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Effects of Listening to Sutra Chanting during Breaks in On-Demand Lecture Attendance

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ABSTRACT

On-demand lectures are characterized by the fact that students themselves can freely arrange the lecture format, such as whether or not to take breaks during the lecture. This study aims to construct an effective lecture/training method suitable for on-demand lectures. Considering the time and location constraints of on-demand lectures, this study examines ways to provide adequate relaxation and a change of pace. Therefore, we propose listening to sutra chanting as an effective method during breaks in on-demand lectures. The effects of sutra chanting are considered to be a calm mind, moderate stimulation and a change of mood. An experiment was conducted to confirm the effect of sutra chanting during breaks in on-demand lectures. The participants were 20 university students. As a result, when attending on-demand lectures, we sought changes in subjective evaluation of listening to the sutra chanting during breaks.

Keywords: On-demand lecture, Breaks, Listening, Sutra chanting, Experiment

INTRODUCTION

On-demand lectures are characterized by the fact that students can freely arrange the format of the course, including whether or not there are breaks during the course. Regarding the challenges of distance learning, there is a tendency for the dropout rate of students to be higher than that of face-to-face classes (Phipps and Merisotis, 1999) and for students to be isolated from human relationships, making them more likely to become lonely (Galusha, 1997). On the other hand, there is a report that show that the use of online video has contributed to higher grades and lower dropout rates (Nagy and Bernschütz, 2016).Therefore, there is a need for a system that effectively enables students to attend online lectures and increase their satisfaction with learning.

This study aims to construct an effective way of lecturing and attending lectures that is suitable for on-demand lectures. The purpose of this study is to obtain basic information on the differences in the state of students who take breaks during on-demand lectures through experiments.

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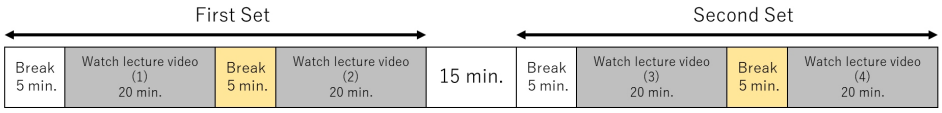

Figure 1: The flow of the experiment.

Figure 2: The content of the Heart Sutra.

A related study is a review on how to take breaks during work (Scholz et al. 2019). The effectiveness of exercise during breaks has also been reported (Horie, 1995), as well as the proposal of multiple break methods and their effectiveness (Yoneyama et al. 1990).

In this study, we examine methods to provide adequate relaxation and a change of mood considering time and location constraints in the case of on-demand lectures. Therefore, we propose listening to sutra chanting as an effective method during breaks in on-demand lectures. The effects of sutra chanting are considered to be a calm mind, moderate stimulation and a change of mood. These effects are expected to improve the condition of attending on-demand lectures after listening to sutra chanting.

METHOD

An experiment was conducted to confirm the effect of sutra chanting during breaks in on-demand lectures. The flow of the experiment is shown in Figure 1.

In the experiment, four types of lecture videos were prepared. Then, two videos were set as one set, with a 5-minute break in the middle. Each break was set to either listen to the sutra chanting or do nothing, taking the sequential effect into consideration. The Heart Sutra was selected as the sutra. The Heart Sutra is one of the sutras widely read at funerals of several Buddhist sects in Japan, and it is assumed that many Japanese have heard the phrase. The content of the Heart Sutra is shown in Figure 2.

The four types of lecture video viewing were set in consideration of the order effect, and the order of the four types was set for each participant. For the selection of the four lecture videos, a preliminary video

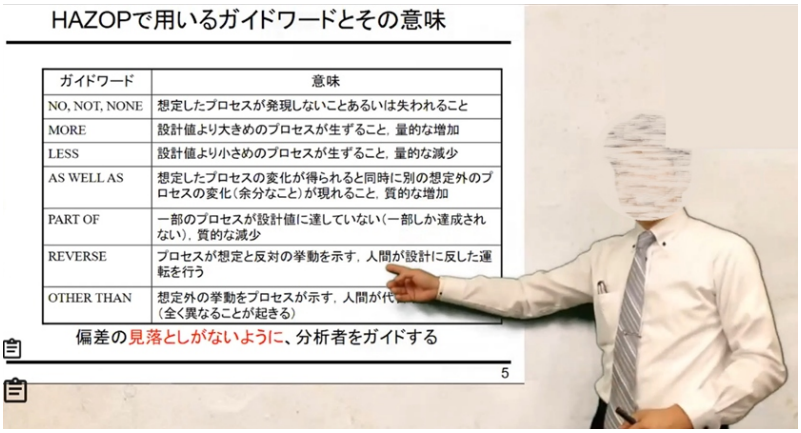

Figure 3: The content of the Heart Sutra.

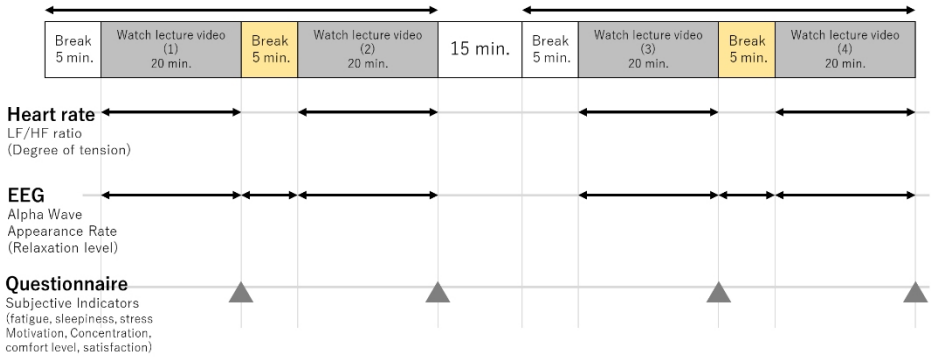

Figure 4: Duration and timing of measurement data acquisition.

selection experiment was conducted for 10 participants in order to equalize the video contents, and four videos were selected from among seven videos. An example screen shot of the selected lecture videos is shown in Figure 3.

During the experiment, heart rate and EEG were measured as physiological indices. The heart rate EEG meter used was the Muse Brain System by Digital Medic, Inc. As subjective indices, fatigue, sleepiness, stress, motivation, concentration, comfort, and satisfaction were also asked by questionnaire. The questionnaire was given on a 101-point scale from 0 to 100, with the higher the number, the greater the degree. The duration and timing of measurement data acquisition are shown in Figure 4.

At the end of each lecture video viewing, seven questionnaire items were asked as a subjective evaluation. For the heart rate, the LF/HF ratio was obtained to measure the degree of tension during lecture viewing. For the EEG, the alpha wave rate was obtained during each video viewing and during breaks to measure the degree of relaxation.

The duration of the experiment was approximately 2 hours and 30 minutes. Twenty university students participated in the experiment. This experiment was approved by the Ethics Committee of Kyoto Tachibana University.

Figure 5: The experimental setup.

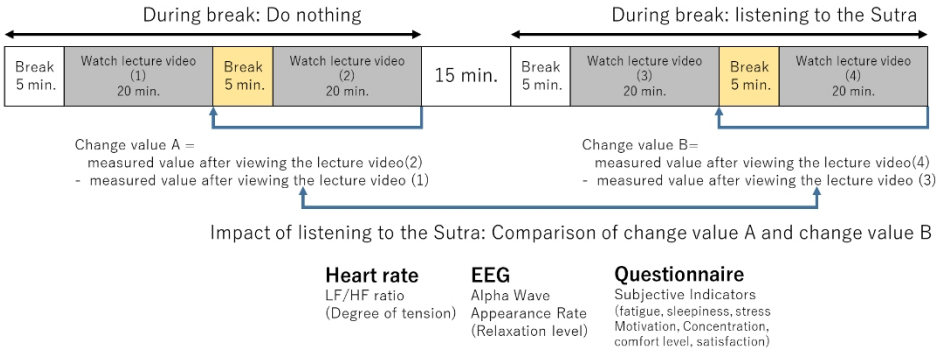

Figure 6: How to obtain the change value.

RESULTS

The experiment is shown in Figure 5. The picture on the left in Figure 5 shows the entire experiment, with the experimental participant positioned in the back and the experimenter behind the participant. The picture on the right in Figure 5 is an example of how the participant wears the electroencephalograph.

As a result, the amount of change in each item after viewing the video was compared for each case with and without viewing the sutra chanting. The method of obtaining the change values is shown in Figure 6. In one set, the video was viewed twice with a 5-minute break in between. The measured value at the end of the previous video is subtracted from the measured value at the end of the second video. In the case of a break with no activity, the value is calculated as the change value A. In the case of a break when the participants listened to the sutra chanting, it is calculated as the change value B.

Regarding the questionnaire results, data from 19 participants were included in the analysis due to missing values in the data of one participant. The results of the questionnaire are shown in Table 1. The mean values and standard deviations for the seven items are shown for the case of doing nothing (change value A) and for the case of listening to the sutra chanting (change value B). Also shown are the p-values for the corresponding t-tests and effect size d. Table 1 shows that for fatigue, the mean increase in fatigue was greater

Table 1. Questionnaire results.

	Without Sutra (change value A) Average	sd	With Sutra (change value B) Average	sd	p-value	Cohen's d
Fatigue	4.2	8.6	7.2	13.5	0.430	0.26
Motivation	−3.4	15.2	−6.6	16.2	0.640	0.20
Concentration	−2.9	8.3	−4.3	13.5	0.747	0.13
Stress	2.9	11.0	8.9	20.9	0.341	0.36
Comfort	−1.3	17.1	−3.4	10.8	0.687	0.15
Sleepiness	−0.3	20.0	−11.6	25.1	0.186	0.50
Satisfaction	1.1	16.2	5.5	12.7	0.233	0.30

for those with sutra chanting, $p > .05$. For motivation, concentration, and comfort, the mean decrease in each was greater for those with sutra, but $p > .05$. For stress, the mean increase was greater for those with sutra, $p > .05$, $d = .20$. For sleepiness, the mean decrease in sleepiness was greater for those with sutra, $p > .05$, $d = .50$. With regard to satisfaction, there was greater satisfaction with the sutra, $p > .05$, $d = .30$.

From the above, no significant difference in subjective evaluation was indicated by listening to the sutra chanting during breaks when attending the on-demand lectures.

Ten of the 20 participants were able to measure EEG and heart rate without any problems. For the data that could be measured, the alpha ratio of the EEG was calculated as an index of the degree of relaxation, and LF/HF as an index of the degree of tension. As with the questionnaire results, change values were calculated and compared, however due to the small sample size, it was not possible to properly compare the average values.

CONCLUSION

In this study, we conducted a basic examination of how to effectively attend on-demand lectures. Specifically, we focused on how to take breaks during the viewing of on-demand lectures and examined ways to provide adequate relaxation and refreshment. We proposed listening to sutra chanting as an effective method for taking breaks during on-demand lectures. Listening to sutra chanting was expected to calm the mind as well as provide a change of mood. An experiment was conducted to confirm the effect of listening to sutra chanting during breaks. Participants were 20 university students. As a result, when attending on-demand lectures, we sought changes in subjective evaluation of listening to the sutra chanting during breaks. In the future, we would like to extract the effects indicated by physiological indices by measuring heart rate and electroencephalogram during the on-demand lectures, and to further examine effective methods of attending lectures.

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