

# Using Time-Anchored Peer Comments to Enhance Social Interaction in Online Educational Videos

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# Online Education



# Online Education



## Self Education



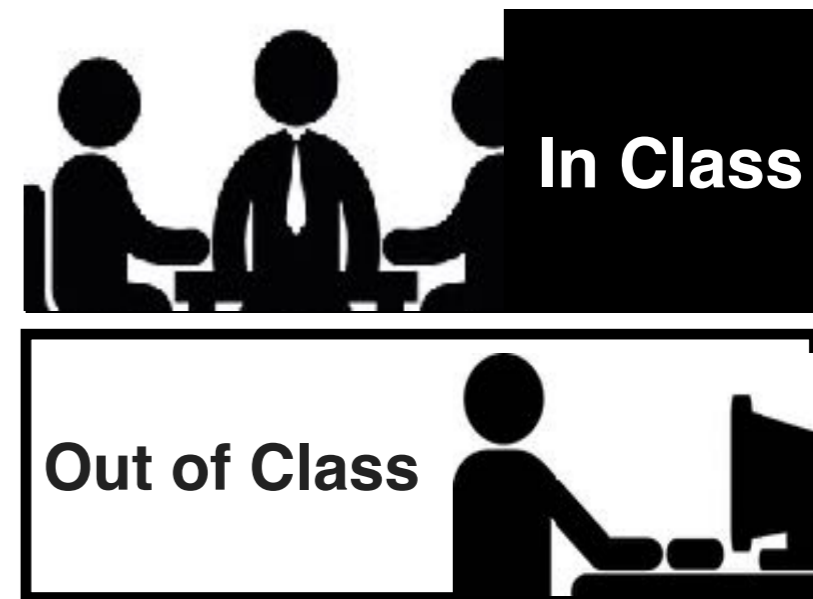
# Online Education



## Self Education



## Flipped Classroom



# Online Education



- Lack of **Social** Interaction
- **Hinder** Learning Performance

[cf. Kizilcec et al., 2014; Abrami, P. C et al., 2001;27]

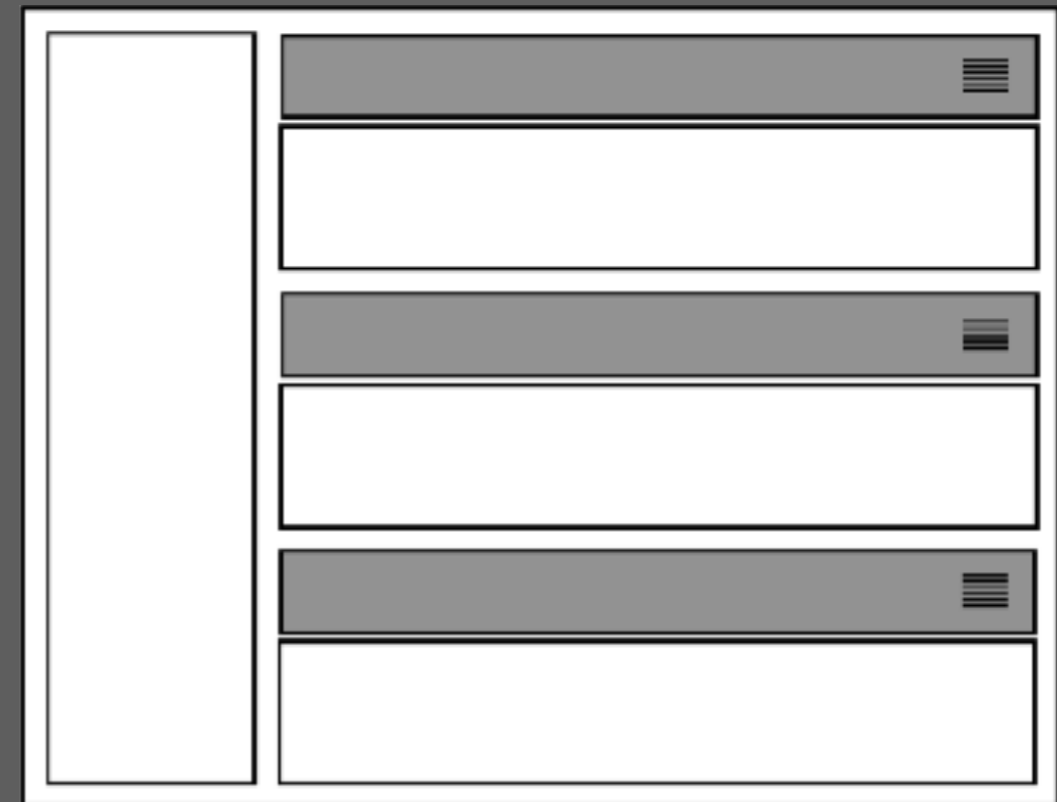
# Synchronous

## Chatroom



# Asynchronous

## Discussion Board



# Synchronous

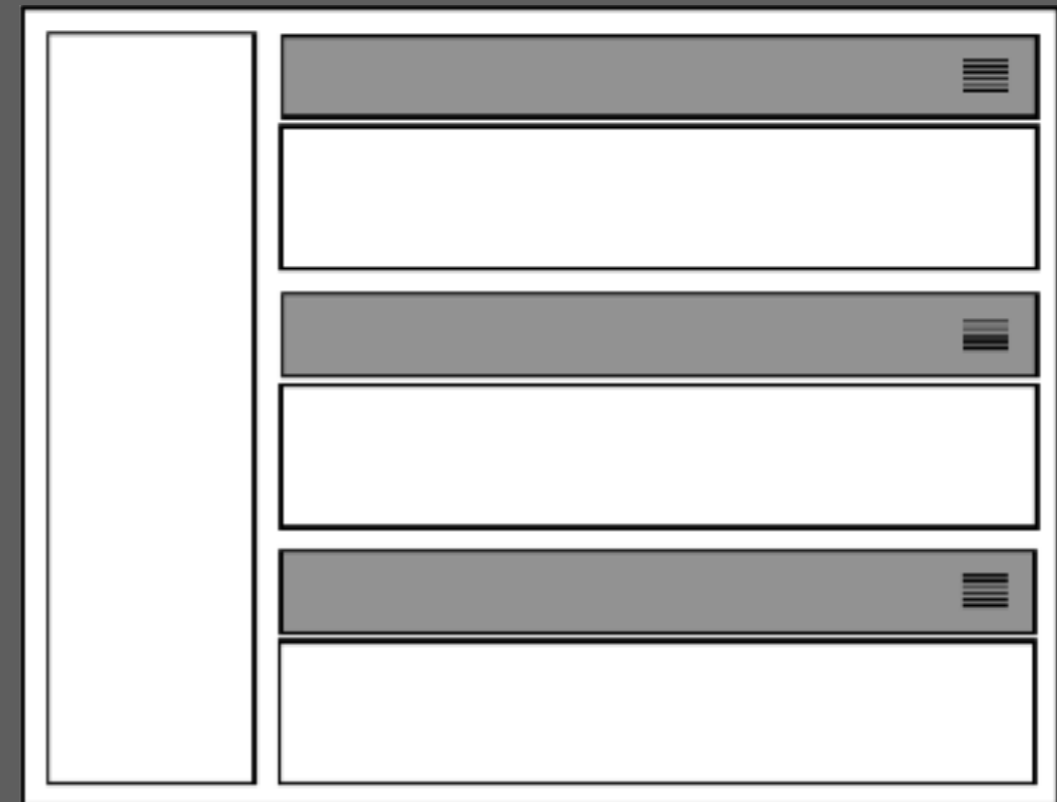
## Chatroom



Lack of Deep Reflection  
Various Time Zone

# Asynchronous

## Discussion Board



Lack of Immediate Feedback  
Few Learner Engagement

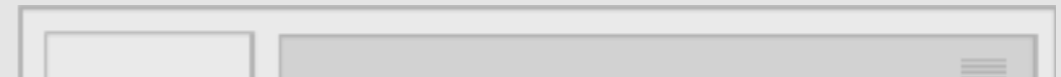
**Synchronous**

**Chatroom**



**Asynchronous**

**Discussion Board**



# Time-Anchored Comment

Lack of Deep Reflection  
Various Time Zone

Lack of Immediate Feedback  
Few Learner Engagement



# Time-Anchored Comment



+ Create Comment  
+ CREATE COMMENT



# Time-Anchored Comment



**I feel ...**

+ Create Comment  
+ CREATE COMMITMENT

# Time-Anchored Comment

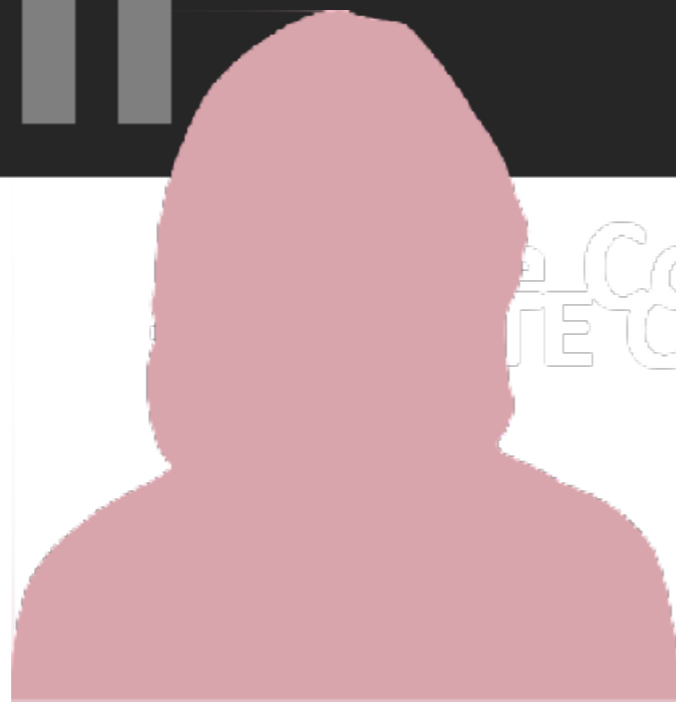


**I feel ...**

comment  
commitment

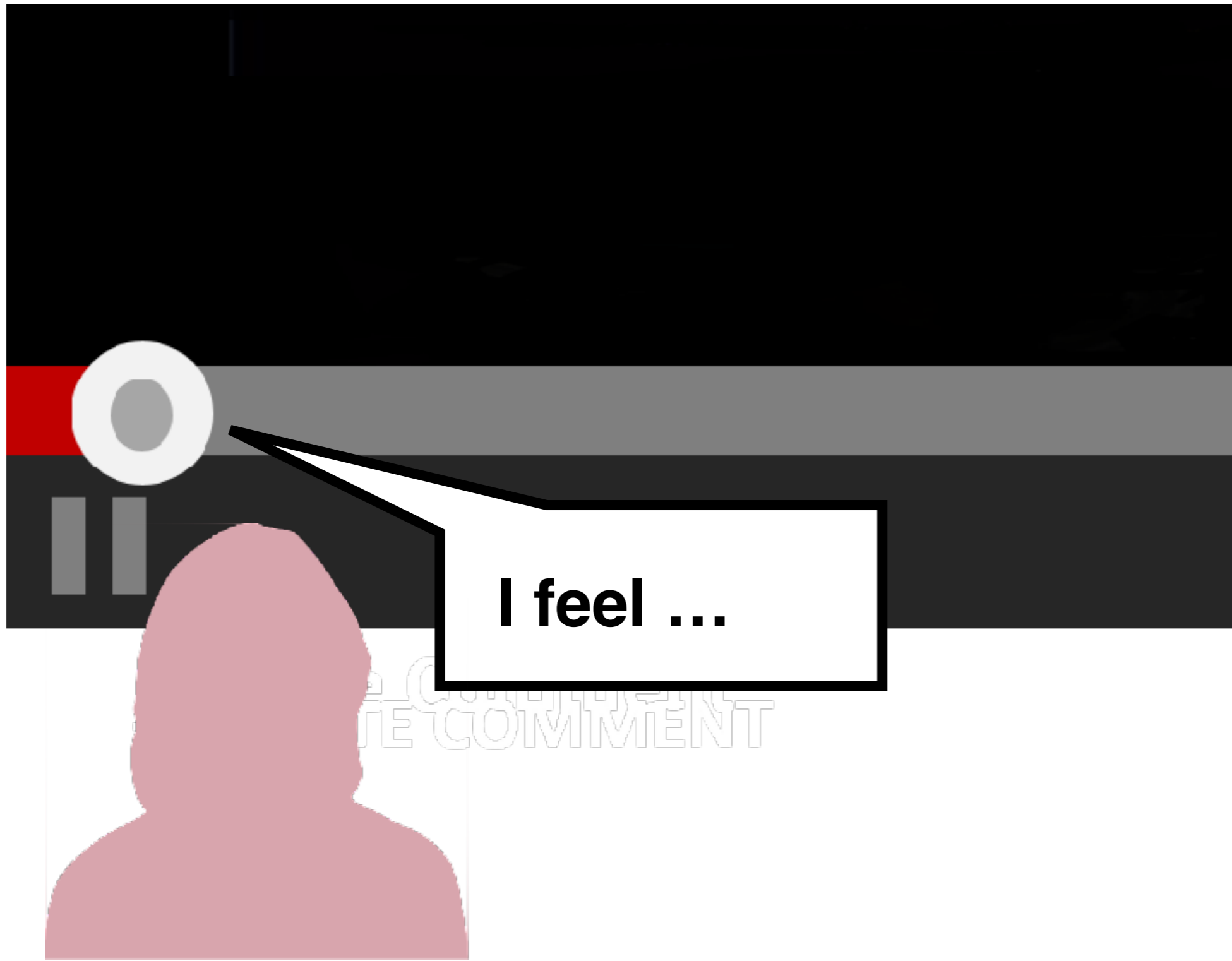


# Time-Anchored Comment



Comment  
COMMENT

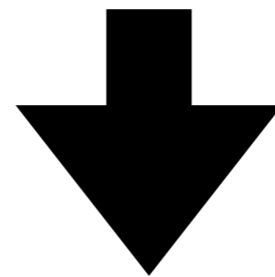
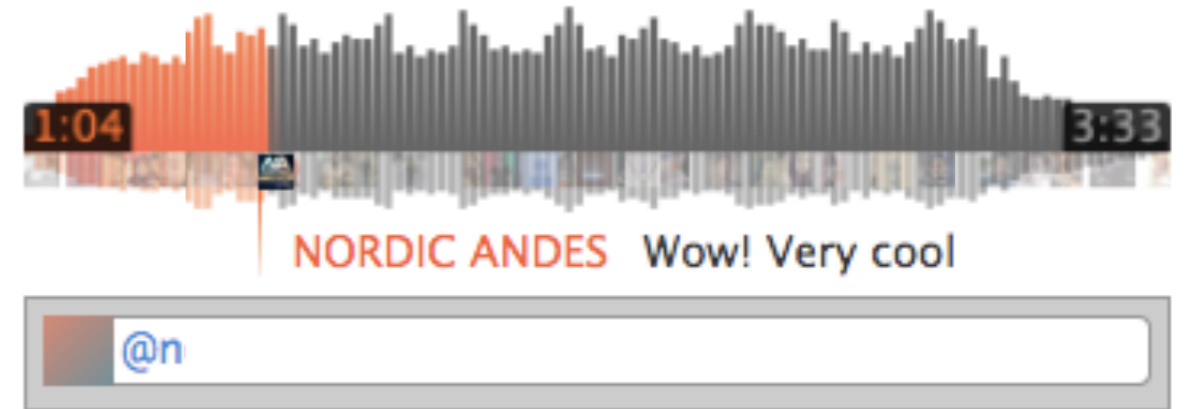
# Time-Anchored Comment



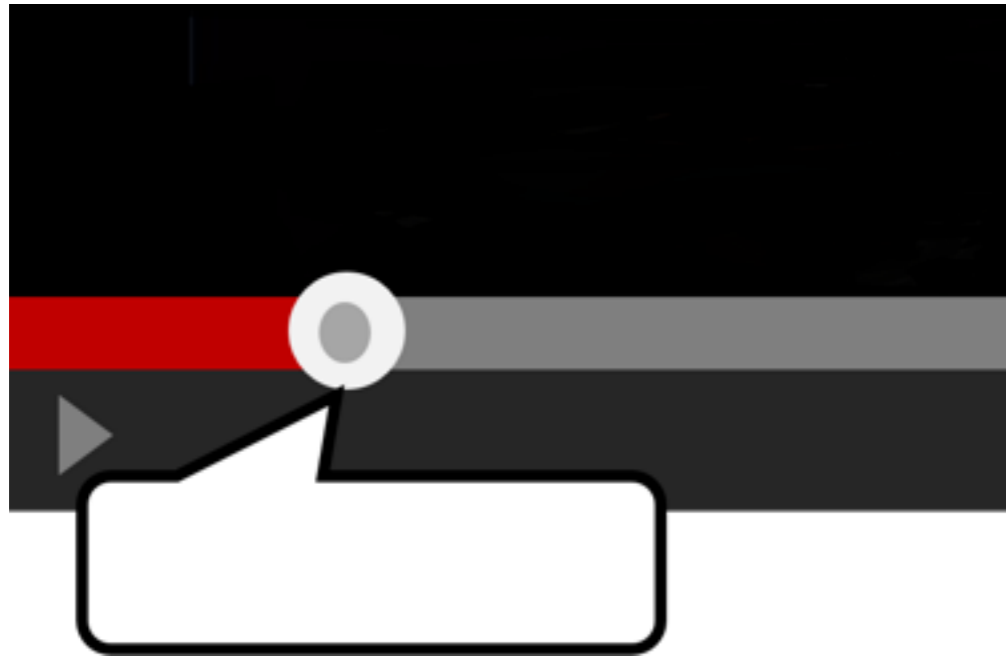


NORDIC ANDES Wow! Very cool





# Online Education



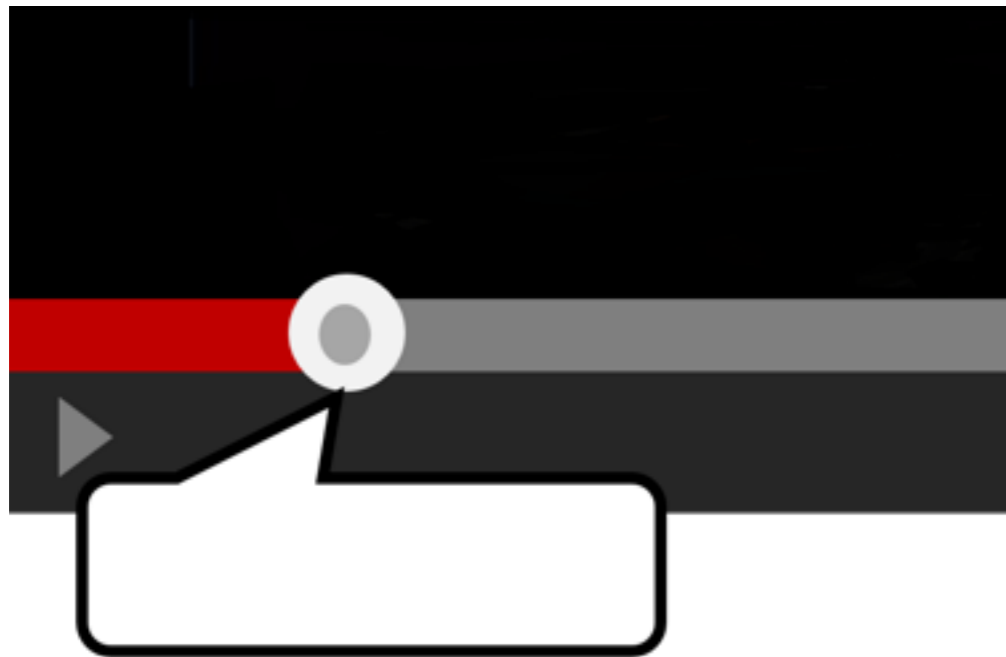
**Time-Anchored  
Comment**

+



**Online Educational  
Video**





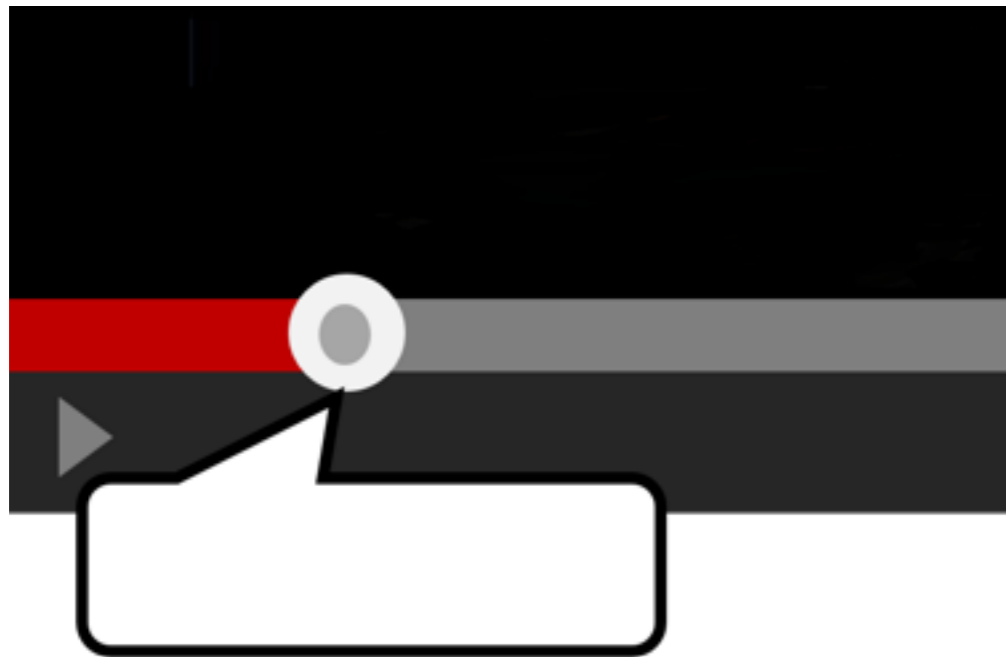
+



**Time-Anchored  
Comment**

**Online Educational  
Video**

**Experiment**



**Time-Anchored  
Comment**

+



**Online Educational  
Video**

┌ **Experiment** ─┐  
**Research Hypotheses**

# Research Hypothesis #1

Time-anchored comments enhance perceived engagement.

This effect is more marked as the number of content-related comments increases.

# Research Hypothesis #2

Dynamically displaying comments enhance perceived social interactivity and make learners leave more comments.

# Research Hypothesis #3

Content-related comments result in better learning outcomes than social-oriented comments.

# Experimental Design

## Stage A

- 50 Participants
- Complete 3 Course Videos **Online**
- **Collect Comments**

# Experimental Design

## Stage A

- 50 Participants
- Complete 3 Course Videos **Online**
- **Collect Comments**

Course	Number of Comments
Neural Science	430
Economics	420
Philosophy	427

# Experimental Design

## Stage B

- 52 Participants
- Complete 3 Course Videos in Lab
- Factors: **Comment Type & Display Type**



# Comment Type

**Content-Related**

**Note, Question,  
Opinion...**

*“Law of demand: ...”*

(Economics Course)

**Social-Oriented**

**Off-topic conversation,  
Joke,...**

*“The instructor could  
speak slowly.”*

(Neural Science Course)

# Display Type

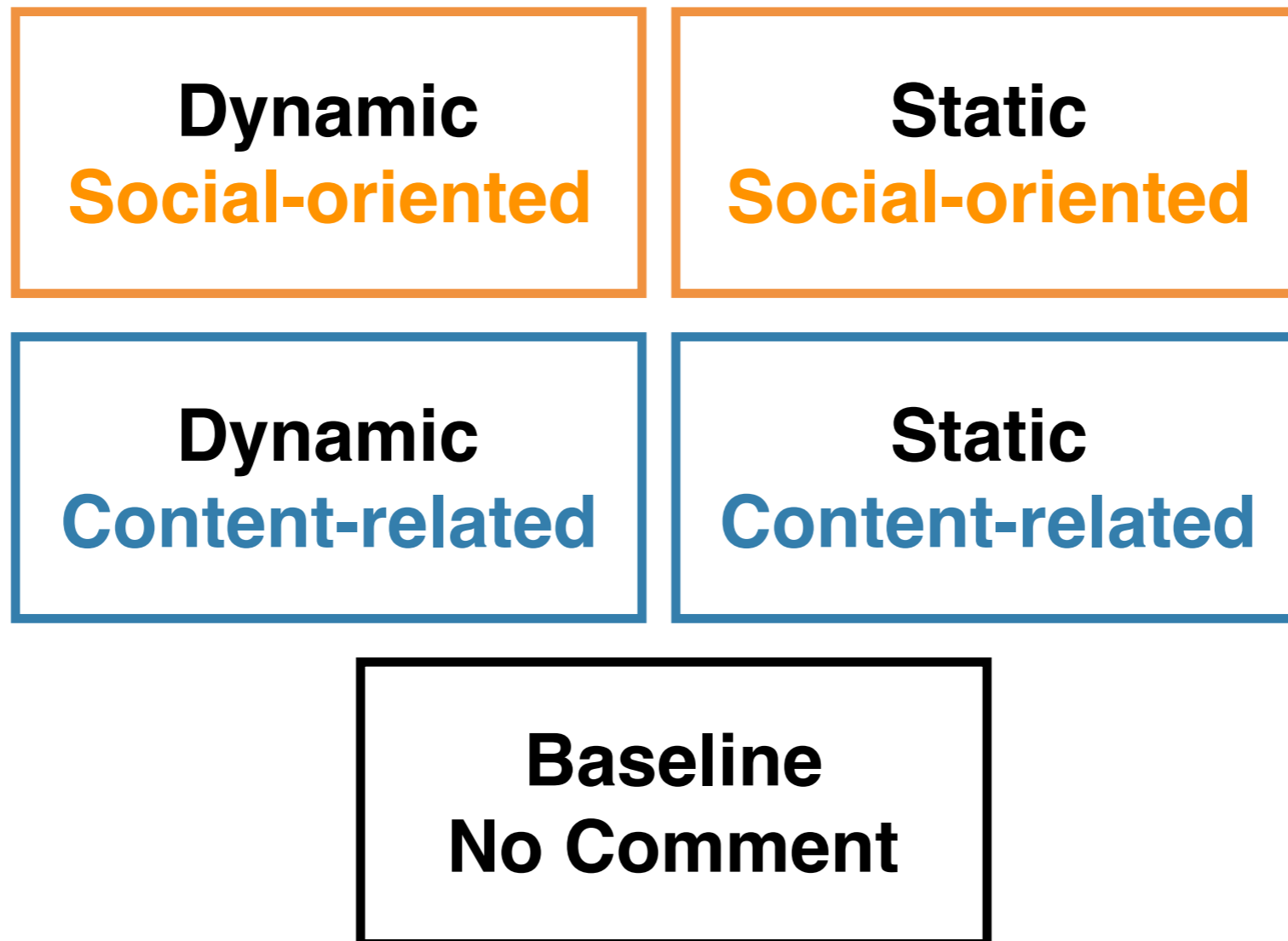
**Static Display**

# Experiment Conditions

**Comment Type X Display Type**

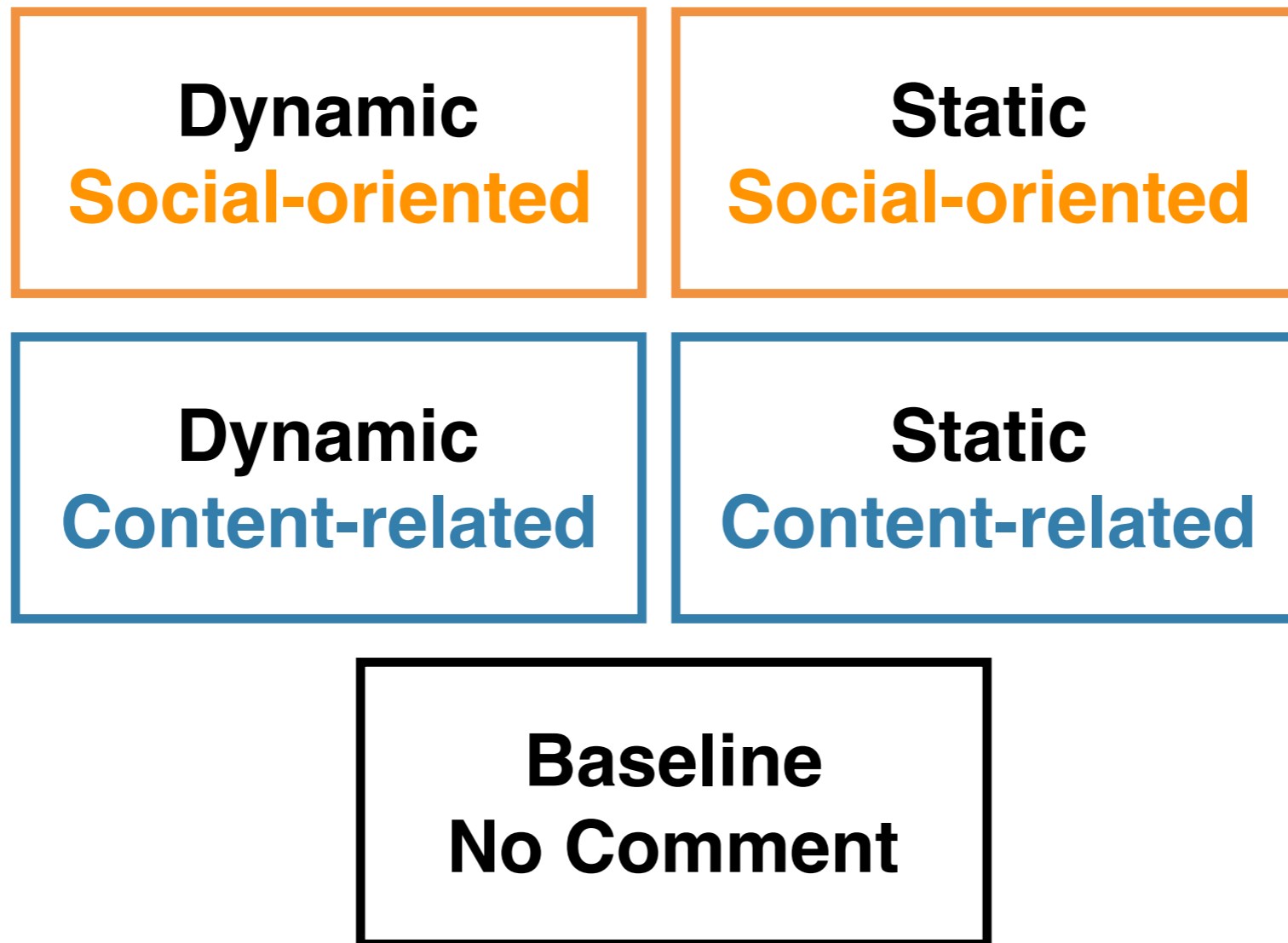
# Experiment Conditions

Comment Type X Display Type



# Experiment Conditions

Comment Type X Display Type



Measure Participants' Experience

# Measure

## Questionnaire

- After Watching Video

### Perceived Social Interactivity

[cf. Zhang, S. et al., 2011; Granovetter, M. et al., 1983.]

*I feel attached to these people who interact on this video course*

### Perceived Engagement

[cf. O'Brien, H. L. et al., 2010]

*I was so involved in this course that I lost track of time.*

Strongly  
Disagree



Strongly  
Agree

# Measure

## Learning Outcomes

- Pretest & Posttest
- Questions From Course Content

*What is Reward System?  
Please give a brief explanation.*  
(Neural Science Course)

*What is Law of Demand?  
Please give a brief explanation.*  
(Economics Course)

# Experiment Procedure





# Experiment Procedure

**5 Conditions**

**Randomly** assigned to each participant with **equal** probability



# Experiment Procedure



# Experiment Procedure

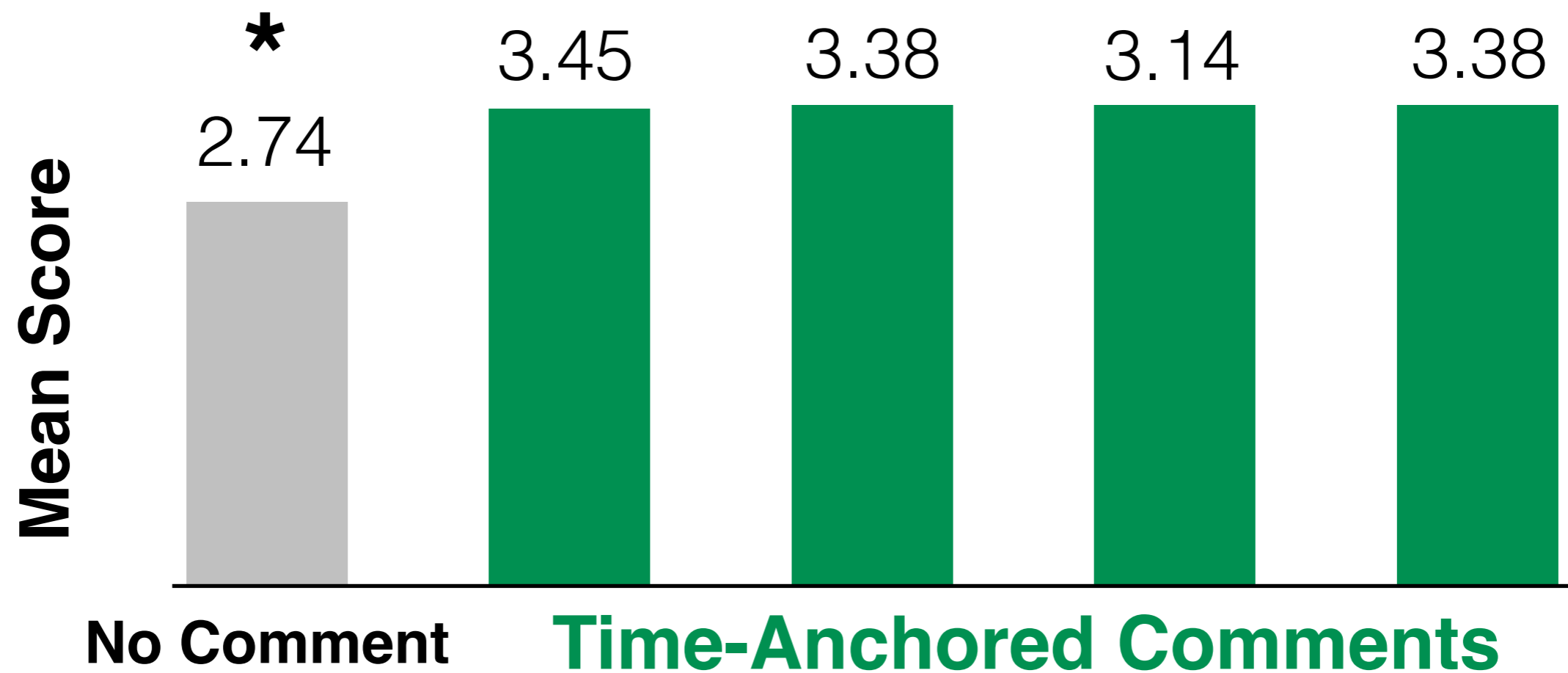


# Results

Whether time-anchored comments made the learners perceive more **engagement**?



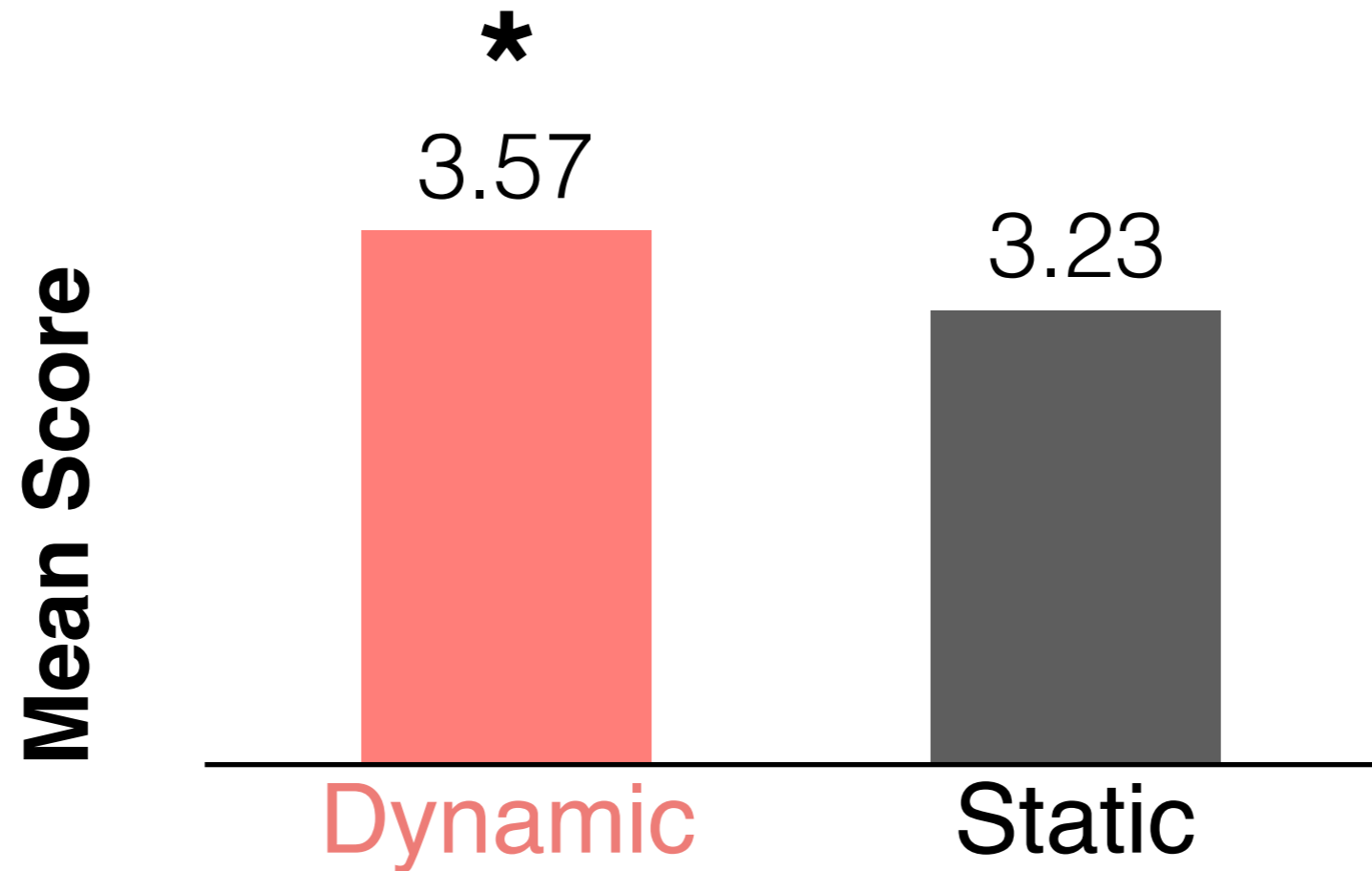
# Comments enhanced perceived engagement.



What is the influence of display type on participants' **perceived social interactivity**?



# Dynamic display enhanced perceived social interactivity.

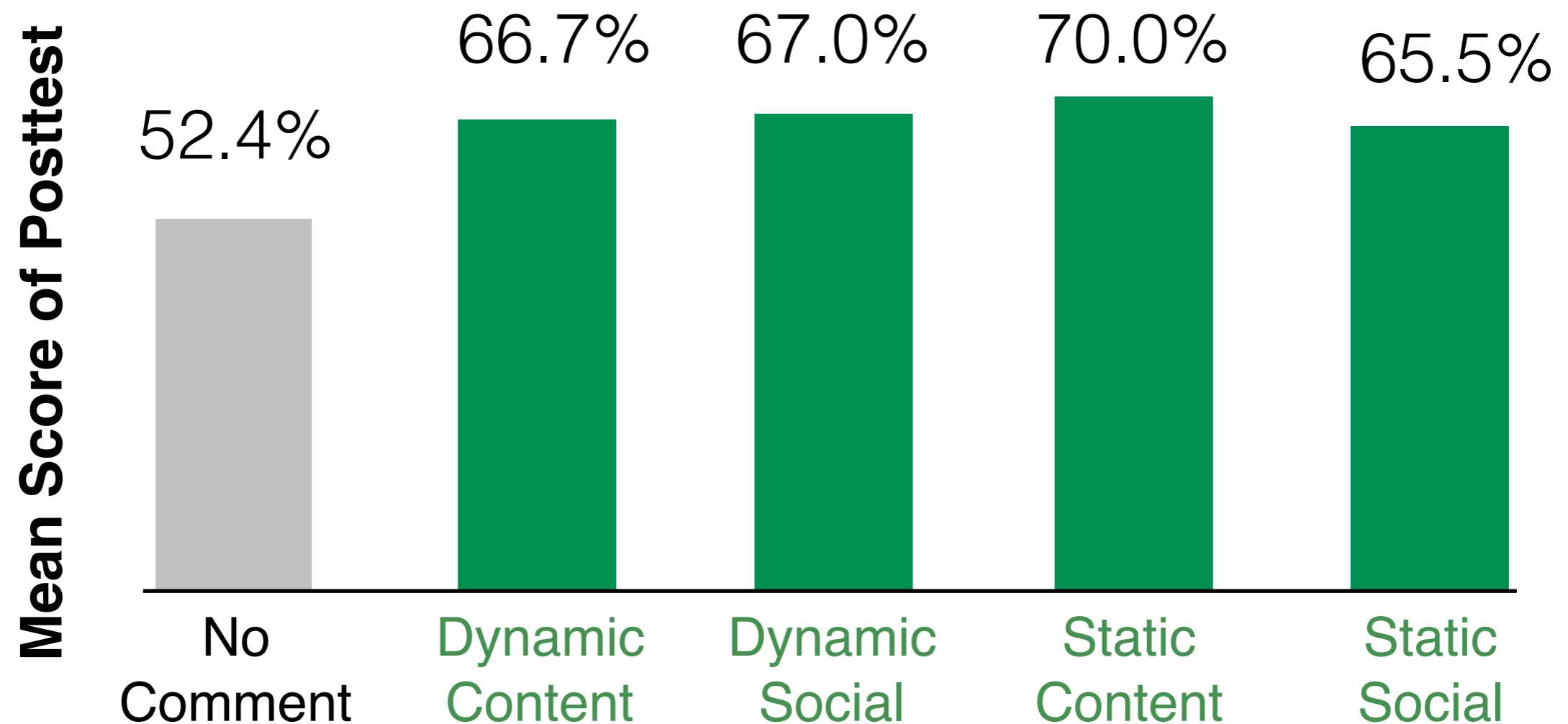




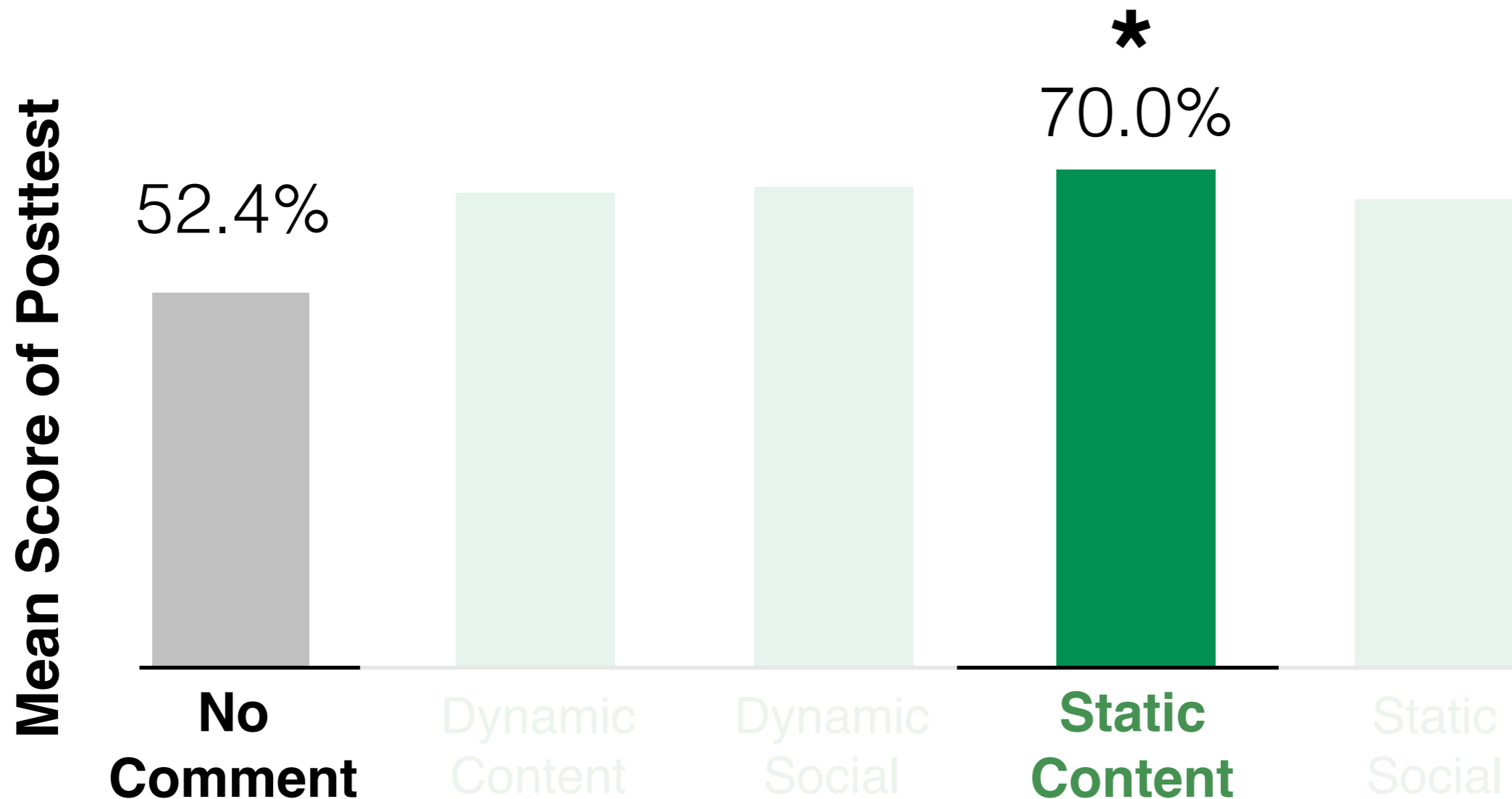
Whether time-anchored comments could help participants to **learn better?**



# Comments didn't hinder learning outcomes.



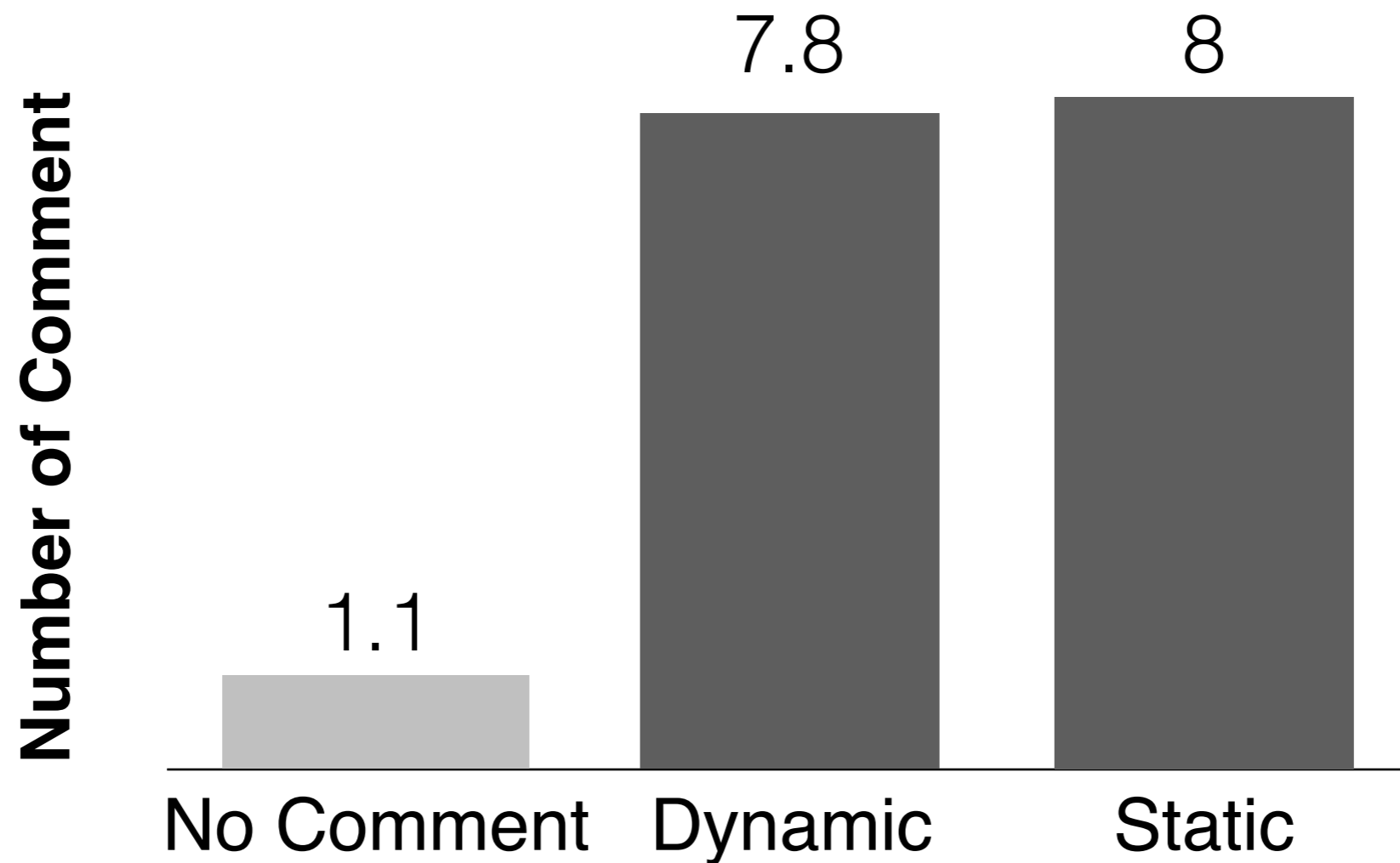
# Statically displaying content-related comments enhanced learning outcomes.



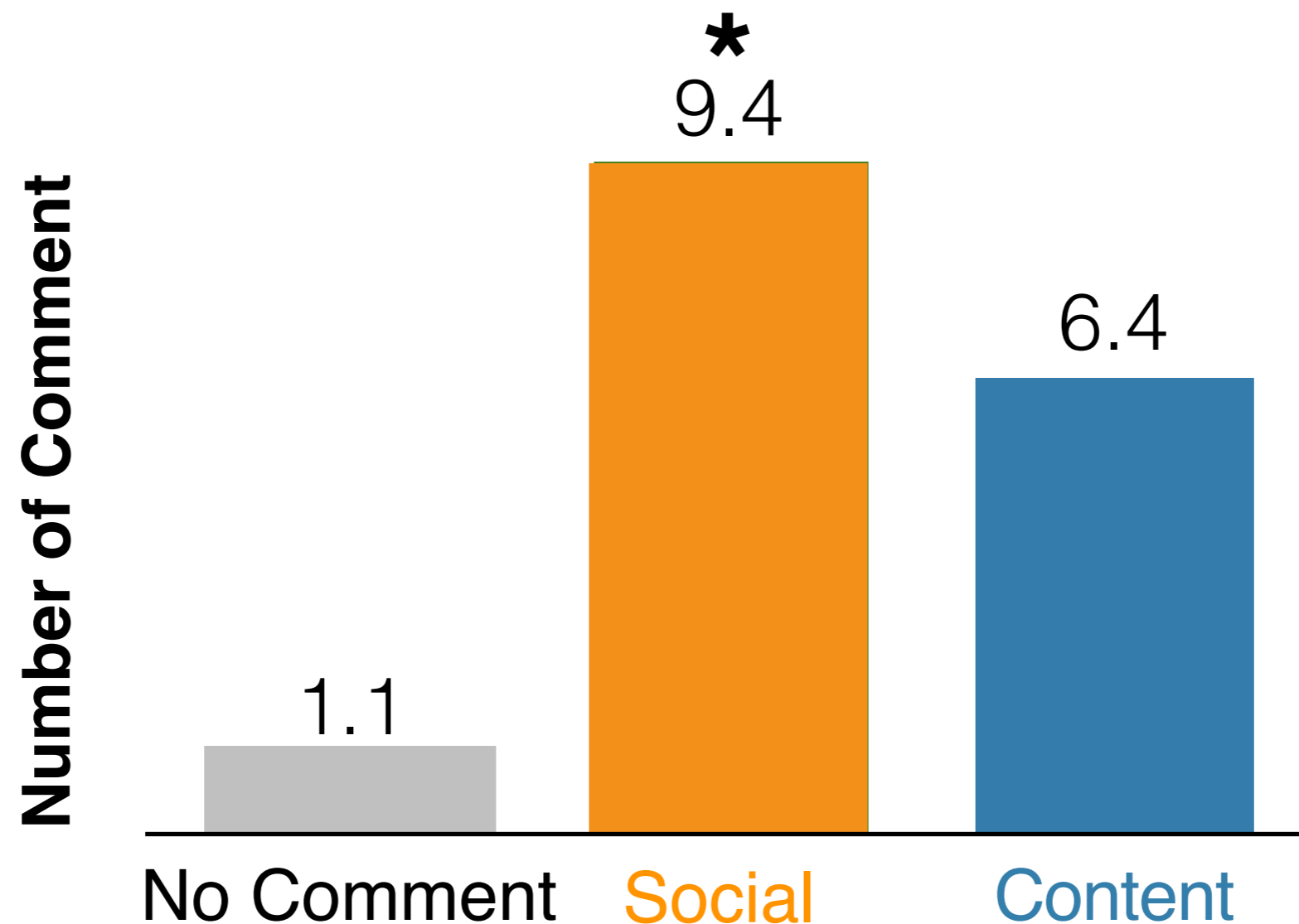
How the experimental factors influence the participants' **commenting behaviors**?



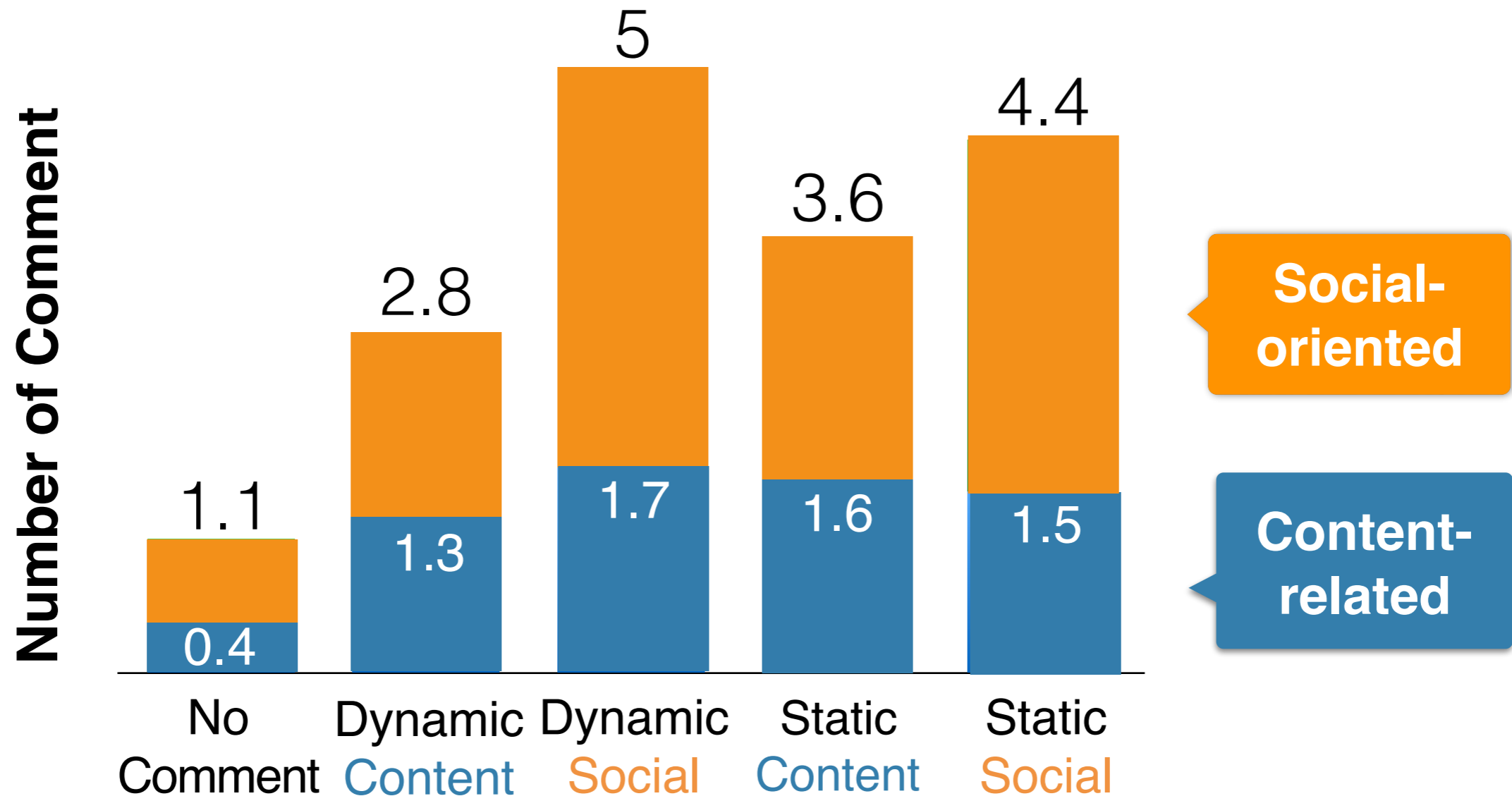
# Display Type didn't affect intention to leave comments.



# Social-oriented comments increased intention to leave comment.



# Social-oriented comments didn't distract learners from leaving content-related comments.



Perceived  
Engagement

Perceived Social  
Interactivity

# Design Implications

Learning  
Outcomes

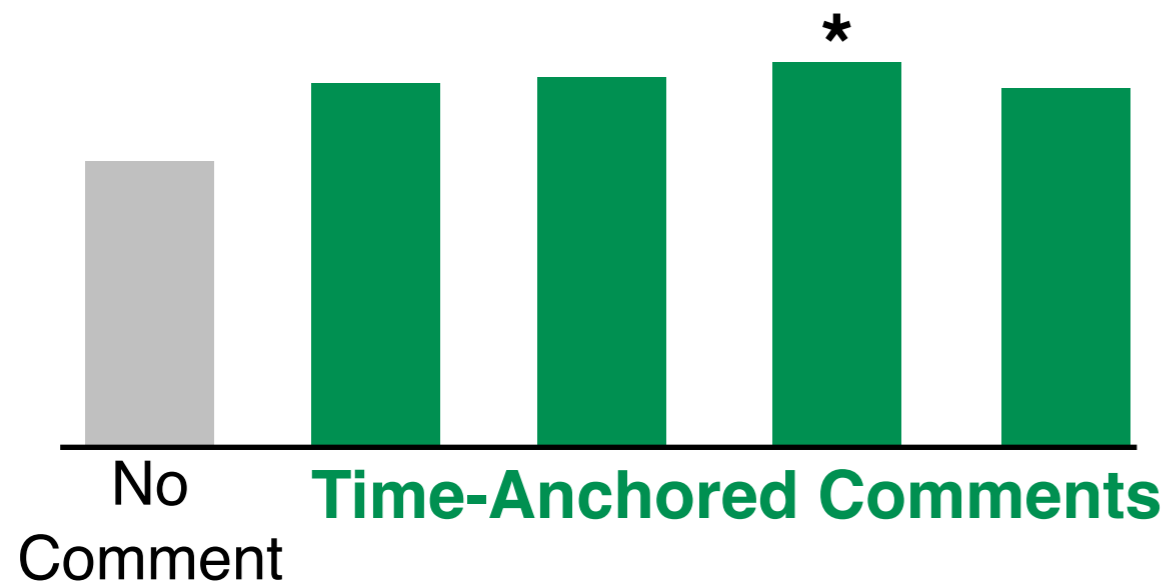
Comment  
Number



# Design Implication #1

Video-centered, time-anchored comments exchange supports collaborative learning.

## Learning Outcomes

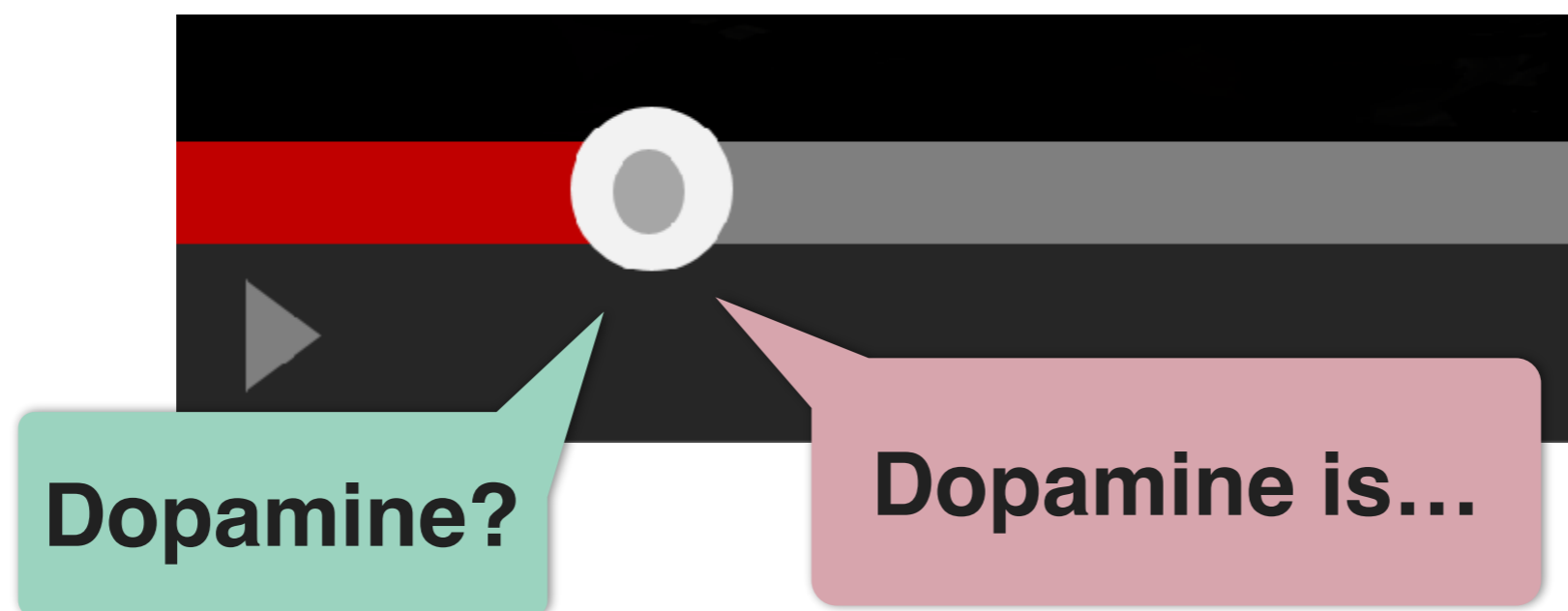


## Perceived Engagement



# Design Implication #1

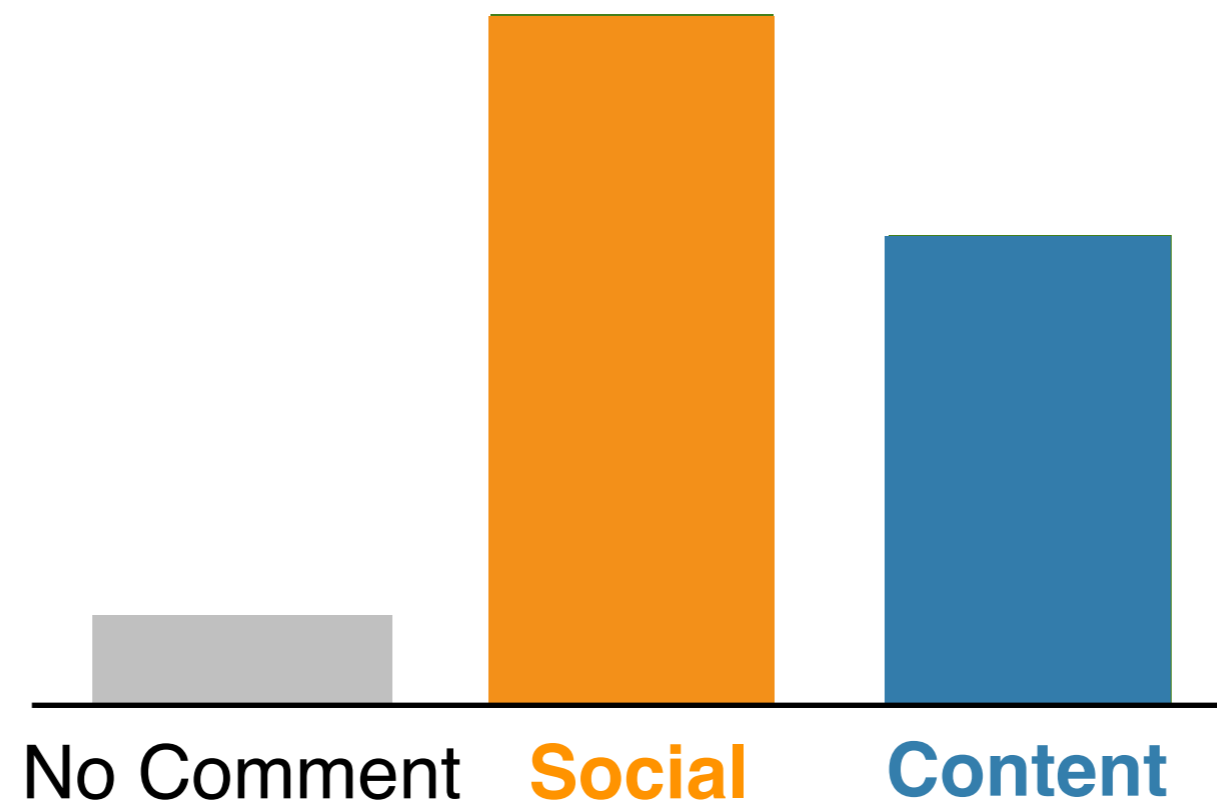
*“Some users **noted** the important or **complex contents** of the courses, and I can **read** these notes after watching the course video.” (S2)*



# Design Implication #2

Social-oriented comments are desirable.

**Comment number left by participants**



# Design Implication #2

*”There are lots of **interesting** comments in the video. I’d like to **read and respond to those comments** when I feel something is boring in the courses.” (S15)*

A black silhouette of a person's head and shoulders is centered in the lower half of the slide. To the left of the silhouette is an orange speech bubble with a white border and a tail pointing towards the person's mouth. Inside the speech bubble, the text "Social-oriented" is written in white, bold, sans-serif font.

**Social-  
oriented**

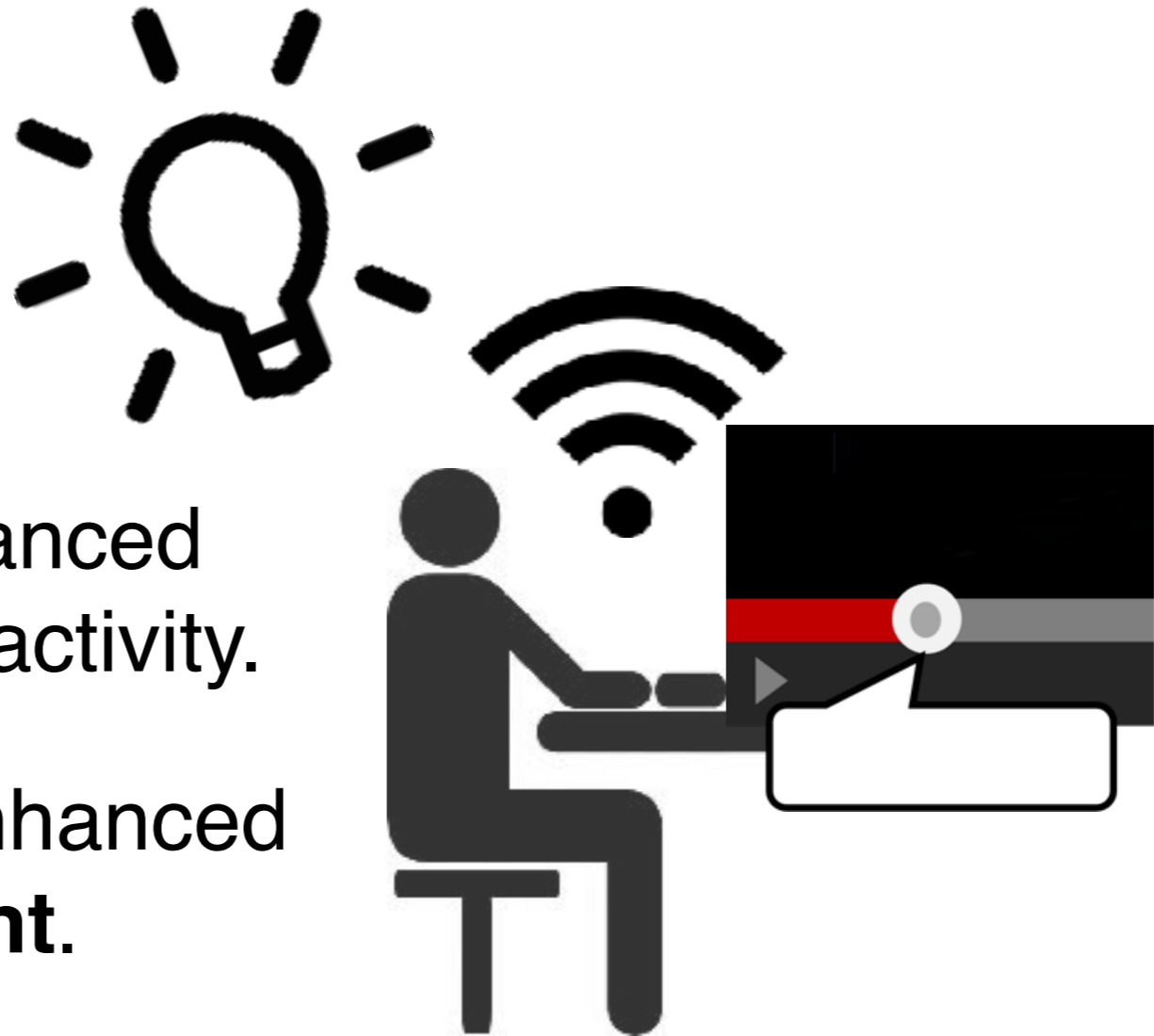
# Conclusion

**Dynamic** display enhanced perceived **social** interactivity.

Display **comments** enhanced perceived **engagement**.



# Conclusion



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Display **comments** enhanced perceived **engagement**.

# Acknowledgement

## Anonymous Reviewers

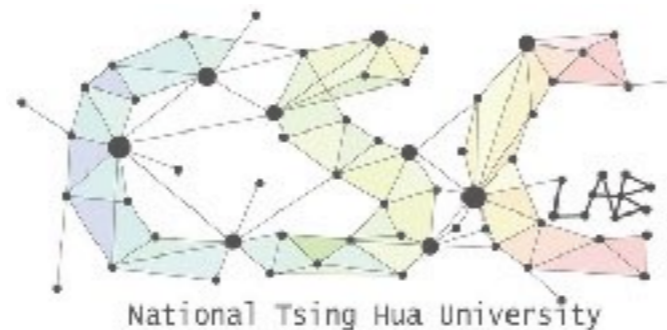
For insightful comments

## Taiwan Ministry of Science and Technology (MOST)

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## International Center of Excellence in Advanced Bioengineering Taiwan MOST I-RiCE Program

103-2911-I-009-101



# **Limitation**

Lab Setting Experiment

Lack of Contextual Factors



# **Future Work**

Deployment Studies

Actual Online learners