

Understanding the Effect of In-Video Prompting on Learners and Instructors

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4m, 4.2m, 5m, 4.3m, 5.5m

$$\mu = 4.6m$$

It tends to be a
useful way of doing it.

YouTube

2:19 / 8:04



Learners



Instructors

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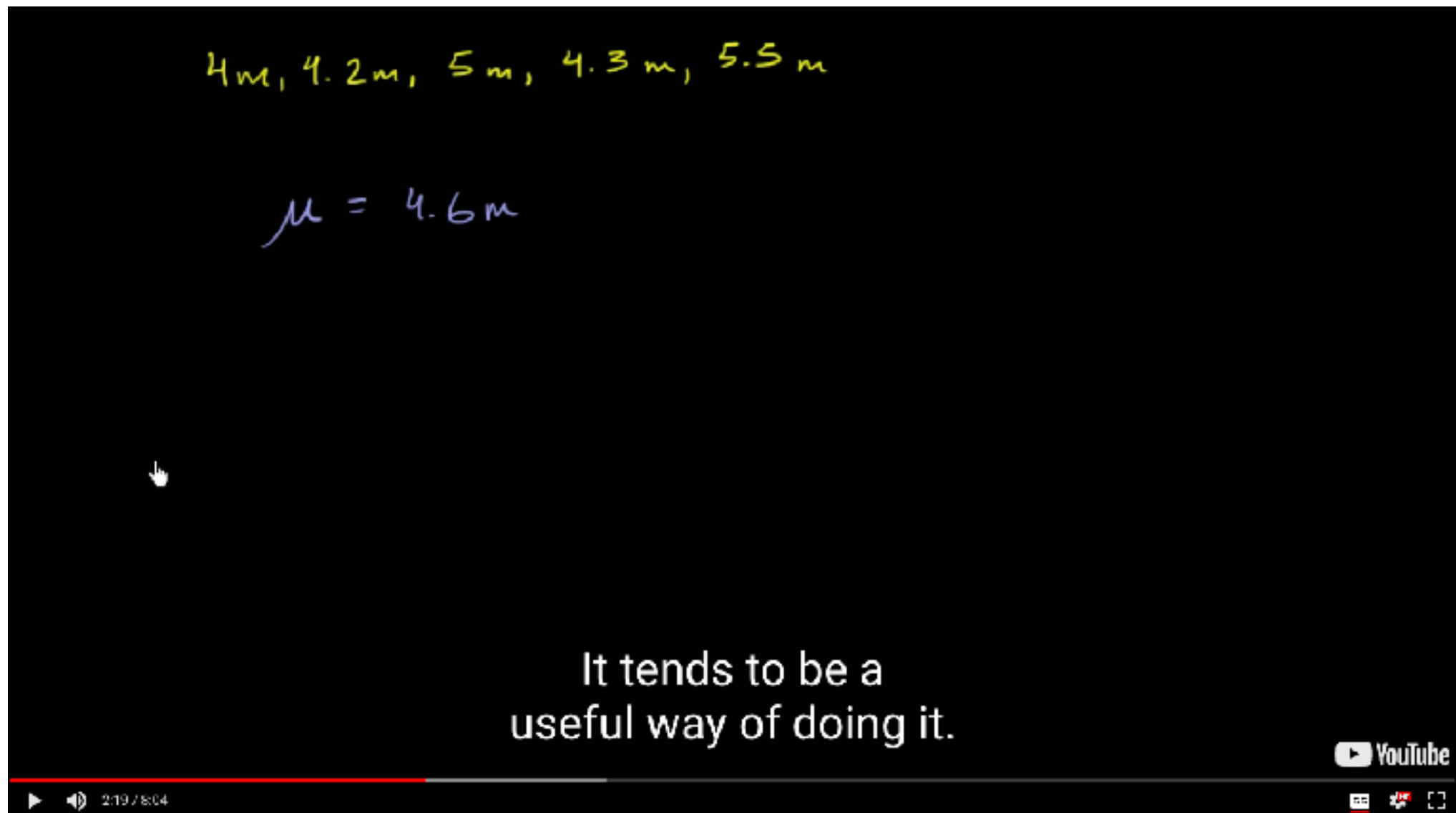
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Learners



Instructors

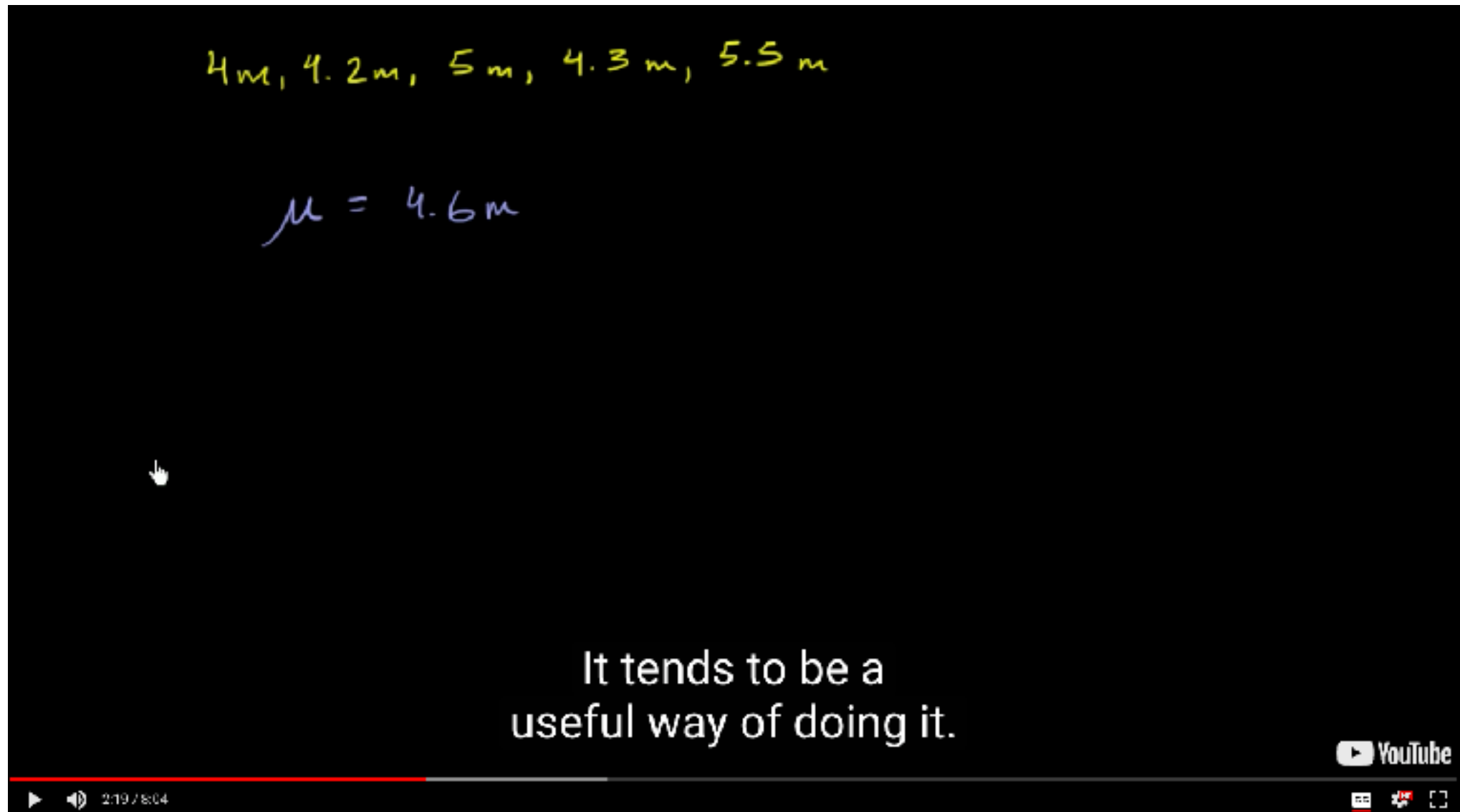


Learners

How well are learners following the lecture?



Instructors



Learners

How well are learners following the lecture?

How learners perceive the lecture?



Instructors

Discussion forums

why linear regression a convex optimization problem??

Mentor Replied

Last post by

54
views

3
replies

Gradient descent

Last post by

50
views

3
replies

How is the cost function a function of parameter θ_1

Mentor Replied

Last post by

57
views

2
replies

**Why do we have to square the difference between the
calculated result $h(\theta; x^i)$ and the actual result y^i .**

Mentor Replied

Last post by

16
views

2
replies

Review websites



17 May 2016

They jump around too much and it is very hard to follow. Often I
~~feel like I missed out on content.~~



16 May 2016

I thought you would learn how to actually create a website, not just
how to pick and install a premade wordpress theme.



4 May 2016

In-video prompting

4 m, 4.2 m, 5 m, 4.3 m, 5.5 m

$\mu =$



-6:59



In-video prompting

4 m, 4.2 m, 5 m, 4.3 m, 5.5 m

Q. Describe how to calculate mean. You may assume you want to calculate a mean of five numbers.

Submit



-6:11



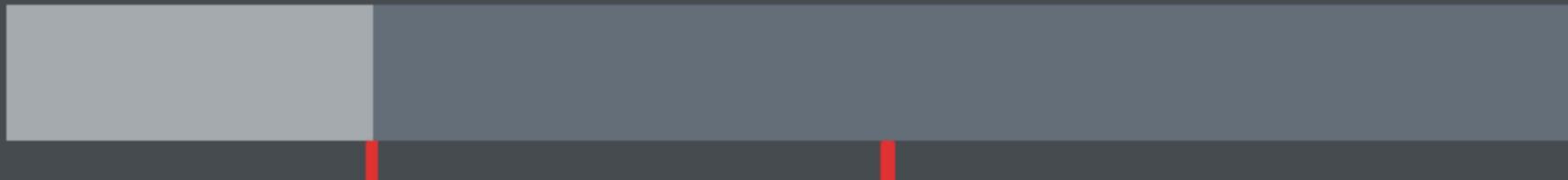
In-video prompting

4m, 4.2m, 5m, 4.3m, 5.5m

Q. Describe how to calculate mean. You may assume you want to calculate a mean of five numbers.

Add up all the numbers and then divide them by the total number of objects you are adding

Submit



-6:11



Properties of in-video prompting

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- All learners encounter the prompts, which is likely to yield a **high response rate**

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Properties of in-video prompting

- All learners encounter the prompts, which is likely to yield a **high response rate**
- In-video prompting can **ask specific questions** to learners
- Prompting at an inopportune time might **distract** learners

Which of the following is **NOT** a category of game elements?

- ☐ Dynamics
- ☒ Mechanics
- ☐ Aesthetics
- ☐ Components

Kinetic Energy (KE)

- Energy due to motion
- $KE = \frac{1}{2}mv^2$
- KE = kinetic energy
- m = mass
- v = velocity

Unit

Joule

kg

m/sec

Mudslide

Why is this *particular* point unclear?

Why is "P" used? What does it stand for?

Cancel OK

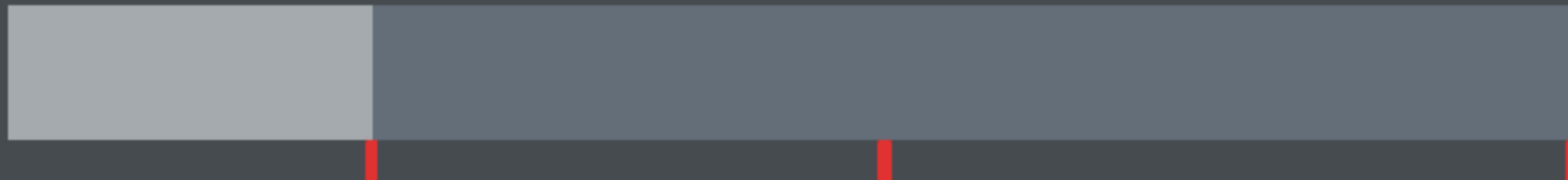
Elena L. Glassman et al., CHI 2015

Little research has investigated
the design space of in-video prompts

4m, 4.2m, 5m, 4.3m, 5.5m

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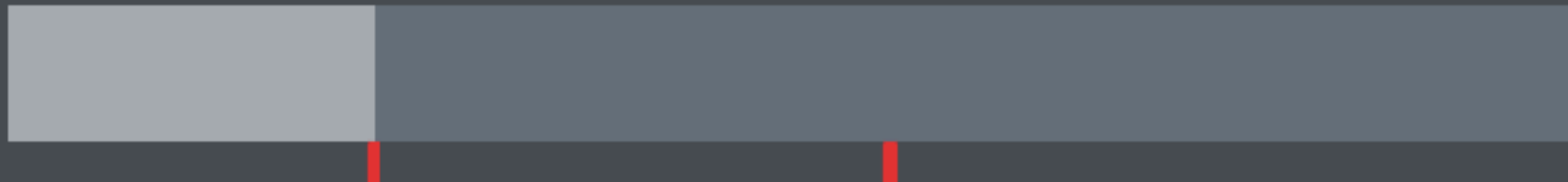
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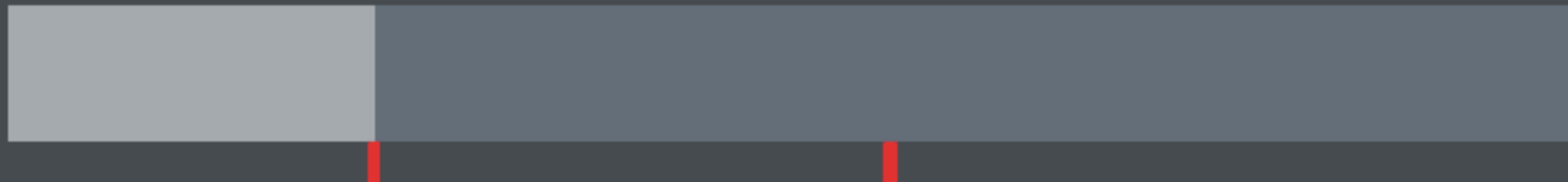


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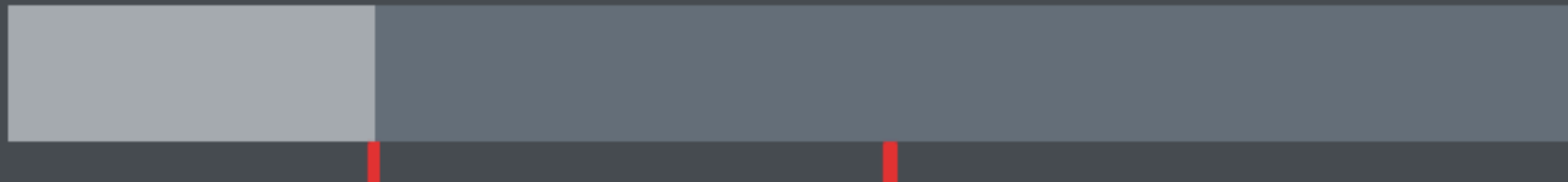
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The design space of in-video prompting questions

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	Comprehension- centered	Experience- centered
General	(A)	(B)
Specific	(C)	(D)

The design space of in-video prompting questions

	Comprehension-centered	Experience-centered
General	(A)	(B)
Specific	(C)	(D)

(A): Describe what you have learned so far

(B): Describe something unsatisfying about the lecture so far

The design space of in-video prompting questions

	Comprehension-centered	Experience-centered
General	(A)	(B)
Specific	(C)	(D)

(A): Describe what you have learned so far

(C): Describe how to calculate the standard deviation

The design space of in-video prompting questions

	Comprehension-centered	Experience-centered
General	(A)	(B)
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-6:59



Research questions

1. What are learners' perceptions of in-video prompting?
2. How do different in-video prompting questions affect the learning experience?
3. How useful are learner responses to in-video prompts as feedback to instructors?

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Research questions

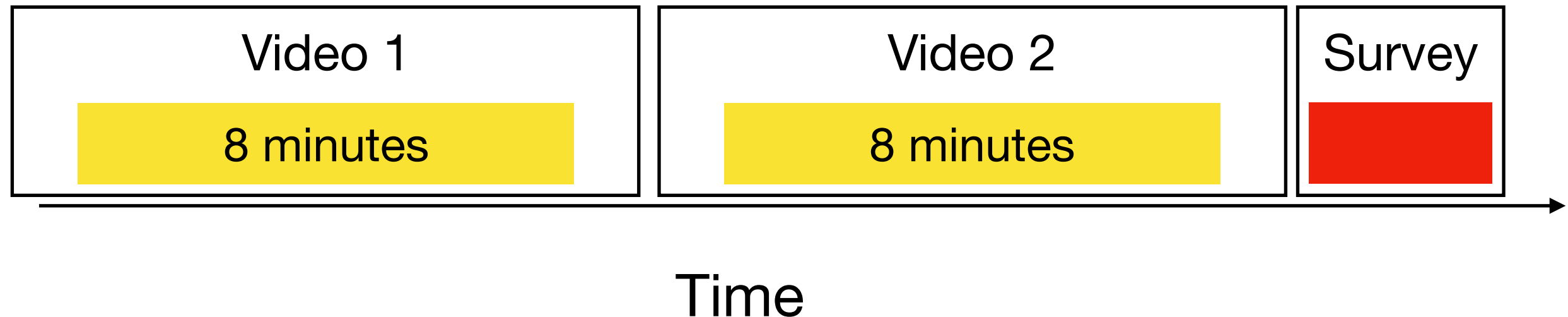
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3. **How useful are learner responses to in-video prompts as feedback to instructors?**

Study 1. Learners' perceptions



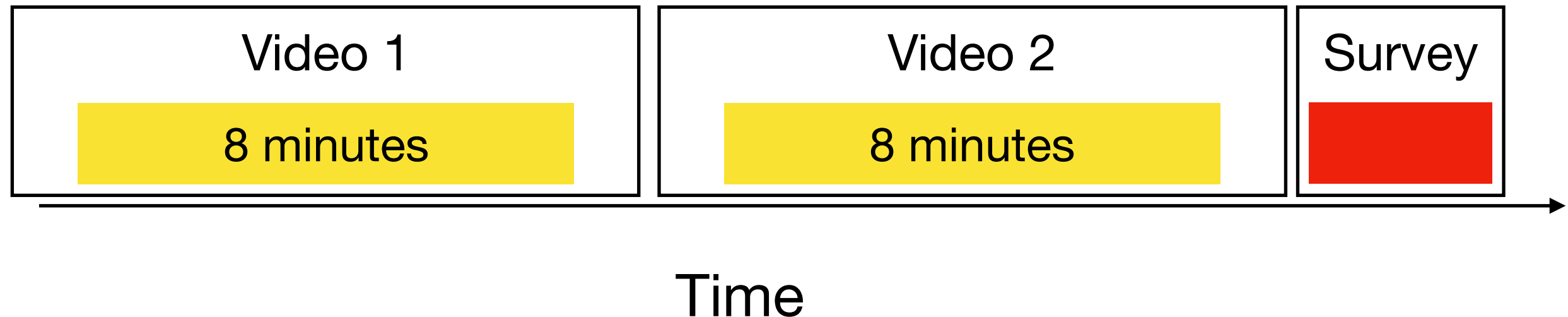
Time

Study 1. Learners' perceptions



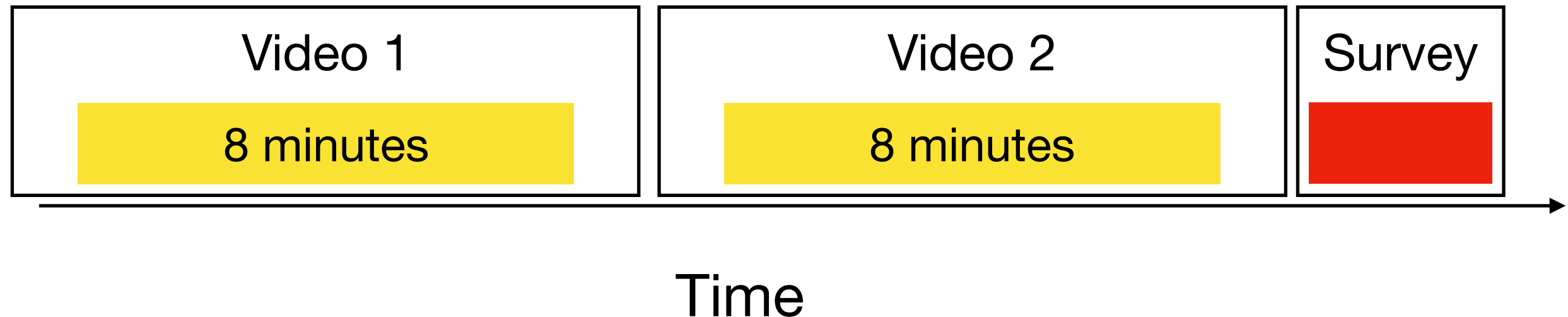
Study 1. Learners' perceptions

The order of presentation topic was counterbalanced



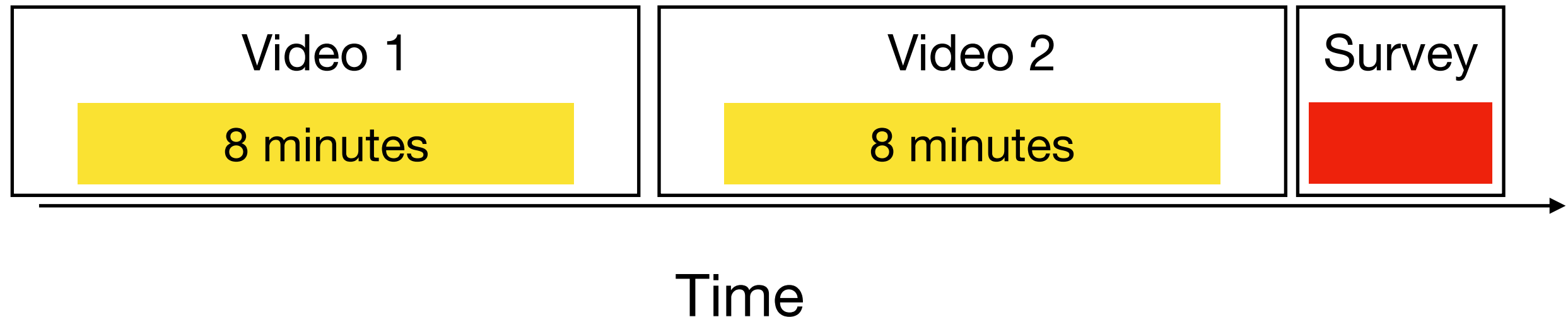
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The order of presentation topic was counterbalanced
pairing of prompting condition



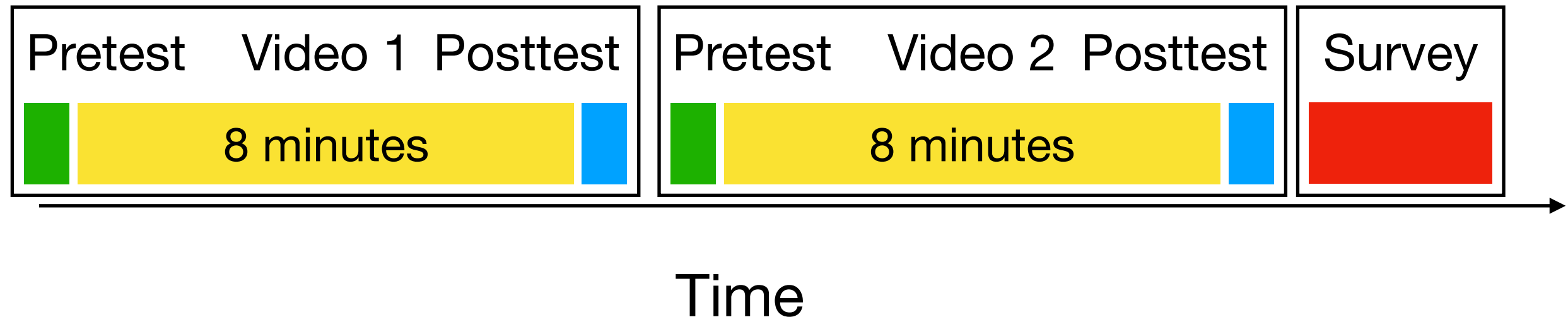
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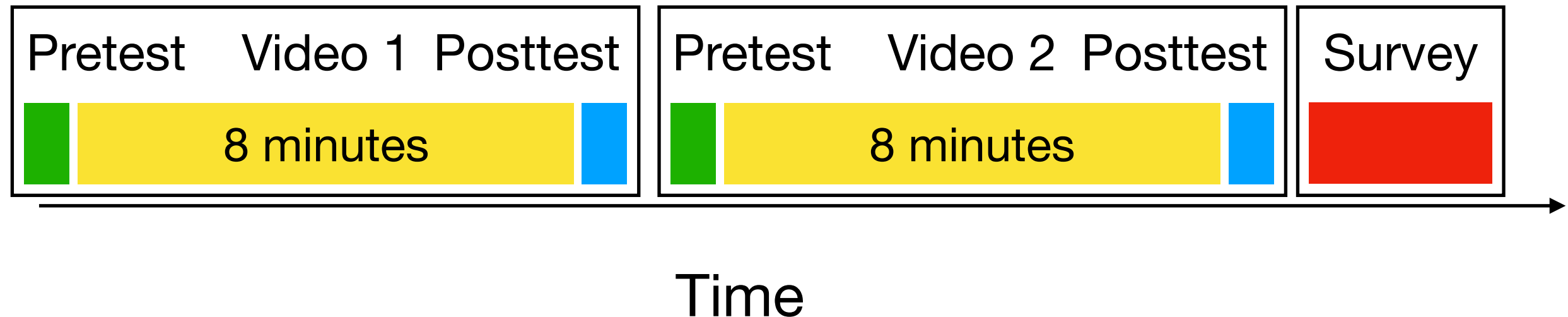
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Study 1. Learners' perceptions

100 participants on Amazon Mechanical Turk

The order of presentation topic was counterbalanced
pairing of prompting condition
prompting questions



Pros of in-video prompting

- Enhance learners' concentration
- Encourage reflection
- Split the lecture into small pieces
- Help grasp key concepts
- Provide interactivity

Pros of in-video prompting

- **Enhance learners' concentration**
- Encourage reflection
- Split the lecture into small pieces
- Help grasp key concepts
- Provide interactivity

“the prompts gave me a good attention check to make sure I understood what was being discussed.”

Pros of in-video prompting

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“Having a prompt helps to indicate exactly what the key concept was so you can take a moment and decide if you fully understand it.”

Pros of in-video prompting

- Enhance learners' concentration
- Encourage reflection
- Split the lecture into small pieces
- Help grasp key concepts
- **Provide interactivity**

“I think prompts make videos more hands-on and interactive and deliver a more educational experience.”

Cons of in-video prompting

- Distract from the learning process
- Provide no feedback on responses
- Cause anxiety

Cons of in-video prompting

- **Distract from the learning process**
- Provide no feedback on responses
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“it might cause you to lose focus on the material in the video by breaking your chain of thought because you are basically being interrupted.”

Cons of in-video prompting

- Distract from the learning process
- **Provide no feedback on responses**
- Cause anxiety

“there is no feedback so even if I answer the prompt question and I’m confident, I may be wrong.”

Cons of in-video prompting

- Distract from the learning process
- Provide no feedback on responses
- **Cause anxiety**

“I felt frustrated that it appeared difficult for me to explain what I learned thus far.”

Study 2. Effects of different prompting strategies

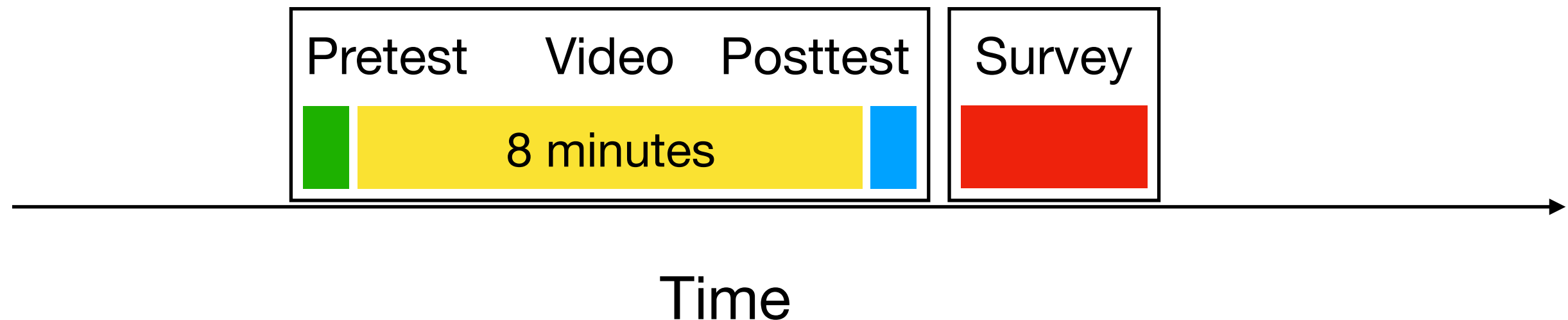
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Study 2. Effects of different prompting strategies



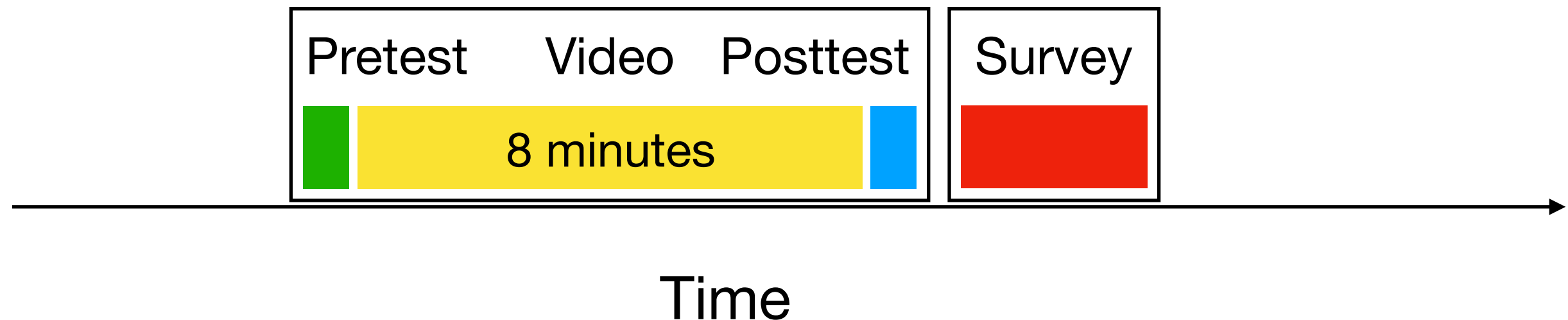
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Study 2. Effects of different prompting strategies



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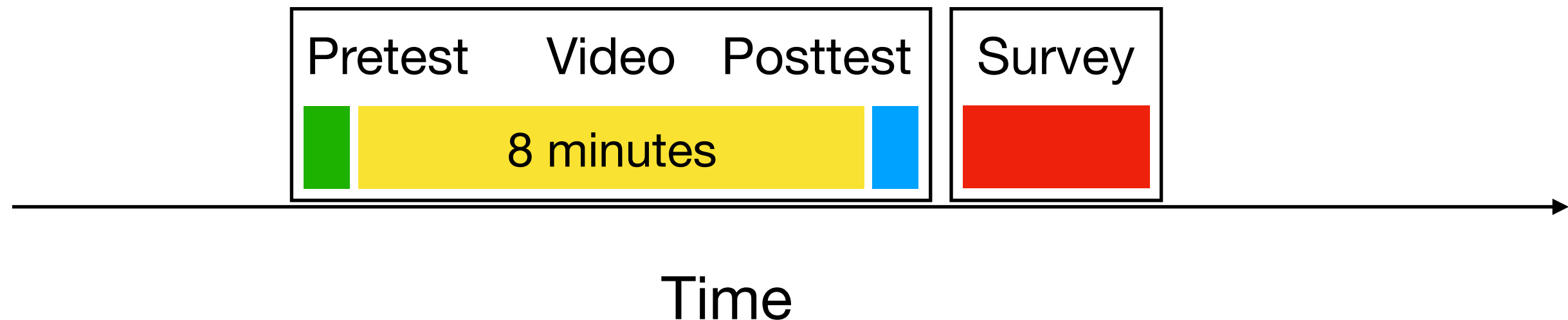
Prompting strategies were randomly assigned



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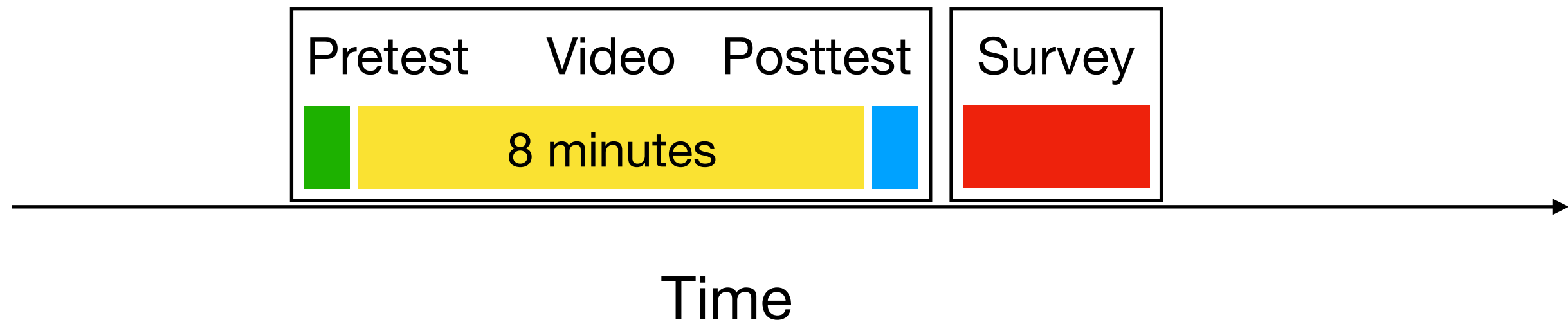
200 participants on Amazon Mechanical Turk



Study 2. Effects of different prompting strategies

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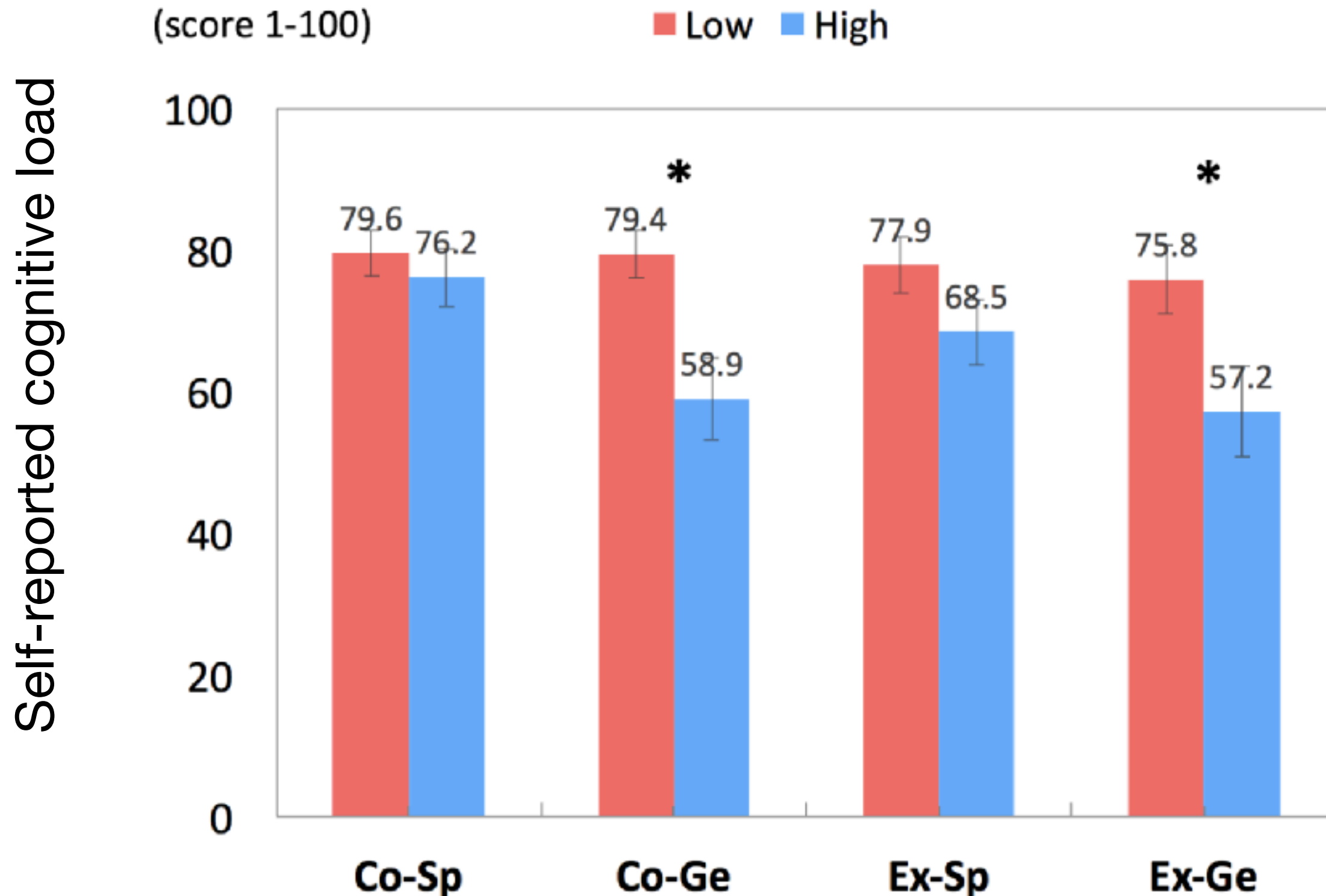
200 participants on Amazon Mechanical Turk



“Prompting made me worried about giving inappropriate responses”

Learners found
comprehension-centered questions
less interruptive
more enjoyable
more helpful
than experience-centered questions

Low-performing group had more cognitive load on prompts

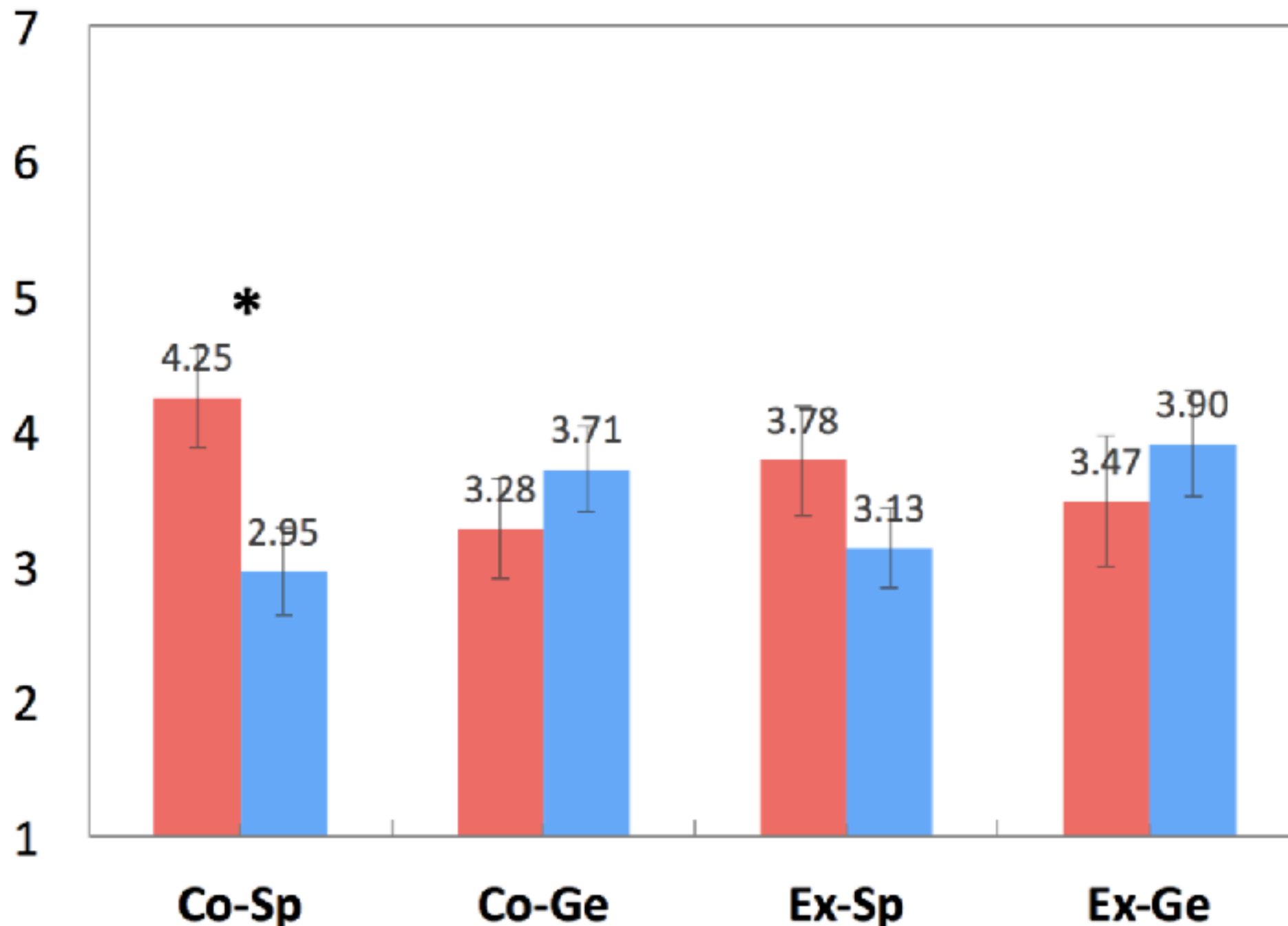


The level of specificity gave different effects on the groups

“Prompting made me worried about giving inappropriate responses”

(score 1-7)

Low High



Instructors preferred experience-centered questions

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- Comprehension-centered vs. Experience-centered
 - Experience-centered questions give more actionable feedback

“I did not like how the screen was black for most of the explanation”

“Lecturer never clearly defined variance”

“The instructor’s handwriting is a little bad”

Instructors preferred experience-centered questions

- Comprehension-centered vs. Experience-centered
 - Experience-centered questions give more actionable feedback
- Learner responses on in-video prompting were specific

Discussion

- Trade-off between prompting strategies
- Trade-off between questions and responses for instructors

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 - Comprehension-centered was better for learners, whereas experience-centered was better for instructors
- Trade-off between questions and responses for instructors

Discussion

- Trade-off between prompting strategies
 - Comprehension-centered was better for learners, whereas experience-centered was better for instructors
- Trade-off between questions and responses for instructors
 - Specific prompting tends to yield more specific responses, but it is more expensive to design

Future work

- Designing personalized in-video prompts

4 m, 4.2 m, 5 m, 4.3 m, 5.5 m

? Q. Describe how to calculate mean. You may assume you want to calculate mean of five numbers.

?

? Submit

65

Describe what you have learned so far.

I S ?

Another question

Skip

Submit



4:00

/

15:09



Describe what you have learned so far.

We need to further explore the design space of in-video prompting

[Skip](#)

[Submit](#)



4:00

/

15:09



Conclusion

- We investigated the effects of in-video prompting on both learners and instructors
- Comprehension-centered questions are less interruptive, more enjoyable, and more helpful for learners
- Experience-centered questions give more actionable feedback for instructors

We need to further explore the design space of in-video prompting