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Development of Video Presentation Mutual Evaluation Support System with Portable Mobile-Devices using Drag and Drop Evaluation Function

Shin KURATA[ab*], Takashi FUJIKI[a] & Masao MUROTA[c]
[a]*Faculty of Education, Nagasaki University, Japan*
[b]*Graduate School of Decision Science and Technology, Tokyo Institute of Technology, Japan*
[c]*Institute for Liberal Arts, Tokyo Institute of Technology, Japan*
*shin1222kurata@nagasaki-u.ac.jp

Abstract: The purpose of this study is to introduce a portable mobile-device learning environment that realizes accurate evaluation communication for presentation rehearsal. To accomplish this, we developed a Video Presentation Mutual Evaluation Support System (VPE system) with a Drag and Drop (D&D) evaluation function. In the D&D evaluation function, the reviewers drag and drop a marker (the evaluation marker) onto a slide on a video presentation, for accurate evaluation communication. We conducted an evaluation experiment using the VPE system on university students, and verified its function through a questionnaire. The results reveal that the D&D evaluation function can convey accurate timing and accurate position information from the reviewers using the evaluation marker. Further, it was revealed that the D&D evaluation function is easy to operate.

Keywords: video, presentation, mutual evaluation, mobile learning, mobile application

1. Introduction

Mutual evaluation is an effective learning tool for presentation rehearsals. It is a method of peer review, and the presenter can improve the presentation by incorporating criticism and the opinions of reviewers (Miyawaki et al. 2010). To date, some studies on system development that support mutual evaluation of video presentations have been conducted. For example, there are system development studies that support mutual evaluation through the use of text input (Shibasaki 2008), the pressing of a button (Okura 2001), and the displaying of visual annotations (Watanabe 2014).
Currently, 97.4% of Japanese university students have a portable mobile-device (Mainabi Co., Ltd. 2016). It is said that it is important to develop learning and educational approaches that take advantage of mobile-devices (Sarrab 2016). The screen size of these devices is relatively small, and they lack conventional input interfaces such as a mouse and keyboard. Therefore, it is necessary to incorporate ideas that are different from conventional system development studies that support mutual evaluation of video presentations.

The purpose of this study is to introduce a mobile-device learning environment that utilizes simple functions to carry out mutual evaluation of presentations. For this purpose, we have developed a video presentation mutual evaluation support system (VPE system), with functions that allow the reviewers to easily evaluate presentations using a drag and drop (D&D) evaluation function, and a function that enables presenters to play their video presentation back, incorporating reviewer's evaluations on a portable mobile-device. In addition, we investigated the simplicity of operation and accurate timing and accurate position of evaluation in this system.

2. VPE system

Evaluation activities interface is shown as figure 1, the D&D evaluation function is shown as figure 2. The VPE system is a client server system that supports mutual evaluation of video presentations by

using a portable mobile-device. It is an application software that runs on Apple iOS. Learners can evaluate other learner's video presentations asynchronous.

We implement a D&D evaluation function for accurate timing and accurate position of evaluation communication in a VPE system. There are three main features of this D&D evaluation function. The first feature is the category of evaluation, which includes: "praise • affirm", "opinion • pointed out • suggestion", and "questionable • difficult to understand". This feature is a classification of online interactions of mutual evaluation (Kurata et al 2015), which makes it possible to clarify the quality of the presentation. The second feature is that markers (evaluation markers) that illustrate the three evaluation categories are always displayed, as shown in Figure 1. This makes it possible to constantly display the evaluation category, even though the portable mobile-device has a small screen. By incorporating this feature, reviewers can constantly evaluate the presentation by using markers while viewing it. The third feature is an evaluation method that utilizes dragging and dropping of the evaluation marker onto the video presentation screen while the video presentation is playing, as shown in Figure 2. This makes it possible for reviewers to directly evaluate the accurate timing and accurate position in any particular slide of the presentation. Further, after dropping the evaluation marker, the video presentation pauses, and a window to add supplementary text information appears. Subsequently, the reviewers can input information using either the soft keyboard function or the speech recognition function. When all evaluations have been completed for the video presentation, the reviewers can confirm and correct their evaluations on the confirmation screen. Then, evaluation information (position, timing, supplementary explanations, etc. in the evaluated slide) is sent to the presenter.

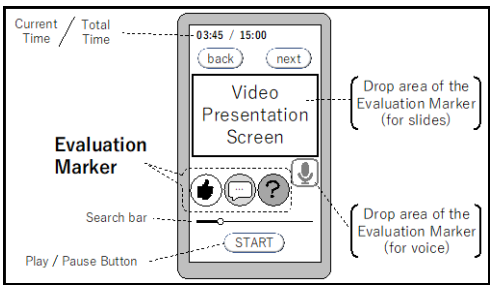

Figure 1. Evaluation activities interface

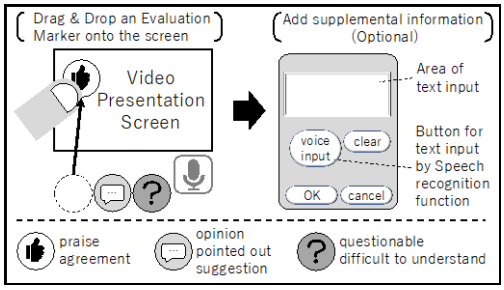

Figure 2. the D&D evaluation function

3. Research Design and Methods

The research design is shown in Figure 3, and the subjective questionnaire survey items are shown in Table 1. The aim of this survey is to evaluate the D&D evaluation function. So, we compared three types of evaluation functions as shown in figure 3. The first, it's the D&D evaluation function (type A system). The second, it's the D&D evaluation function introducing tap instead of D&D (type B system). The third, it's the D&D evaluation function that the evaluation marker is single and evaluation operation is tapped (type C system). We divided subjects equally for each type of function. In addition, we conducted the questionnaire survey. The contents of the questionnaire concerned the simplicity of operation and accurate timing and accurate position of evaluation of the VPE system.

The survey was conducted as follows:

1 We explained the experiment to the participants.

2 Subjects experienced the steps for using the VPE system in sample videos, according to our research design as shown in figure 3.

3 Participants answered the subjective questionnaire.

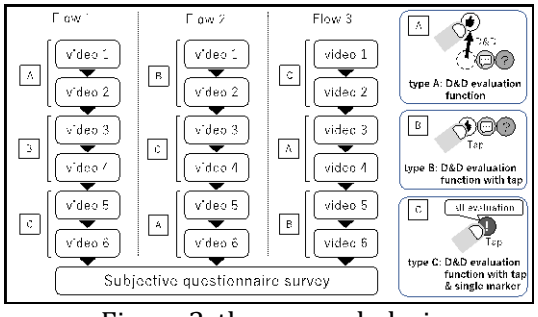

Figure 3. the research design

Table 1. The subjective questionnaire survey items

	contents	question item
[1]	simplicity of operation on type A system	It is easy to drag & drop and evaluate from 3 evaluation markers
[2]	simplicity of operation on type B system	It is easy to tap and evaluate from 3 evaluation markers
[3]	simplicity of operation on type C system	It is easy to tap and evaluate only one evaluation marker
[4]	accurate timing of evaluation on type A system	you can evaluate at the timing you want to evaluate when you drag and drop evaluation marker.
[5]	accurate position of evaluation on type A system	You can evaluate the location of the pinpoint on the video screen when you drag and drop evaluation marker.

The questionnaire comprised five items, numbered [1] to [5] as shown in table 1. [1] was regarding the simplicity of operation of the type A system. [2] was regarding the simplicity of operation of the type B system. [3] was regarding the simplicity of operation of the type A system. [4] was concerning the accurate timing of evaluation of the type A system. [5] was concerning the accurate position of evaluation of the type A system. We conducted the questionnaire survey based on a four-point Likert scale (4=Strongly Agree, 3=Agree, 2=Disagree, 1=Strongly Disagree).

4. Results and Discussion

Table 2 shows results of the subjective assessment on the simplicity of operation and accurate timing and accurate position of evaluation of the VPE system. We conducted a two-sided t-test with a significance level of 5%, to ascertain whether there was a significant difference between the average value of the questionnaire evaluation value and the median value of 2.5 in [1], [2], and [3]. The results indicated that there was a significant difference. The average value was higher than the median value in [1], [2], and [3]. Further, we performed a one-factor analysis of variance to ascertain whether there was a difference between questionnaire items [1] to [3]. The results indicated that there was no difference between the mean of [1] to [3]. These results reveal that systems of A, B, and C are equally simple. In addition, it can also be said that the D&D evaluation function facilitates easy operation for the reviewers. We conducted a two-sided t-test with a significance level of 5%, to ascertain whether there was a significant difference between the average value of the questionnaire evaluation value and the median value of 2.5 in [4] and [5]. The results indicated that there was a significant difference. The average value was higher than the median value in [4] and [5]. These results reveal that reviewers think that the D&D evaluation function can convey accurate timing and accurate position information using the evaluation markers.

Table 2. Results of the subjective assessment on the simplicity of operation and accurate timing and accurate position of evaluation of the VPE system

		M	SD	T-TEST (vs 2.5)	ANOVA
[1]	simplicity of operation on type A system	3.52	0.60	t(20)=7.43, p=.00	
[2]	simplicity of operation on type B system	3.67	0.48	t(20)=7.79, p=.00	n.s.
[3]	simplicity of operation on type C system	3.81	0.40	t(20)=14.91, p=.00	
[4]	accurate timing of evaluation on type A system	3.24	0.70	t(20)=11.06, p=.00	-
[5]	accurate position of evaluation on type A system	3.24	0.89	t(20)=8.80, p=.00	-

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