Getting every student prepared for every class

Zürcher Hochschule für Angewandte Wissenschaften
Winterthur, Switzerland, 18 January 2017

Getting every student prepared for every class

Program

9:30	Introduction to Perusall
10:15	Reading assignment (read, annotate, respond)
10:45	Coffee
11:00	Demonstration of Gradebook and Confusion Report
11:20	Discussion
12:00	Adjourn

Please make an account at http://app.perusall.com

Zürcher Hochschule für Angewandte Wissenschaften
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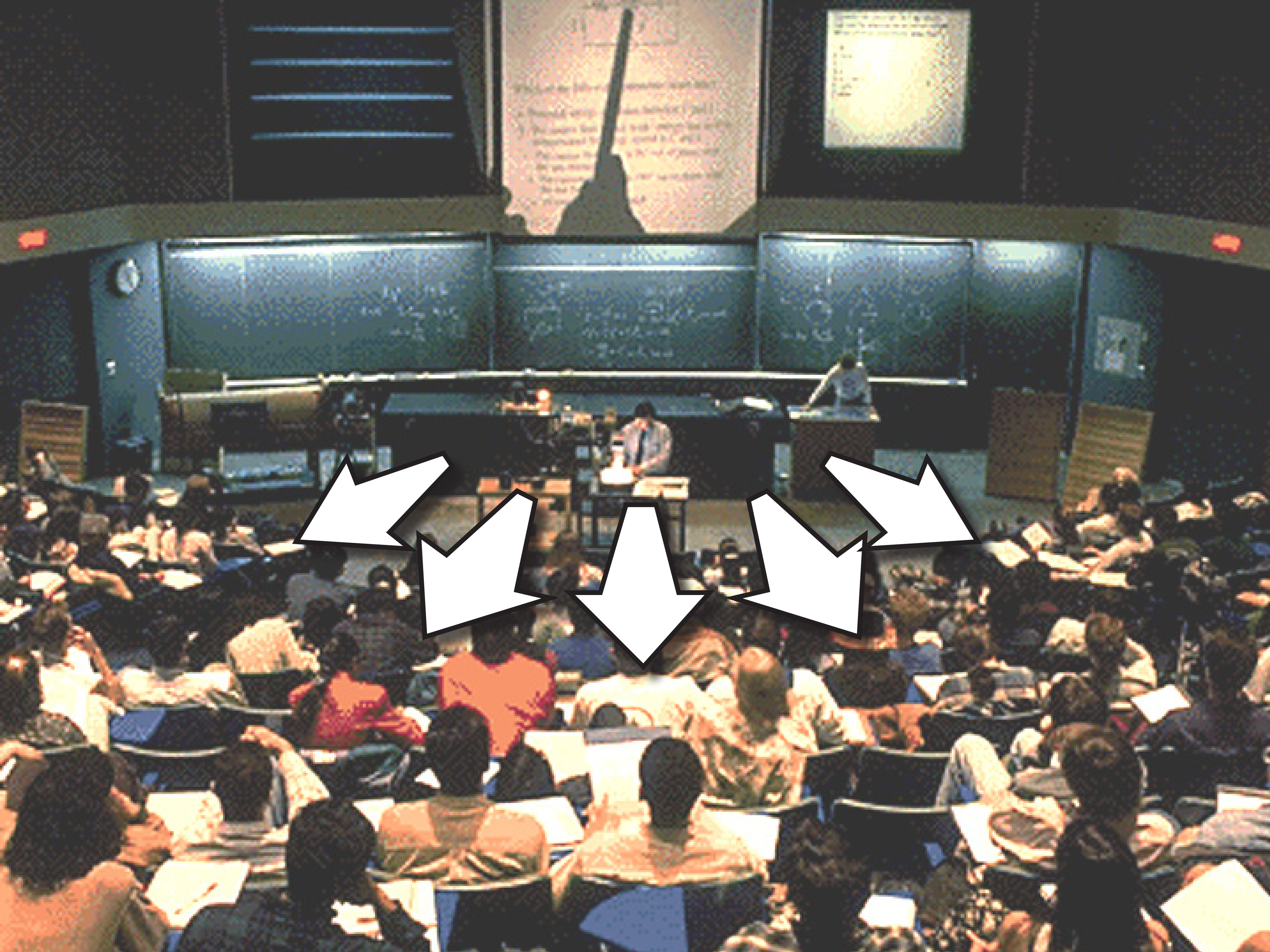


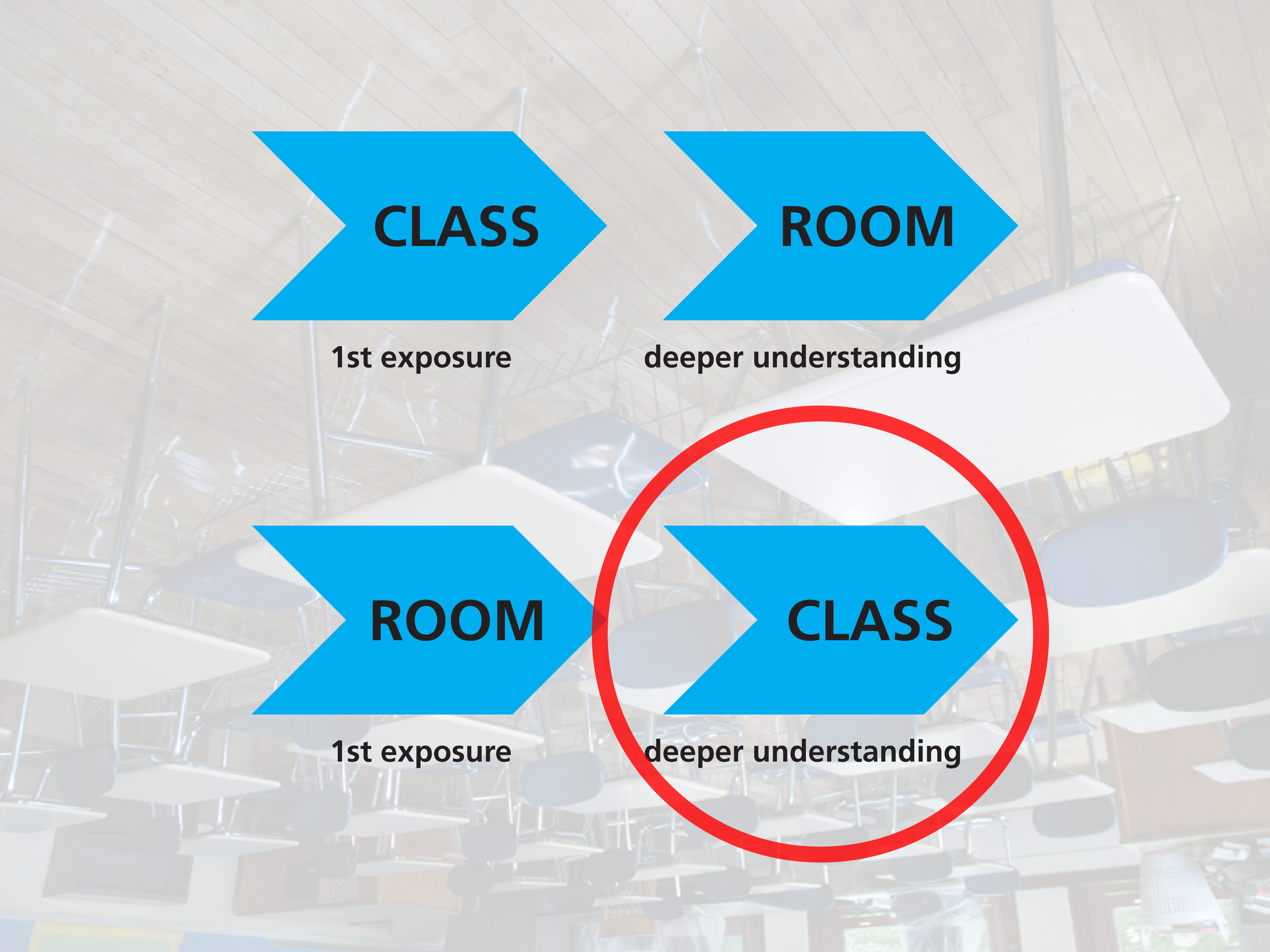

CLASS
ROOM
1st exposure
deeper understanding

CLASS → **ROOM**

1st exposure — deeper understanding

ROOM → **CLASS**

1st exposure — deeper understanding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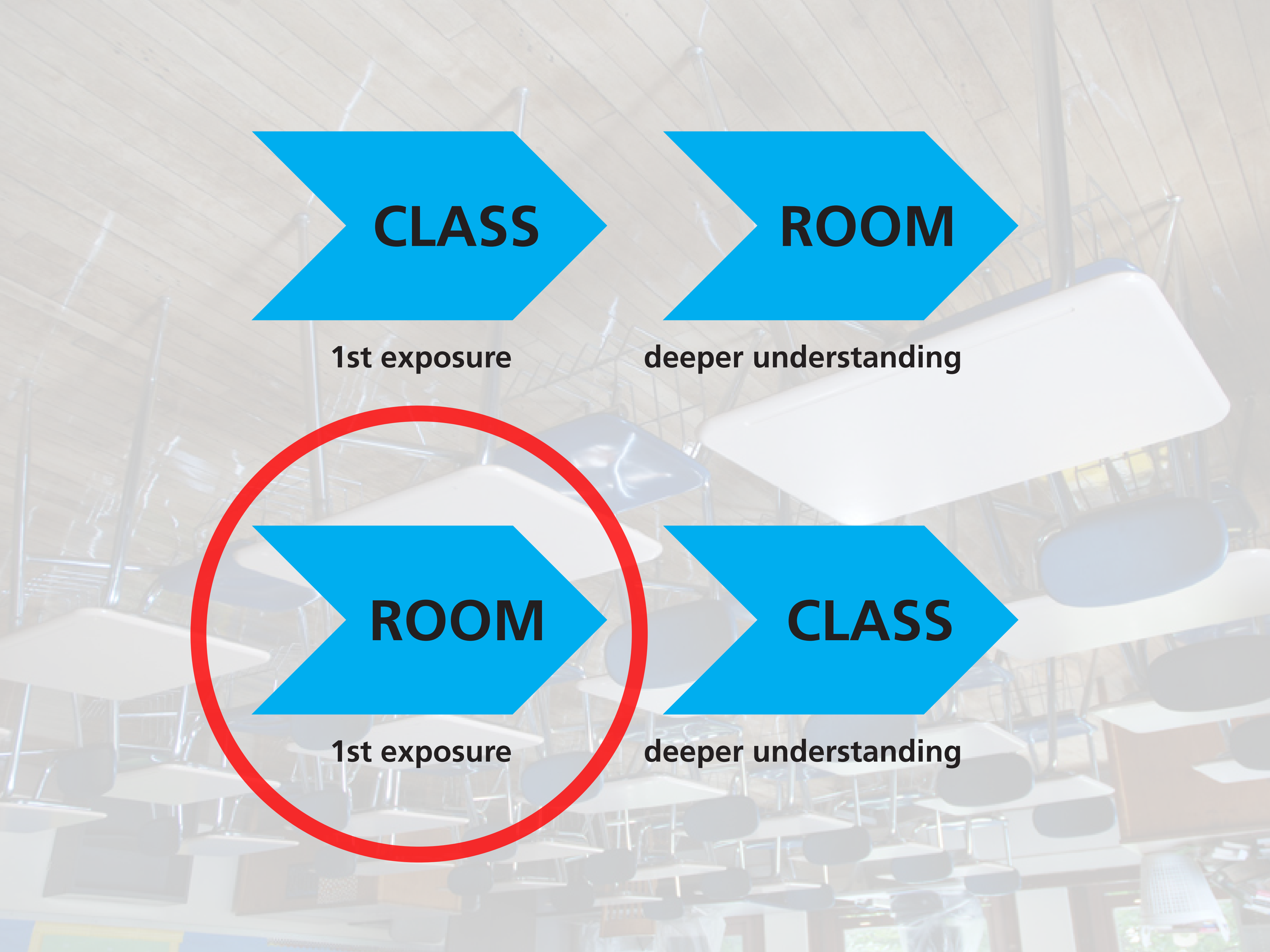
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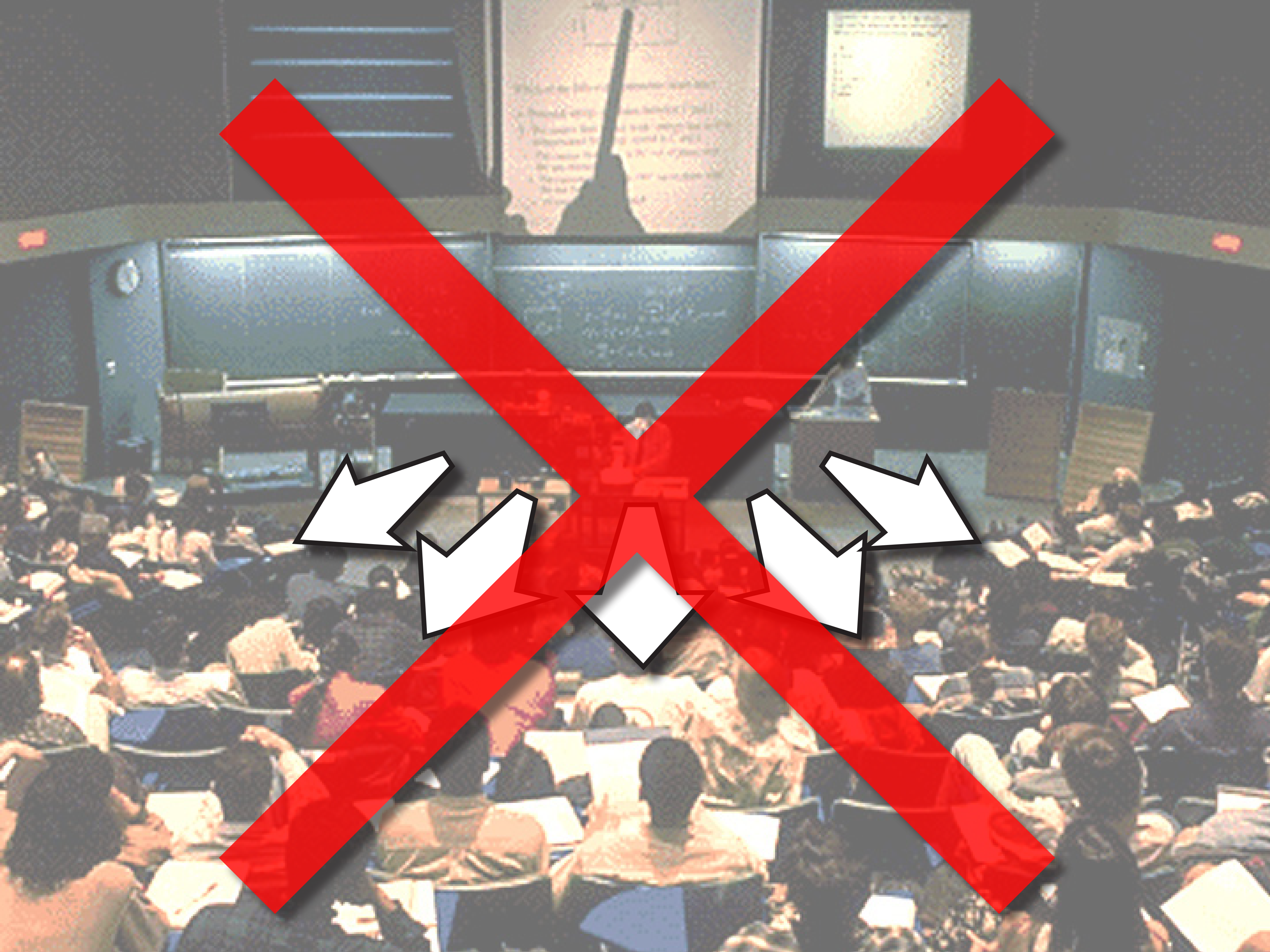
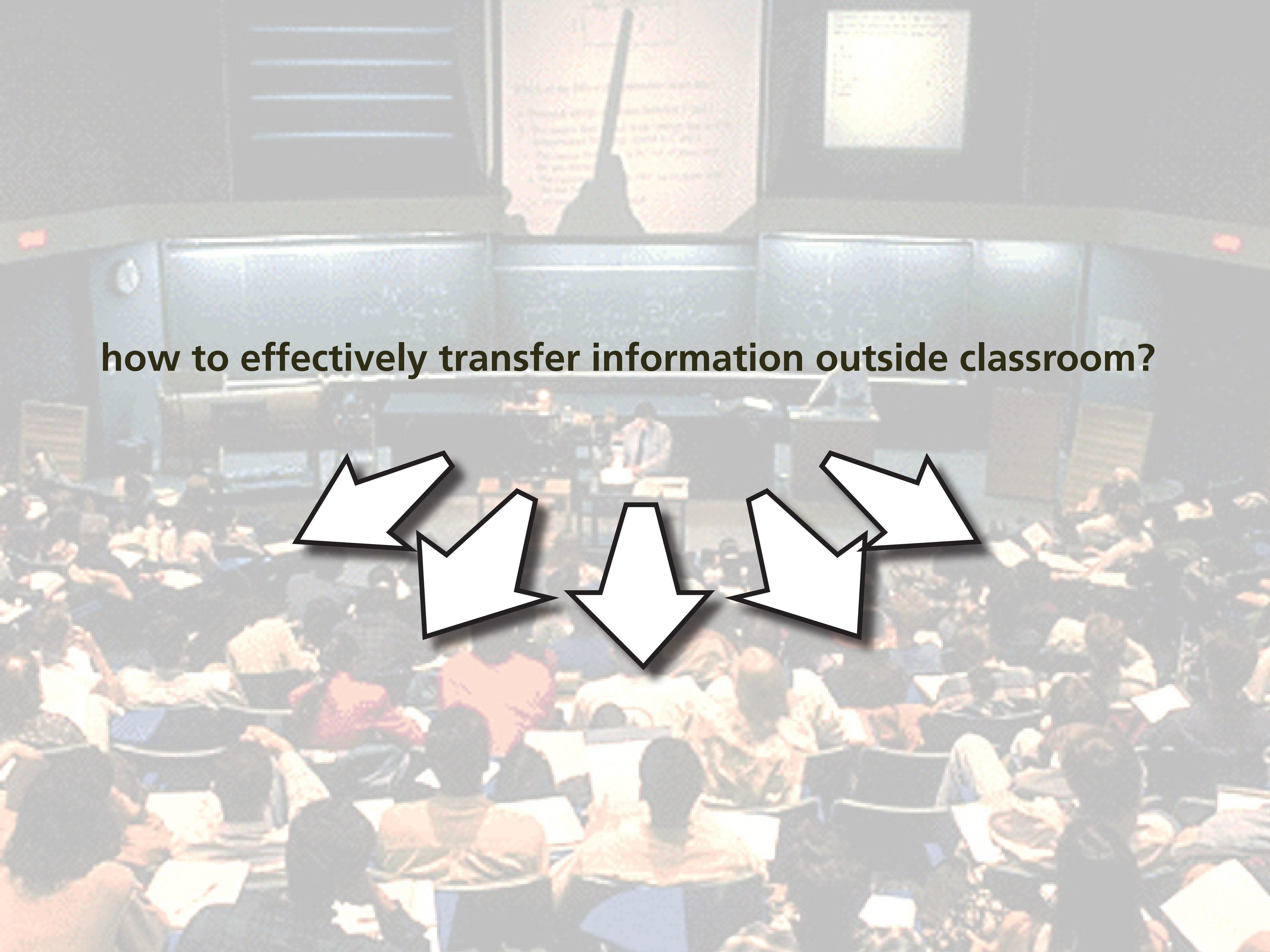
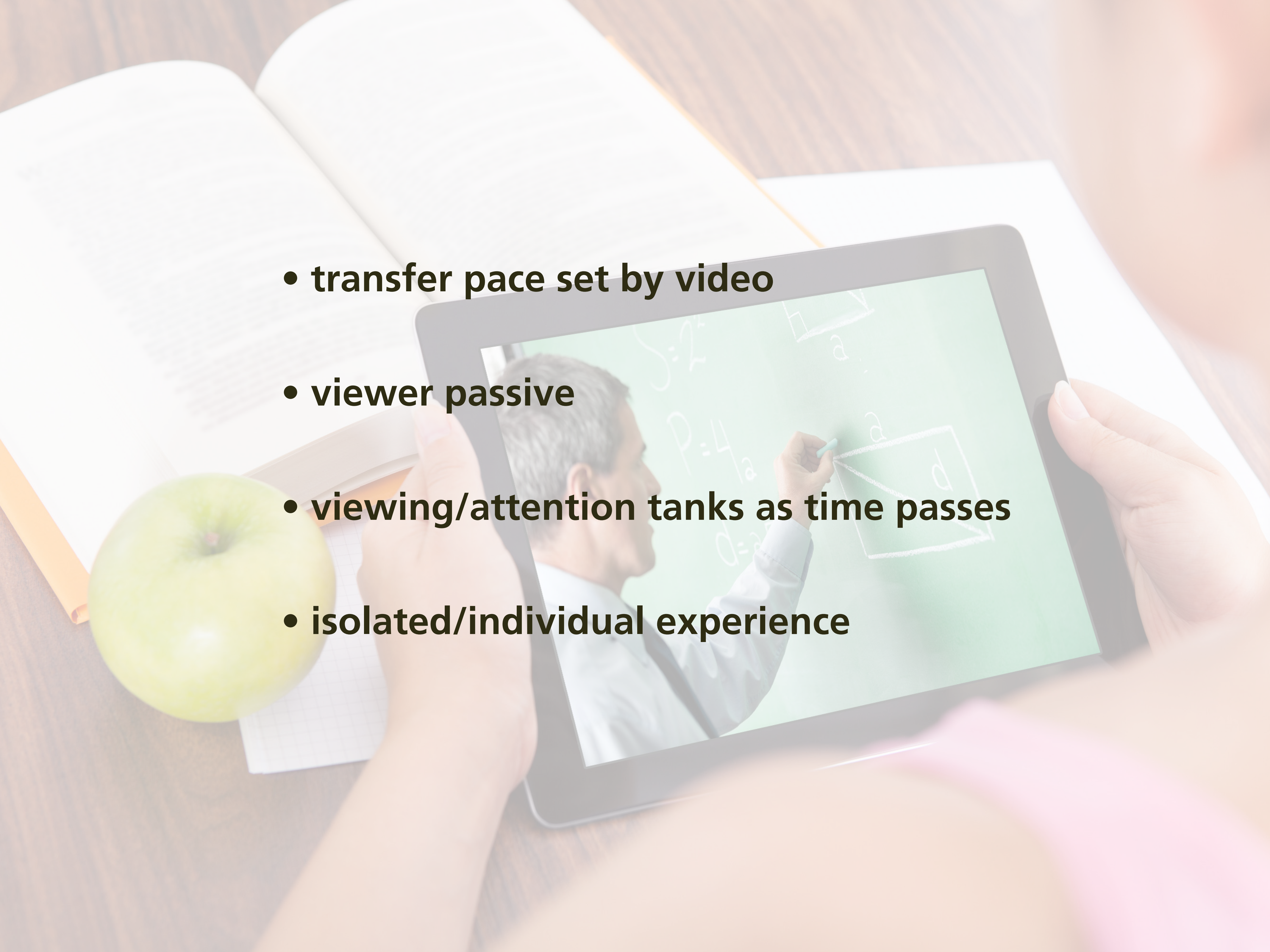




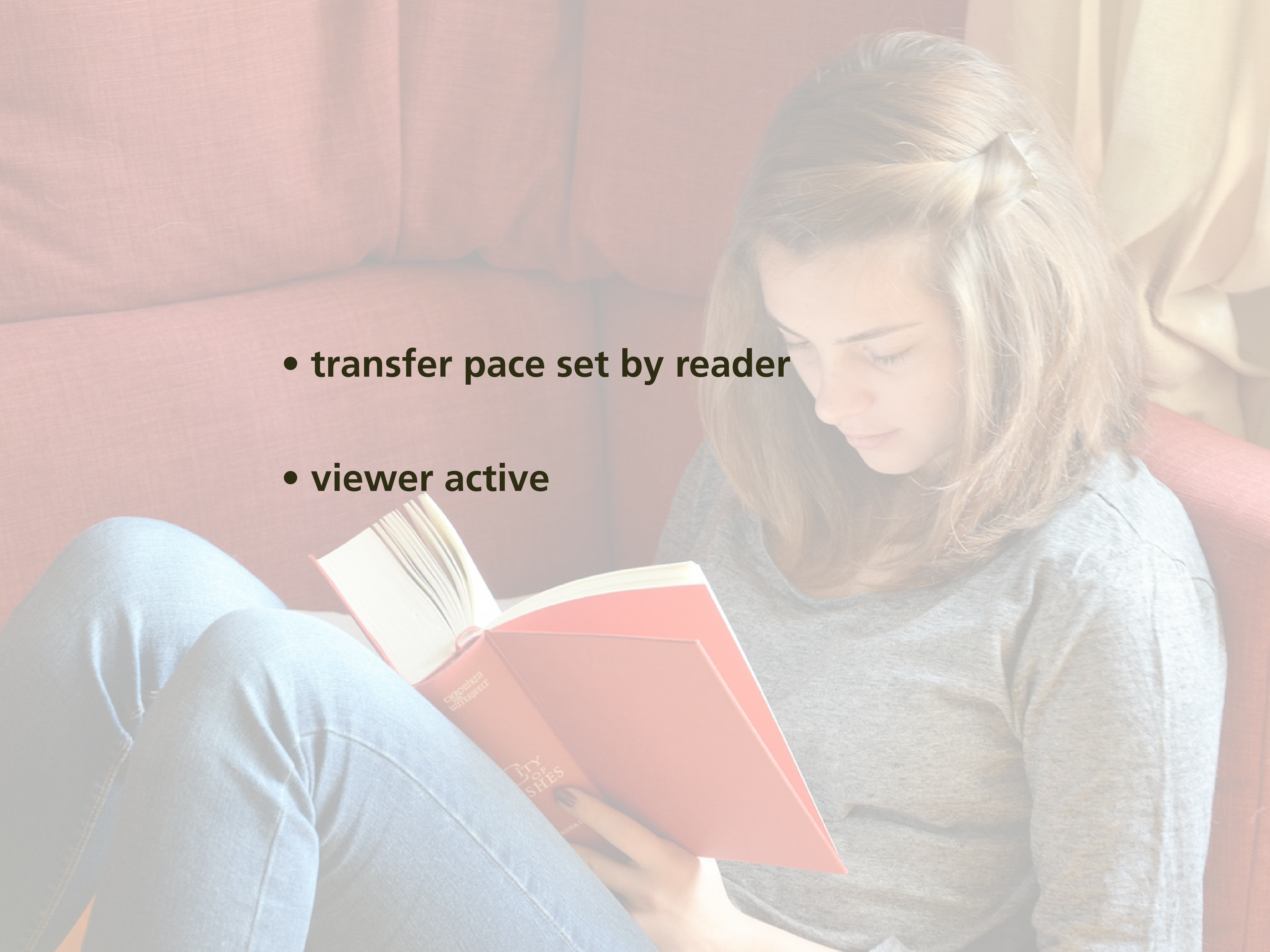
how to effectively transfer information outside classroom?


but…



- transfer pace set by video
- viewer passive
- viewing/attention tanks as time passes
- isolated/individual experience

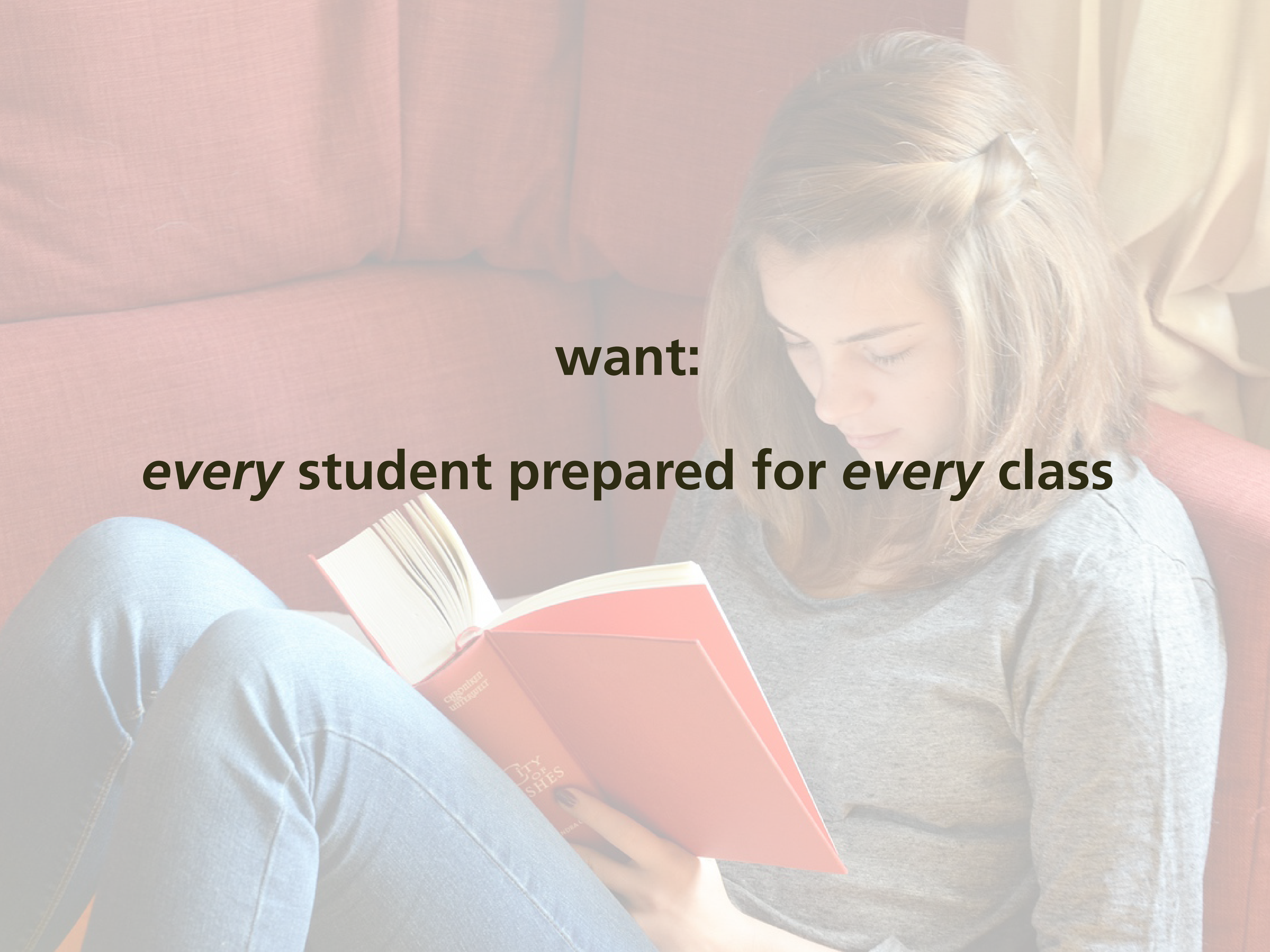

we’re simply moving this outside classroom!

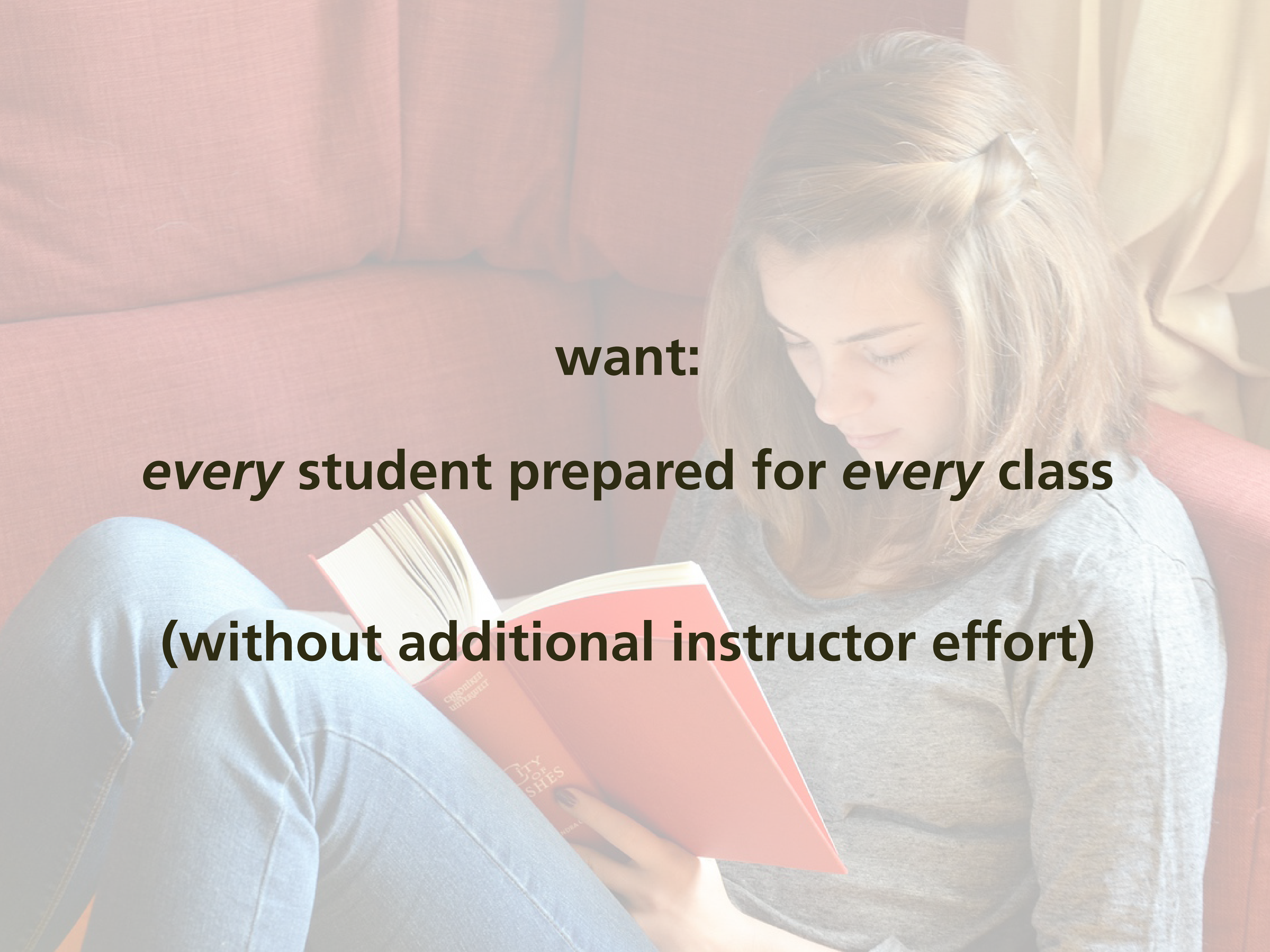


- transfer pace set by reader
- viewer active


but…


isolated/individual experience &
no real accountability


want:
every student prepared for *every* class



want:

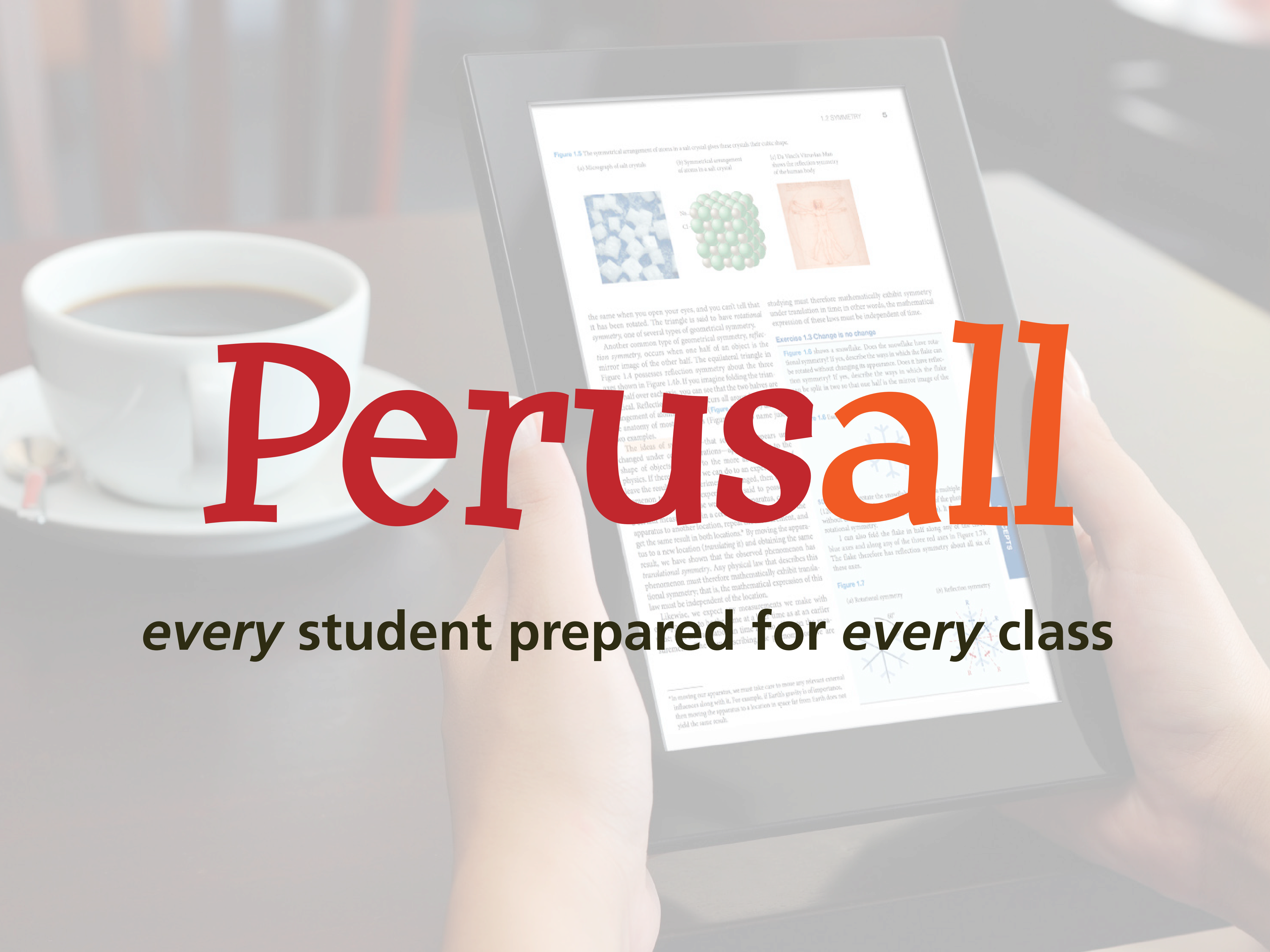
every **student prepared for** ***every*** **class**

(without additional instructor effort)

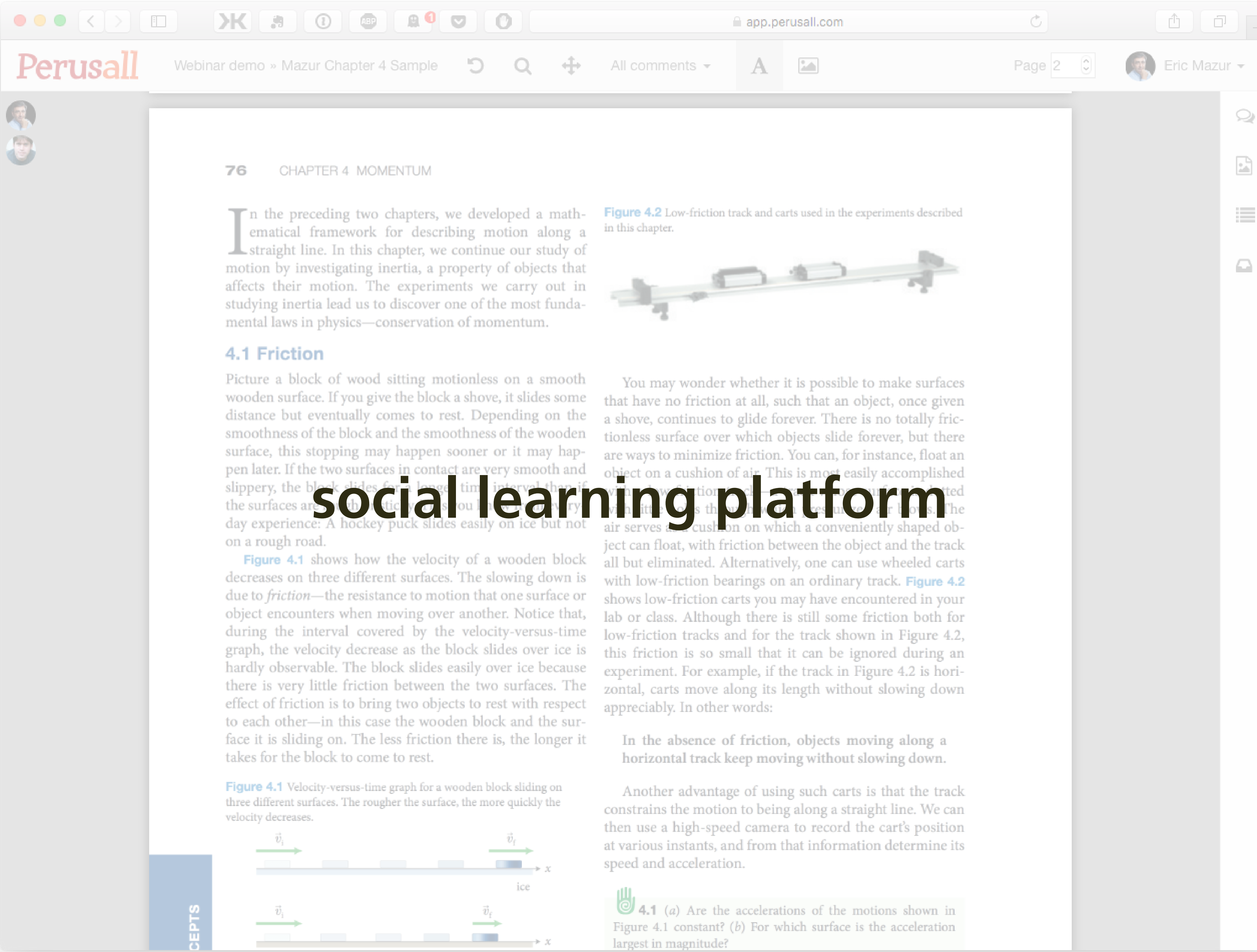
Solution

turn out-of-class component

also into a social interaction!


Perusall
every student prepared for *every* class

social learning platform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Eric Mazur

76 CHAPTER 4 MOMENTUM

In the preceding two chapters, we developed a mathematical framework for describing motion along a straight line. In this chapter, we continue our study of motion by investigating inertia, a property of objects that affects their motion. The experiments we carry out in studying inertia lead us to discover one of the most fundamental laws in physics—conservation of momentum.

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$\vec{v}_i$ $\vec{v}_f$ x ice

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CEPTS

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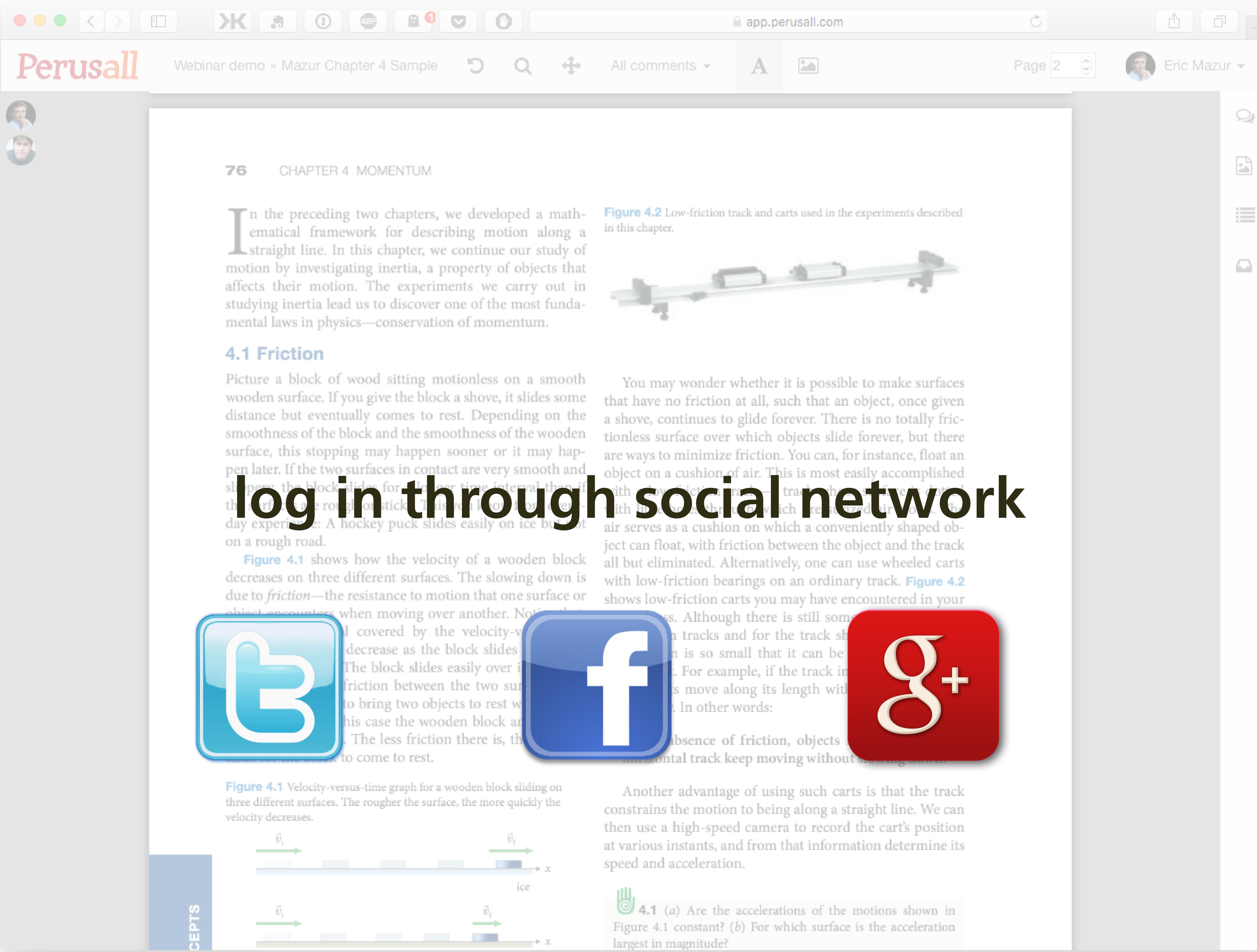
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log in through social network

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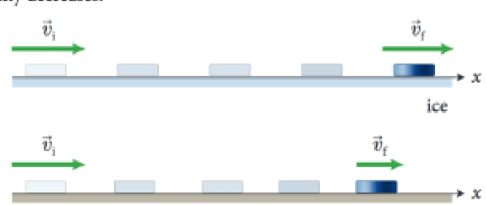

CEPTS

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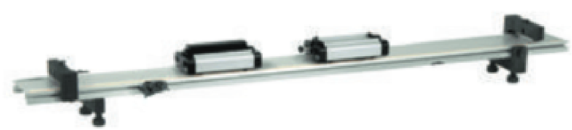

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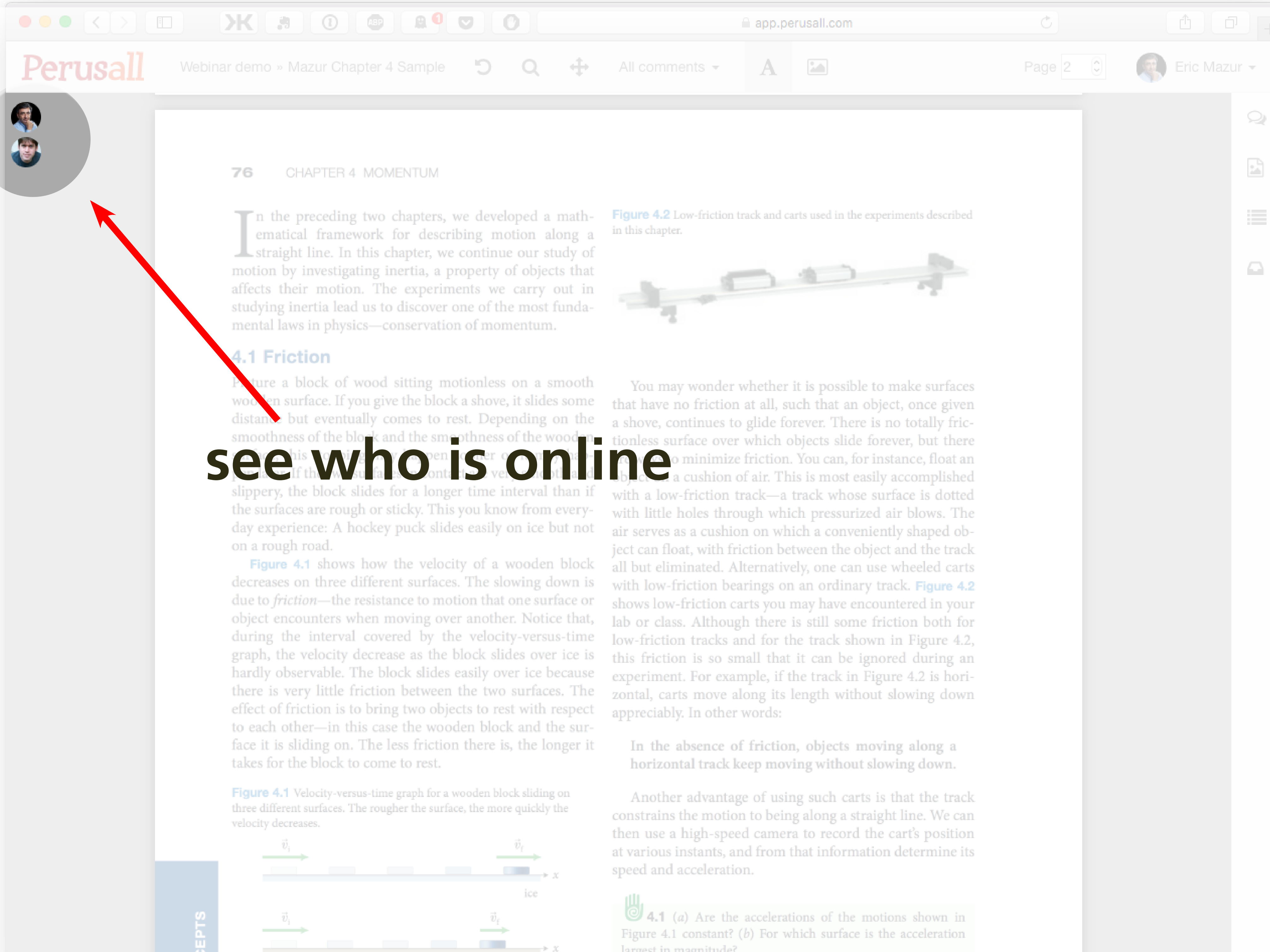
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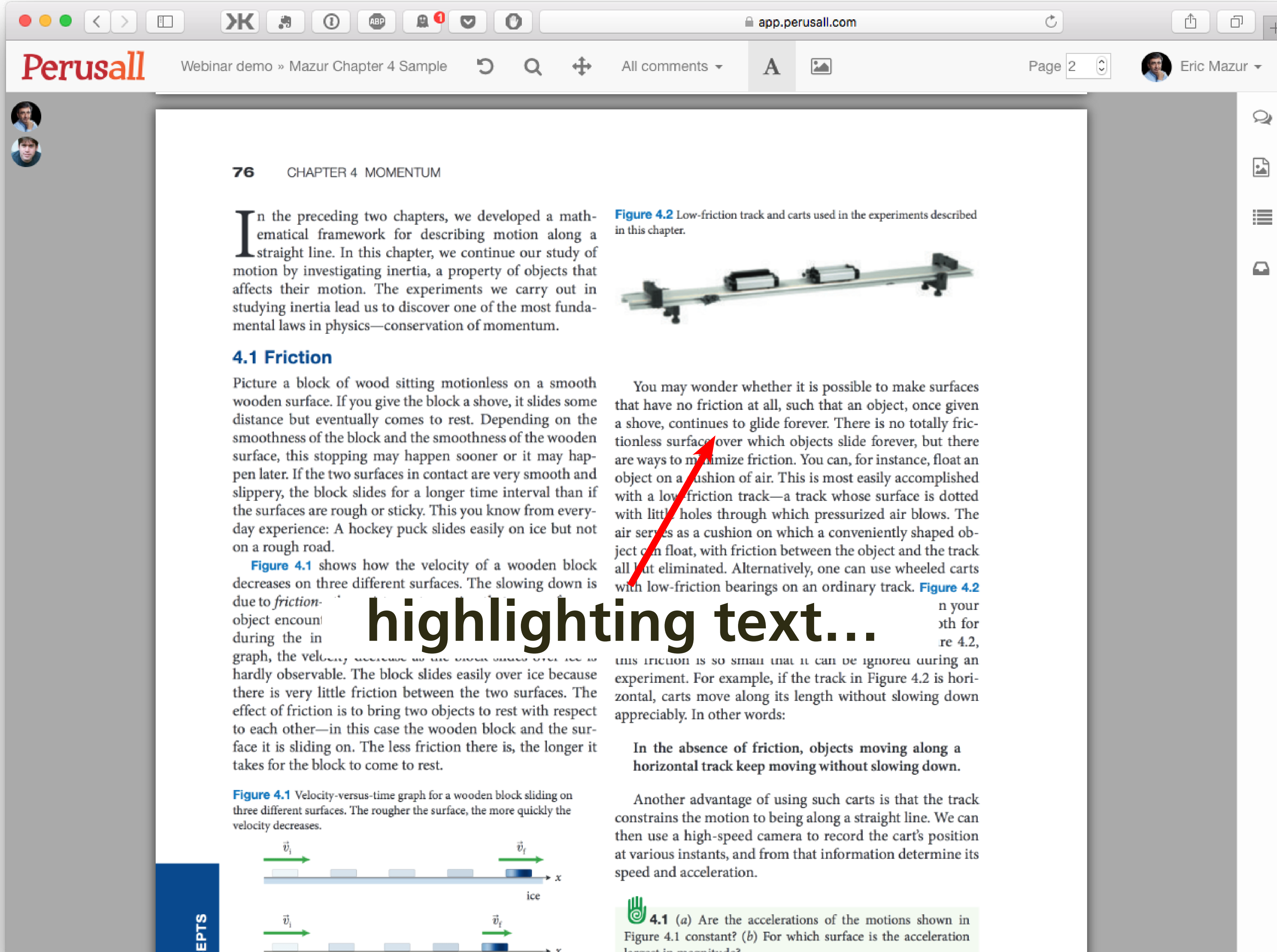

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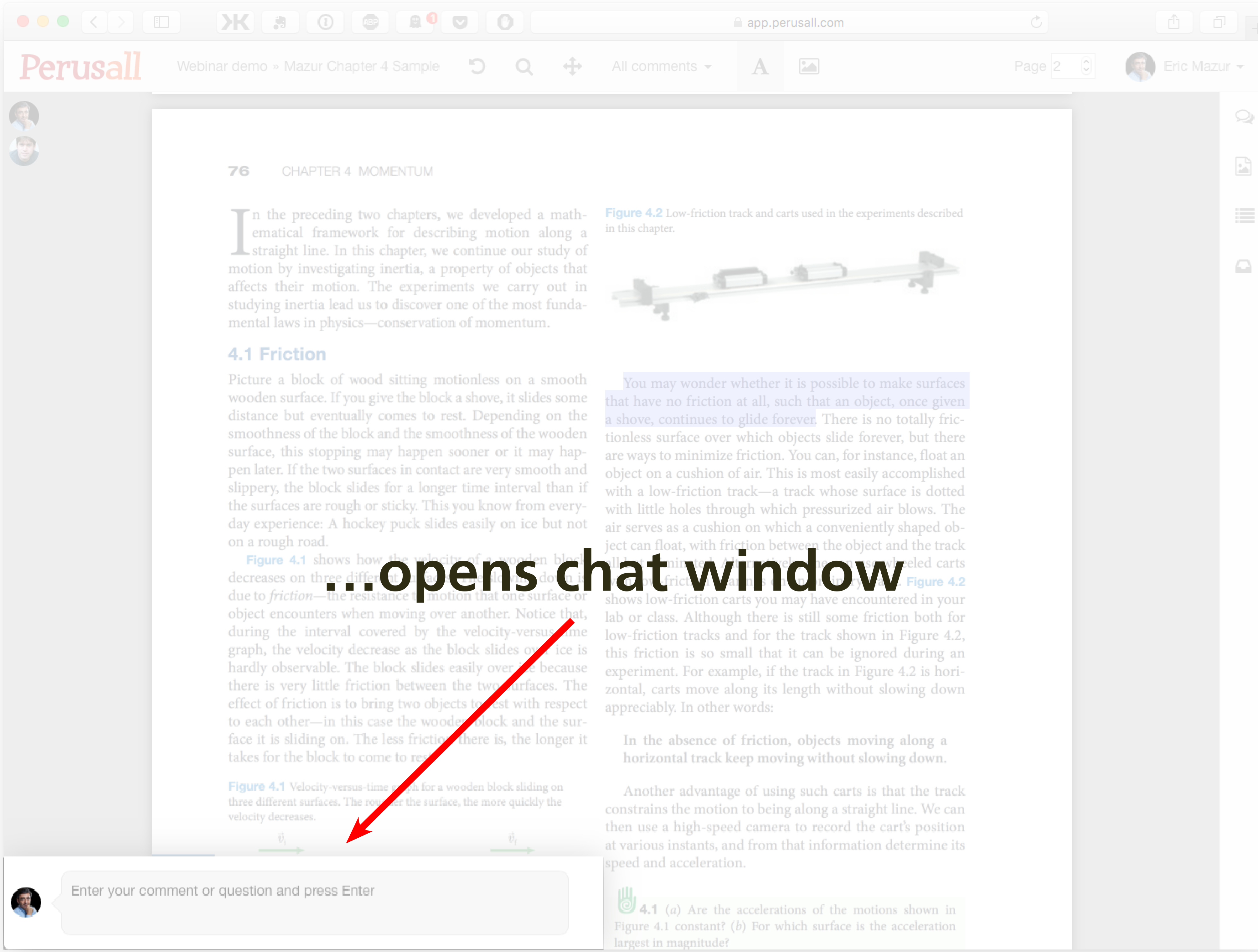
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...opens chat window
Enter your comment or question and press Enter

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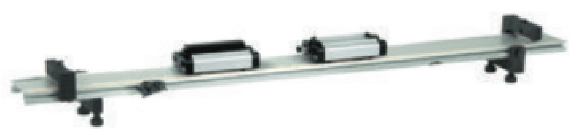

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No friction at all seems impossible. Isn't there always some friction in any real case.

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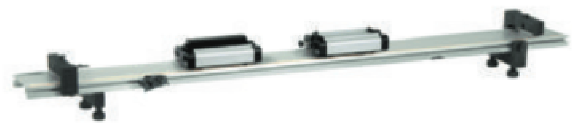

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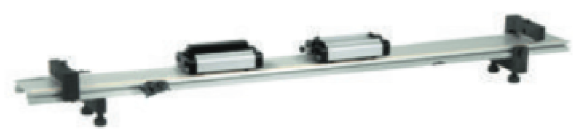

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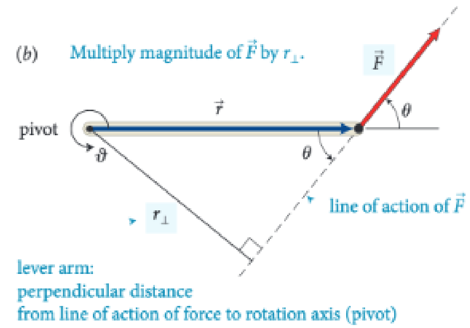


action of the force and the axis of rotation. So, the torque caused by a force exerted on an object is the product of the magnitude of the force and its lever arm distance. It can be written equivalently as $rF_\perp$ and as $r_\perp F$.

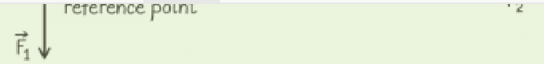
Like other rotational quantities, torque carries a sign that depends on the choice of direction for increasing ϑ. In Figure 12.4, for example, the torque caused by $\vec{F}_1$ about the pivot tends to rotate the rod in the direction of increasing ϑ and so is positive; the torque caused by $\vec{F}_2$ is negative. The sum of the two torques about the pivot is then $r_1F_1 + (-r_2F_2)$. As we've seen, the two torques are equal in magnitude when the rod is balanced, and so the sum of the torques is zero. When the sum of the torques is not zero, the rod's rotational acceleration is nonzero, and so its rotational velocity and angular momentum change.

In the situations depicted in Figures 12.4 and 12.5 we used the pivot to calculate the lever arm distances. This is a natural choice because that is the point about which the object under consideration is free to rotate. However, torques also play a role for stationary objects that are suspended or supported at several different points and that are not free to rotate—for example, a plank or bridge supported at either end. To determine what reference point to use in such cases, complete the following exercise.

Exercise 12.1 Reference point

Consider again the rod in Figure 12.4. Calculate the sum of the torques about the left end of the rod.

SOLUTION I begin by making a sketch of the rod and the three forces exerted on it, showing their points of application on the rod (Figure 12.6).



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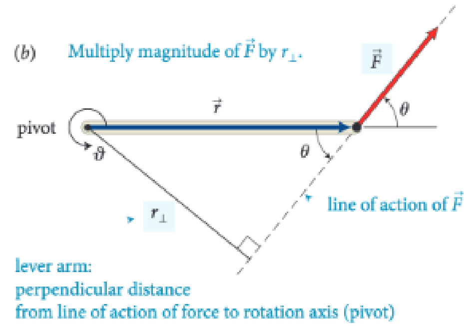

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SB

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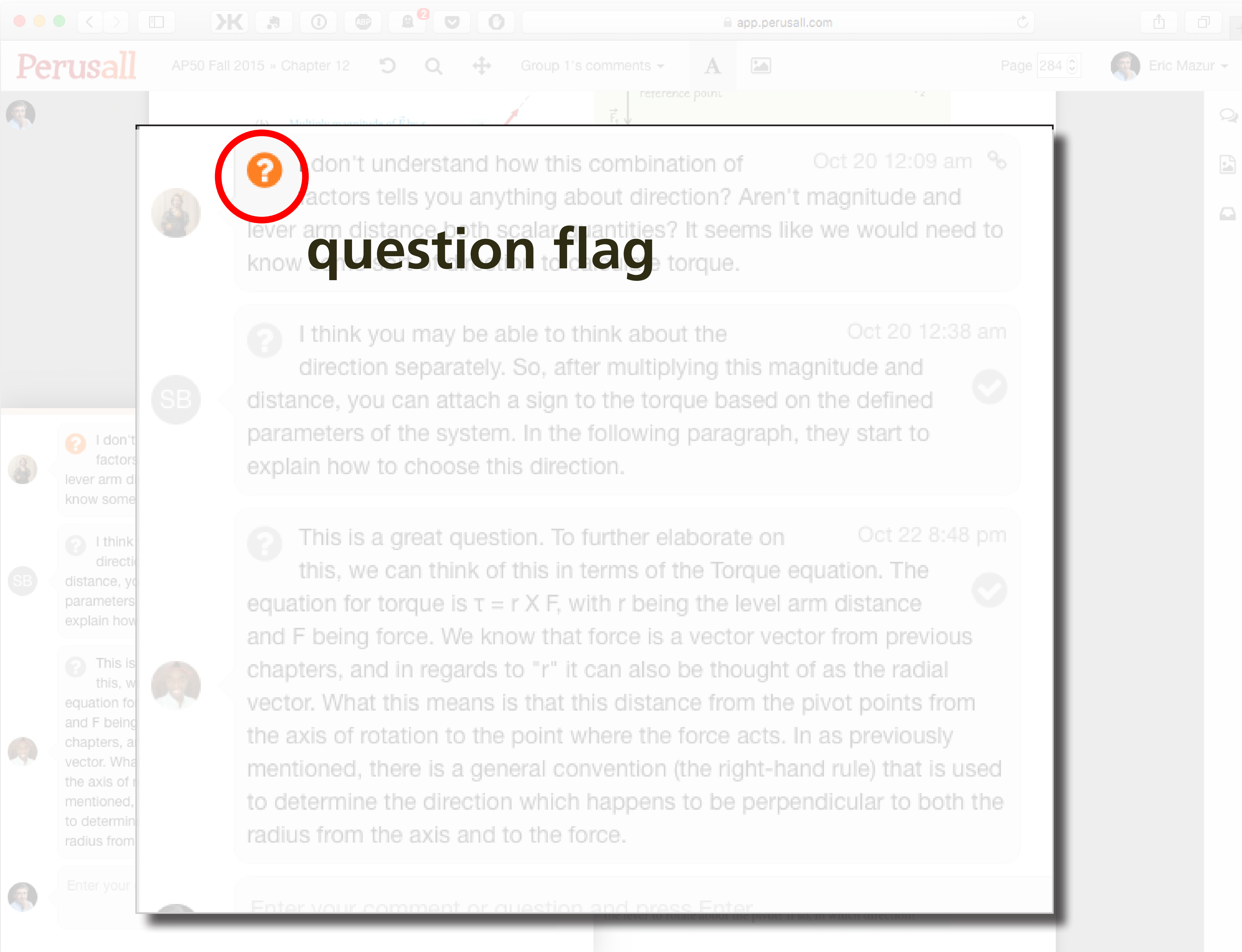
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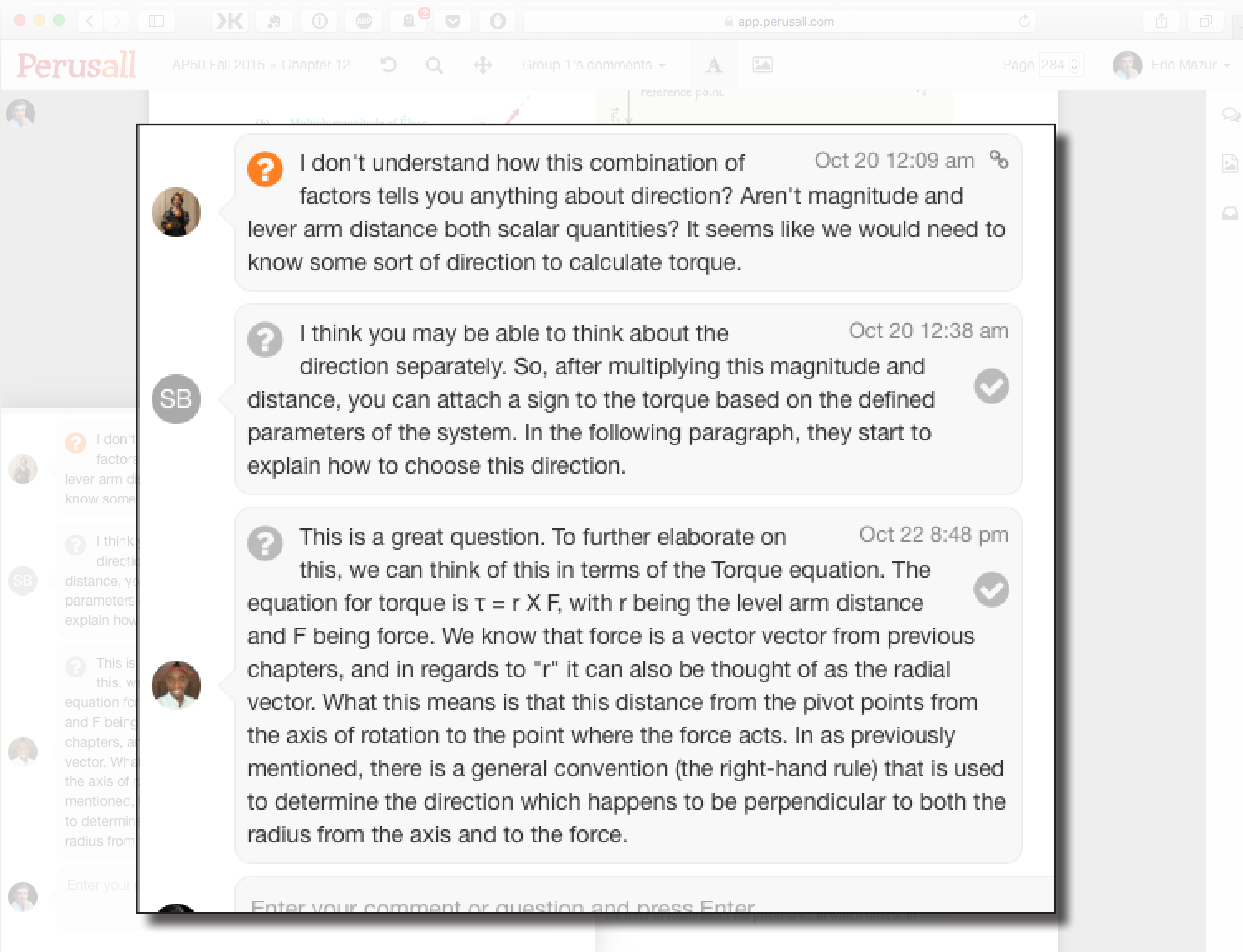
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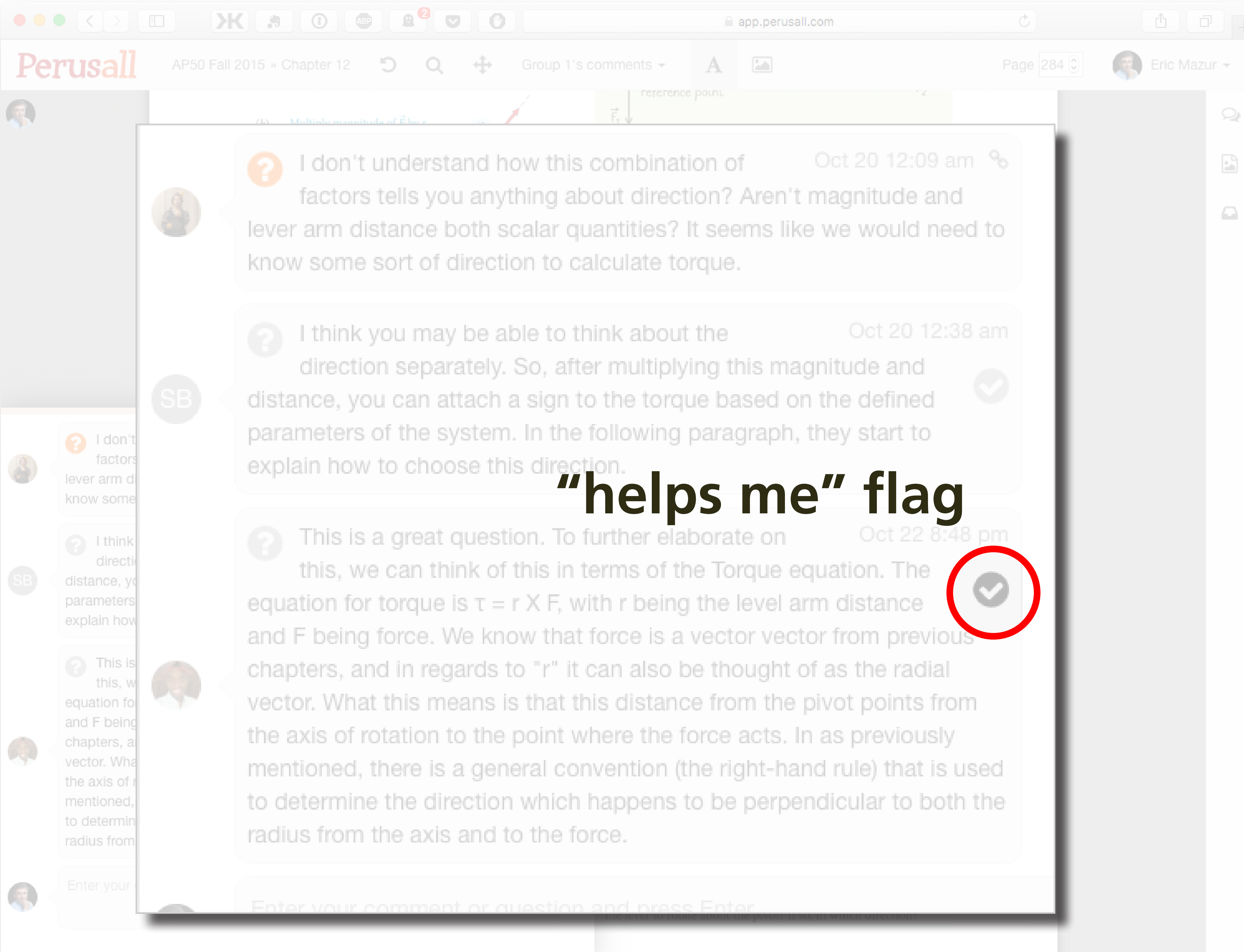

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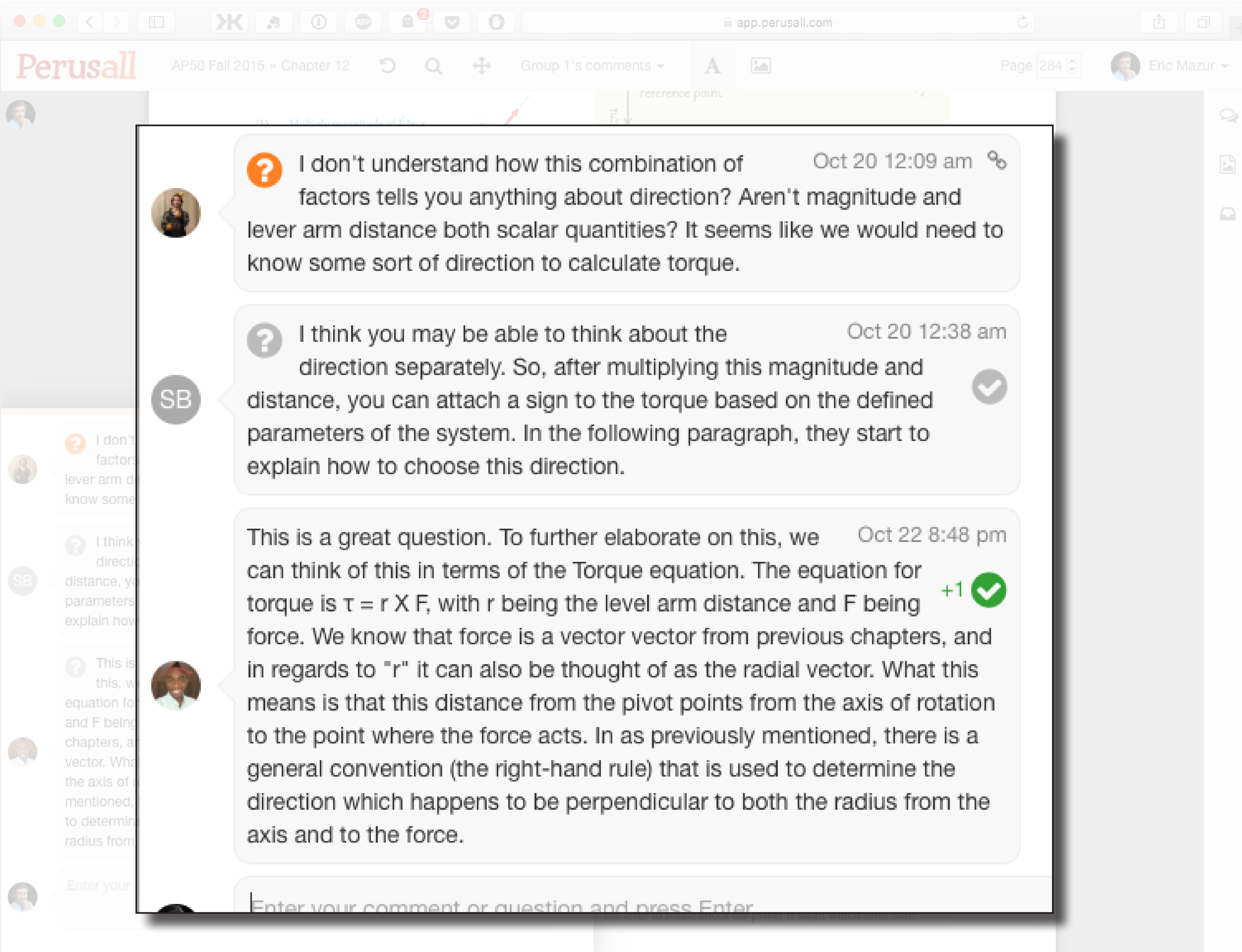
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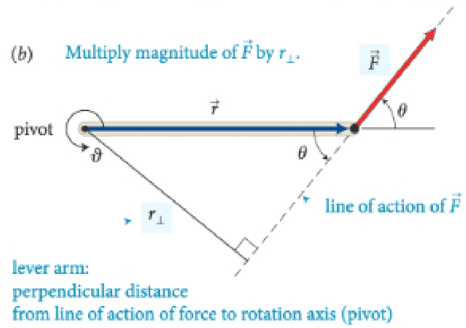

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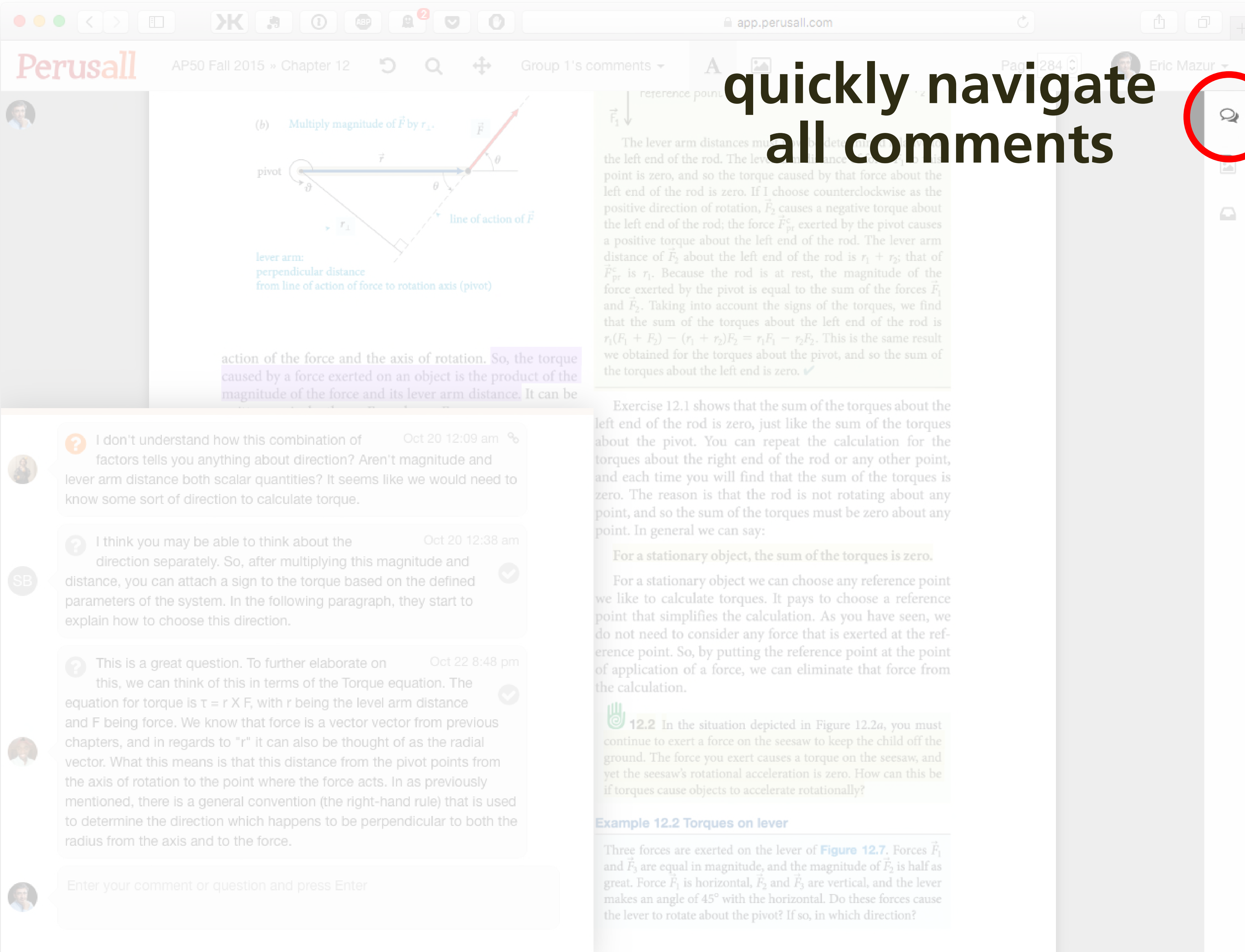
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pivot
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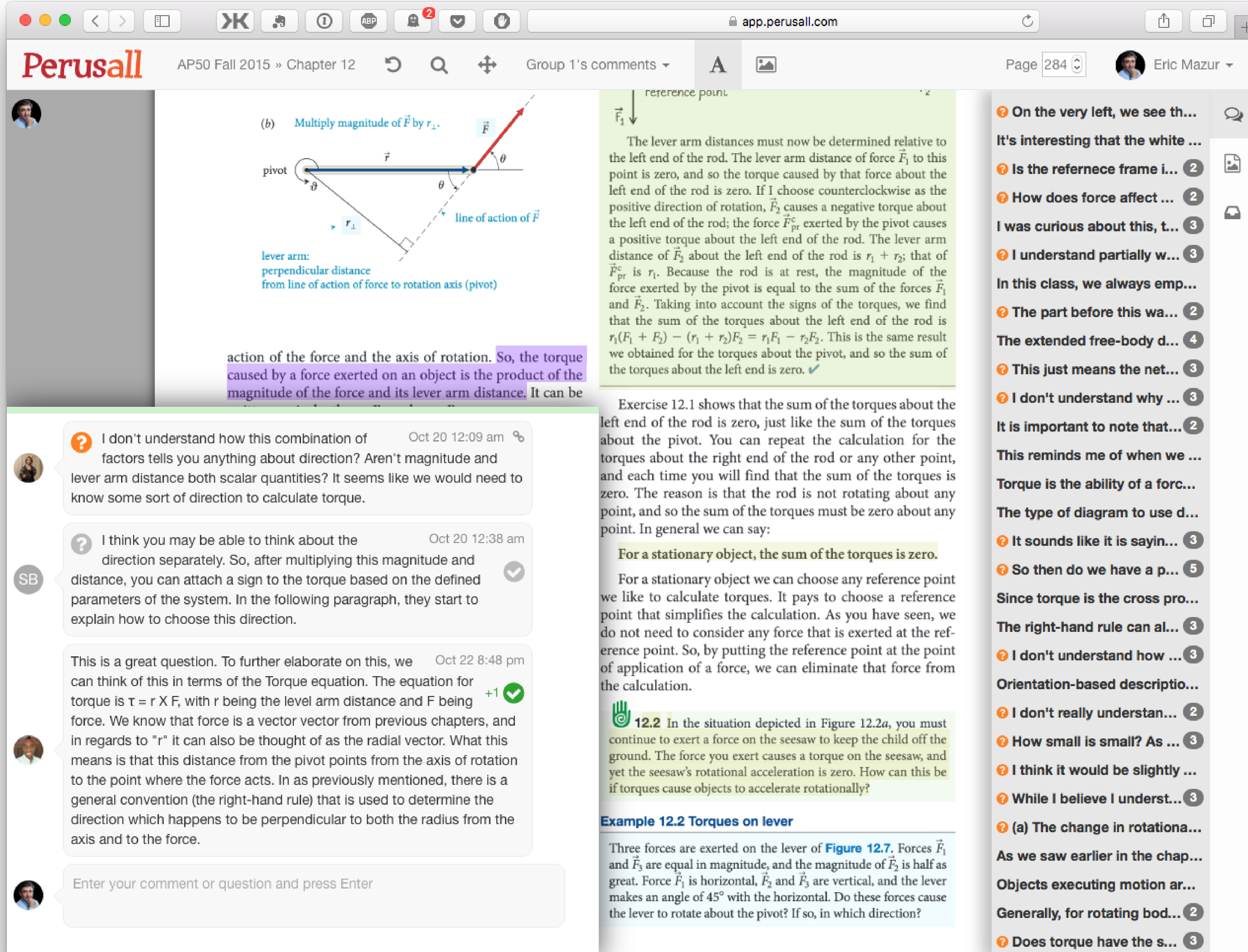
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On the very left, we see th...
It's interesting that the white ...
Is the refernece frame i... 2
How does force affect ... 2
I was curious about this, t... 3
I understand partially w... 3
In this class, we always emp...
The part before this wa... 2
The extended free-body d... 4
This just means the net... 3
I don't understand why ... 3
It is important to note that... 2
This reminds me of when we ...
Torque is the ability of a forc...
The type of diagram to use d...
It sounds like it is sayin... 3
So then do we have a p... 5
Since torque is the cross pro...
The right-hand rule can al... 3
I don't understand how ... 3
Orientation-based descriptio...
I don't really understan... 2
How small is small? As ... 3
I think it would be slightly ...
While I believe I underst... 3
(a) The change in rotationa...
As we saw earlier in the chap...
Objects executing motion ar...
Generally, for rotating bod... 2
Does torque have the s... 3

email notifications

Brian Lukoff responded to a question in Mazur Chapter 4 Sample that you wanted to know the answer to

21 minutes ago, you asked this question on Perusall:

> No friction at all seems impossible. Isn't there always some friction in any real case?

Brian Lukoff just responded to the question by saying:

> Right - I think there will always be some friction due to the second law of thermodynamics.

If this helps your understanding, click the button below. If you want to respond, simply reply to this email to post to Perusall.

View conversation **This comment helps my understanding**

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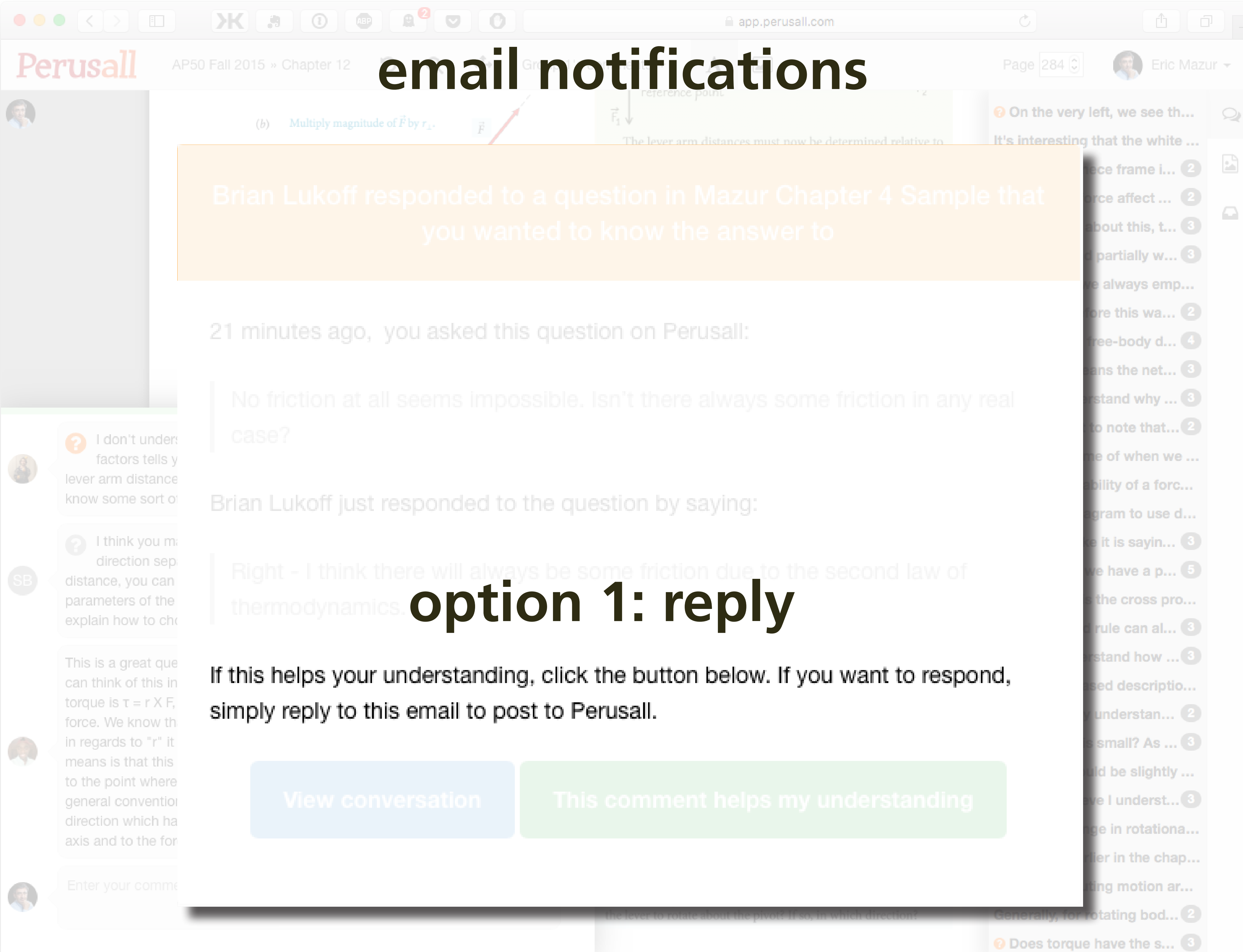

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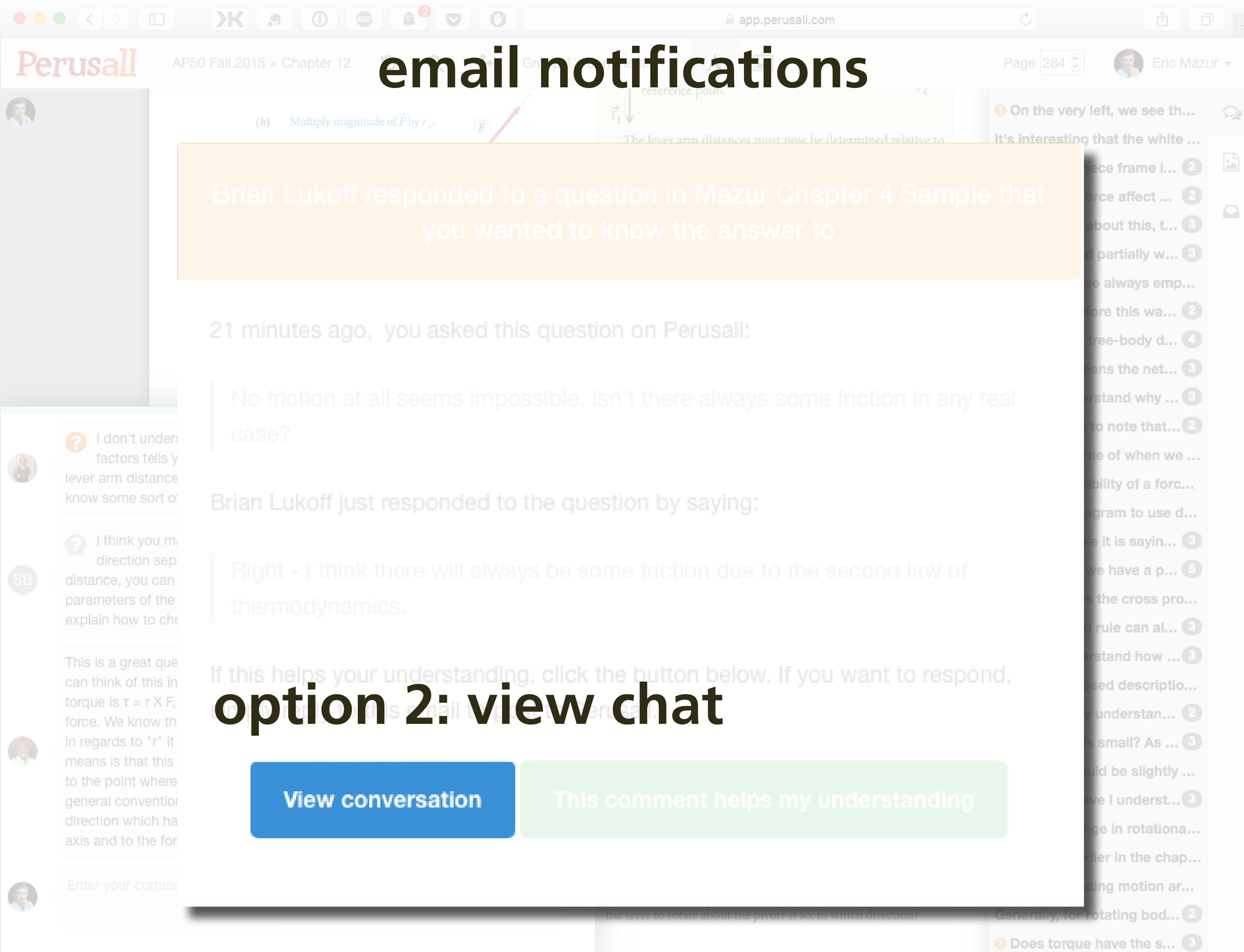

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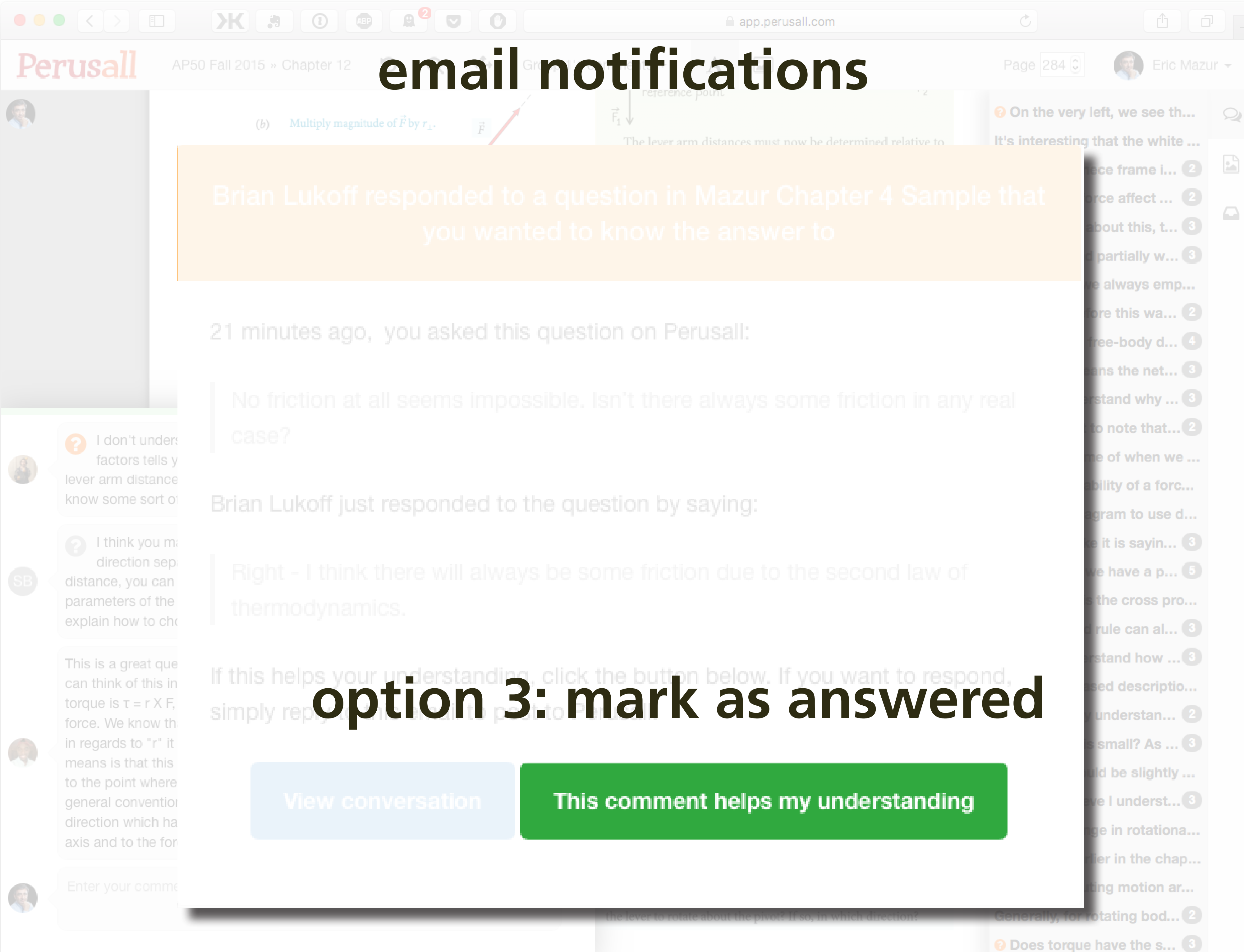
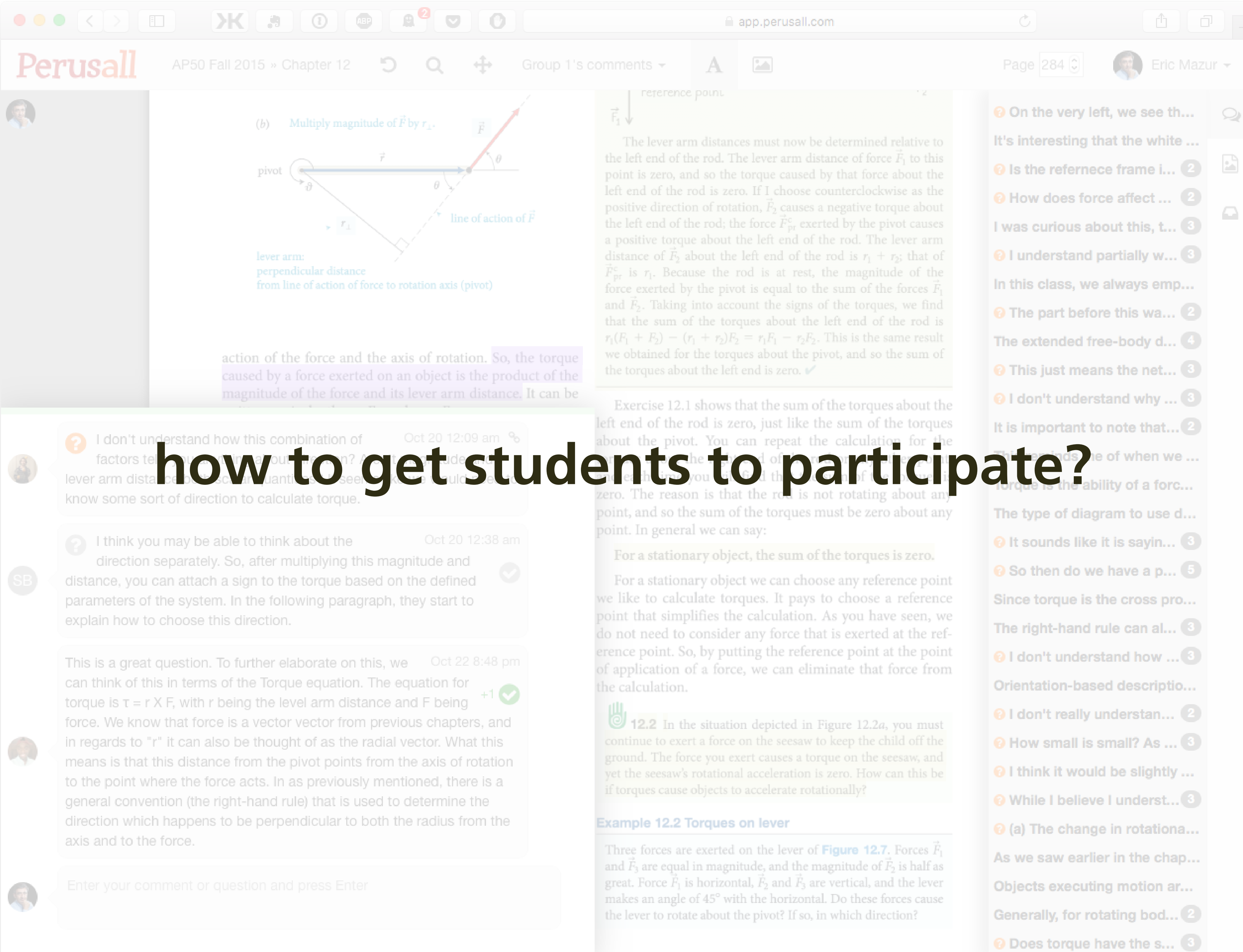
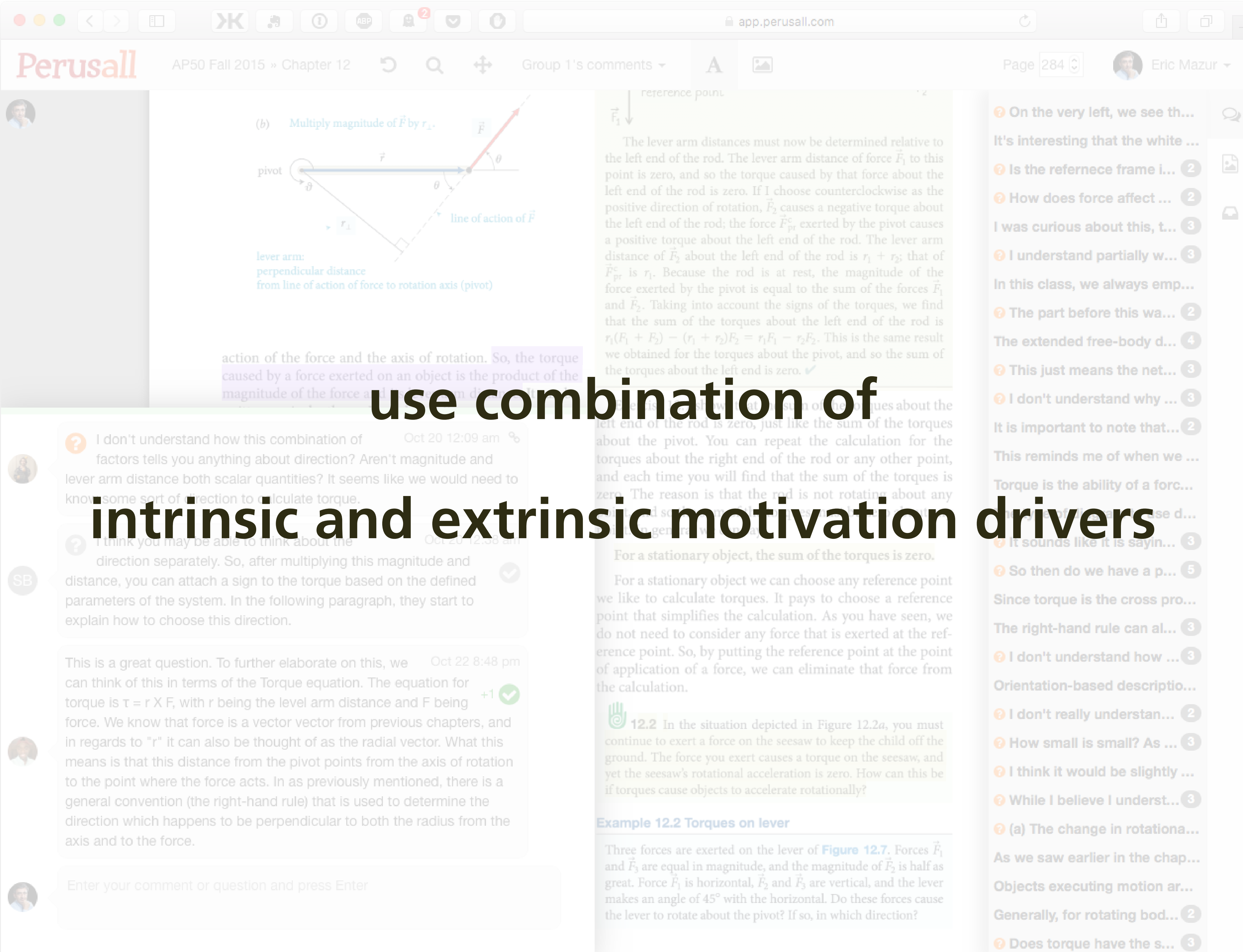


option 3: mark as answered

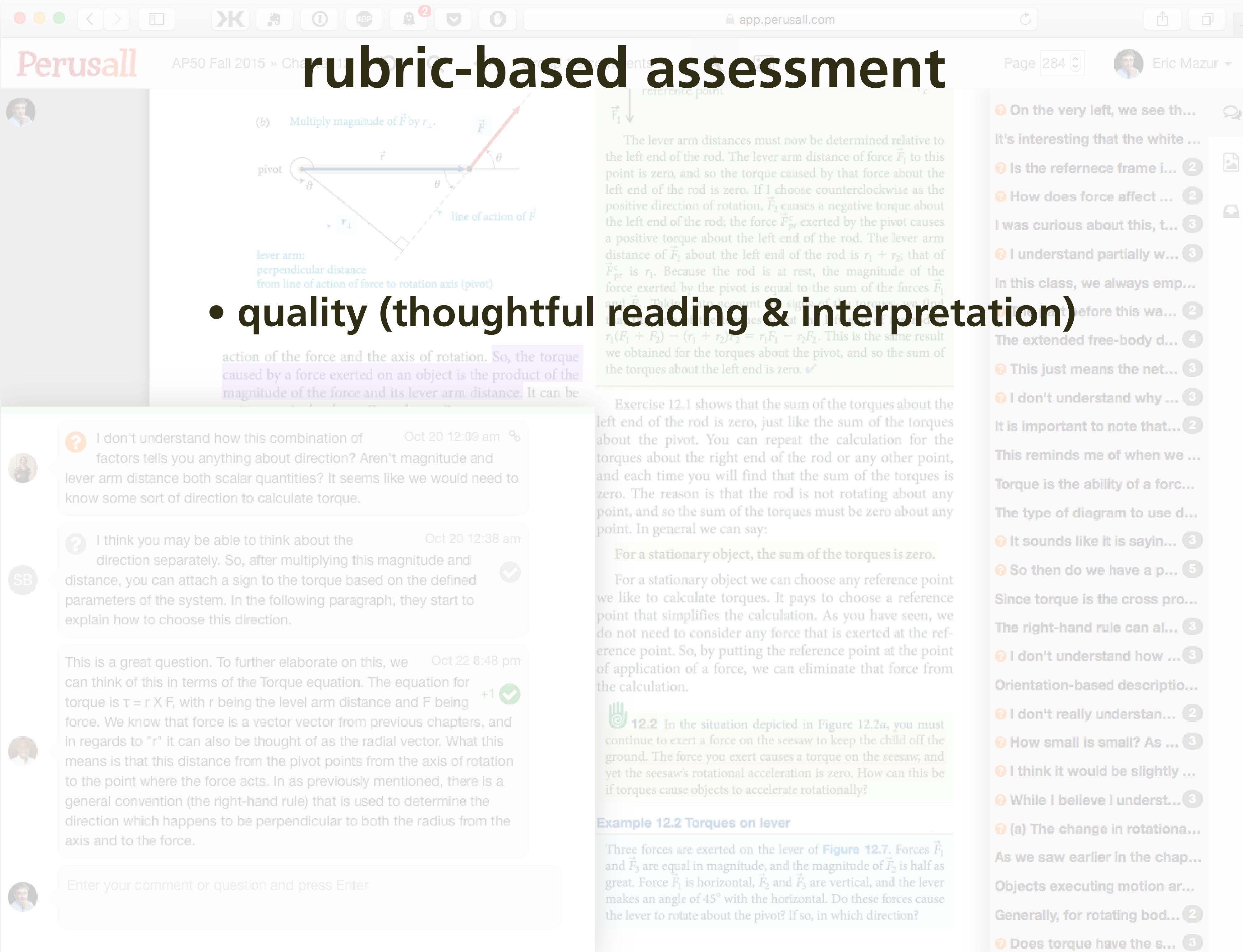
how to get students to participate?



use combination of intrinsic and extrinsic motivation drivers



rubric-based assessment



- quality (thoughtful reading & interpretation)

rubric-based assessment

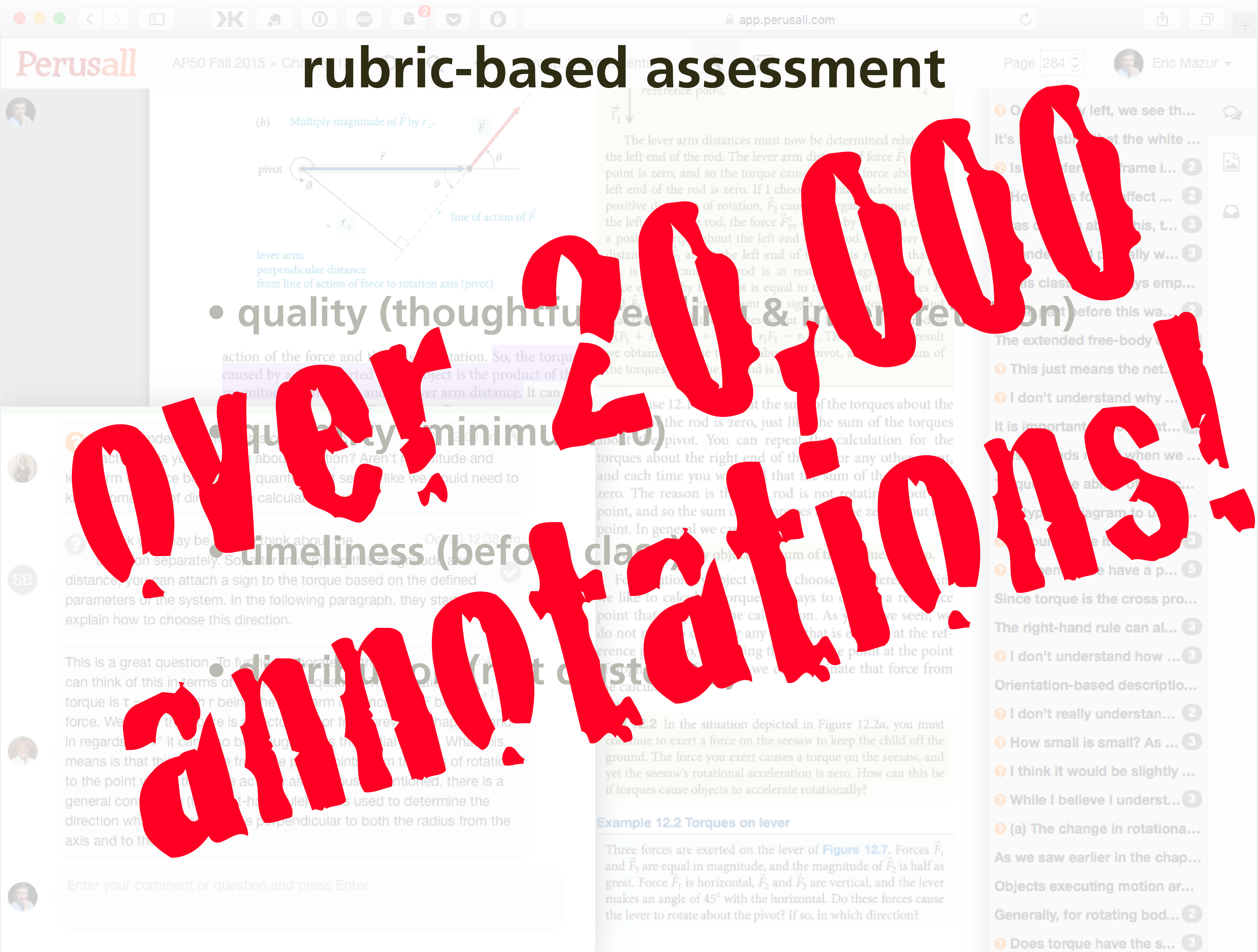
- quality (thoughtful reading & interpretation)
- quantity (minimum 10)

rubric-based assessment

- quality (thoughtful reading & interpretation)
- quantity (minimum 10)
- timeliness (before class)

rubric-based assessment

- quality (thoughtful reading & interpretation)
- quantity (minimum 10)
- timeliness (before class)
- distribution (not clustered)



rubric-based assessment

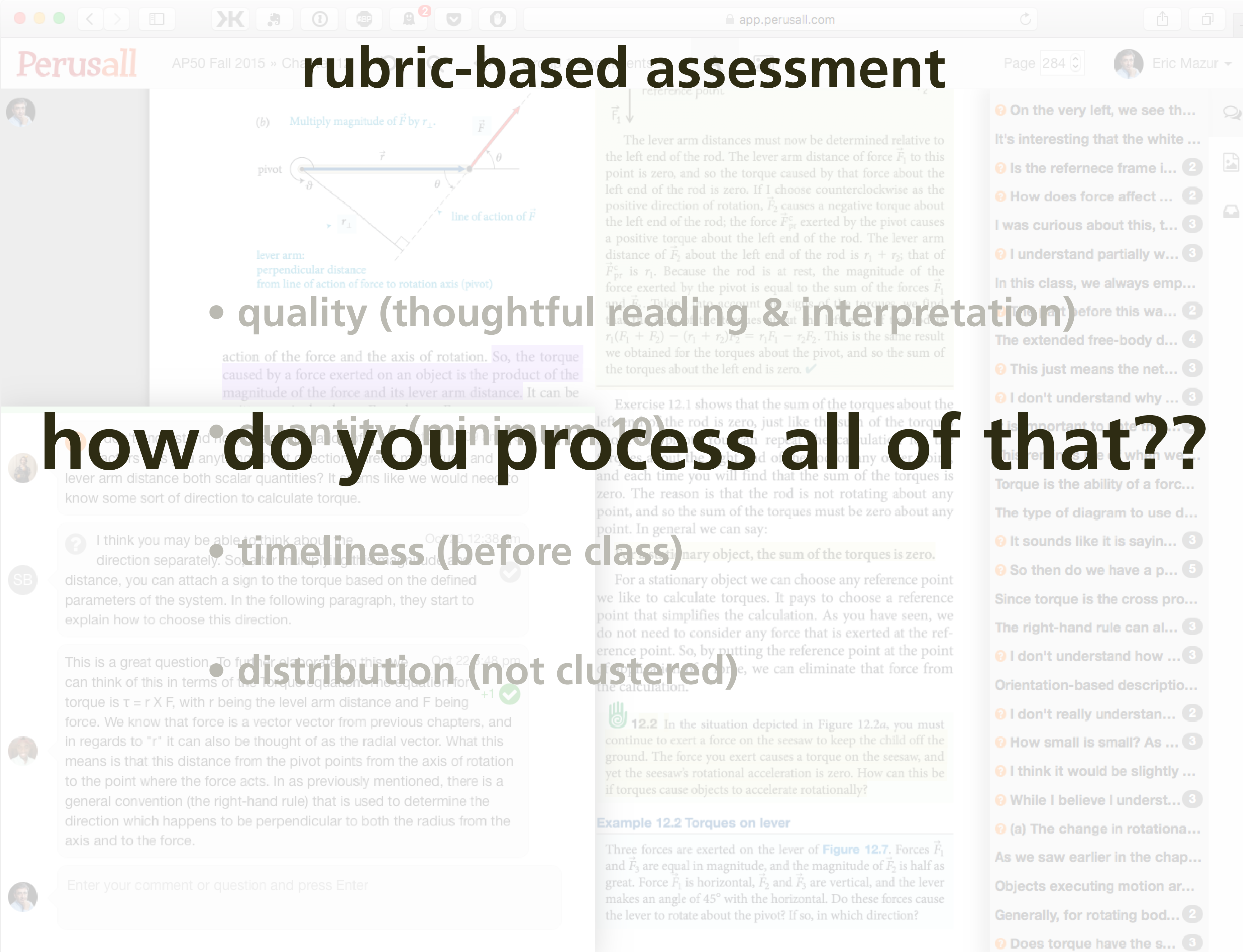
- quality (thoughtful reading & interpretation)
- quantity (minimum 10)
- timeliness (before class)
- distribution (not clustered)

over 20,000 annotations!

rubric-based assessment

- quality (thoughtful reading & interpretation)
- quantity (minimum 10)
- timeliness (before class)
- distribution (not clustered)

how do you process all of that??



rubric-based assessment

- quality (thoughtful interpretation)
- quantity (minimum 10)

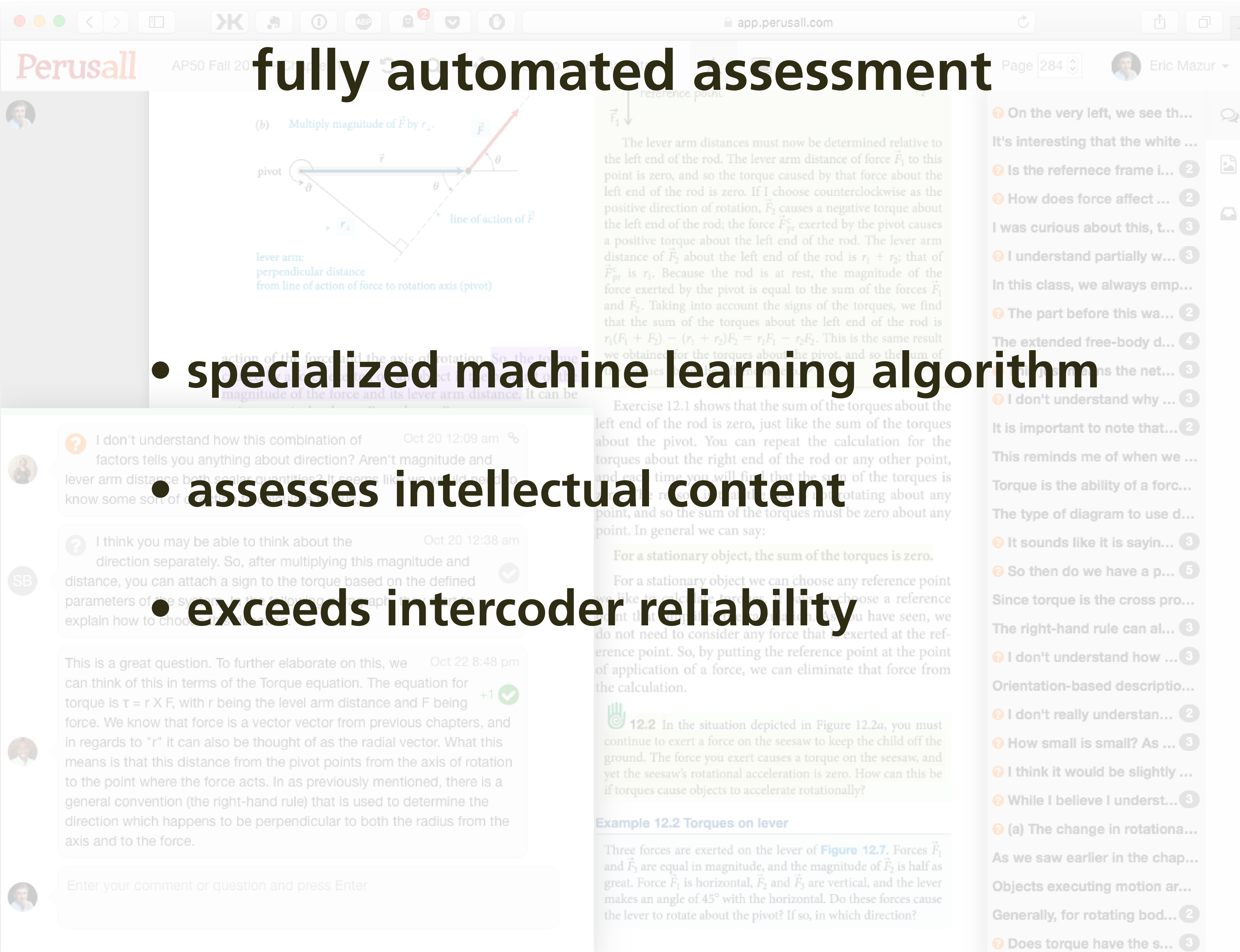
how do you process all of that??

- timeliness (before class)
- distribution (not clustered)

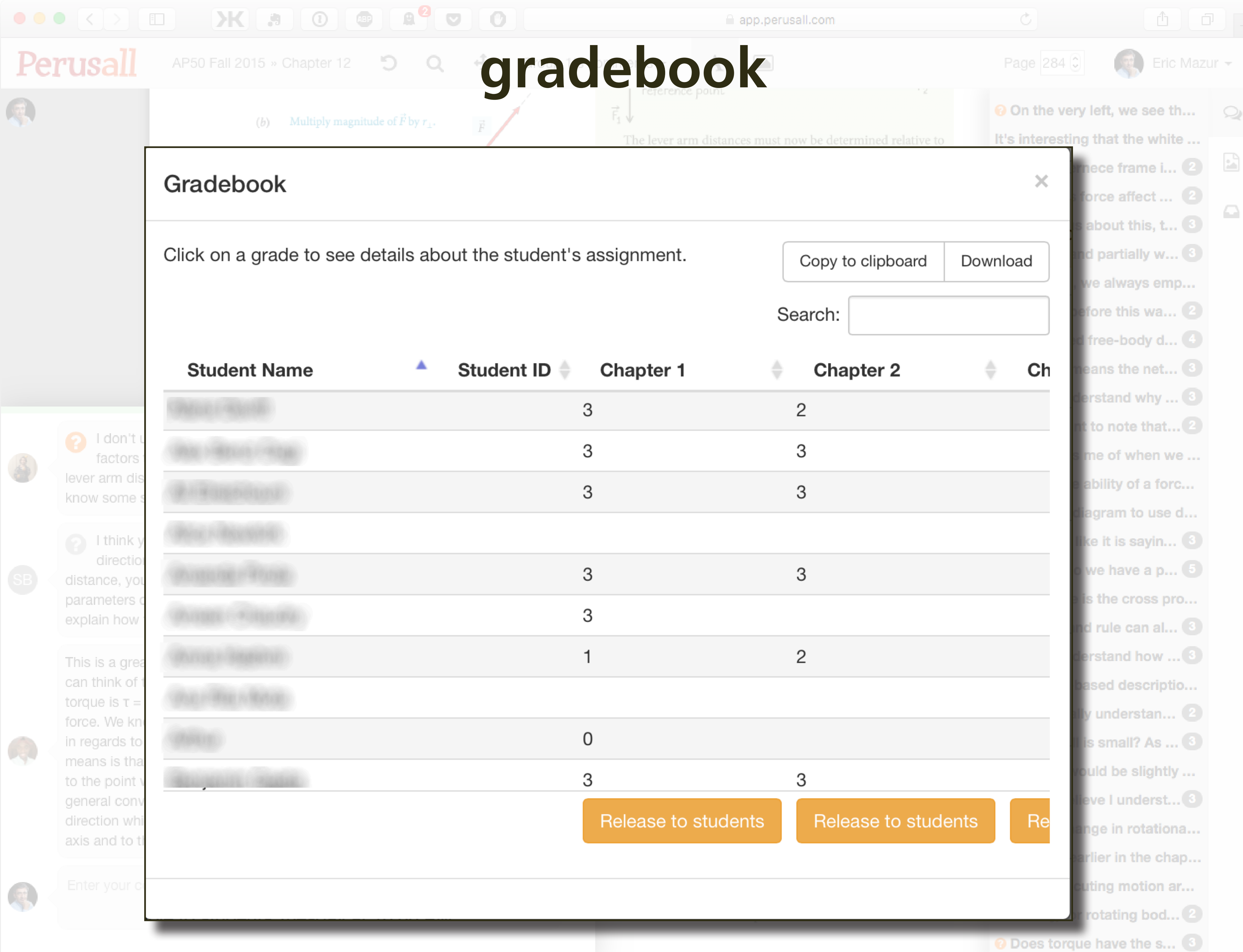
fully automated assessment

fully automated assessment

- specialized machine learning algorithm
- assesses intellectual content
- exceeds intercoder reliability



gradebook



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Eric Mazur
Gradebook
Click on a grade to see details about the student's assignment.
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Chapter 2
3 2
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3 3
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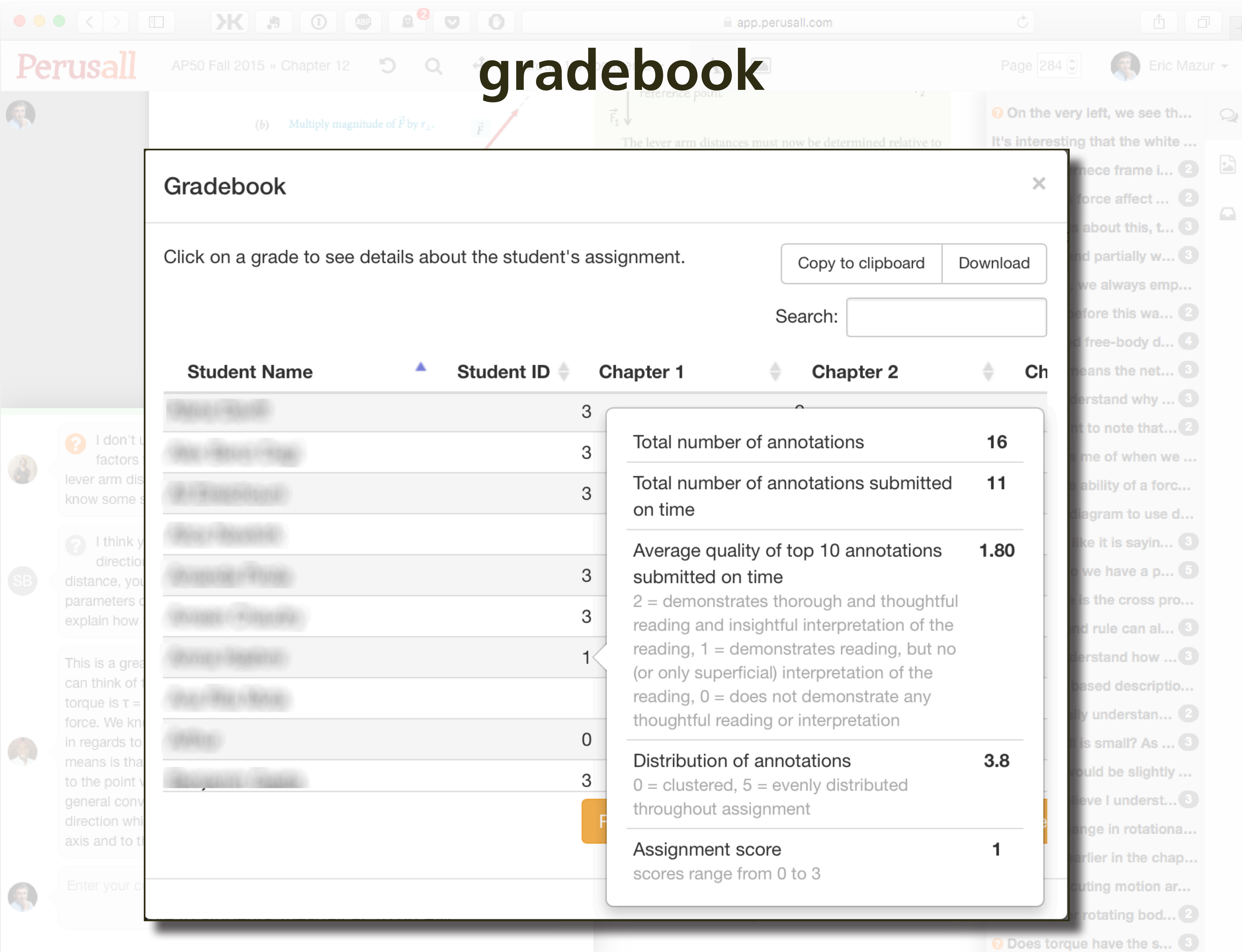
3 3
Release to students
Release to students

gradebook



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Eric Mazur
Gradebook
Click on a grade to see details about the student's assignment.
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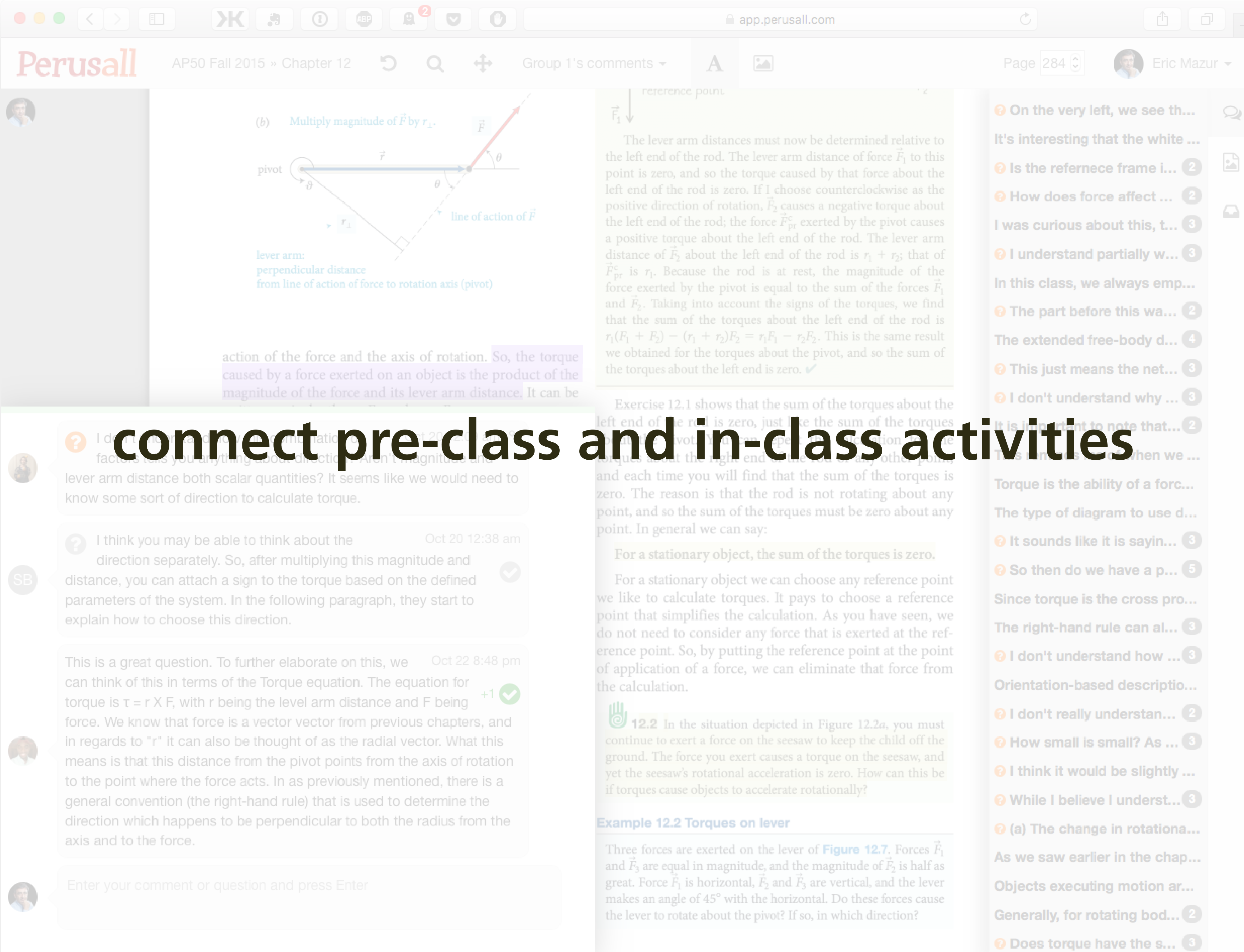
Search:
Student Name
Student ID
Chapter 1
Chapter 2
Ch
3
3
3
3
3
1
0
3
Total number of annotations 16
Total number of annotations submitted on time 11
Average quality of top 10 annotations submitted on time 1.80
2 = demonstrates thorough and thoughtful reading and insightful interpretation of the reading, 1 = demonstrates reading, but no (or only superficial) interpretation of the reading, 0 = does not demonstrate any thoughtful reading or interpretation
Distribution of annotations 3.8
0 = clustered, 5 = evenly distributed throughout assignment
Assignment score 1
scores range from 0 to 3

connect pre-class and in-class activities



confusion report

Confusion report for Chapter 24

right hand rule (11 questions)

JB — Can someone in simpler terms explain the right- hand rule? +1

WJ — Is there another way, besides the right hand rule, to find the direction of the magnetic field with a current?

SB — Using the right hand rule, I believe the answer is D. Is that correct?

Show more...

direction magnetic field (8 questions)

CP — Why is it that the magnet field points away from the north pole and towards the south pole? When on the previous page it stated that the direction of the magnetic field is the direction that the north pole of a compass needle points. +2

AB — How can you determine which direction the magnetic field will point towards? +1

KH — So whichever way the north pole faces is the direction of the magnetic field but that doesn't always mean its pointing true north? +1

Show more...

earth magnetic field (6 questions)

CP — Does that mean that the compass will be distracted from the Earth's magnetic field and use the magnetic field that the current of the wire gives off?

AK — Can someone explain why this type of bacteria knows what direction the earth's magnetic fields are facing?

J — Does the circular loop of current have any similarities with the look of the earths magnetic field? They kind of look similar to me.

Show more...

motivating factors

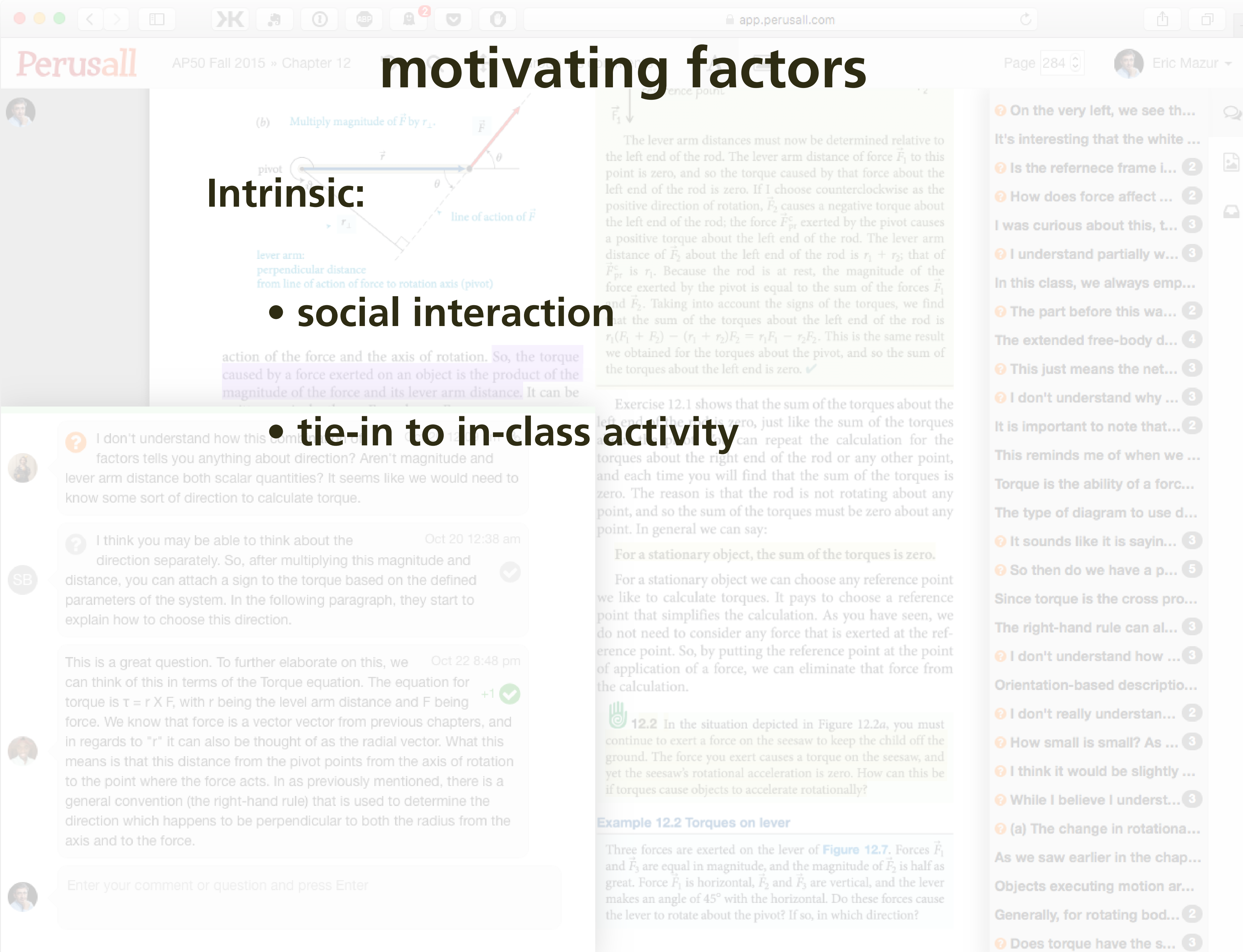
Intrinsic:

- social interaction

motivating factors

Intrinsic:

- social interaction
- tie-in to in-class activity



motivating factors

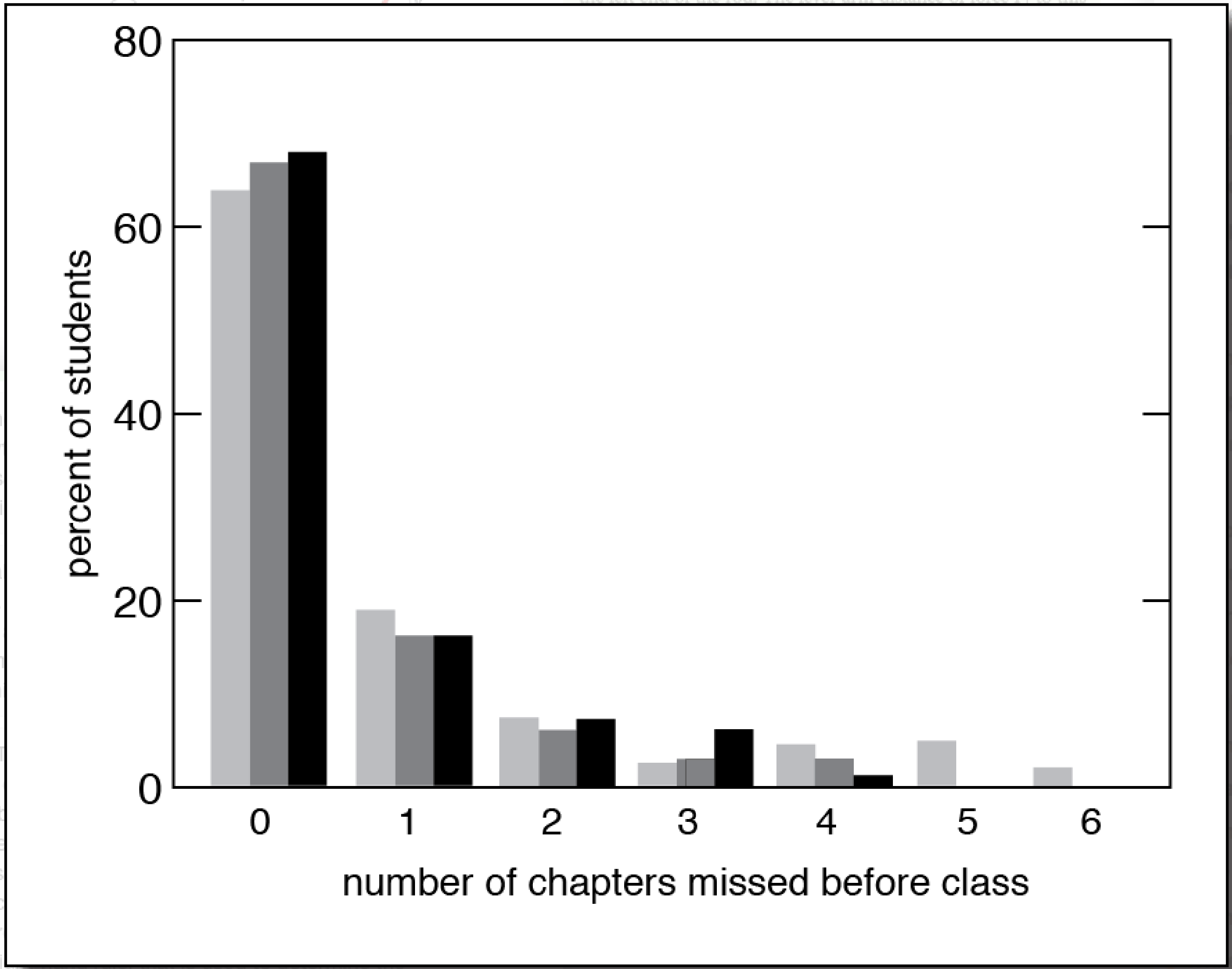
Intrinsic:

- social interaction
- tie-in to in-class activity

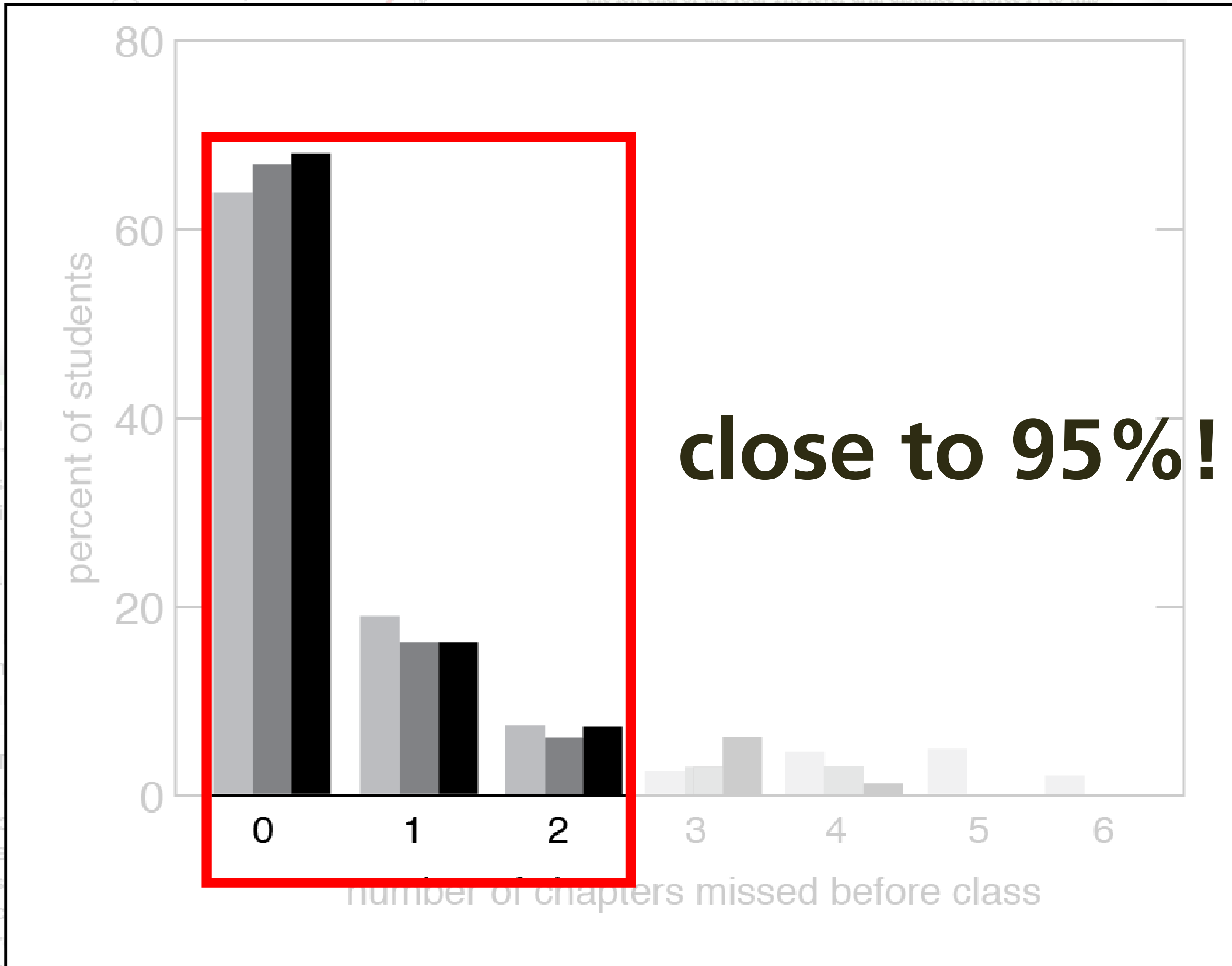
Extrinsic:

- assessment (fully automated)

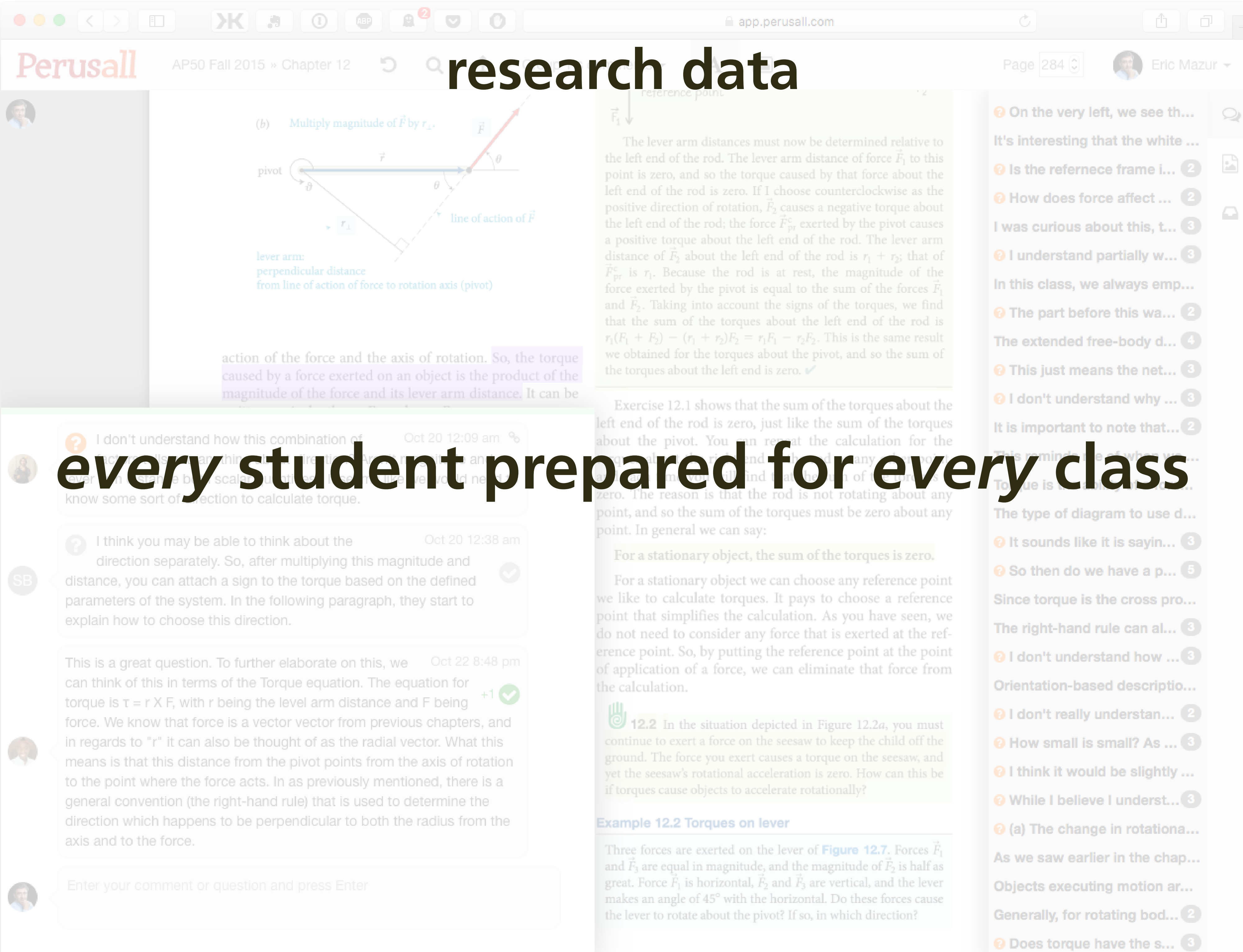
research data



research data



research data

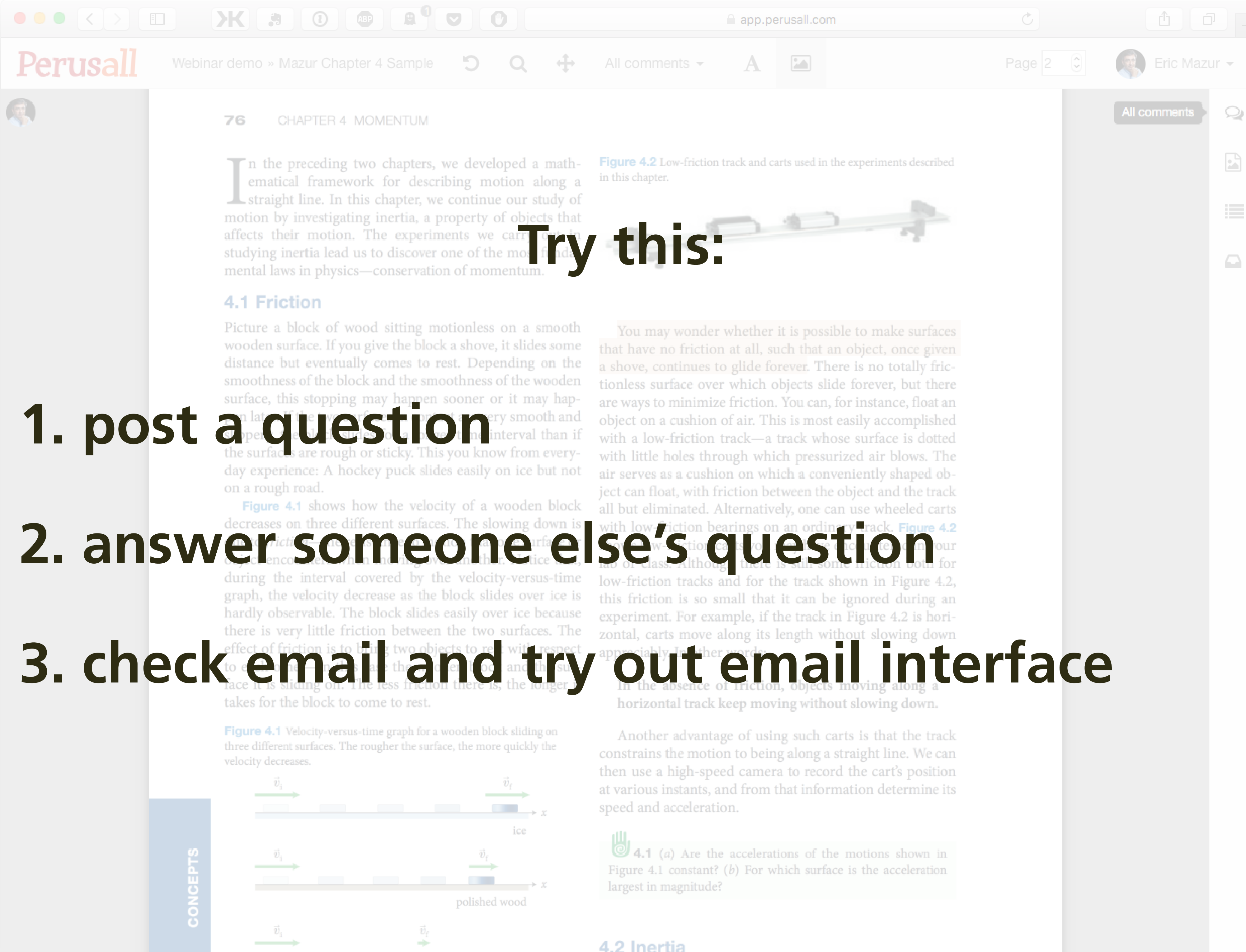


every student prepared for *every* class

Let’s try it out!

- sign on to http://app.perusall.com
- enter access code MAZUR-3898
- click on “Reading Assignment on Weight”
- read (and pose or answer questions)

coffee @10:45, reconvene @11:00



Try this:

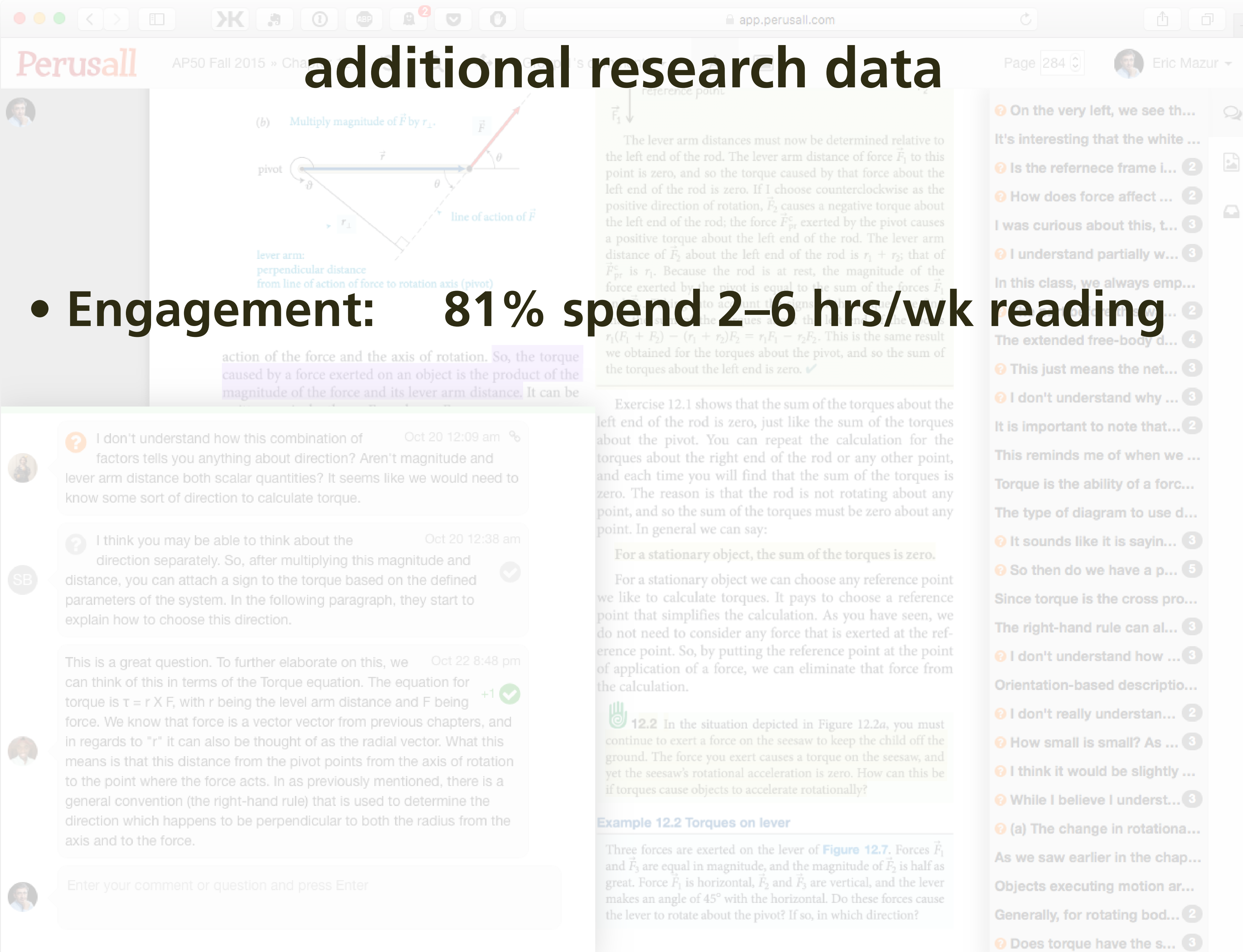
1. post a question

2. answer someone else's question

3. check email and try out email interface

additional research data

- Engagement: 81% spend 2–6 hrs/wk reading



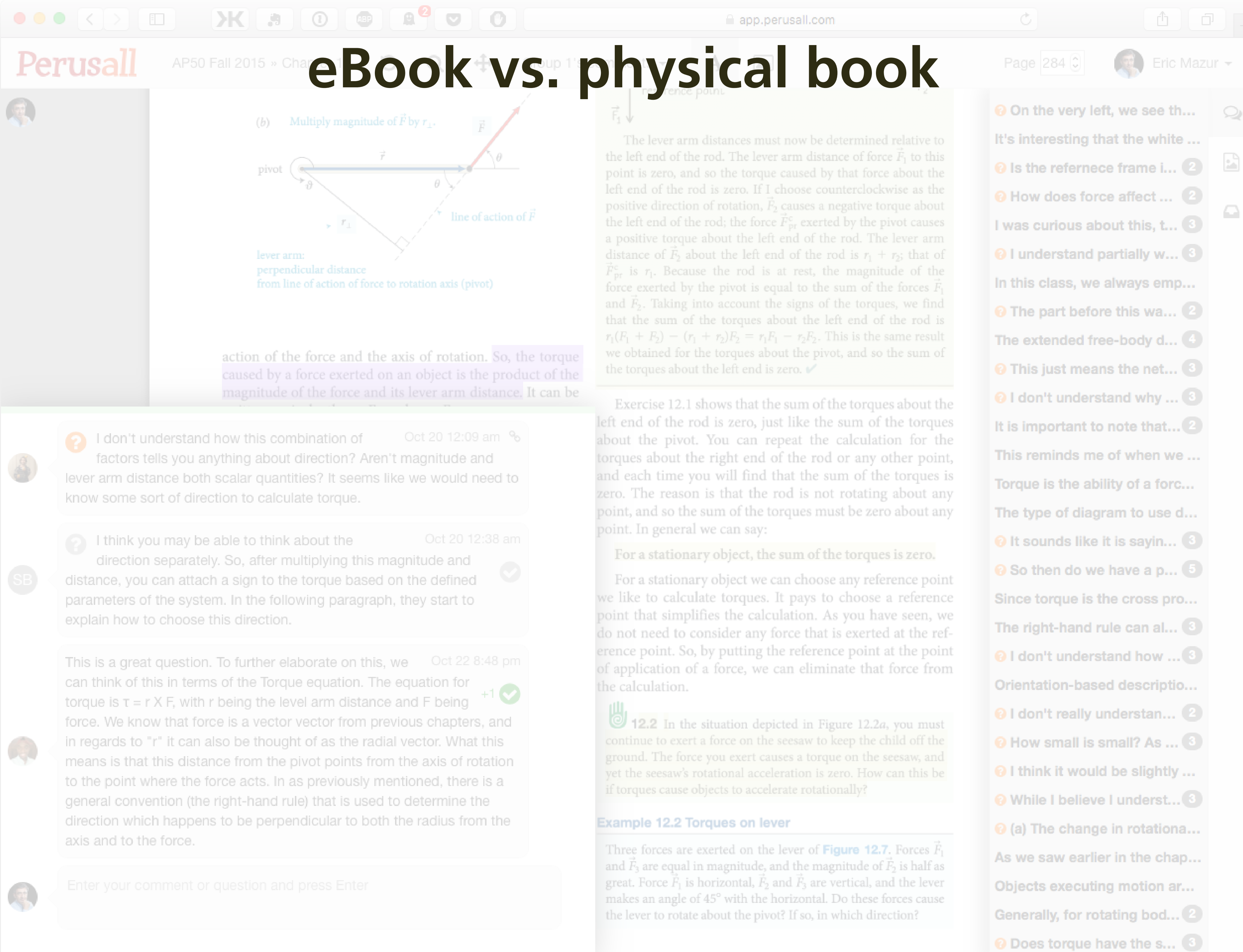
additional research data

- Engagement: 81% spend 2–6 hrs/wk reading
- Active reading: 85% annotate as they read and
  40% take notes while reading

additional research data

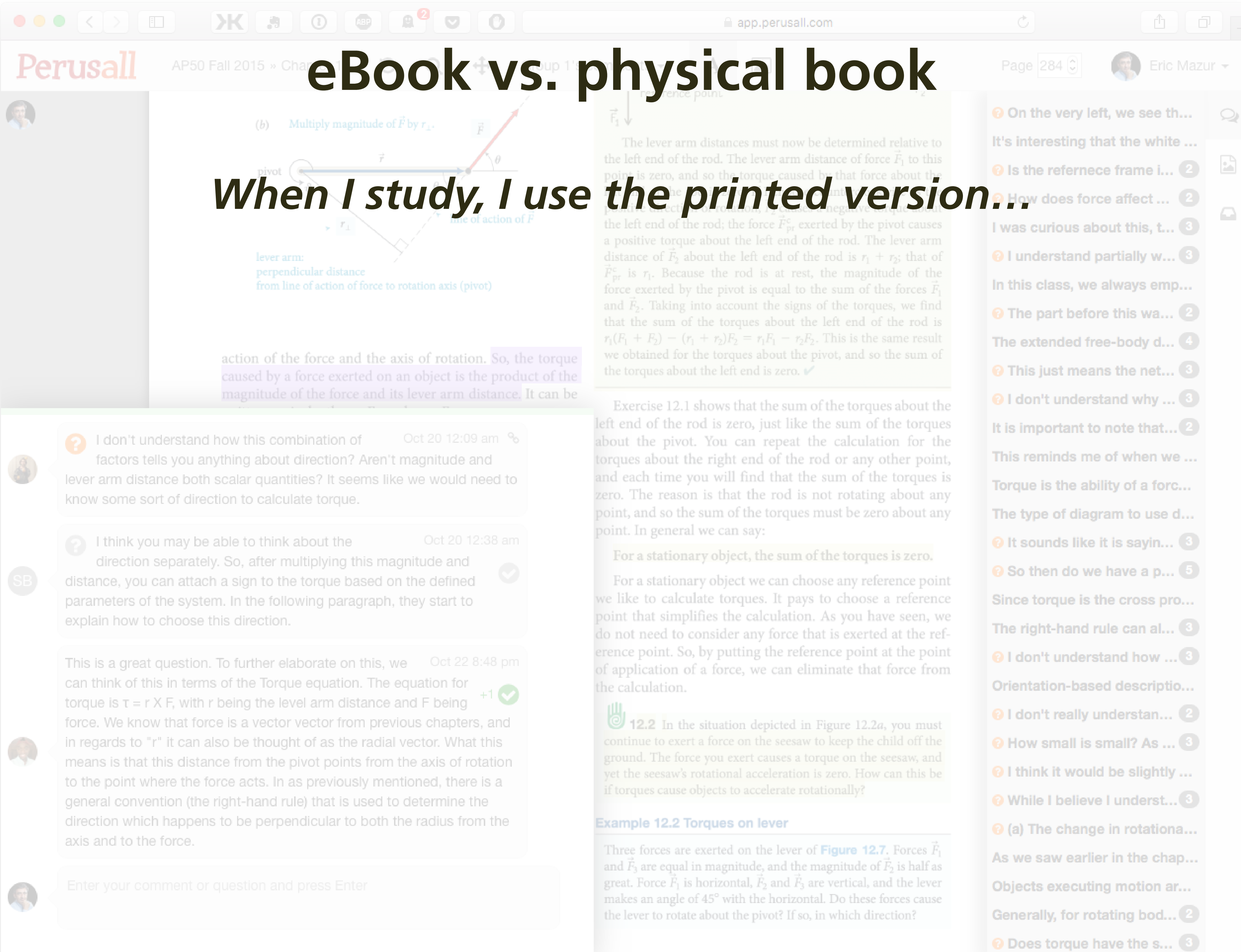
- **Engagement:** 81% spend 2–6 hrs/wk reading
- **Active reading:** 85% annotate as they read and 40% take notes while reading
- **Performance:** significantly higher scores

eBook vs. physical book



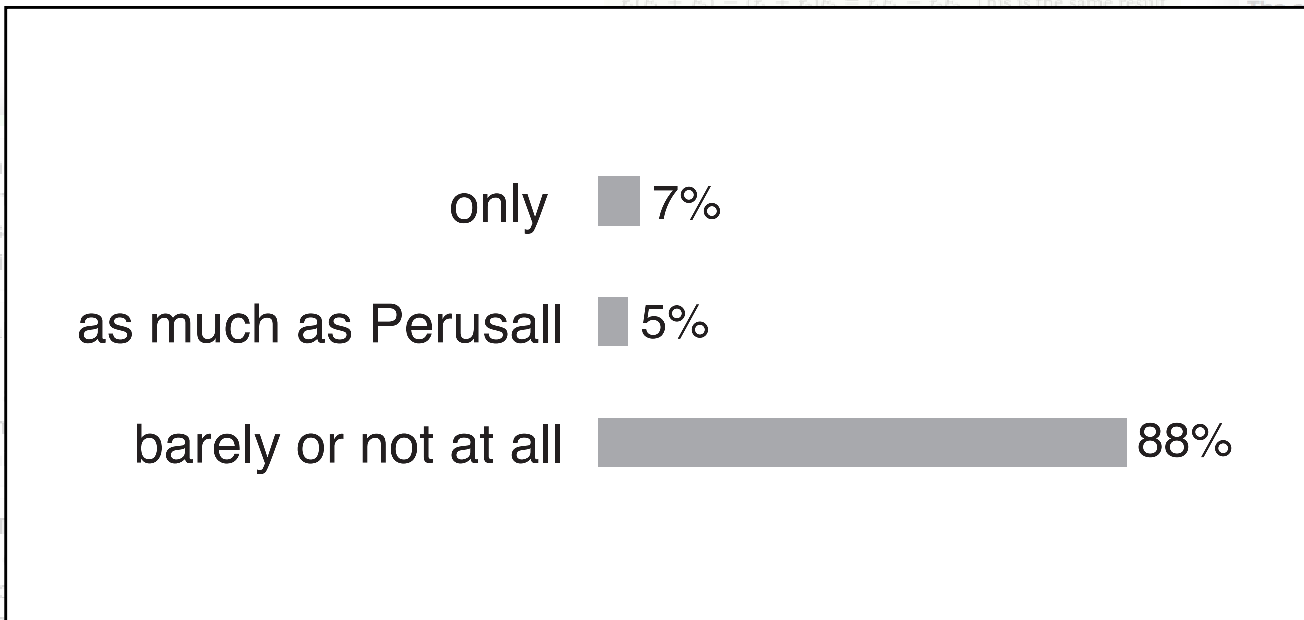
eBook vs. physical book

When I study, I use the printed version…



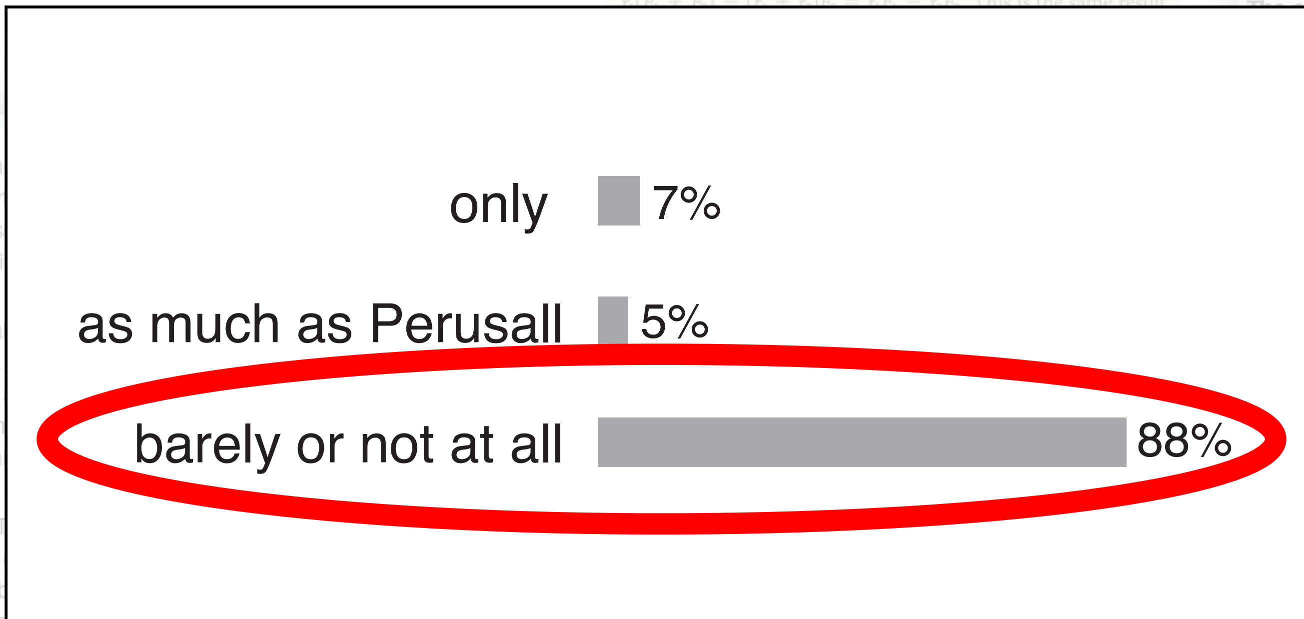
eBook vs. physical book

When I study, I use the printed version…



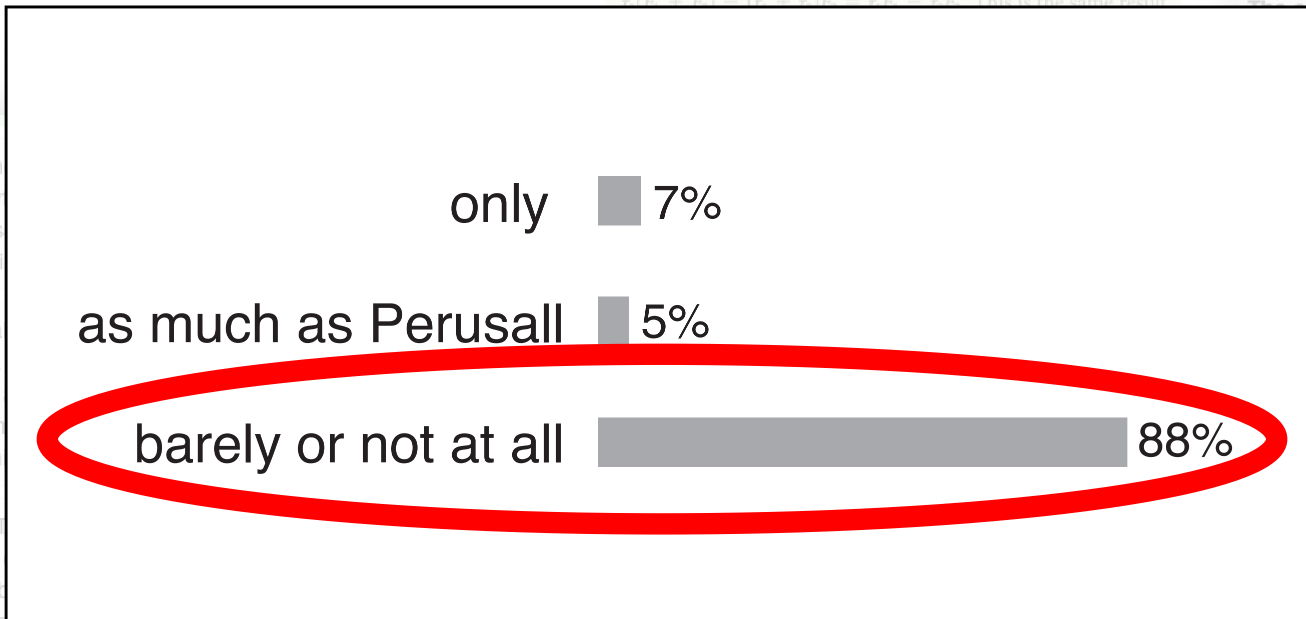
eBook vs. physical book

When I study, I use the printed version…



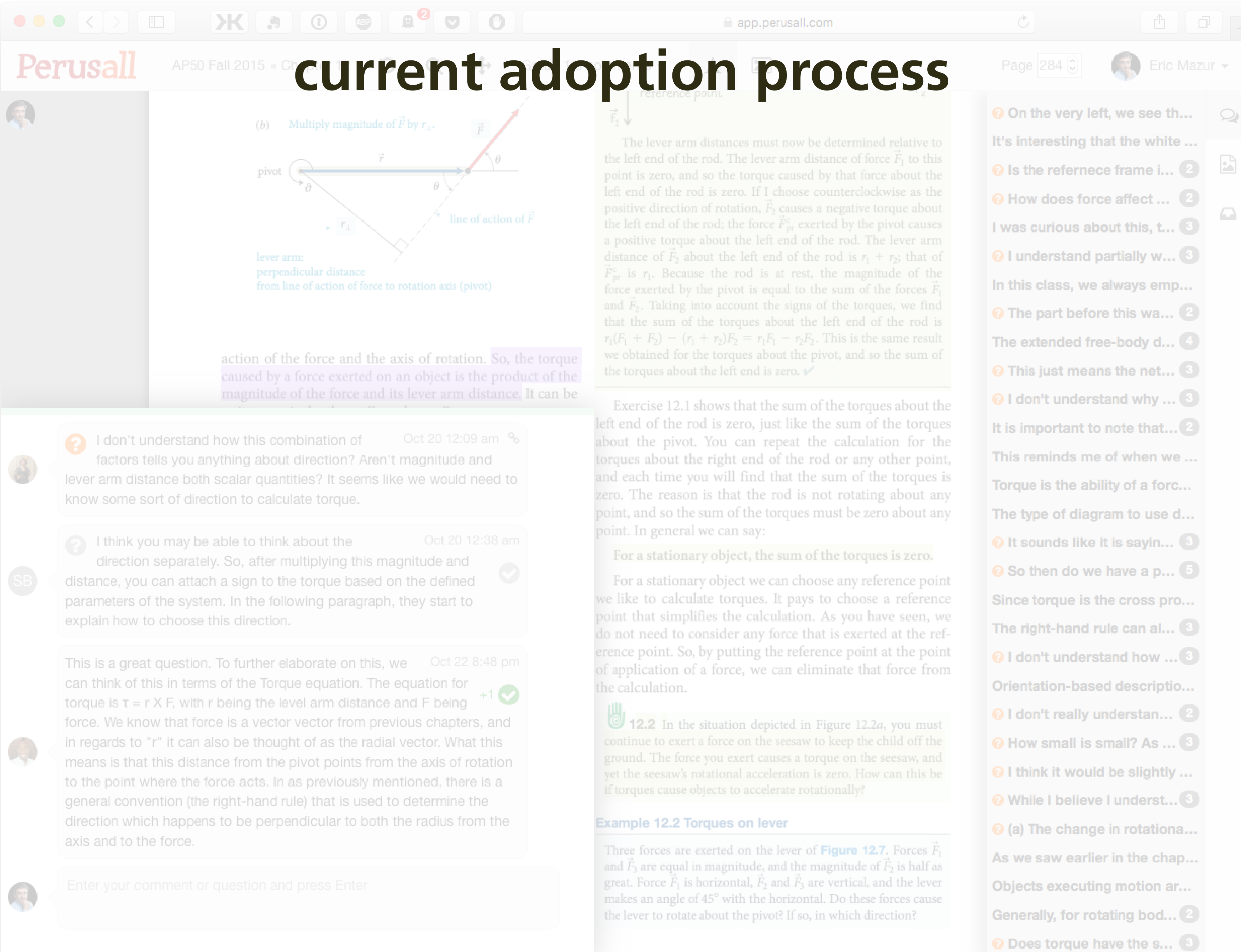
eBook vs. physical book

When I study, I use the printed version…



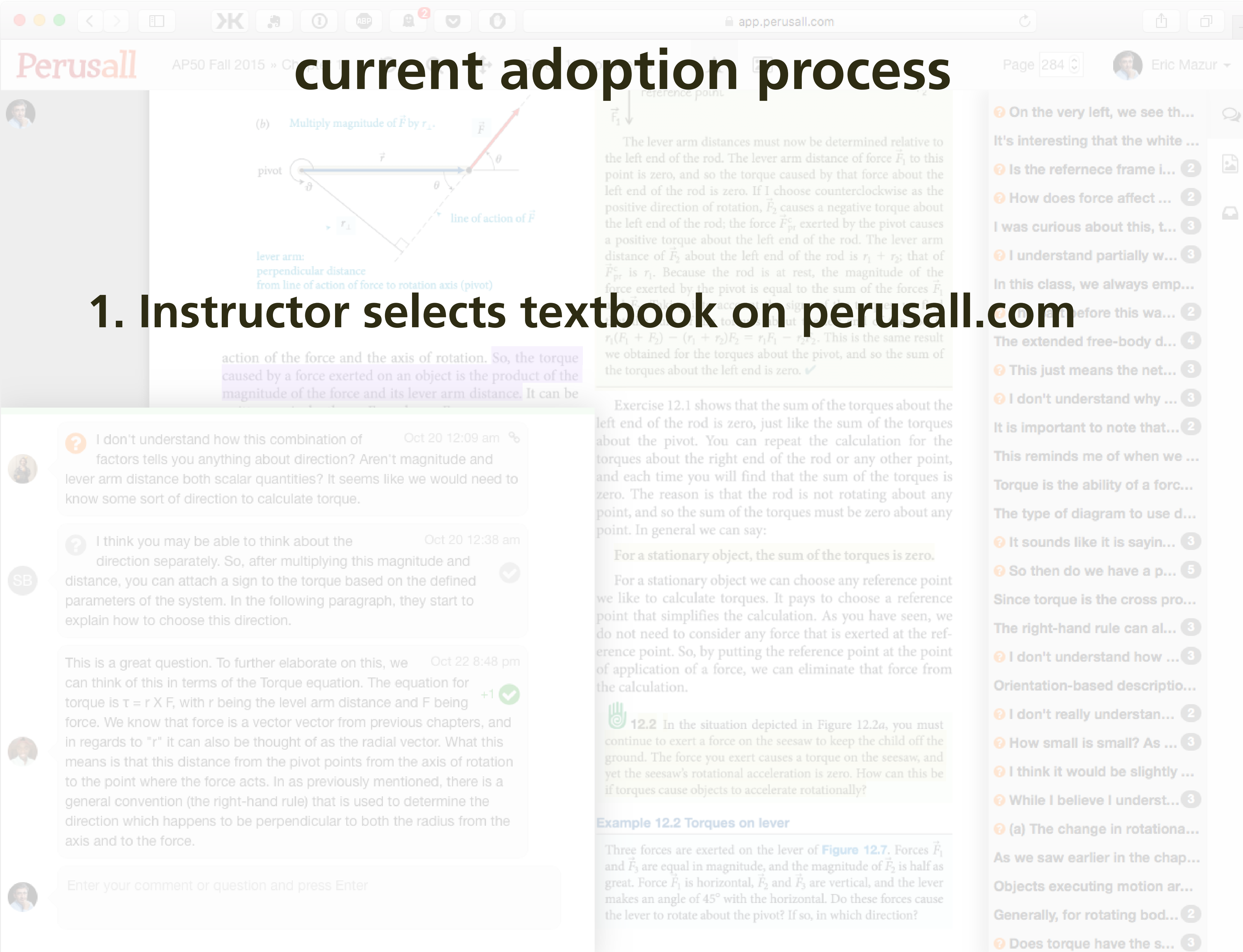
can eliminate printed books!

current adoption process

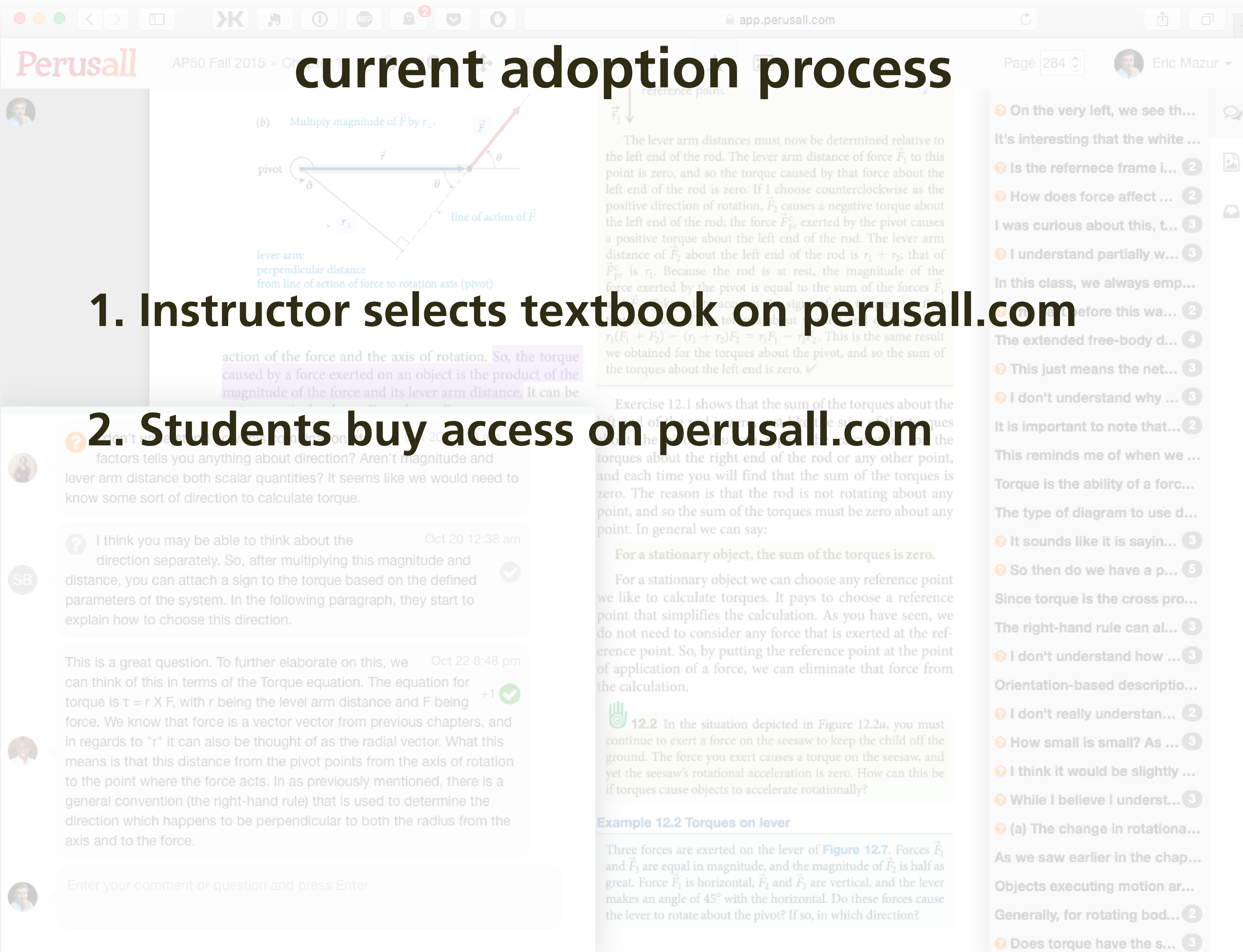


current adoption process

1. Instructor selects textbook on perusall.com



current adoption process



1. Instructor selects textbook on perusall.com

2. Students buy access on perusall.com

current adoption process

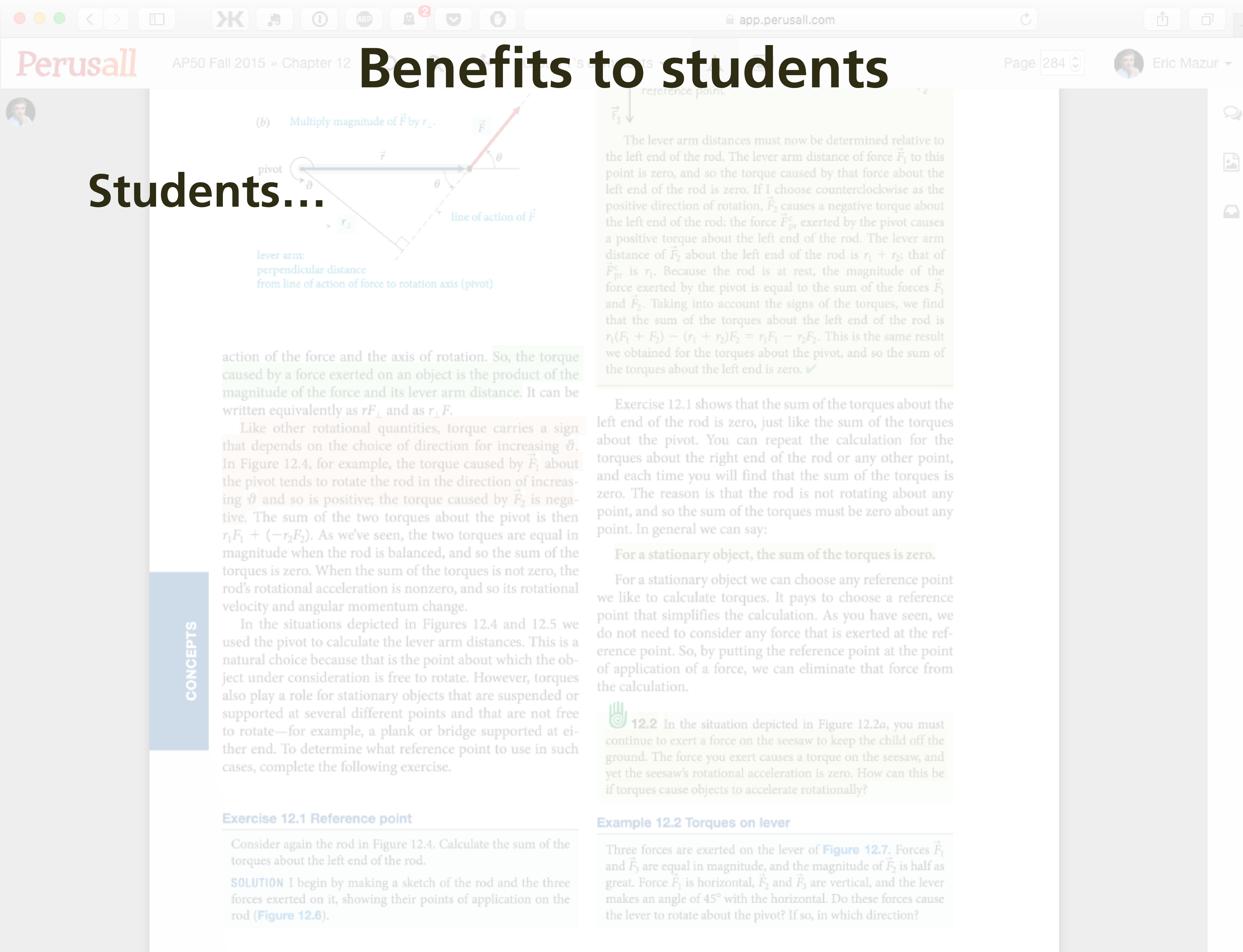
1. Instructor selects textbook on perusall.com

2. Students buy access on perusall.com

textbook available on Day 1!

Benefits to students

Students…



action of the force and the axis of rotation. So, the torque caused by a force exerted on an object is the product of the magnitude of the force and its lever arm distance. It can be written equivalently as $rF_\perp$ and as $r_\perp F$.

Like other rotational quantities, torque carries a sign that depends on the choice of direction for increasing ϑ. In Figure 12.4, for example, the torque caused by $\vec{F}_1$ about the pivot tends to rotate the rod in the direction of increasing ϑ and so is positive; the torque caused by $\vec{F}_2$ is negative. The sum of the two torques about the pivot is then $r_1F_1 + (-r_2F_2)$. As we've seen, the two torques are equal in magnitude when the rod is balanced, and so the sum of the torques is zero. When the sum of the torques is not zero, the rod's rotational acceleration is nonzero, and so its rotational velocity and angular momentum change.

In the situations depicted in Figures 12.4 and 12.5 we used the pivot to calculate the lever arm distances. This is a natural choice because that is the point about which the object under consideration is free to rotate. However, torques also play a role for stationary objects that are suspended or supported at several different points and that are not free to rotate—for example, a plank or bridge supported at either end. To determine what reference point to use in such cases, complete the following exercise.

Exercise 12.1 Reference point

Consider again the rod in Figure 12.4. Calculate the sum of the torques about the left end of the rod.

SOLUTION I begin by making a sketch of the rod and the three forces exerted on it, showing their points of application on the rod (Figure 12.6).

The lever arm distances must now be determined relative to the left end of the rod. The lever arm distance of force $\vec{F}_1$ to this point is zero, and so the torque caused by that force about the left end of the rod is zero. If I choose counterclockwise as the positive direction of rotation, $\vec{F}_2$ causes a negative torque about the left end of the rod; the force $\vec{F}^c_{pr}$ exerted by the pivot causes a positive torque about the left end of the rod. The lever arm distance of $\vec{F}_2$ about the left end of the rod is $r_1 + r_2$; that of $\vec{F}^c_{pr}$ is r_1. Because the rod is at rest, the magnitude of the force exerted by the pivot is equal to the sum of the forces $\vec{F}_1$ and $\vec{F}_2$. Taking into account the signs of the torques, we find that the sum of the torques about the left end of the rod is $r_1(F_1 + F_2) - (r_1 + r_2)F_2 = r_1F_1 - r_2F_2$. This is the same result we obtained for the torques about the pivot, and so the sum of the torques about the left end is zero. ✔

Exercise 12.1 shows that the sum of the torques about the left end of the rod is zero, just like the sum of the torques about the pivot. You can repeat the calculation for the torques about the right end of the rod or any other point, and each time you will find that the sum of the torques is zero. The reason is that the rod is not rotating about any point, and so the sum of the torques must be zero about any point. In general we can say:

For a stationary object, the sum of the torques is zero.

For a stationary object we can choose any reference point we like to calculate torques. It pays to choose a reference point that simplifies the calculation. As you have seen, we do not need to consider any force that is exerted at the reference point. So, by putting the reference point at the point of application of a force, we can eliminate that force from the calculation.

12.2 In the situation depicted in Figure 12.2a, you must continue to exert a force on the seesaw to keep the child off the ground. The force you exert causes a torque on the seesaw, and yet the seesaw's rotational acceleration is zero. How can this be if torques cause objects to accelerate rotationally?

Example 12.2 Torques on lever

Three forces are exerted on the lever of Figure 12.7. Forces $\vec{F}_1$ and $\vec{F}_3$ are equal in magnitude, and the magnitude of $\vec{F}_2$ is half as great. Force $\vec{F}_1$ is horizontal, $\vec{F}_2$ and $\vec{F}_3$ are vertical, and the lever makes an angle of 45° with the horizontal. Do these forces cause the lever to rotate about the pivot? If so, in which direction?

Benefits to students

Students…

- read the textbook

Benefits to students

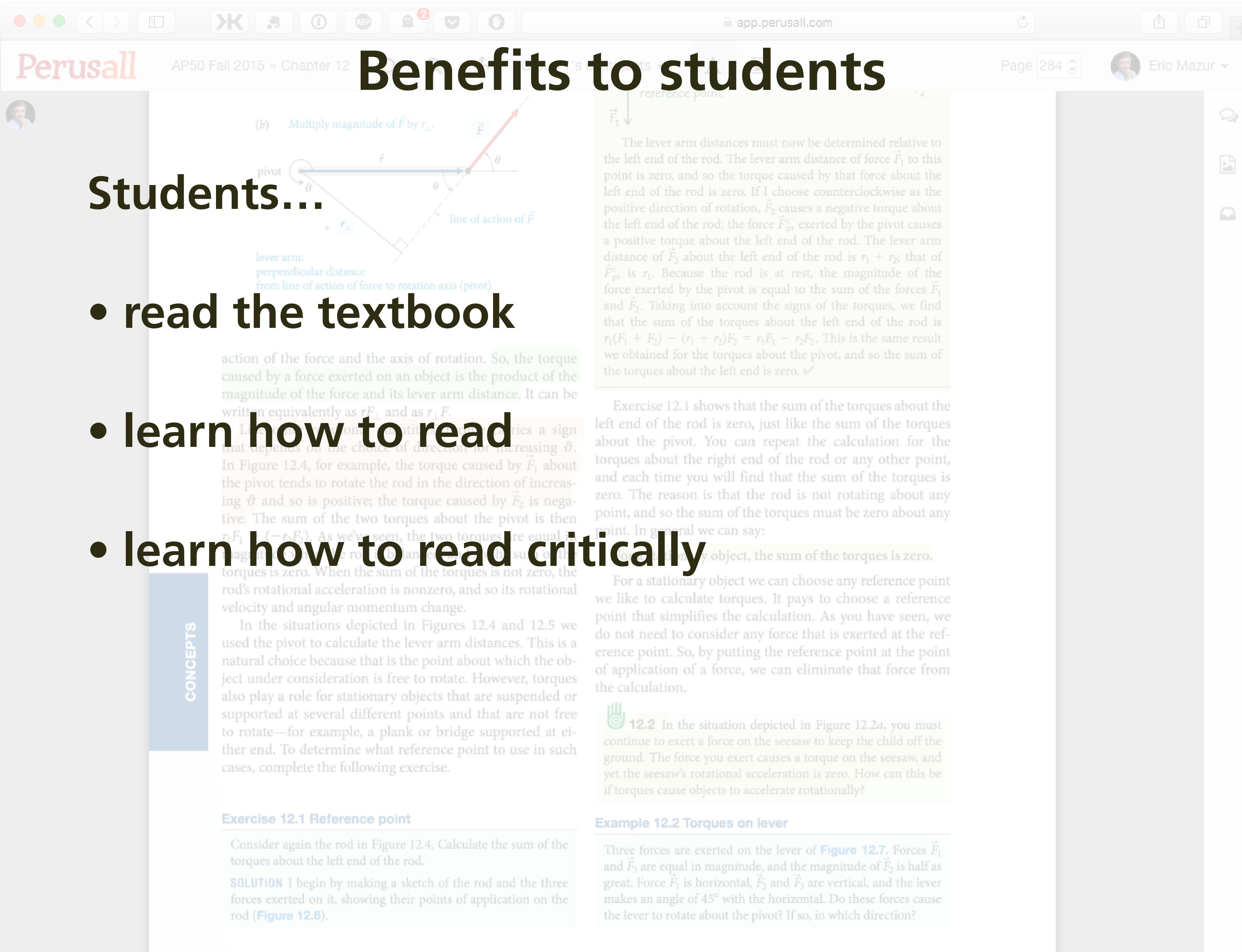
Students…

- read the textbook
- learn how to read

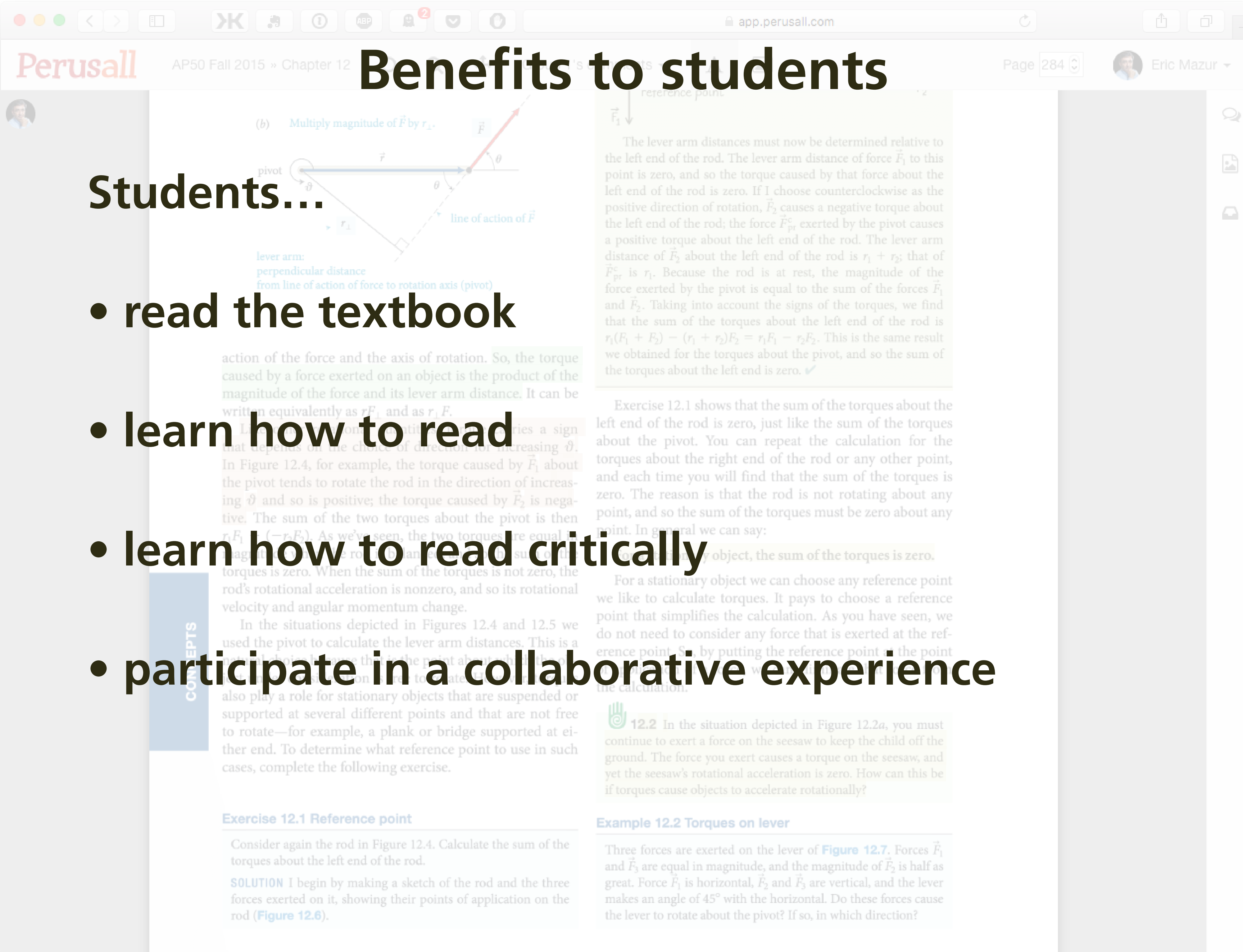
Benefits to students

Students…

- read the textbook
- learn how to read
- learn how to read critically



Benefits to students



Students…

- read the textbook
- learn how to read
- learn how to read critically
- participate in a collaborative experience

Benefits to students

Students…

- read the textbook
- learn how to read
- learn how to read critically
- participate in a collaborative experience
- get more out of their classes

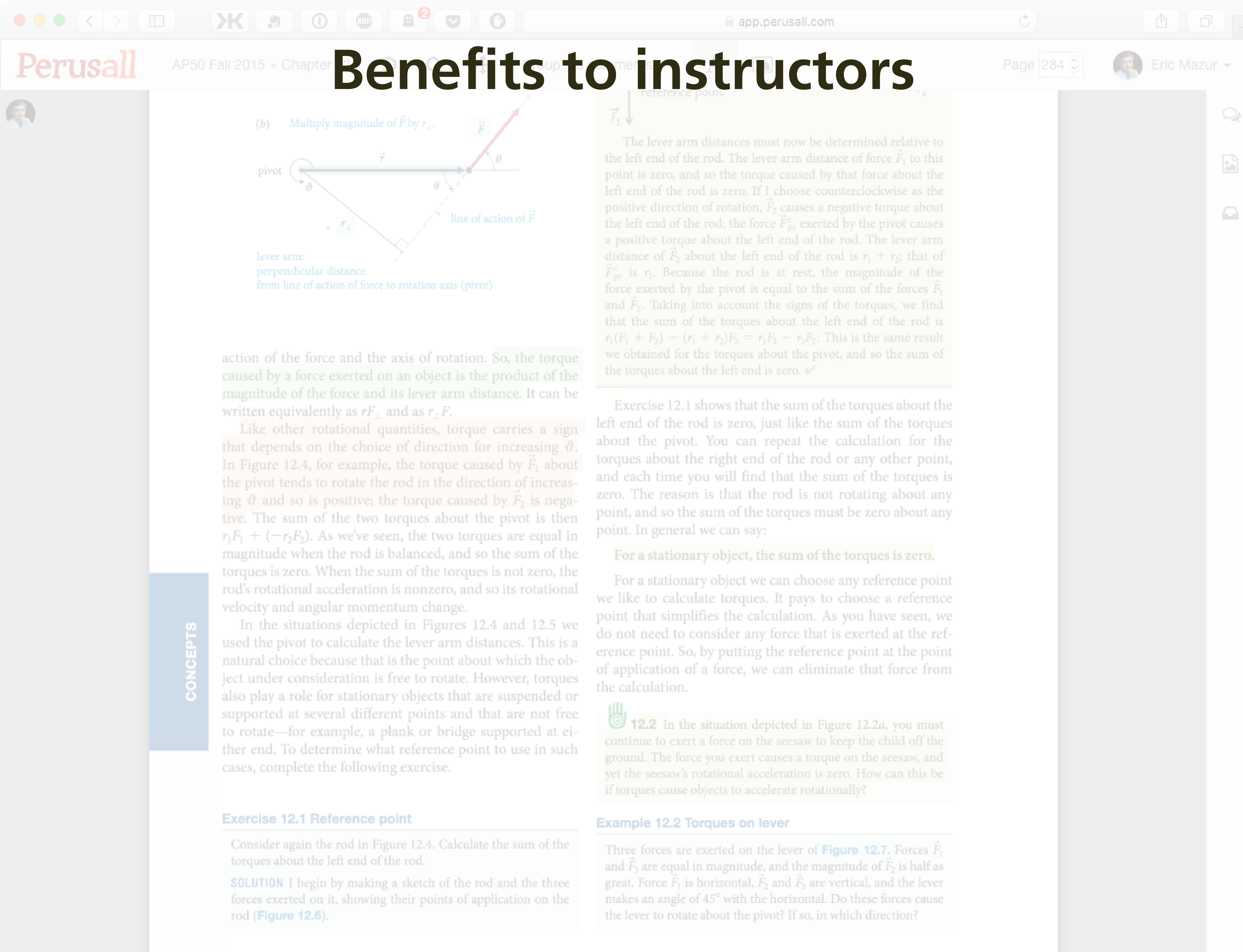
Benefits to students

Students…

- read the textbook
- learn how to read
- learn how to read critically
- learn how to study and work collaboratively
- get more out of their classes

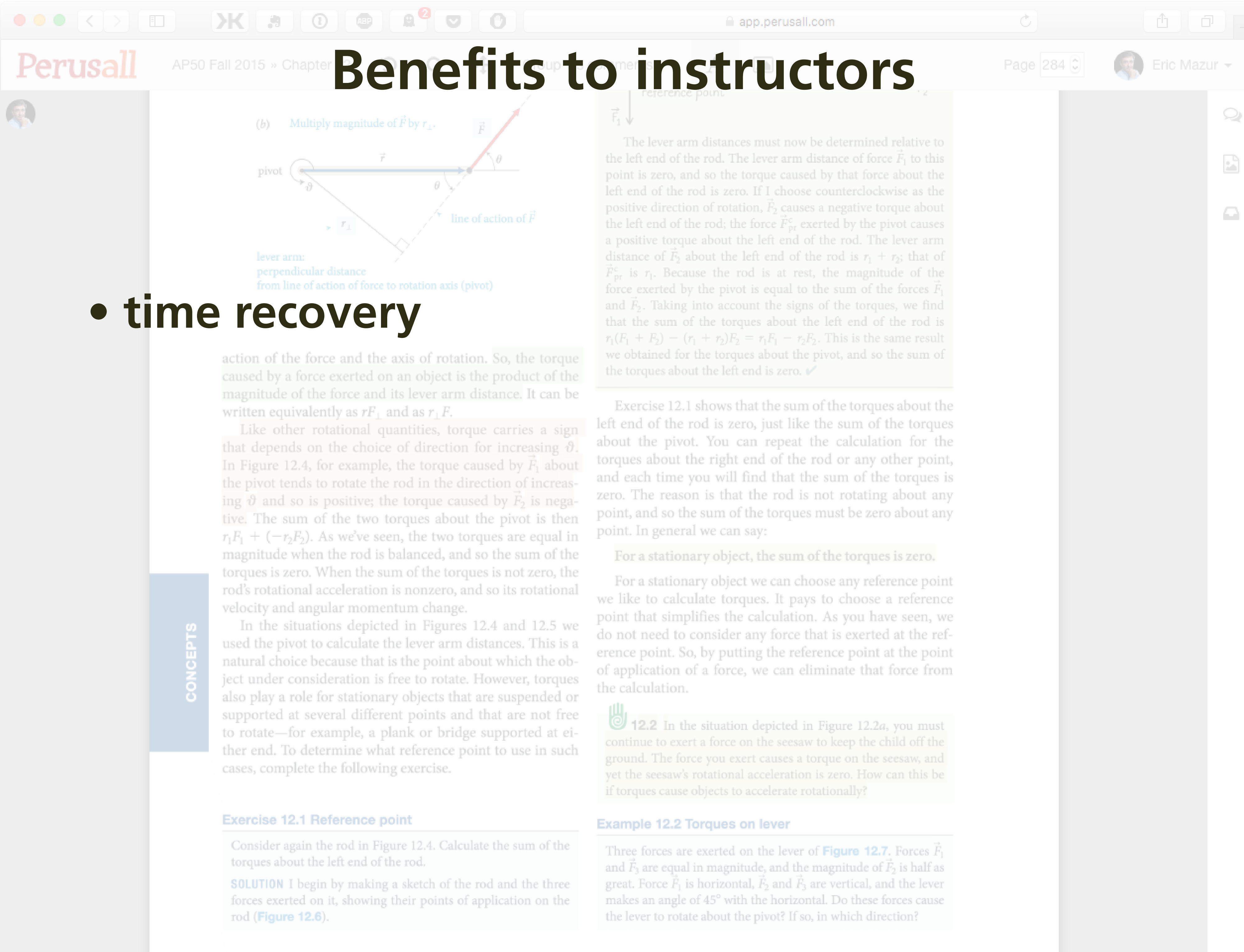
transferable skills

Benefits to instructors



Benefits to instructors

- time recovery



Benefits to instructors

- time recovery
- improved use of class time

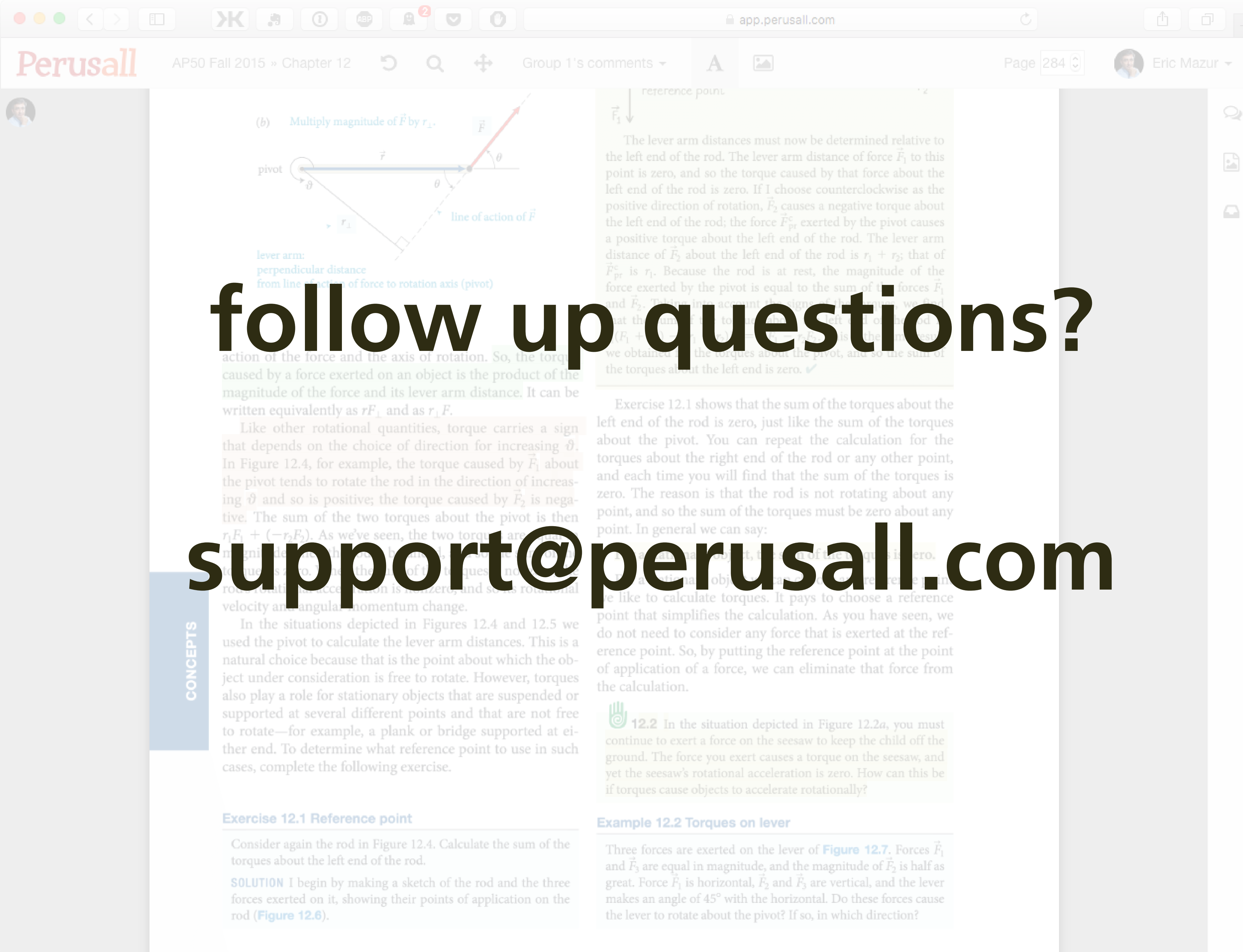
Benefits to instructors

- time recovery
- improved use of class time
- enhanced respect and understanding for students

Benefits to instructors

- time recovery
- improved use of class time
- enhanced respect and understanding for students

all at no cost & no additional effort!



follow up questions?

support@perusall.com