

# Impression Evaluation of Instructor Placement in Online Lecture Screen Displays

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## Abstract

This study investigated whether the instructor's placement with slides in video lecture displays affect the ease of viewing, interest, and understandability of the lecture. Results indicated that positioning the instructor in the same frame as the slides, overlapping them, was more highly evaluated than positioning them in a separate frame. Additionally, positioning the instructor on the right side of the slide was found to be easier to view than on the left side within the same frame. Moreover, within the same frame display, the display where the instructor overlapped the slides, offering a more natural way, was more likely to be interesting than one where the background of the instructor is the classroom scene and the instructor is positioned seamlessly alongside the slide.

*Keywords:* Online, Lectures, Video Lectures, Screen Display, Instructor Position, Instructor Placement.

## 1 Introduction

At the beginning of 2020, the rapid development of online lectures in university education was prompted by the outbreak of the COVID-19. These lectures, implemented during this period have been widely acknowledged for their effectiveness and educational benefits. The results of surveys conducted by a number of universities indicate a strong student preference for the continuation of online lectures in the future. ([1][2][3], etc.) As universities increasingly embrace Digital Transformation (DX), the significance of online lectures is expected to grow. Consequently, exploring and researching methods to enhance the quality of online education is becoming increasingly crucial.

In the evolving landscape of online education, the role of interface design in crafting optimal learning experiences can significant. This study focuses on the impact of the arrangement of the instructor and slides in video lectures, an area that has not been thoroughly explored in existing literature. Therefore, this research is expected to serve as foundational material for future studies on screen displays in online lectures, providing insights that could lead to more engaging and educationally potent online learning environments.t.

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## 2 Problem Awareness and Purpose

Online lectures are primarily categorized into two types: re-al-time(synchronous) and on-demand (asynchronous), with lectures typically delivered through video distribution. In the display of lecture videos, especially in the case of the on-demand type, lecture videos can be edited, allowing for diverse presentation methods, including showing only slides or displaying the instructor alongside the slides. Despite identical content, the display features such as the presence, size, and arrangement of the instructor and slides on the screen may affect students' perceptions of the lecture. To test whether screen display affects learner impressions, a previous study evaluated students' impressions of screen displays [5]. The findings revealed that videos featuring the instructor's face, and particularly their full body, were more positively received than those showing only slides. The results also indicated that displaying images of the instructor and classroom seamlessly alongside the slides received higher evaluations than the images of the instructor shown in a separate frame from the slides. These findings underscore the effectiveness of on-screen instructor presence and also suggest that the arrangement of lecture elements on the screen can also influence students' impressions of the instructor.

In prior research on instructor placement in online lecture screen displays, Zhang et al.[4] explored how different positions of instructors affect student evaluations. Their findings indicated that Chinese students showed higher satisfaction when instructors stood on the right side of the screen rather than the left. Furthermore, a comparative study of online classes between China and Japan [6] revealed differing preferences in the implementation of online classes among students from the two countries. It is presumed that preferences for online lecture screen displays may vary by country. This study aims to investigate Japanese students' preferences regarding the instructor's position on the screen. Additionally, regardless of the same standing position, this study seeks to examine whether the method of separating the instructor and slides into different frames or the same frame influences students' perceptions.

Therefore, building on previous research on screen displays in online lectures [5], this study focuses on the design of the arrangement of the instructor and slides. By producing lecture videos with various display setups and soliciting evaluations from Japanese students, the study intends to clarify whether different arrangements affect the 'ease of viewing', 'interest', and 'understandability' among students.

## 3 Methodology

### 3.1 Production of Lecture Videos

In this study, six different display patterns for arranging the instructor and slides were used as shown in the figure 1. Each video lasted approximately 3 to 4 minutes and consisted of a summary of previous course content.

#### Lecture A: Full-Body Separate Frame 1

The upper half of the instructor explaining the lecture slides is displayed in a separate frame on the right side of the screen.

#### Lecture B: Full-Body Separate Frame 2

The upper half of the instructor explaining the lecture slides is displayed in a separate frame on the left side of the screen

Lecture C: Full-Body Same Frame 1

The upper half of the instructor explaining the lecture slides is overlaid on the slides on the right side of the screen.

Lecture D: Full-Body Same Frame 2

The upper half of the instructor explaining the lecture slides is overlaid on the slides on the left side of the screen.

Lecture E: Classroom Shooting Same Frame 1

The video of the instructor's upper body explaining the lecture slides, along with an image composited in the background of the instructor, is seamlessly displayed on the right side of the slides.

Lecture F: Classroom Shooting Same Frame 2

The video of the instructor's upper body explaining the lecture slides, along with an image composited in the background of the instructor, is seamlessly displayed on the left side of the slides.





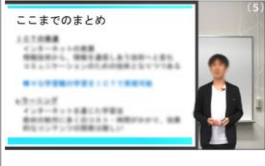
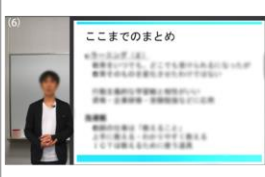
A		<p>The upper half of the instructor's image is displayed in a separate frame on the right side of the slide, set against a white background and outlined with a purple border.</p>
B		<p>The upper half of the instructor's image is displayed in a separate frame on the left side of the slide, set against a white background and outlined with a purple border.</p>
C		<p>The instructor's image is overlaid on the right side of the slide.</p>
D		<p>The instructor's image is overlaid on the left side of the slide.</p>
E		<p>On the right side of the slide, the instructor's image is seamlessly integrated with a background image of a classroom. The display is layered in the order of instructor, slide, and classroom.</p>
F		<p>On the left side of the slide, the instructor's image is seamlessly integrated with a background image of a classroom. The display is layered in the order of instructor, slide, and classroom.</p>

Figure 1: images of six types of lecture video display

The slides were created in a 4:3 format and exported as PNG files (960x729). The video of the instructor for all lectures was filmed with the teacher standing in front of a green screen, explaining the content of each lecture in a natural tone and gestures. The filming size was 1920x1080 at 30fps.

### 3.2 Procedure

159 students from T University participated in the study. They watched six types of lecture videos from A to F in order. After viewing, they completed a web survey on the ease of viewing, level of interest, and understandability of each lecture, rated on a five-point scale (1 for very difficult to watch to 5 for very easy to watch; 1 for no interest at all to 5 for very interesting; 1 for very difficult to understand to 5 for very easy to understand). Before watching the lecture videos, the instructor explained the evaluation method, and students were instructed to avoid fast-forwarding the videos and to exclude audio clarity from their evaluations to minimize factors that could affect the results.

## 4 Results

The results for each lecture from A to F regarding "ease of viewing", "interest", and "understandability" are shown in Table 1,2,3.

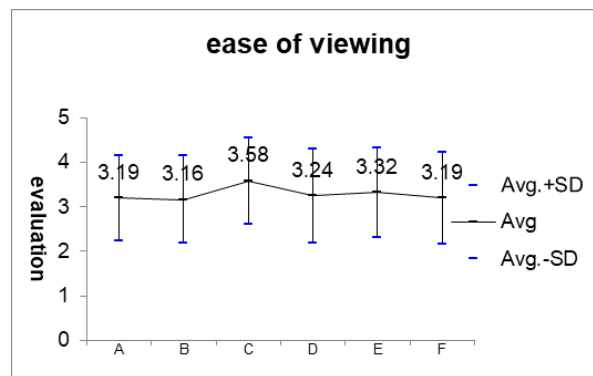


Figure 2: Evaluation score of ease of viewing

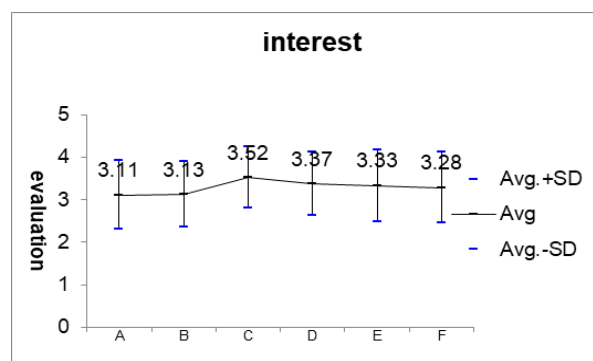


Figure 3: Evaluation score of interest

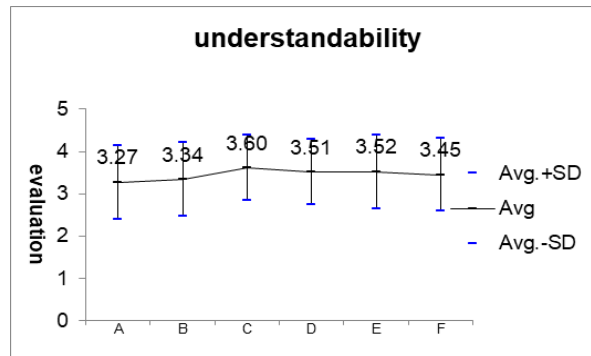


Figure 4: Evaluation score of understandability

A one-way ANOVA was performed across the lectures on the metrics of "ease of viewing", "interest", and "understandability". For "ease of viewing", significant differences were found ( $F(5,790) = 4.9906$ ,  $p < 0.001$ ). Subsequent Bonferroni post-hoc tests showed significant differences between lectures A and C ( $p < 0.01$ ), B and C ( $p < 0.01$ ), C and D ( $p < 0.01$ ), and C and F ( $p < 0.01$ ). These results indicate that for the full-body formats where the instructor is positioned on the right side, the same frame display received significantly higher ratings compared to the separate frame. Moreover, within the full-body same frame setup, the instructor's position on the right side was rated significantly higher over the left side.

An ANOVA on interest levels showed significant results ( $F(5, 790) = 11.8057$ ,  $p < 0.001$ ). Bonferroni post-hoc comparisons revealed significant differences between several pairs: A and C ( $p < 0.01$ ), A and D ( $p < 0.01$ ), A and E ( $p < 0.01$ ), B and C ( $p < 0.01$ ), B and D ( $p < 0.01$ ), B and E ( $p < 0.05$ ), and C and E ( $p < 0.05$ ), C and F ( $p < 0.01$ ). This suggested that for the full-body display lectures, regardless of whether the instructor's position was on the left or right, a same frame display was significantly more favorably rated than a separate frame display. Furthermore, when the instructor was positioned on the right in a same frame display, the standard full-body display received higher ratings compared to the classroom shooting style.

An ANOVA on understandability indicated significant differences ( $F(5, 790) = 5.6255$ ,  $p < 0.001$ ). Bonferroni post-hoc analysis showed significant variations between A and C ( $P < 0.01$ ), A and D ( $P < 0.05$ ), A and E ( $P < 0.05$ ), and B and C ( $P < 0.01$ ). This analysis revealed that with the full-body lecture formats where the instructor positioned on the right, the same frame displays were rated significantly higher than separate frames.

## 5 Discussion

Considering these results, the most preferred configuration for full-body display lectures was to be where the instructor is displayed within the same frame as the slides, specifically on the right side. This arrangement likely mitigates the disjointedness seen with separate frames, creating a natural impression similar to an instructor standing in front of the slides in a physical classroom. Such a same frame display enhances the sense of presence and immersion, ultimately leading to higher evaluations. Moreover, this integrated display may facilitate smoother transitions of students' gaze between the instructor and slides, potentially aiding in understanding the content.

Additionally, it was observed that in full-body display lectures, positioning the instructor on the right side resulted in higher ratings for ease of viewing compared to the left, aligning with the preferences observed among Chinese students in Zhang et al [4]. According to Zhang et al, since reading typically progresses from left to right, an instructor positioned on the left may visually obstruct slide content. This cultural reading habit is consistent among Japanese students as well, suggesting that positioning the instructor on the right side likely enhances focus and visibility of the slides, making the video more viewable.

Furthermore, this study showed that when the instructor is positioned on the right in a same frame display, the standard full-body display format more effectively captivates student interest compared to the classroom shooting style. While previous research [5] found the highest ratings with classroom shooting style where the instructor seamlessly appeared beside the slides, this study suggests the display method where the instructor's image overlaps the slides, integrating them more naturally, may better capture the atmosphere of a face-to-face lecture, enhancing student interest.

However, it appears that the difference between separate and same frame displays is influenced by the instructor's standing position. Specifically, significant differences were observed in all evaluation items when the instructor stood on the right, but when on the left, notable differences were only seen in terms of interest. Furthermore, The impact of the instructor's position also depends on the framing style. In same frame displays, positioning the instructor on the right rather than the left makes a noticeable difference in visibility. In separate frame displays, since the instructor and slides are clearly delineated, it might be easier for viewers to distinguish between their visual information, thus the specific standing position of the instructor likely has a relatively small impact on visibility. Moving forward, we intend to analyze the descriptive content of the surveys to further examine the factors behind the results obtained.

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