Adaptive MOOC

2016-05-04 iLED 세미나

석사과정 정다은

MOOCs and Adaptive Learning Technologies

Nielson, B. (2014)

- Computer-based training(CBT) has been around in some for roughly 50 years

- Two of the biggest promises of CBT
  1. Universal access to education
  2. Adaptive learning

Now, with MOOCs continuing to proliferate and new adaptive learning technologies popping up, it looks like 2014 might be the year these two promises are finally realized, together.

MOOCs and Adaptive Learning Technologies

Nielson, B. (2014)

- **Adaptive learning**

- "an educational method which uses computers as interactive teaching devices. Computers adapt the presentation of educational material according to students' learning needs, as indicated by their responses to questions and tasks" (Wikipedia)

- "… The platform monitors how the student interacts with the system and learns… It assesses not only what a student knows now, but also determines what activities and interactions… delivered in what sequence and medium, most greatly increase the possibility of that student's academic success." (Knewton)

MOOCs and Adaptive Learning Technologies

Nielson, B. (2014)

- **Why should companies care about adaptive learning?**

1. Companies are investing billions of dollars every year in computer-based and online training—adaptive technology can help them ensure they are getting their money's worth in terms of employees actually learning essential knowledge and applicable skills.

2. Can improve compliance training by allowing learners to move quickly through information they already know, which can cut training time by 50 to 80 percent. (Jan Sramek, 2013)

MOOCs and Adaptive Learning Technologies

Nielson, B. (2014)

- **What do MOOCs have to do with adaptive learning?**

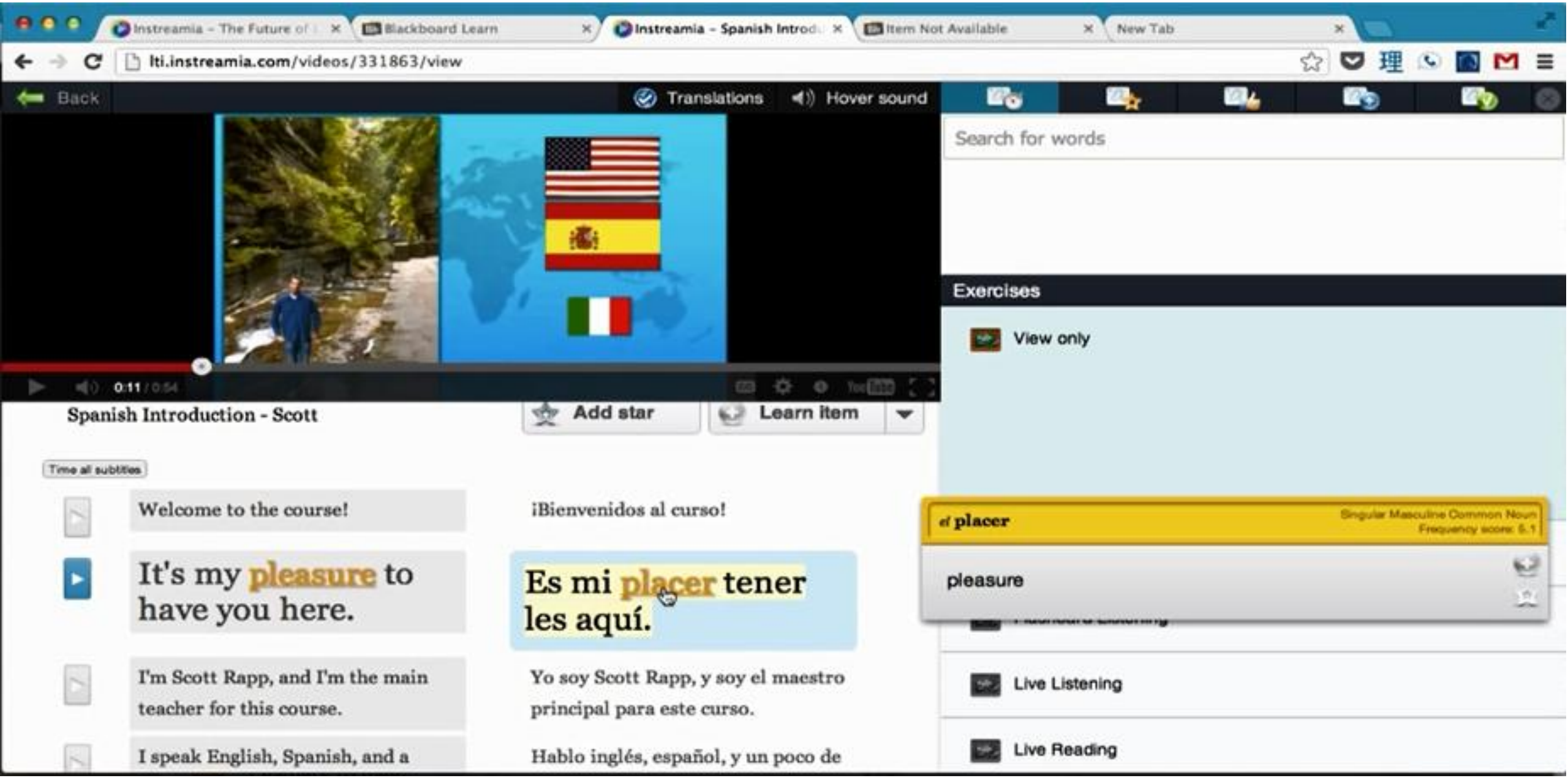
- MOOC on molecular biology (Sonwalkar, 2013)

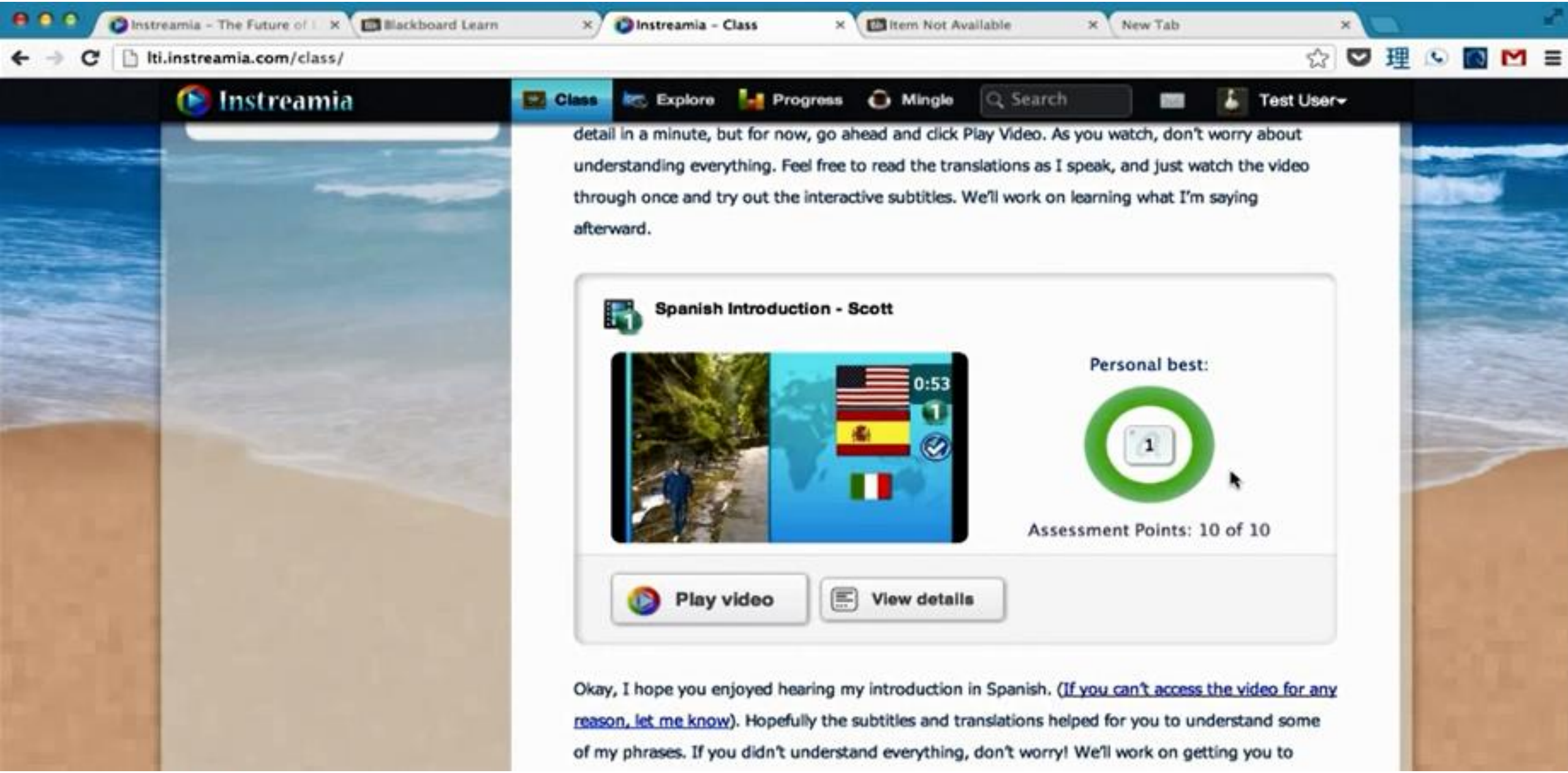
- Khan Academy

- Spanish MOOC by Instreamia

Spanish MOOC www.spanishmooc.com

- Utilizes Instreamia's patent-pending adaptive learning technology
- Instreamia will periodically probe your comprehension with simple knowledge checks, such as a fill-in-the-blank listening problem.
- The accuracy of your response in combination with other information in your learning profile helps Instreamia gauge your overall level, the types of problems you need to work on most, and which vocabulary you need more practice with.


Instreamia – The Future of
Blackboard Learn
Instreamia – Spanish Introd
Item Not Available
New Tab
lti.instreamia.com/videos/331863/view
Back
Translations
Hover sound
Search for words
Exercises
View only
0:11 / 0:54
Spanish Introduction - Scott
Add star
Learn item
Time all subtitles
Welcome to the course!
¡Bienvenidos al curso!
el placer
Singular Masculine Common Noun
Frequency score: 6.1
pleasure
It's my pleasure to have you here.
Es mi placer tener les aquí.
I'm Scott Rapp, and I'm the main teacher for this course.
Yo soy Scott Rapp, y soy el maestro principal para este curso.
I speak English, Spanish, and a
Hablo inglés, español, y un poco de
Live Listening
Live Reading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Blackboard Learn
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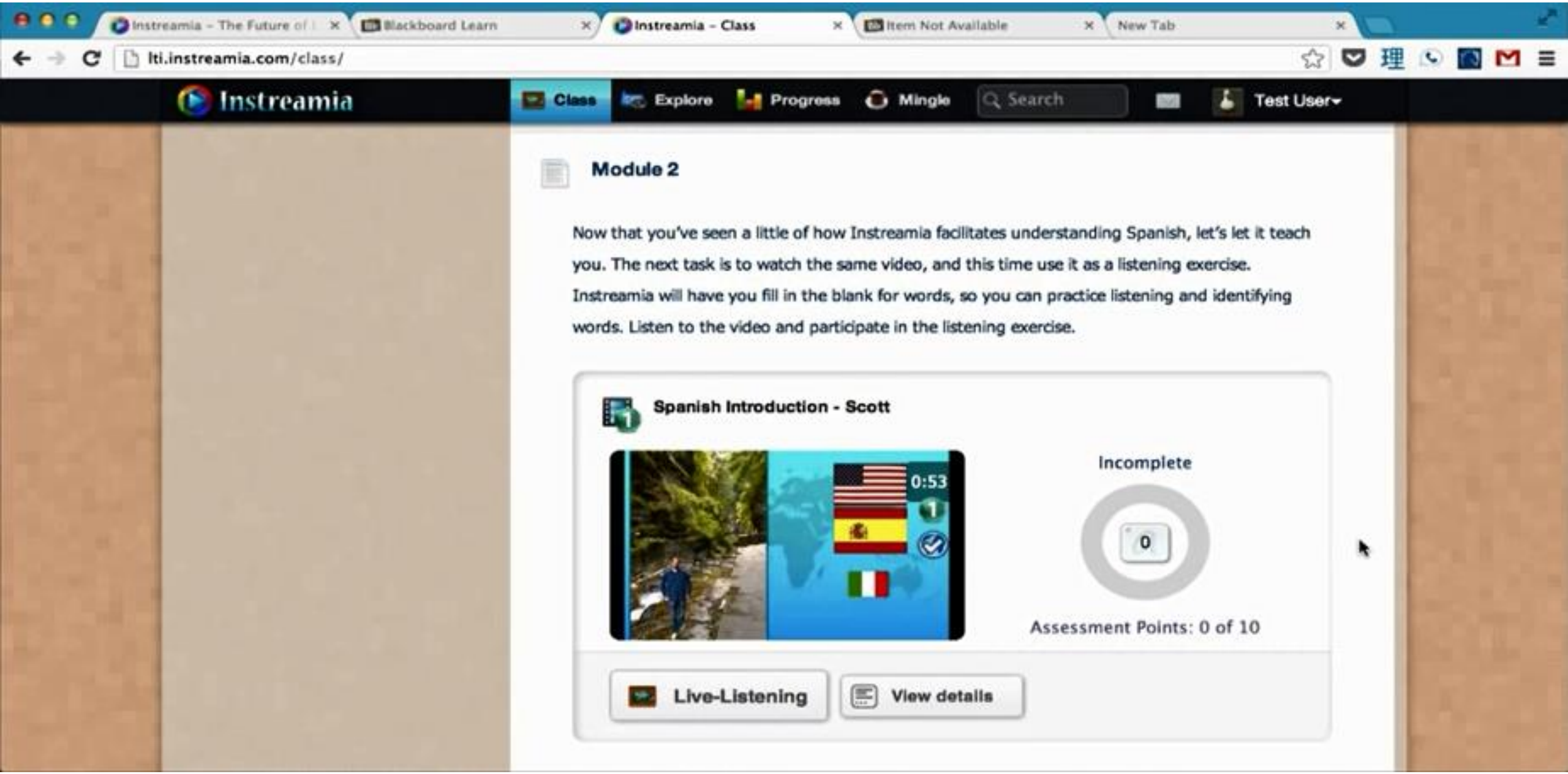
Instreamia
Class
Explore
Progress
Mingle
Search
Test User
detail in a minute, but for now, go ahead and click Play Video. As you watch, don't worry about understanding everything. Feel free to read the translations as I speak, and just watch the video through once and try out the interactive subtitles. We'll work on learning what I'm saying afterward.
Spanish Introduction - Scott
0:53
Personal best:
1
Assessment Points: 10 of 10
Play video
View details
Okay, I hope you enjoyed hearing my introduction in Spanish. (If you can't access the video for any reason, let me know). Hopefully the subtitles and translations helped for you to understand some of my phrases. If you didn't understand everything, don't worry! We'll work on getting you to


Instreamia – The Future of
Blackboard Learn
Instreamia – Class
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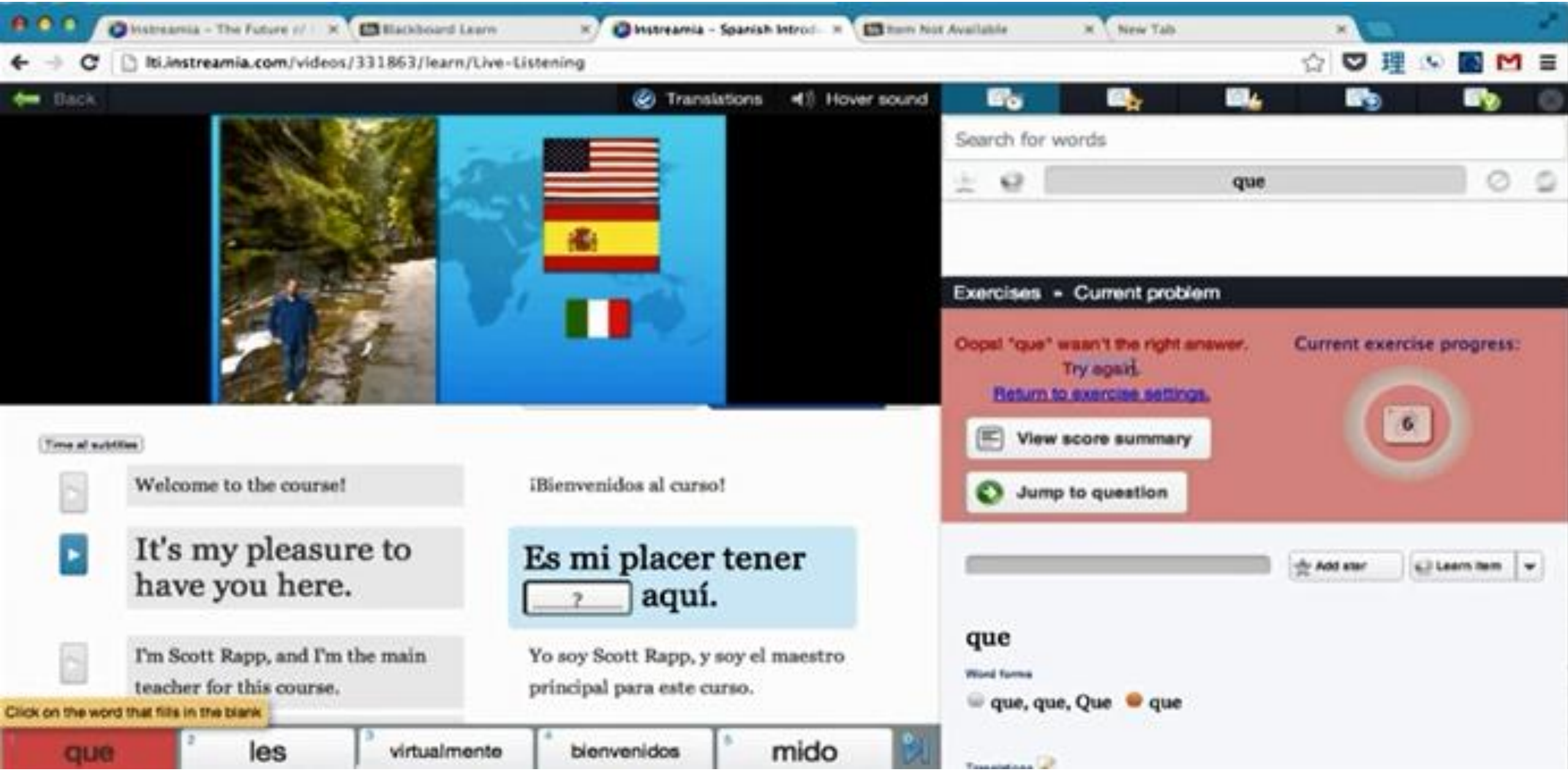
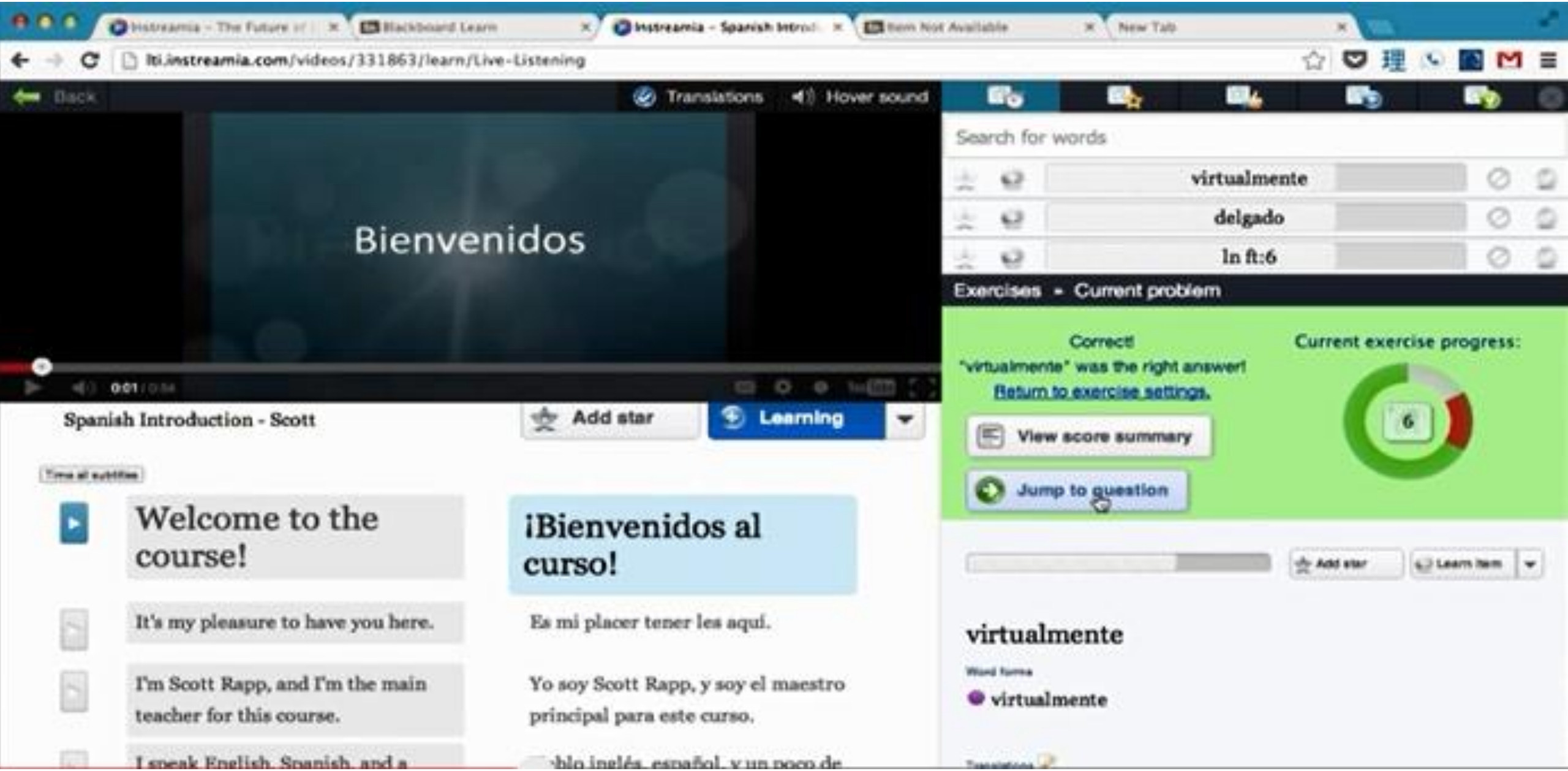
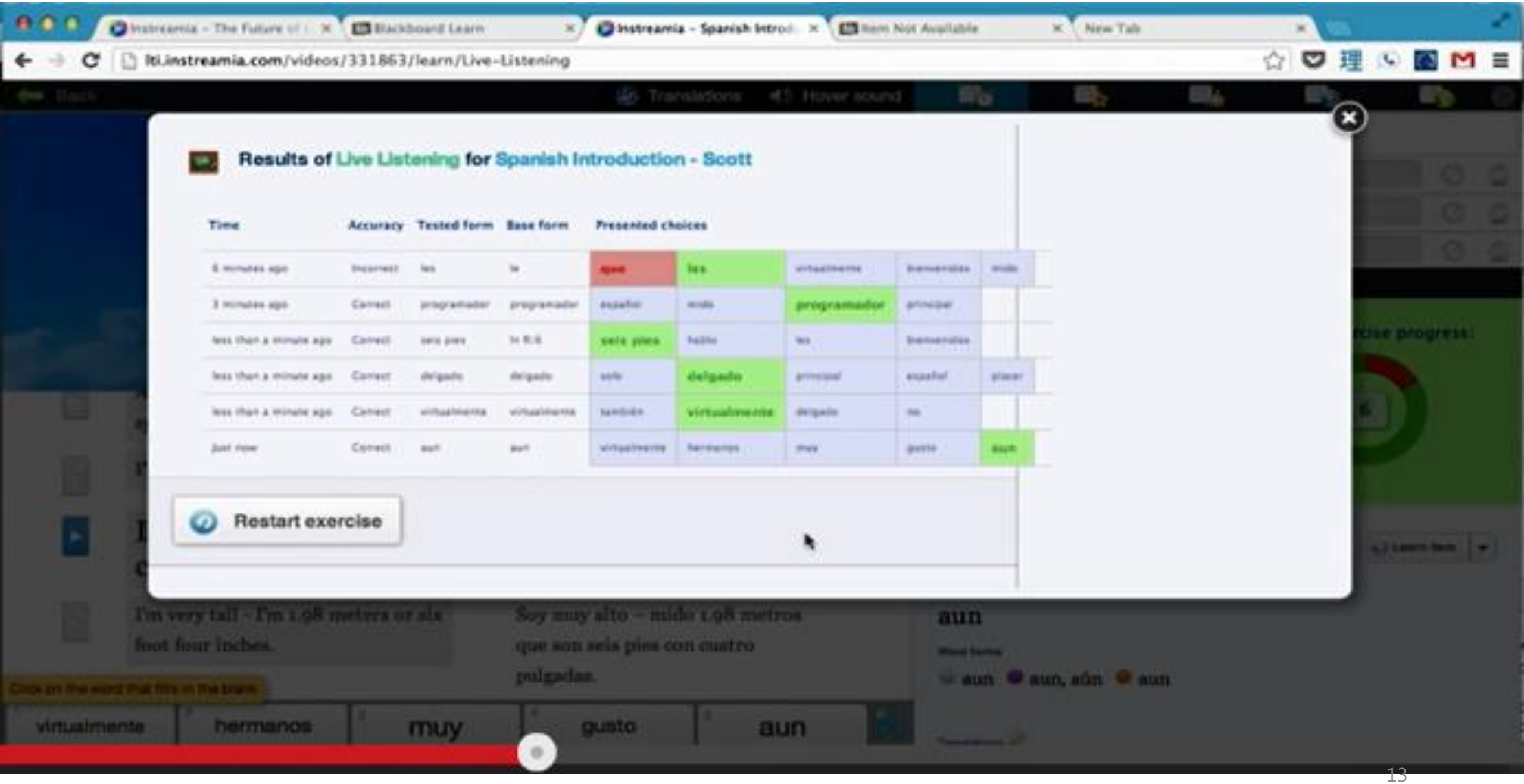
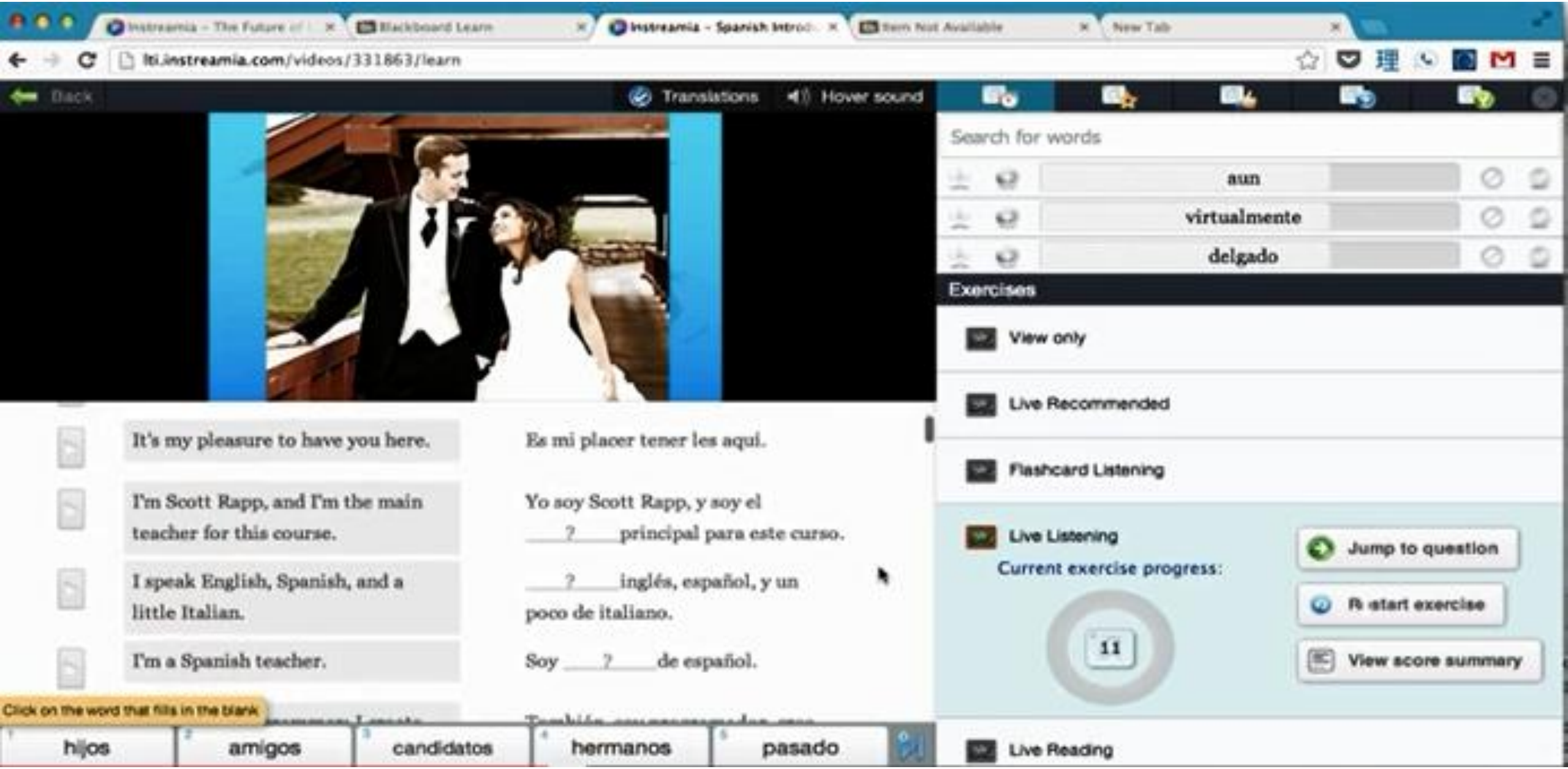
lti.instreamia.com/class/
Instreamia
Class
Explore
Progress
Mingle
Search
Test User
Module 2
Now that you've seen a little of how Instreamia facilitates understanding Spanish, let's let it teach you. The next task is to watch the same video, and this time use it as a listening exercise. Instreamia will have you fill in the blank for words, so you can practice listening and identifying words. Listen to the video and participate in the listening exercise.
Spanish Introduction - Scott
0:53
Incomplete
0
Assessment Points: 0 of 10
Live-Listening
View details


lti.instreamia.com/videos/331863/learn/Live-Listening
Back
Translations
Hover sound
Search for words
que
Exercises - Current problem
Oops! "que" wasn't the right answer.
Try again.
Return to exercise settings.
Current exercise progress:
6
View score summary
Jump to question
Welcome to the course!
¡Bienvenidos al curso!
It's my pleasure to have you here.
Es mi placer tener ? aquí.
I'm Scott Rapp, and I'm the main teacher for this course.
Yo soy Scott Rapp, y soy el maestro principal para este curso.
Click on the word that fits in the blank
que
les
virtualmente
bienvenidos
mido
que
que, que, Que
que


lti.instreamia.com/videos/331863/learn/Live-Listening
Back
Translations
Hover sound
Bienvenidos
Spanish Introduction - Scott
Add star
Learning
Welcome to the course!
¡Bienvenidos al curso!
It's my pleasure to have you here.
Es mi placer tener les aquí.
I'm Scott Rapp, and I'm the main teacher for this course.
Yo soy Scott Rapp, y soy el maestro principal para este curso.
Search for words
virtualmente
delgado
ln ft:6
Exercises - Current problem
Correct!
"virtualmente" was the right answer!
Return to exercise settings.
Current exercise progress:
6
View score summary
Jump to question
virtualmente
virtualmente


lti.instreamia.com/videos/331863/learn/Live-Listening
Results of Live Listening for Spanish Introduction - Scott
Time
Accuracy
Tested form
Base form
Presented choices
Restart exercise
I'm very tall - I'm 1.98 metres or six foot four inches.
Soy muy alto – mido 1.98 metros que son seis pies con cuatro pulgadas.
aun
virtualmente
hermanos
muy
gusto
aun


lti.instreamia.com/videos/331863/learn
Back
Translations
Hover sound
Search for words
aun
virtualmente
delgado
Exercises
View only
Live Recommended
Flashcard Listening
Live Listening
Current exercise progress:
11
Jump to question
Restart exercise
View score summary
Live Reading
It's my pleasure to have you here.
Es mi placer tener les aqui.
I'm Scott Rapp, and I'm the main teacher for this course.
Yo soy Scott Rapp, y soy el ___?___ principal para este curso.
I speak English, Spanish, and a little Italian.
___?___ inglés, español, y un poco de italiano.
I'm a Spanish teacher.
Soy ___?___ de español.
Click on the word that fills in the blank
1 hijos
2 amigos
3 candidatos
4 hermanos
5 pasado

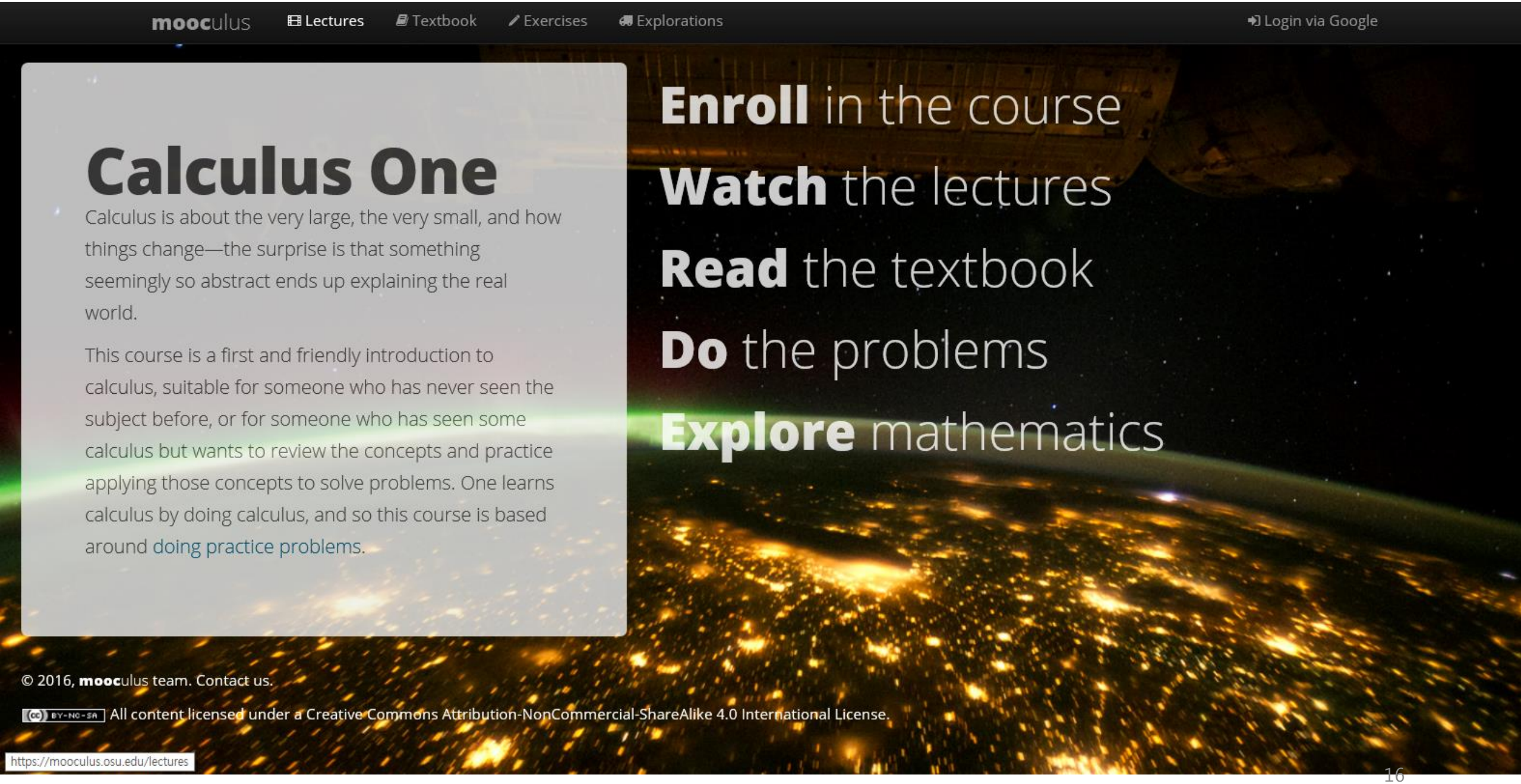
MOOCulus

Briggs, L. L. (2014). Enhancing a MOOC With Adaptive Learning.

- Caculus MOOC (launched January 2013)
  → practice doing math problems that matched skill level
- The number and sort of questions depending on the students' performance
- Coursera: the same number of questions to every student

- Hybrid: Coursera MOOC platform + adapting learning tool
- The student's answer- whether right or wrong → determine which question to display next
- Collects participation data in the background → the level of understanding of the current concept is displayed to the student on a color-coded progress bar

- https://mooculus.osu.edu/


mooculus
Lectures
Textbook
Exercises
Explorations
Login via Google
Calculus One
Calculus is about the very large, the very small, and how things change—the surprise is that something seemingly so abstract ends up explaining the real world.
This course is a first and friendly introduction to calculus, suitable for someone who has never seen the subject before, or for someone who has seen some calculus but wants to review the concepts and practice applying those concepts to solve problems. One learns calculus by doing calculus, and so this course is based around doing practice problems.
Enroll in the course
Watch the lectures
Read the textbook
Do the problems
Explore mathematics
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https://mooculus.osu.edu/lectures

Lectures

You can access the course videos on Coursera or using the YouTube links below.

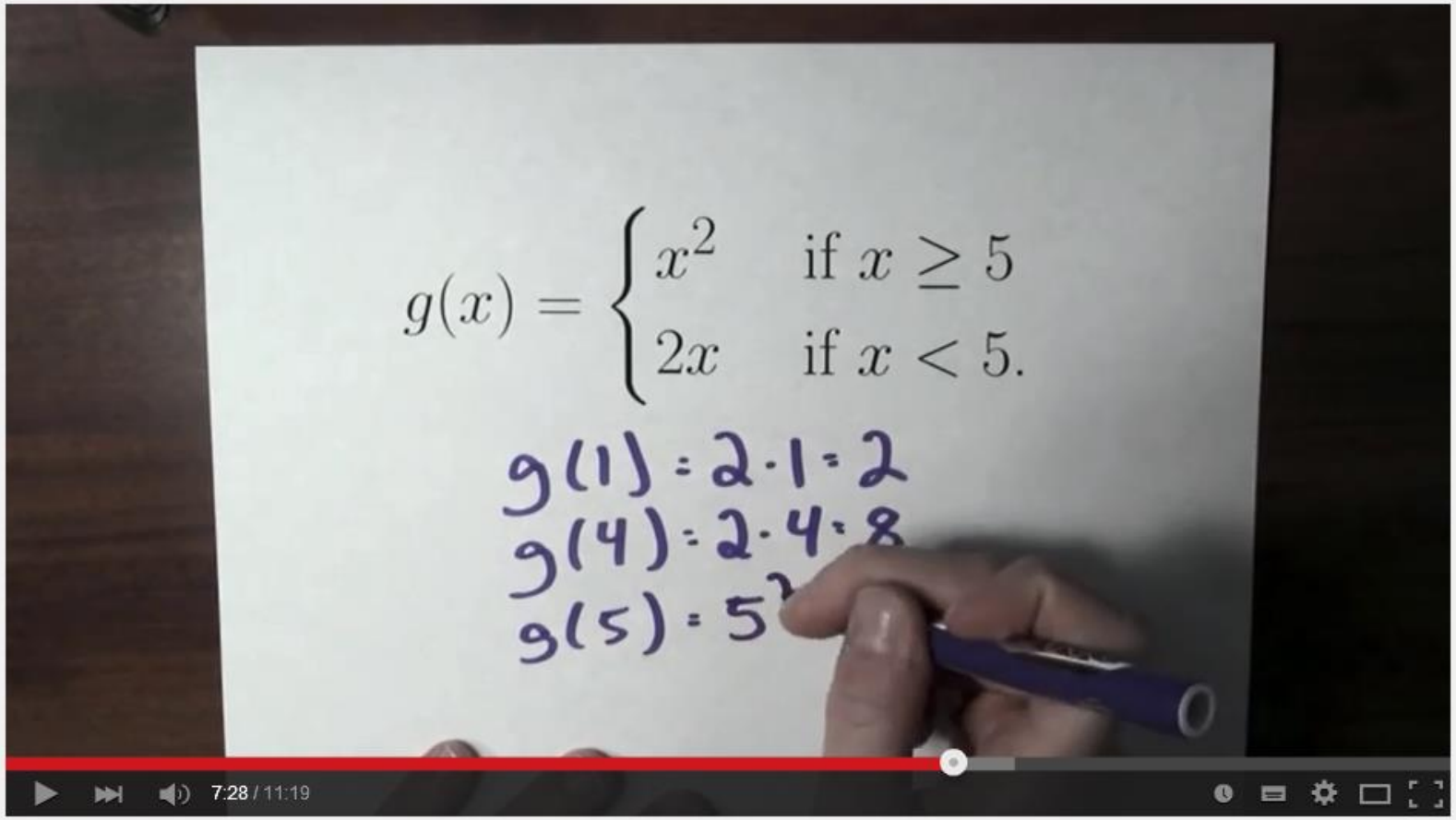
Week 1

Title
Who will help me?
Cat-years vs. human-years
What is a function?
The greatest integer function
Linear functions
Inverses of functions
When are two functions the same?
How can more functions be made?
What are some real-world examples of functions?
What is the domain of square root?
A motivating example for limits
What is the limit of $\frac{x^2-1}{x-1}$?
Four examples of limits

검색

업로드

현재 사용 중인 **Internet Explorer** 이전 버전에 대한 지원이 곧 중지됩니다. 최신 버전으로 브라우저를 업데이트하세요.



What is a function? - Week 1 - Lecture 1 - Mooculus

Jim Fowler

구독 6,507

조회수 20,207회

다음 동영상 자동재생

Maths : What is a Function : y=f(x)
Adam Beatty
조회수 134,594회

Mooculus 1: Functions and limits
Jim Fowler

Calculus 1 Lecture 0.2: Introduction to Functions.
Professor Leonard
조회수 69,243회

When are two functions the same? - Week 1 - Lecture 2 - Mooculus
Jim Fowler
조회수 5,192회

What is a function?
Dr. Patricia Edmiston
조회수 37,239회

Mathematics Gives You Wings
Stanford
조회수 888,210회

What is a Function?
Study.com
조회수 14,225회

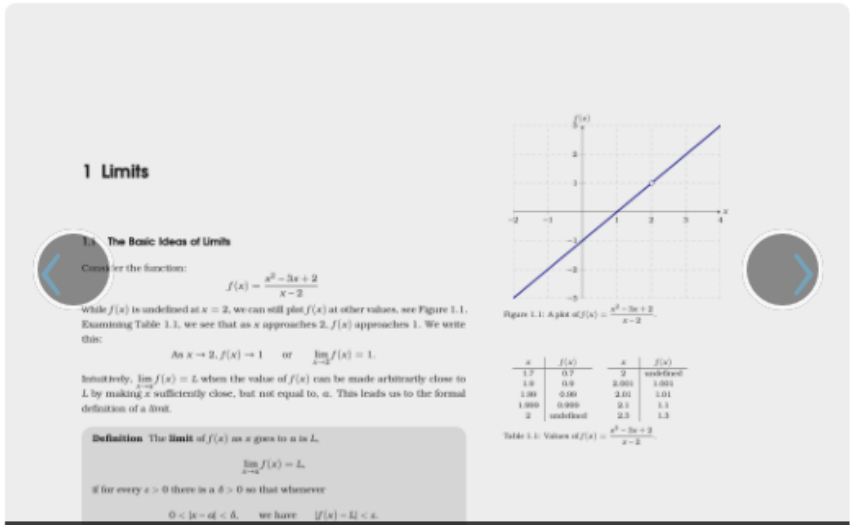
https://www.youtube.com/

the mooculus textbook

Reading a math textbook is not quite the same as reading a novel—math is even more fun! To read mathematics, you need to bring a bit more than just the textbook to the table: you should also bring

a pen,
plenty of blank paper, and
courage to write everything down.

As you read mathematics, you must work along side of the text itself. You must **write** down each expression, **sketch** each graph, and **think**—always think!—about just what you are doing. You should work examples and fill in the details. Like all great things, this is no easy task.



Complete

The complete Calculus One book is now available.

Download the Textbook

Get the printable version with a white background

The first Adaptive MOOC: A Case Study on Pedagogy Framework and Scalable Cloud Architecture—Part 1 Sonwalkar, N. (2013)

• Introduction

AMOL(Adaptive Mobile Learning) system

- five distinct learning strategies
- differentiated learning strategies and dynamic rendering of the content delivery on a massive scale

large numbers of concurrent users

→ conventionally hosted adaptive learning systems?

AWS(Amazon Web Services) Cloud Architecture with AMOL

- Auto-scaling→ throughput and response time remains within acceptable limits for the adaptive learning platform

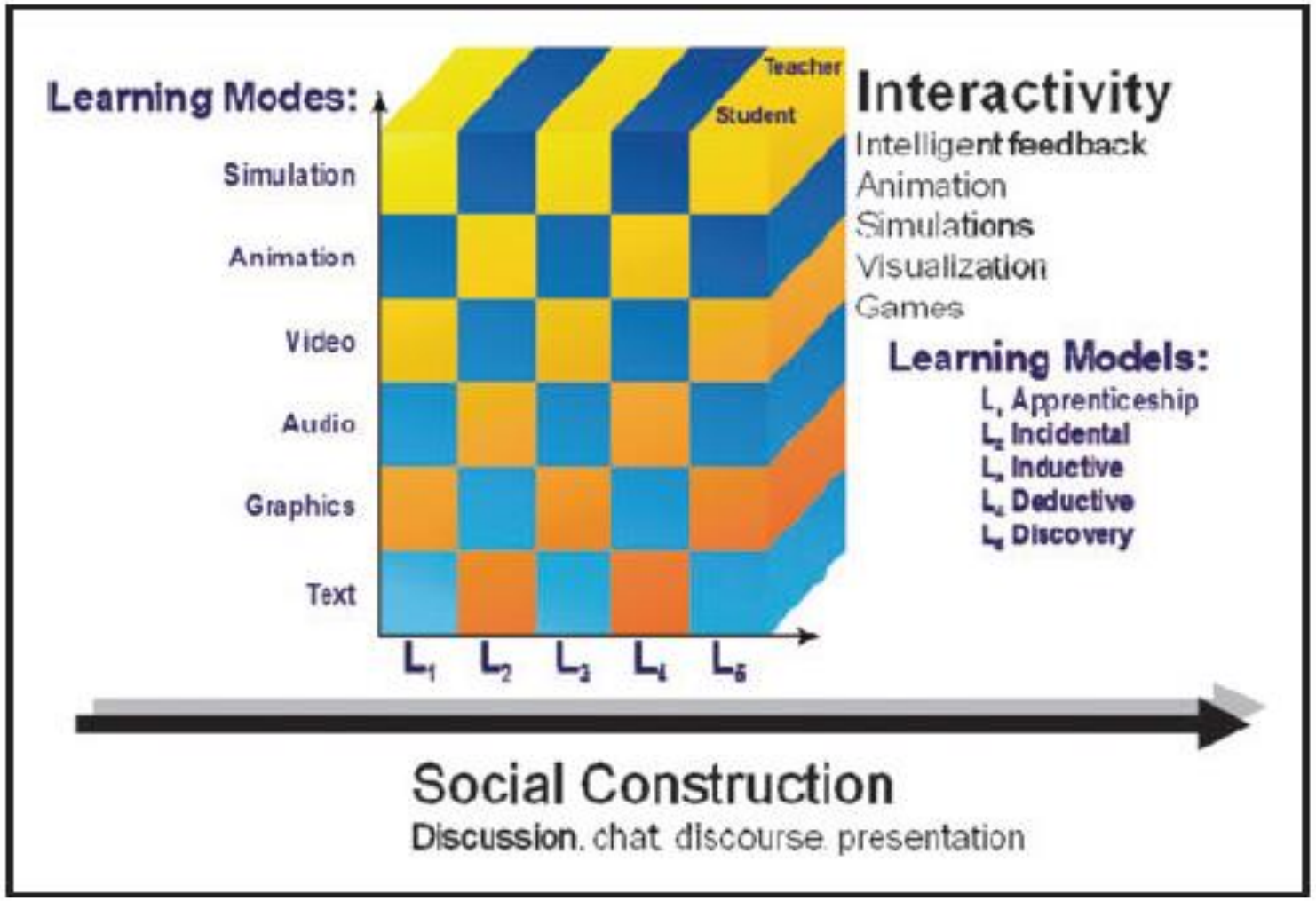


Fig. 2. The four-dimensional learning (4DL) framework for adaptive MOOCs.

Through interaction with an inference engine

(1) Organize learning objects developed in text, graphics, audio, video, animation, and simulations.

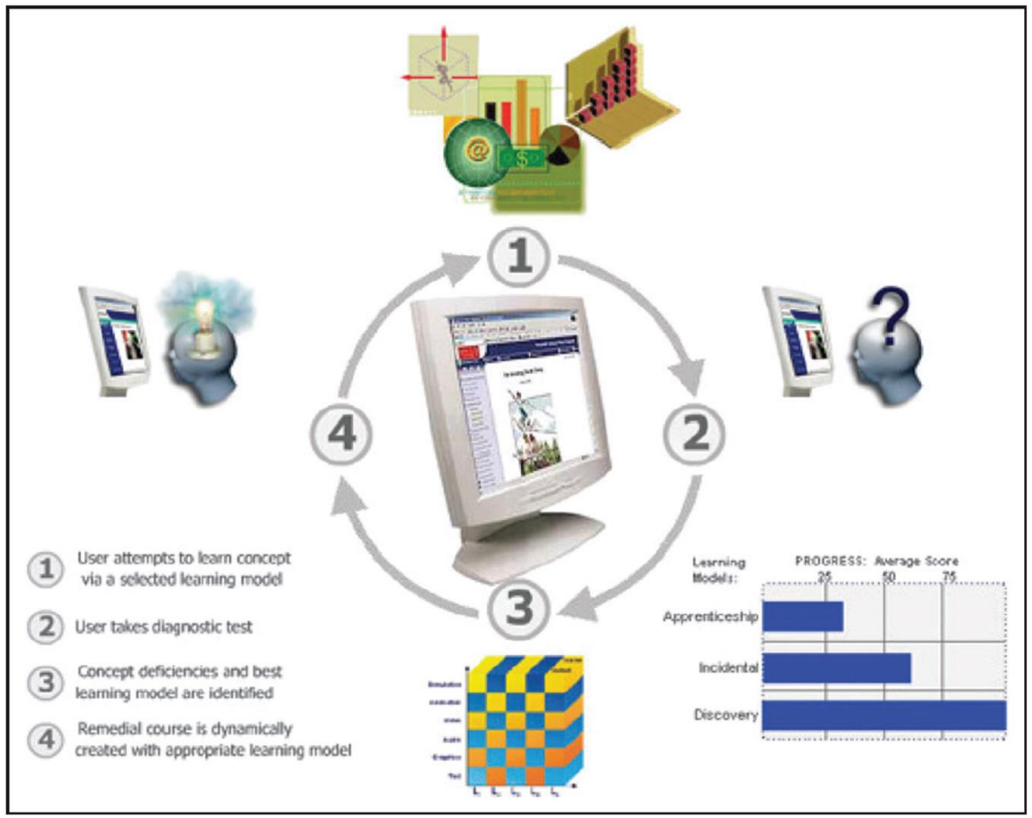
(2) in the five learning pathways conforming to the pedagogy of apprentice, incidental, inductive, deductive, and discovery learning models.

(3) The third axis of the cube indicates increased interactivity between student and teachers

(4) And the forth axis is for social learning via blog, wiki, podcasting, and YouTube.

The first Adaptive MOOC: A Case Study on Pedagogy Framework and Scalable Cloud Architecture—Part 1 Sonwalkar, N. (2013)

- **Adaptive Learning Methodology for MOOCs**



The learning cycles for self-improvement in the adaptive learning system.

① User attempts to learn concept via selected learning model

② User takes diagnostic test

③ Concept deficiencies and best learning model are identified

④ Remedial course is dynamically created with appropriate learning model

The first Adaptive MOOC: A Case Study on Pedagogy Framework and Scalable Cloud Architecture—Part 1 Sonwalkar, N. (2013)

• Conclusions

1. The pedagogical instructional design was modeled to accommodate five learning strategies.
2. The AMOL tools were effective and adequate for the rapid production of the adaptive MOOC course in a very difficult subject matter.
3. The cloud architecture was necessary to accommodate expected large loads for a MOOC
4. The pedagogy and technology developed for the adaptive MOOC shows great promises for the future creation and conversion of the one-size-fits-all MOOC into effective adaptive MOOC

Design Framework for an Adaptive MOOC Enhanced by Blended Learning: Supplementary Training and Personalized Learning for Teacher Professional Development Gynther, K. (2016)

- **Introduction**

- In 2020, it will be a requirement that Danish primary school teachers need bachelor degree in the subjects they teach.
- More than 10,000 teachers need professional development.
- Therefore municipalities ask for new concepts for in-service training.
- A number of municipalities (the customers) and University College Zealand (the provider)
- Desgin Based Research (DBR)

Design Framework for an Adaptive MOOC Enhanced by Blended Learning: Supplementary Training and Personalized Learning for Teacher Professional Development Gynther, K. (2016)

- **Introduction**

① Flexible in relation to teachers' work situation

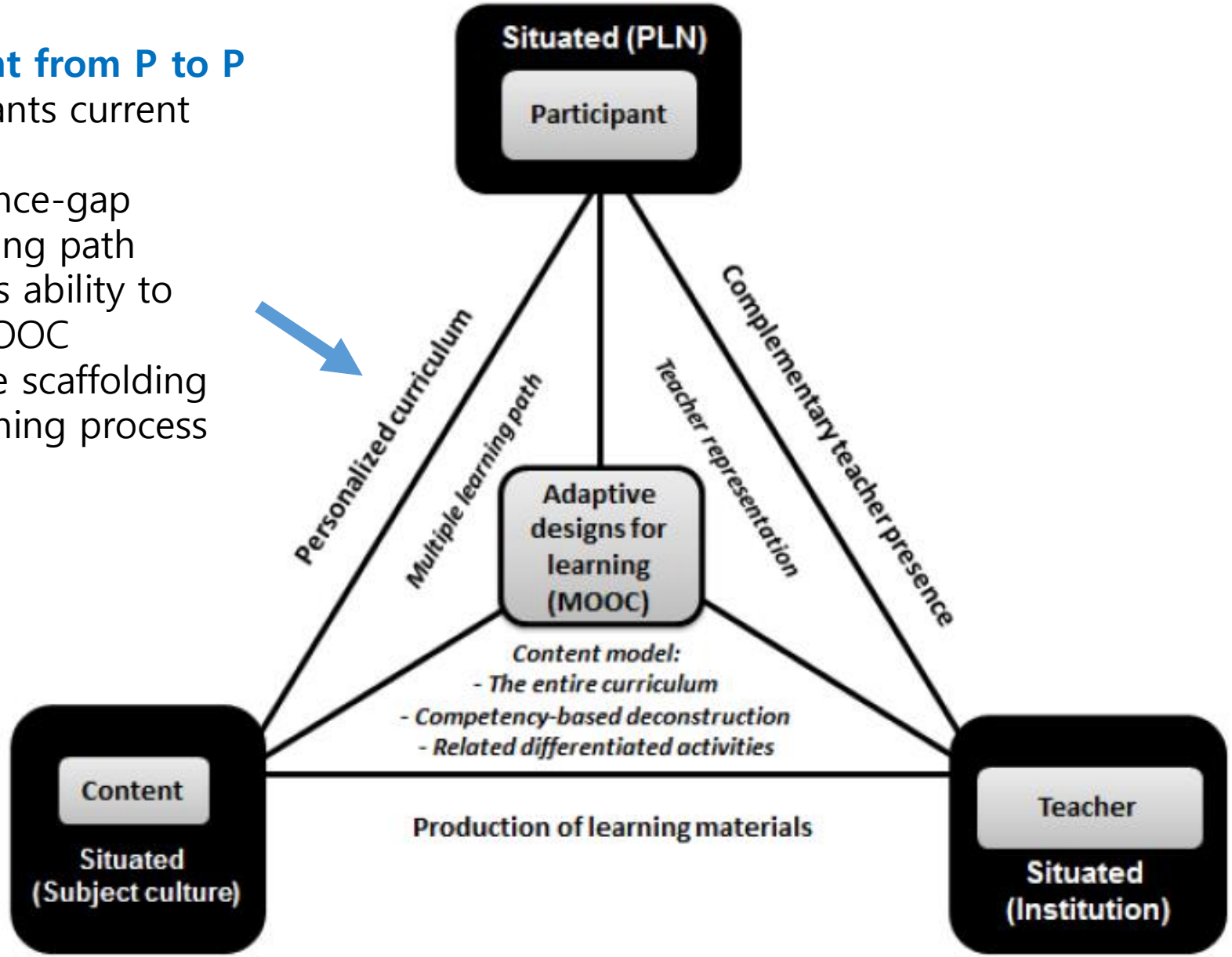
② Based on the fact that the teachers already have a number of professional skills →personalized curriculum

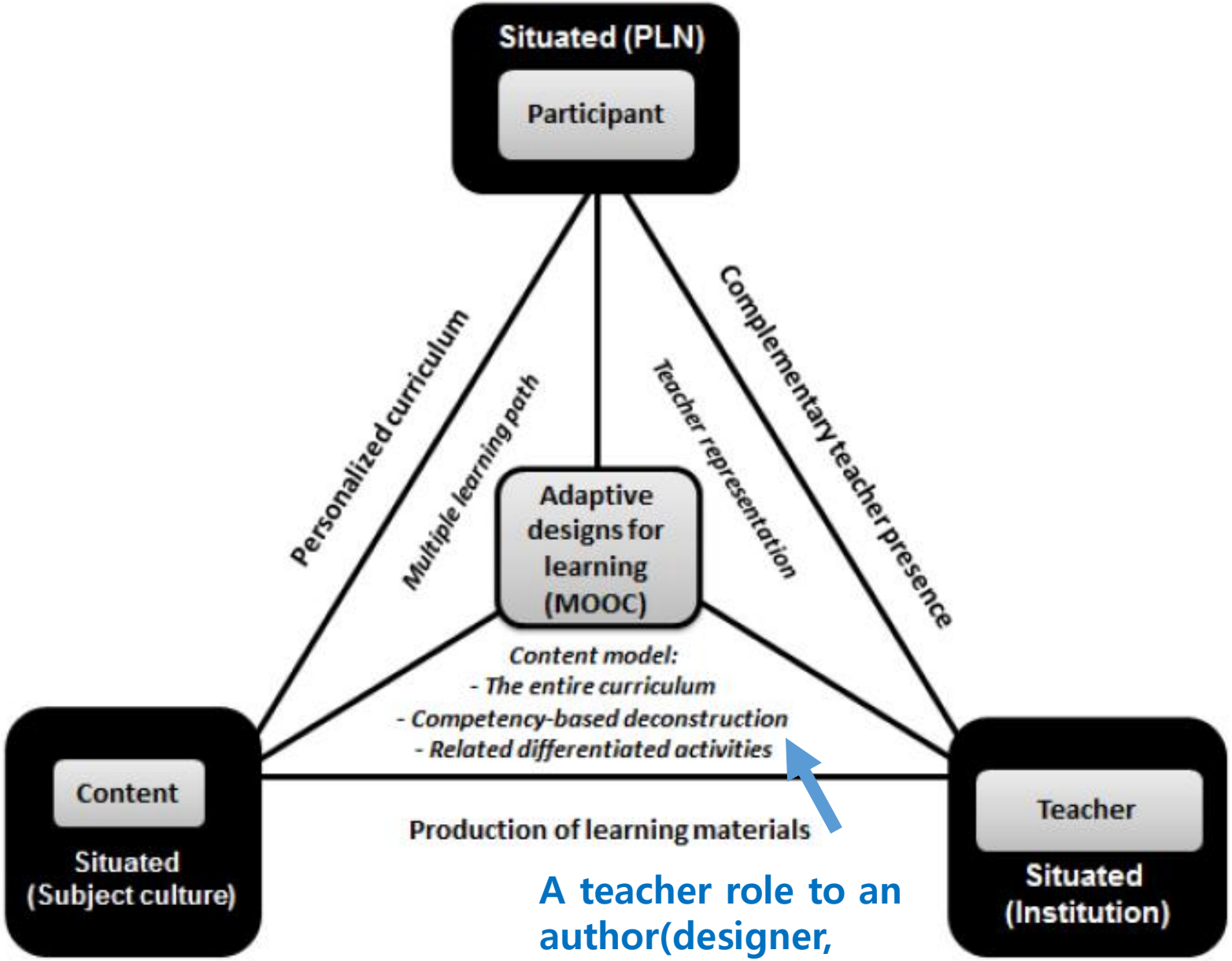
③ Resource-efficient compared to the price and the time teachers must use to be formally qualified

④ The concept has to be scalable because it is uncertain how many teachers need training within each subject area.

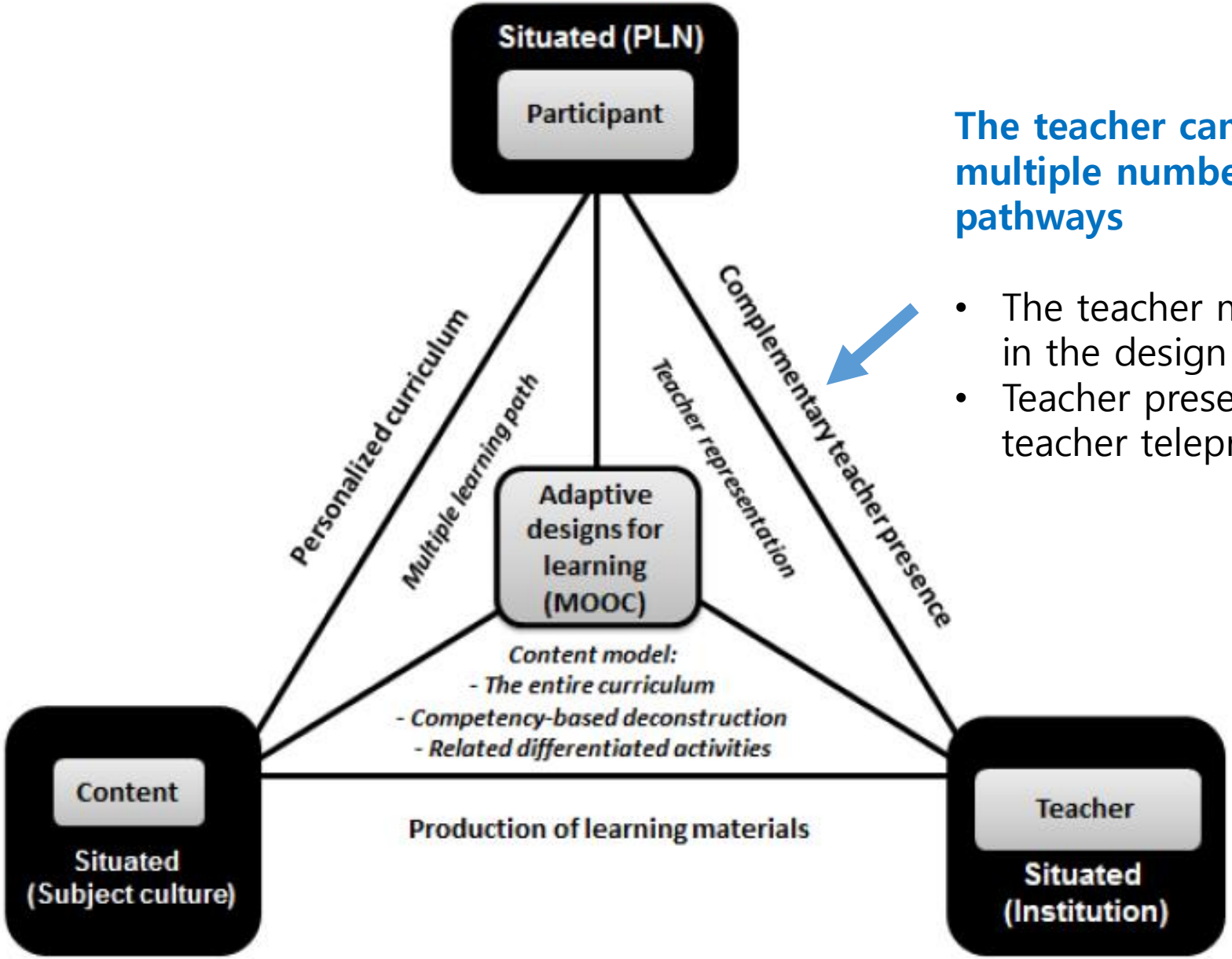
Skills are very different from P to P

- Identify the participants current skills
- Visualize a competence-gap
- Recommend a learning path
- Identify the student's ability to learn in and with MOOC
- Establish an adaptive scaffolding of the student's learning process in the MOOC





A teacher role to an author(designer, producer) role



The teacher cannot be present in a multiple number of learning pathways

- The teacher must be represented in the design
- Teacher presence → Asynchronous teacher telepresence

Design Framework for an Adaptive MOOC Enhanced by Blended Learning: Supplementary Training and Personalized Learning for Teacher Professional Development Gynther, K. (2016)

- **MOOCs and blended learning**

- In out project, we work primarily with small MOOCs similar to a SPOC.
- Which are only open to students whose municipality has purchased access
- Use face-to-face interaction to support the asynchronous and mediated teacher presence in the MOOC (ex. teaching on the content that is difficult for all students, individualized and differentiated feedback on individual performance in the MOOC…)
- Scaffold learning in and with MOOC

References

Briggs, L. L. (2014, May 14). Enhancing a MOOC With Adaptive Learning. Retrieved from https://campustechnology.com/Articles/2014/05/14/Enhancing-a-MOOC-With-Adaptive-Learning.aspx?Page=1

Gynther, K. (2016). Design Framework for an Adaptive MOOC Enhanced by Blended Learning: Supplementary Training and Personalized Learning for Teacher Professional Development. *The Electronic Journal of e-Learning, 14(1).* 15-30.

Nielson, B. (2014, March 10). MOOCs and Adaptive Learning Technologies. Retrieved from http://www.yourtrainingedge.com/moocs-and-adaptive-learning-technologies/

Sonwalkar, N. (2013). The first Adaptive MOOC: A Case Study on Pedagogy Framework and Scalable Cloud Architecture—Part 1*, MOOCs Forum*, 22-29.

http://spanishmooc.com/
https://www.youtube.com/watch?v=W1NhonMhPvo

Discussion