledge and the new inference task in the next course was presented. When all courses finished, subjects were asked to fill out a questionnaire for each test course. The questionnaire was consisted seven items: 3 items about the effectiveness of prior inference activity and other 4 items about the effectiveness of those courses as the off-campus training course. All items had a 4 point scale with 1 representing strongly disagree to 4 indicating strongly agree.

3.2 Results

Table 1 shows mean scores of the items about the effectiveness of prior inference activity. All scores were higher than 2.5 (mid value on a scale of 1-4). The result of an ANOVA demonstrated no significant effect between courses on any item. Table 2 indicates mean scores of the items about the effectiveness of those courses as the off-campus training course. All scores were higher than 2.5. As the result of an ANOVA, there was a significant effect on only “motivation” item ($F(2,30)=4.02, p<.05$). This effect was due to the difference between course B and C. In course C, the streaming video was presented at the inference task while in other two courses one picture was used. It would seem that too much information from the video decrease learner's motivation.

4. Conclusion

In this study, we developed a new type of WBL courses with prior inference task for professional development of teachers. Though the courses were generally evaluated as useful by subjects, it was also suggested that inference activity was more effective in the case of presenting simple information than that of complicated one.

References