

Online Courses: Learning and Artificial Intelligence

**Studium
Generale**

Jeffrey S. Cross, Professor, School of Environment and Society; General Manager Online Education Development Office, Tokyo Tech, Tokyo, Japan

Lecture Content

1. About me and my hometown
2. Introduction - ice breaker
3. Online Educational Technology
4. Trends in Educational Technology
5. Examples of Educational Technology Research
6. AI Examples from my lab
7. Summary / Conclusion

My Academic Pathway in the USA



KSU Administration

<https://www.k-state.edu/media/mediaguide/stock-photo.html>

Kansas



UofA "Old Main"

https://es.wikipedia.org/wiki/Universidad_de_Arkansas#/media/Archivo:Old_main_fayetteville.jpg

Arkansas



ISU Engr. Bldg

https://iowastate.photoshelter.com/galleries/C0000rWLI9E_0k6c/G000002URC8Afrq/Campus-Stock-images

Iowa



<https://www.facebook.com/ksurodeo/>



https://en.wikipedia.org/wiki/Donald_W._Keynolds_Razorback_Stadium#/media/File:09-02-06-RRS-Ozarks.jpg

Figure removed due to copyright restrictions.

Student festival

BS, ChE: Kansas State University 1982-86

MS, ChE: University of Arkansas 1986-88

Ph.D. (ChE): Iowa State University of Science & Tech. 1988-92

From Corporate Researcher to Professor

1992 Graduate Ph.D. (Chem. Engr) Iowa State University, **USA**

- Molybdenum oxide film process and characterization

1993 NSF-STA Post-doc Fellow, NIRIM(NIMS) Tsukuba, **Japan**

1994 NSF-CGF Post-doc Fellow, Fujitsu Lab, Atsugi

1996 Researcher, Fujitsu Lab, Atsugi

- **Ferroelectric capacitors for non-volatile memory**

2003 Senior Researcher, Fujitsu Lab

2003 Visiting Assoc. Prof., Tokyo Tech

2006 Visiting Prof., Tokyo Tech

2008 Prof., ENG, Tokyo Tech

2014 Online Educ. Dev. Office

2016 Prof. Env. Soc., TSE & Energy course

<https://www.titech.ac.jp/public-relations/about/campus-maps/campus-highlights/seasons>



Questions for thought #1

What is educational technology? examples?

What is online educational technology?

What is a MOOC?

What is Lifelong learning?

Think about it for a minute and share your thoughts!

Ed tech intro – digital/IT

What Educational Technology means

- ❖ **technology to support the learning process**
- ❖ **It's also known variously as e-learning**
- ❖ **Refers to their inventions and discoveries**
- ❖ **Broadest term in application of scientific**
- ❖ **Education in order to effect learning**

http://images.slideplayer.com/24/6934815/slides/slide_2.jpg

14th Century Lecture Room



Lecturer speaking from a book.

Learners, what are they doing?

What is different today about Teaching and Learning in a classroom lecture?

https://en.wikipedia.org/wiki/Scholasticism#/media/File:Laurentius_de_Voltolina_001.jpg
g

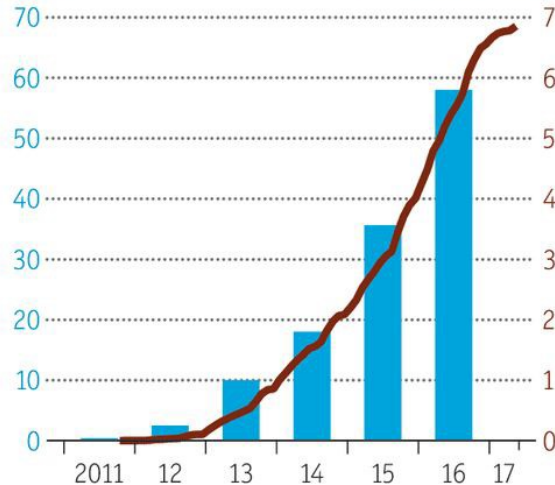
Online learning and online courses

Learning curve

Massive open online courses, main international providers

Registered
users, m

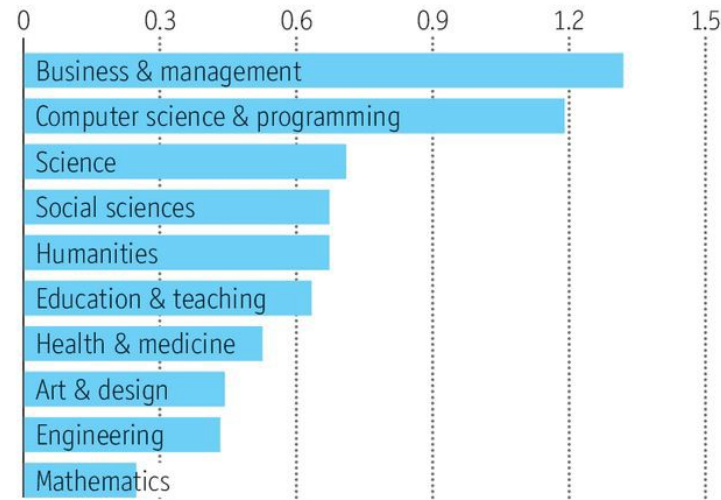
Cumulative number
of courses*, '000



Source: Class Central

Economist.com

Courses by subject, 2011-17*, '000



*By start date

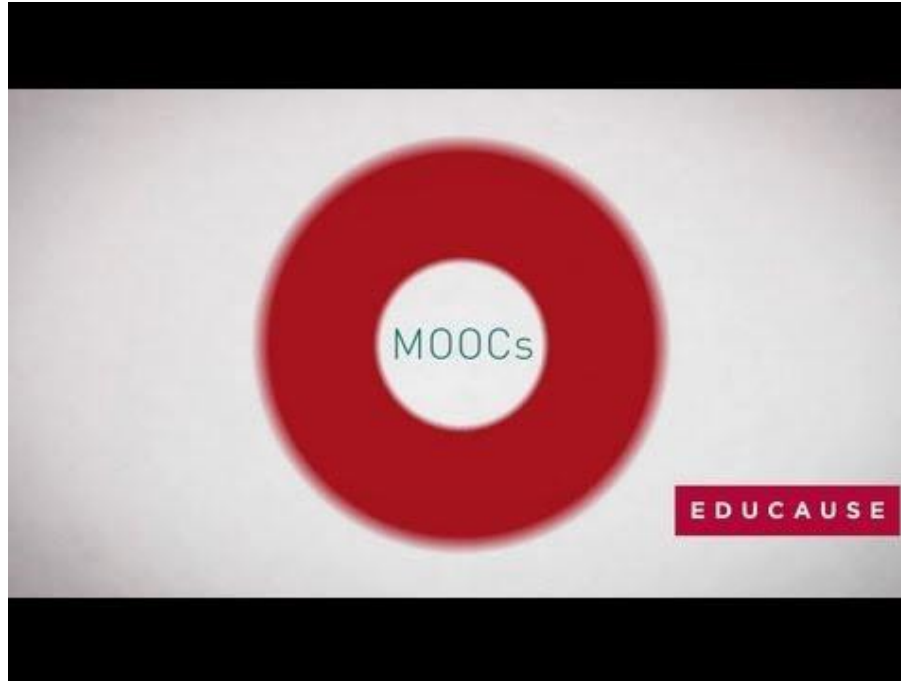
MOOC – Massive Online Open Course

Providers: edX, Coursera, Udacity, Future Learn, JMOOC....

What is a MOOC?

Massive Online Open Course or MOOC see this youtube video

<https://youtu.be/XGMrzQ7YOfI>



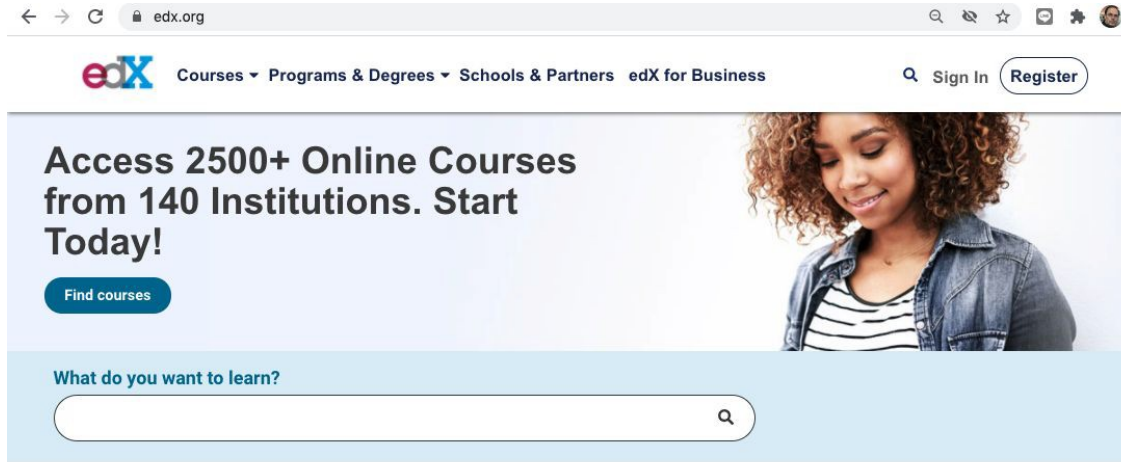
Question for thought #2

What does an online course using a learning management system allow that a conventional course such as that shown below does not? (photo with Creative Commons License)



Think about it for a minute and share your thoughts!

Online Courses edX Website



The screenshot shows the edX website homepage. At the top is a navigation bar with the edX logo, links for Courses, Programs & Degrees, Schools & Partners, and edX for Business, along with Sign In and Register buttons. Below this is a large banner with the text "Access 2500+ Online Courses from 140 Institutions. Start Today!" and a "Find courses" button. To the right of the text is a photo of a smiling woman with curly hair. Below the banner is a search bar with the placeholder text "What do you want to learn?". At the bottom of the page, there is a row of logos for partner institutions: MIT, Massachusetts Institute of Technology, Harvard University, Berkeley University of California, The University of Texas System, Boston University, and The Hong Kong Polytechnic University.

Started in 2012

Non-profit organization
started by Harvard & MIT

<https://www.edx.org>

Japan Univ. Members:
Tokyo, Kyoto, Osaka, Tokyo
Tech and Waseda

Popular Subjects

Computer Science	Language	Data Science
<ul style="list-style-type: none">◦ Azure◦ Blockchain◦ C Programming◦ Devops◦ Django	<ul style="list-style-type: none">◦ Chinese◦ English◦ ESL◦ Grammar◦ Italian	<ul style="list-style-type: none">◦ Artificial Intelligence◦ Big Data◦ Cloud Computing◦ Computer Programming◦ Data Analysis

Courses offer a certificate
and some courses are
taught for credit but these
are not free

edX courses and program offerings

- Individual online courses are offered for free (no assessments or homework)

- [MicroBachelors Program](#)

Undergraduate-level, for career advancement or a degree path

- [MicroMasters Program](#)

Graduate-level, for career advancement or a degree path

- [Professional Certificate](#)

From employers or universities to build today's in-demand skills

- [Online Master's Degree](#)

Top-ranked programs, affordable, and fully online

- [Global Freshman Academy](#)

Freshman year courses for university credit from ASU

- [XSeries](#)

Series of courses for a deep understanding of a topic

- [Executive Education](#)

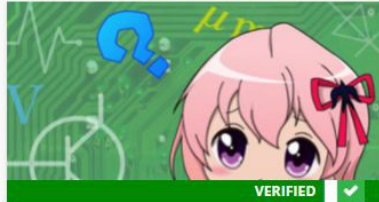
Courses designed for business leaders for developing strategic skills

TokyoTechX Channel on edX Website

<https://www.edx.org/school/tokyotechx>

Tokyo Institute of Technology MOOCs

Browse free online courses in a variety of subjects. Tokyo Institute of Technology courses found below can be audited free or students can choose to receive a verified certificate for a small fee. Select a course to learn more.



TokyoTechX
Introduction to Electrical and
Electronic Engineering : 電気.

Current
Starts: May 31, 2017



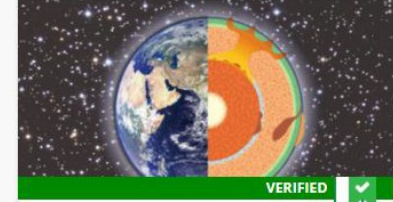
TokyoTechX
Science and Engineering
Ethics 科学技術倫理

Starting Soon
Starts: June 28, 2017



TokyoTechX
Modern Japanese
Architecture: From Meiji...

Current
Starts: April 19, 2017



TokyoTechX
Introduction to Deep Earth
Science

Current
Starts: November 10, 2016

edX Course Introduction to Deep Earth Science

<https://www.edx.org/school/tokyotechx>

edX.org/course/introduction-to-deep-earth-science



Courses ▾ Programs & Degrees ▾ Schools & Partners edX for Business

Search Sign In Register

Catalog > Energy & Earth Sciences Courses

Introduction to Deep Earth Science

Learn about the nature and dynamics of the Earth's core, mantle and crust in this introductory Earth Science course.



10,878 already enrolled!

Enroll
Starts Oct 5

☐ I would like to receive email from TokyoTechX and learn about other offerings related to Introduction to Deep Earth Science.



About this course

Have you ever imagined what is deep under the ground? What is happening deep inside the earth? How has the earth evolved into its present state? This course is an introduction to earth science, focusing on the deep earth. We will learn how temperature and chemical compositions inside the Earth are inferred from limited observations combined with laboratory experiments. We will also explore the fate of

water on the early Earth related to advanced research missions. Have fun! This

+ More about this course

🕒 Length:	5 Weeks
🕒 Effort:	1~2 hours per week
💰 Price:	FREE Add a Verified Certificate for \$60 USD
🏛️ Institution	TokyoTechX

edX Course Introduction to Deep Earth Science

<https://www.edx.org/school/tokyotechx>

After registering for the
Course you would
See this

The screenshot shows the edX course page for 'Introduction to Deep Earth Science'. The browser address bar displays the URL 'courses.edx.org/courses/course-v1:TokyoTechX+GeoS101x+1T2019/course/'. The page has a navigation bar with links for 'Course', 'Progress', 'Discussion', 'Syllabus', and 'Instructor'. The 'Course' link is active. The main heading is 'Introduction to Deep Earth Science', with a 'Resume Course' button to its right. A light blue box contains a warning: 'Audit Access Expires May 21, 2019. You lose all access to this course, including your progress, on May 21, 2019. Upgrade by Jul 21, 2021 to get unlimited access to the course as long as it exists on the site. Upgrade now'. An 'Expand All' button is located below this box. On the right, the 'Goal' is 'Explore the course'. Under 'Course Tools', there are links for 'Bookmarks', 'Financial Assistance', 'Updates', and 'Upgrade to Verified'. The 'Upcoming Dates' section shows 'Jul 31, 2021' as the 'Course End' date, with a note that content will be archived after this date. The left sidebar lists the course weeks: 'Week 0. Getting started', 'Week 1. Introduction to the solid Earth', and 'Week 2. Plate Tectonics', with 'Week 2' being the current selection.

courses.edx.org/courses/course-v1:TokyoTechX+GeoS101x+1T2019/course/

Course Progress Discussion Syllabus Instructor

Introduction to Deep Earth Science

[Resume Course](#)

Audit Access Expires May 21, 2019
You lose all access to this course, including your progress, on May 21, 2019.
Upgrade by Jul 21, 2021 to get unlimited access to the course as long as it exists on the site.
[Upgrade now](#)

[Expand All](#)

Goal: Explore the course

Course Tools

- [Bookmarks](#)
- [Financial Assistance](#)
- [Updates](#)
- [Upgrade to Verified](#)

Upcoming Dates

[Jul 31, 2021](#)

Course End
After this date, course content will be archived.

- Week 0. Getting started
- Week 1. Introduction to the solid Earth
- Week 2. Plate Tectonics

edX Course Introduction to Deep Earth Science

<https://www.edx.org/school/tokyotechx>

Discussion board where
Learners post questions
And learners or staff
Respond.

Learners frequently
introduce themselves -
Social learning or
Learning community

The screenshot shows the 'Discussion' tab of the edX course page. The browser address bar displays the URL: <https://www.edx.org/school/tokyotechx>. The course navigation bar includes 'Course', 'Progress', 'Discussion' (selected), 'Syllabus', and 'Instructor'. The discussion board interface features a sidebar with 'All Topics' and a search bar. The main content area shows a post titled 'heyyyy' by user 'nblazic00', posted 26 days ago. The post content is 'Hello! My name is Ab...' and 'This is Natalie from Las Vegas excited to take this sweet course!'. The post is related to 'Week 0 / Welcome' and is visible to everyone. There is one response from user 'roderickwright2' posted 3 days ago, which says 'This is Rod from Michigan excited to learn Im 83'. The interface also includes buttons for 'Add a Post', 'Add a Response', and 'Search all posts'.

Course Progress **Discussion** Syllabus Instructor

[All Topics](#) [Add a Post](#) Search all posts [Search](#)

Show all posts by recent activity

heyyyy
question posted 26 days ago by [nblazic00](#)

Related to: [Week 0 / Welcome](#)
This post is visible to everyone.

1 response

[Add a Response](#)

[roderickwright2](#)
3 days ago

This is Rod from Michigan excited to learn Im 83

Add a comment

edX Course Introduction to Deep Earth Science

<https://www.edx.org/school/tokyotechx>

Assessment gives
immediate feedback.

Give hints and show
correct answer with
explanation

Quiz

[Bookmark this page](#)

INSTRUCTIONS FOR THE Week 1 Quiz

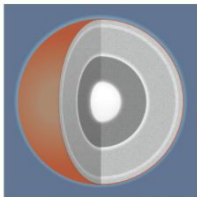
Here is the quiz for Week 1. Read the information below and answer the questions. You can always go back to the previous weeks to review what you've learned so far.

STAFF DEBUG INFO

Q1

1/1 point (graded)

State the major component of the crust and the state of the substance.



Submit

You have used 1 of 1 attempt



Show Answer



Correct (1/1 point)

[Screenshot](#)

edX Course Introduction to Deep Earth Science

<https://www.edx.org/school/tokyotechx>

Video lecture in the course

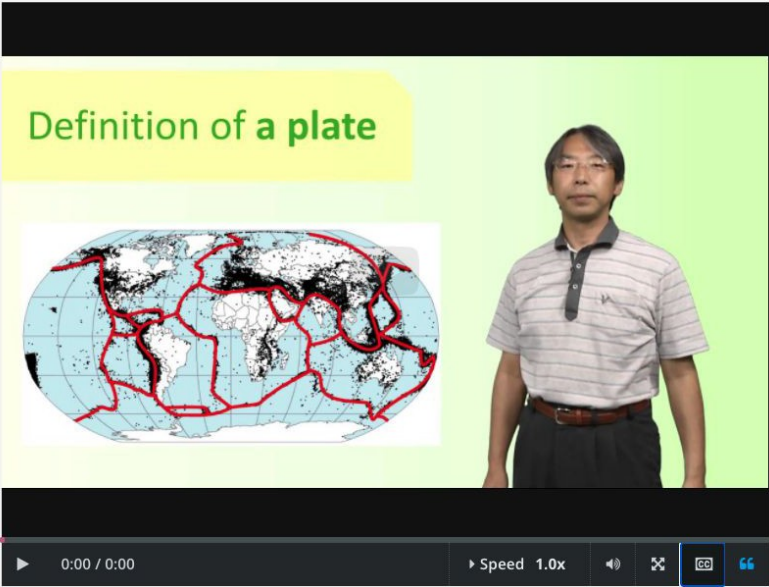
Right side there is a transcript (CC). CC is timed and linked to the video. Read transcript or play the video.

Video and transcript can be downloaded.

2-1-1. video lecture

[Bookmark this page](#)

Video



Start of transcript. Skip to the end.

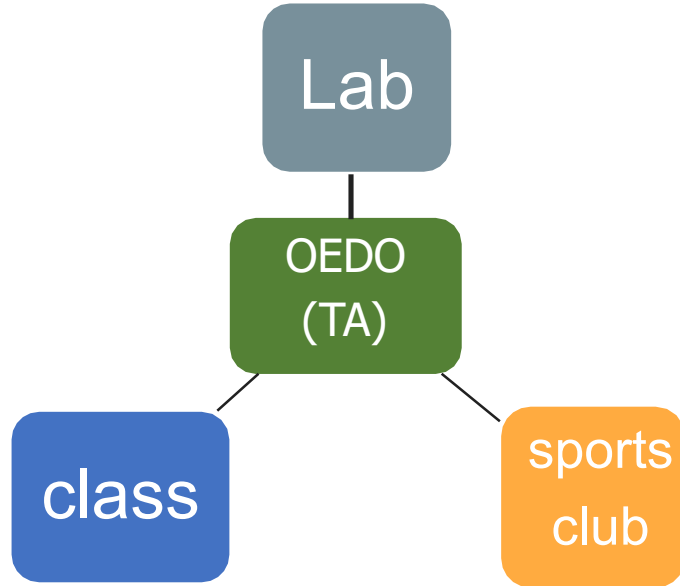
This week, we will discuss plate tectonics. You may have heard the term "plate tectonics" before. Historically speaking, earth science began from geology. Therefore, in the past, this discipline did not possess the perspective of future predictions. Our current topic of plate tectonics is extremely revolutionary in that it is a theory which

Video
[Download video file](#)

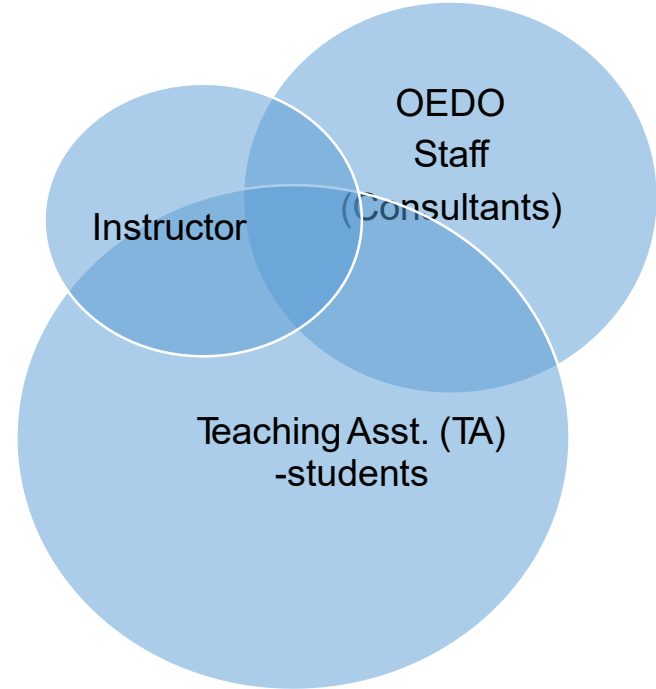
Transcripts
[Download SubRip \(.srt\) file](#)
[Download Text \(.txt\) file](#)

Tokyo Tech MOOC making model

Tokyo Tech edu - OEDO 4th place on campus for learning by teaching



OEDO MOOC making model



Teaching is learning, where do you learn on campus?

Tokyo Tech OEDO MOOC making with TAs

TA during training



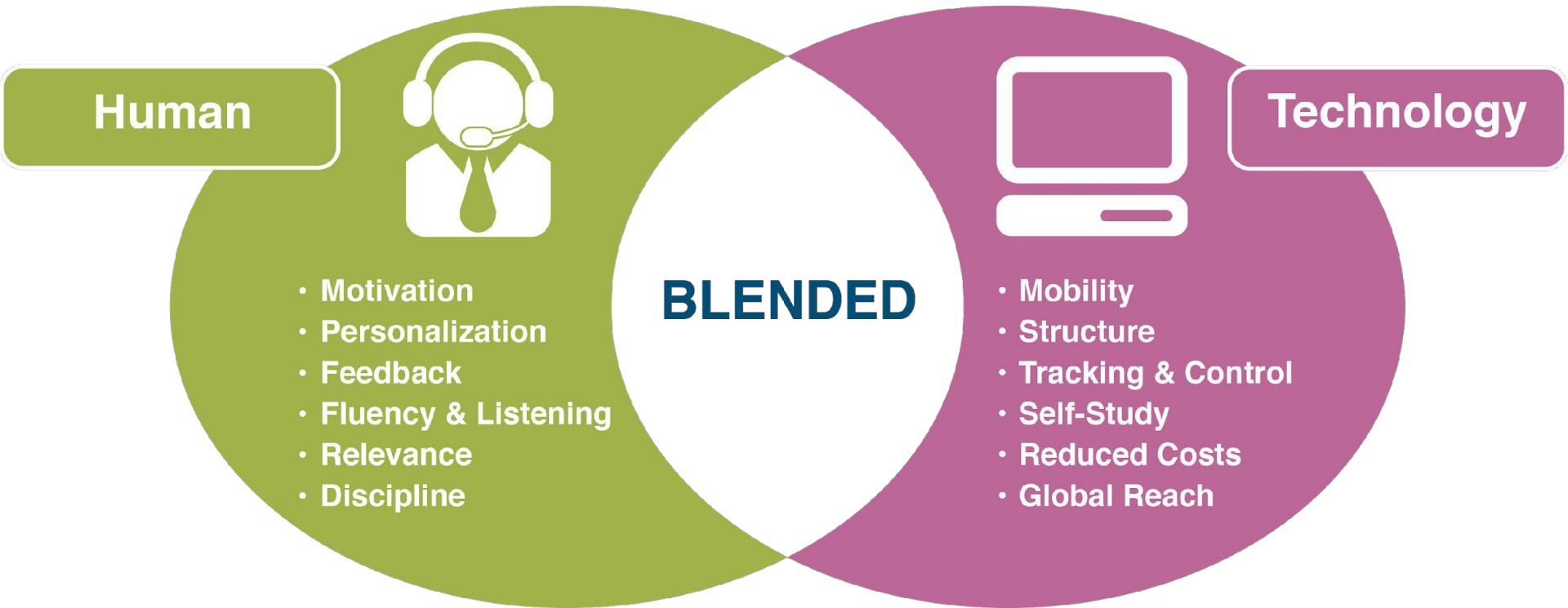
MOOC Making in the Studio



What is needed to make an online course?

1. Learning management system (LMS): displays course content, manages interaction with learner, collects data, manages content
2. Course online grade recording system - LMS
3. Content: video, text and assessment (quiz, report...)
4. Human resources to create course: expert, instructional designer, video technician, staff or TAs to create course
5. Staff to manage the online course (?s, problems, complaints, grades)
6. Facilities: studio for recording video, video equipment, computers and software, audio equipment
7. Internet access, internet browser and WebServer
8. Data storage system (AWS) - records learner interactions with content (clickstream)

Blended or Flipped Learning



http://www.globalenglish.com/why_PEBS/blended_learning

Video use in University Courses Expanded

- Online Video use in higher education (Univ.) accelerating world-wide
- Youtube, Vimeo.... Many sites where video can be uploaded for free
- Video allows for incorporating educational materials into course which not possible during classic lecture format (interview, demos...., guests)
- New concepts on teaching such as blended learning or flipped classroom
 - classroom time is used for discussion and problem solving where lecture materials can be video recorded in advance
- Education research has shown enhanced learning using blended learning

Playing HQ Lecture Videos vs Class Lecture

Students can pause video, replay video (speed-up/slowdown)

- control pace yourself
- videos can be more dense in content than lecture
- Introduce materials not possible in lecture

Time control – viewing

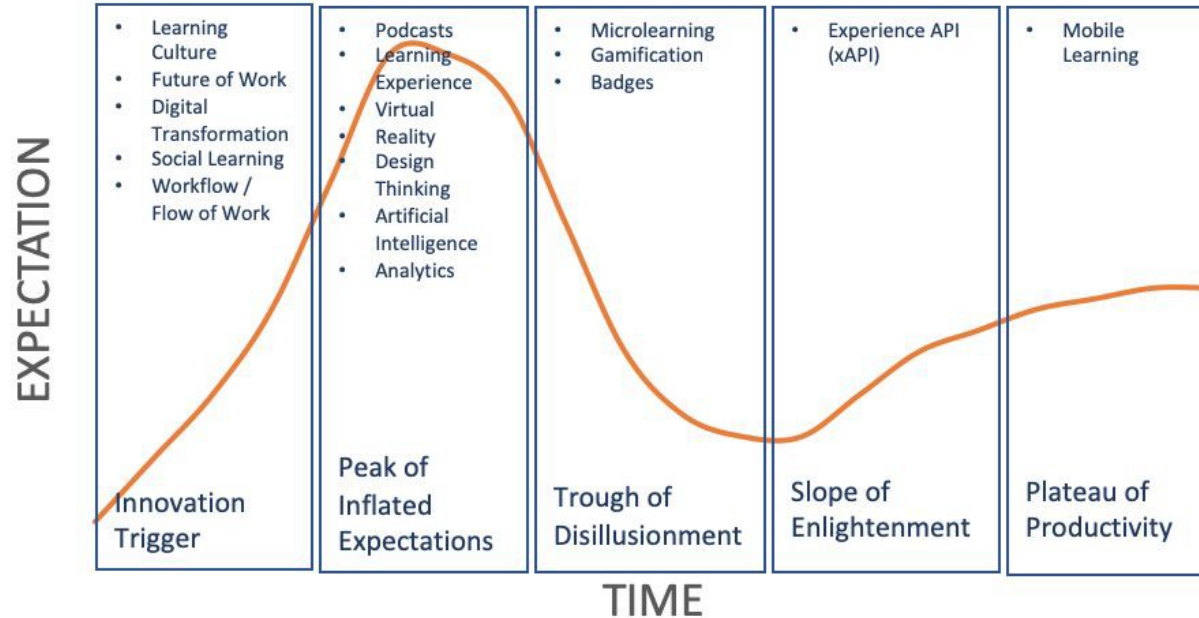
- cross-cutting lectures
- analysis of video viewing

Videos can be dramatical, visual, & persuasive/personal

Video allows greater engagement – internet connection

Trends in Educational Technology Research

2020 ELEARNING PREDICTIONS HYPE CURVE



- A hype cycle is a graphic image of a technology & use versus time.
- The graph on the left is created by using data from Twitter.
- Some topics discussed in succeeding slides.

Understanding the educational technology Hype Curve (hype or excitement changes over time)

Learning Culture and Future Jobs

Learning culture and **future of work** are considerations for educational technology.

After your graduation, you will need to continue to learn since technology impacts us. Have you heard of Society 5.0? Therefore life-long learning on job/home is important.



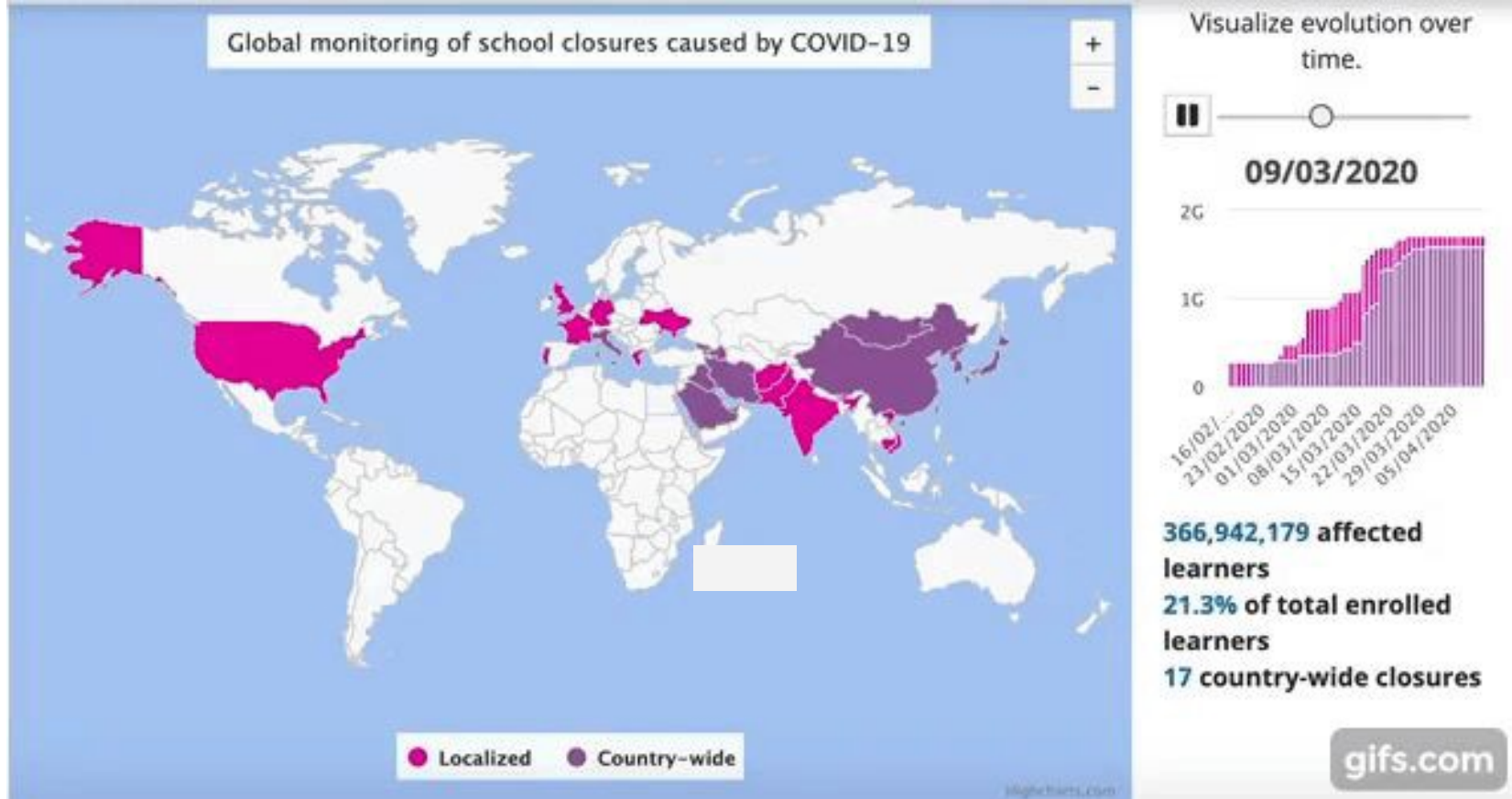
https://www.youtube.com/watch?v=4_Um62YaYoQ

IT related Jobs that did not exist 15 years ago:

- Content-related
 - Social Media Manager
 - Podcast Producer
 - Content Moderator
- Data-related
 - Data Scientist
 - Employment Brand Manager
- Software
 - Mobile Application Developer
 - AI Careers (Engineers, Chatbot Copywriters, etc.)
- Gig Economy-related
 - Ride-sharing Drivers (Uber)
 - Virtual Assistant

COVID impact on school closures

<https://en.unesco.org/covid19/educationresponse/>



Social Learning Importance

- In university courses, learners learn in various ways but often from their **interactions** with instructors and fellow learners of the course material.
- **Collaboration software** such as discussion forums, messaging tools, and video-conferencing applications provide social interactions to support and engage learners.
- Important of social learning has become more important since **COVID19** pandemic forced closures and instruction needed to shift quickly to the online format.

Podcasts for Education



<https://apps.apple.com/jp/app/apple-podcasts/id525463029>

- Podcasts started out as pre-recorded audio file for iPod devices.
- Podcasts remain a popular content delivery platform.
- Educational content (audio or lecture recording) has made its way to podcasts.
- Podcasts are unique platforms as they allow passive content consumption by the learner (doing something else, running, cooking etc.)

Virtual Reality (VR) and Simulation

<https://c21u.gatech.edu/blog/building-camaraderie-scale-exploring-virtual-reality-vr-georgia-techs-omscs-program>

- Research on virtual reality in education relies on the assumption that the brain learns more effectively when it is actively doing something.
- VR allow interactions of learner with a virtual environment (deep sea, on a boat, inside human body...)
- Need a headset device etc.



Georgia Institute of Technology's experiment on virtual classroom

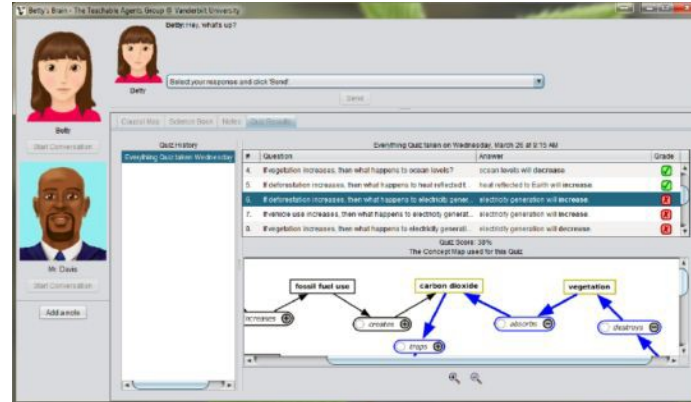
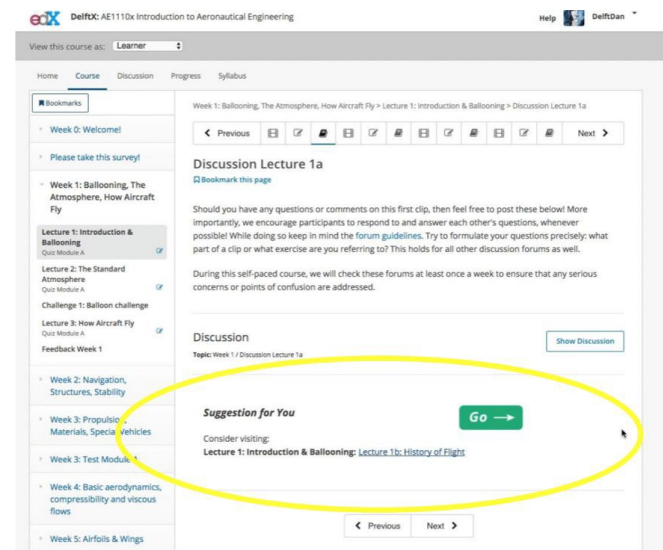
Artificial Intelligence Use in Education

- AI in education examples adaptive learning (modifying learning paths to optimize learning) and intelligent tutoring systems (computers used for teaching with minimal human intervention).

<https://wp0.vanderbilt.edu/oele/bettys-brain/>

University of California Berkeley's research on adaptive learning through a recommender system

ref. Pardos, Z. A., Tang, S., Davis, D., & Le, C. V. (2017, April). Enabling real-time adaptivity in MOOCs with a personalized next-step recommendation framework, Proceedings of the Fourth (2017) ACM Conference on Learning@ Scale (pp. 23-32).



Vanderbilt University's Betty's Brain, an Intelligent Tutoring System that enables learning by teaching.

Gamification and Badges

- Gamification is using leisurely gaming to inform instructional strategies.
- Gamification research is interested in what keeps a student motivated and engaged.
- Does receiving a badge motivate learners to complete an online course?

<https://www.slideshare.net/PlayMoolah/innovation-in-action-managing-change-in-practice>



PlayMoolah's gamified financial literacy course

<https://www.khanacademy.org/badges>

Khan Academy's badges

BADGE TYPES



Meteorite badges are common and easy to earn when just getting started.



Moon badges are uncommon and represent an investment in learning.



Earth badges are rare. They require a significant amount of learning.



Sun badges are epic. Earning them is a true challenge, and they require impressive dedication.



Black Hole badges are legendary and unknown. They are the rarest Khan Academy awards.

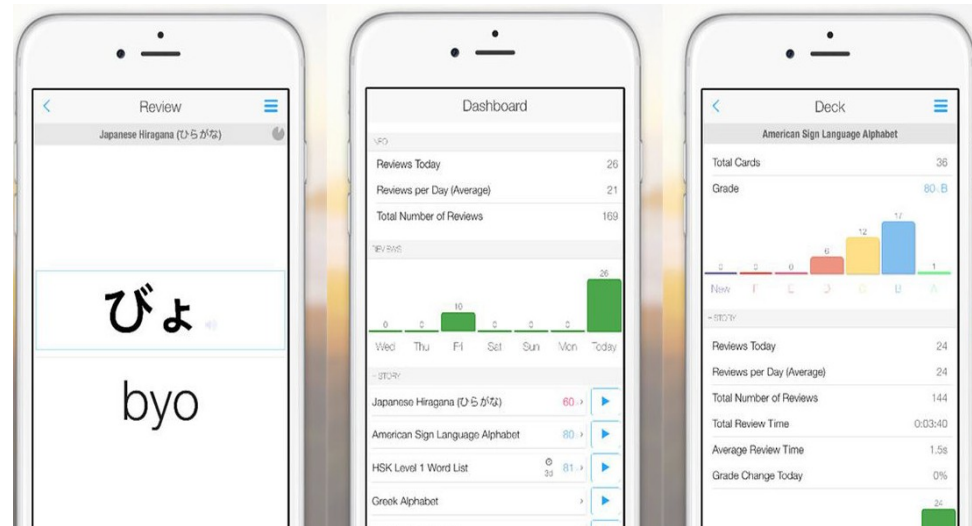


Challenge Patches are special awards for completing topic challenges.

Microlearning and Mobile Learning

- Mobile Learning, or learning using mobile devices, is another educational technology research theme.
- Many mobile with a cellphone users learn in bursts (e.g. during train rides), microlearning, or learning in small chunks (e.g. using flashcards), is a topic of research.
- In developing world mobile learning is very common.

<https://www.ankiapp.com/>



Anki flashcard mobile application

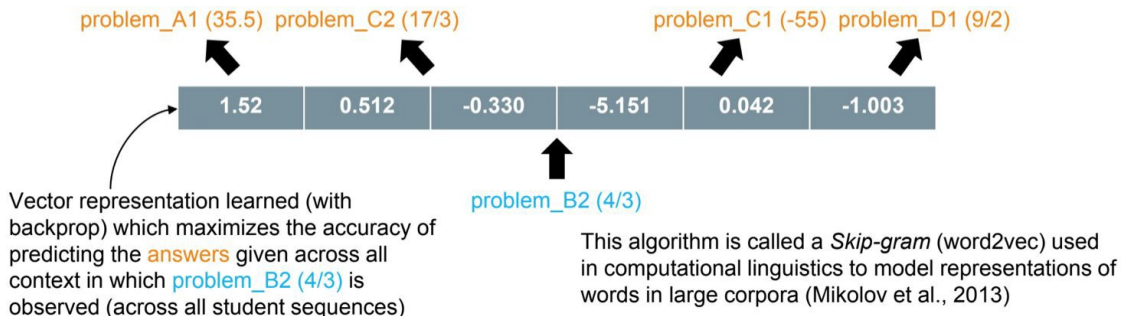
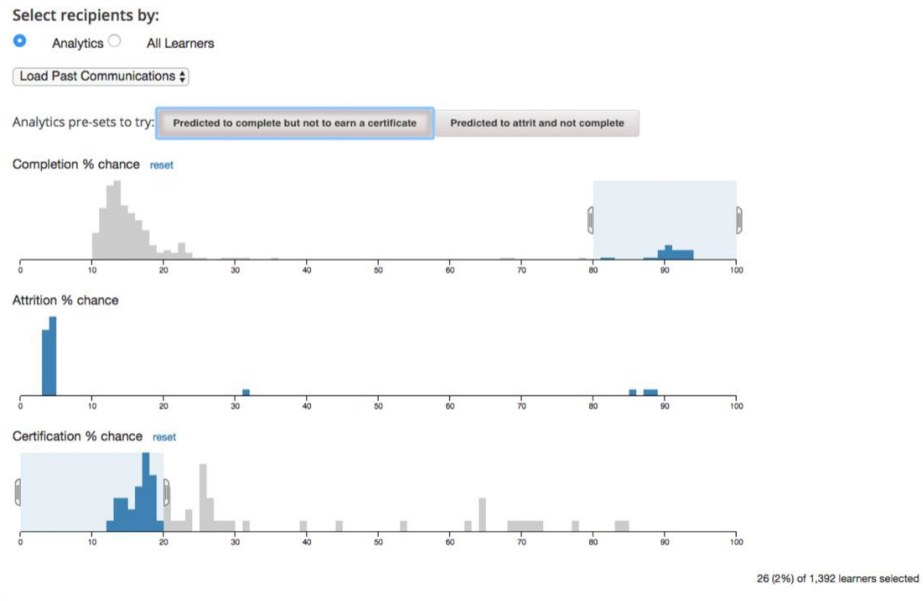


Analyzing Your Lesson To Discover More With Learning Analytics

- Online learning allows instructor to monitor students interaction with course
- Instructor can access the data and assessments (grade) in realtime before class starts
- Instructor can adjust course content based on students learning - blended learning
- Learning Analytics

Learning Analytics

- Learning analytics is the collection and analysis of learner data to optimize learning (warning, reminder, predictions).
- On right predict whether a student will finish online course based upon homework completion



Course Video Interactions

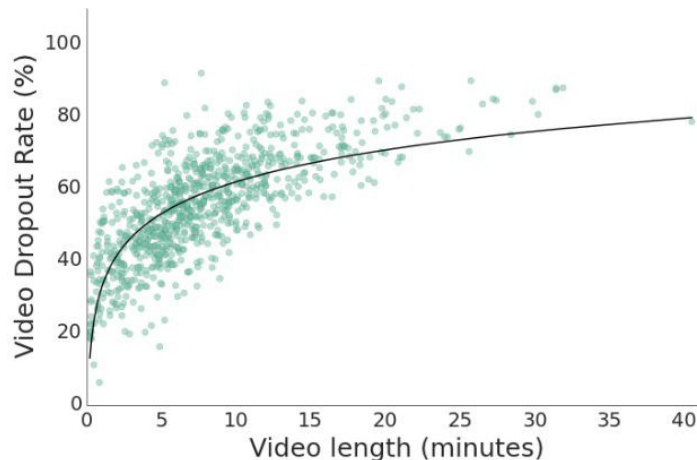


Figure 1. Longer videos exhibit higher dropout rates. Our linear regression model uses the log-transformed video length (x-axis) to predict the dropout rate (y-axis). The model fits the data well with $r=0.55$ with 95% CI = [0.50, 0.59].

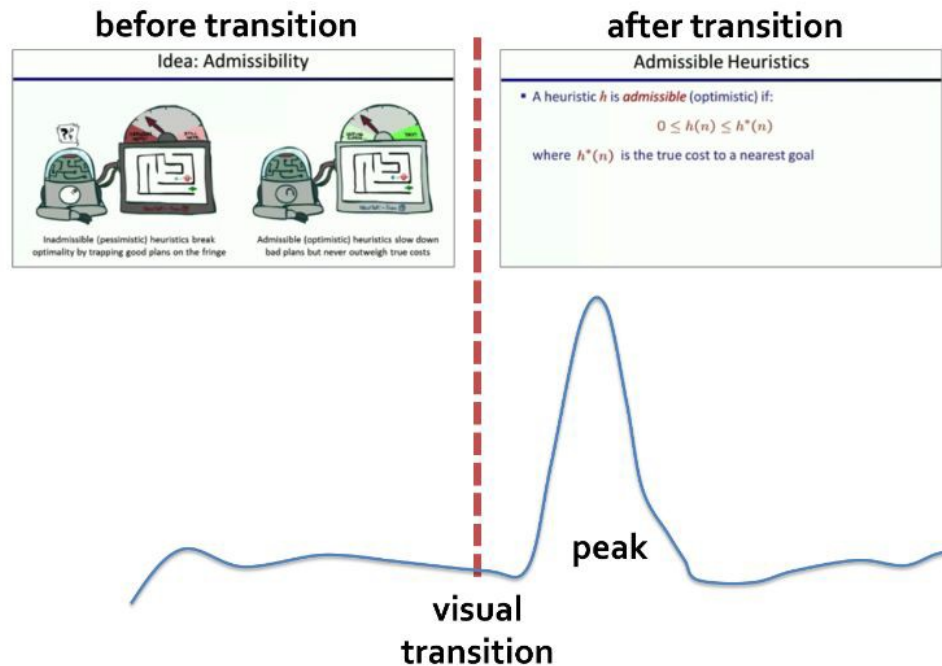


Figure 6. This peak represents the start of a new concept. The instructor started presenting a formal definition of a concept (admissibility) after changing the slide. The peak occurred when this concept explanation started.

Kim, J., Guo, P. J., Seaton, D. T., Mitros, P., Gajos, K. Z., & Miller, R. C. (2014, March). Understanding in-video dropouts and interaction peaks in online lecture videos. In *Proceedings of the first ACM conference on Learning@ scale conference*(pp. 31-40). ACM.

Deep Earth Science (DES) Tokyo Tech 1st MOOC analysis

About the course:

Language English

Length 4 weeks

Effort 2-3 hours/week

Start Date October 7th, 2015

End Date November 30th, 2015

Total enrollment 5403

Verified enrollment 17

21% of enrolled watch
First video

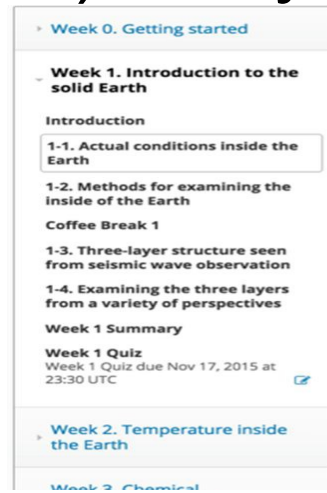
Lecture 1 (6:10 min)

Week	Completion rate (%)
1	77.9

Start	Finish	Drop
1118	872	246

Week 1 video making

Niche course



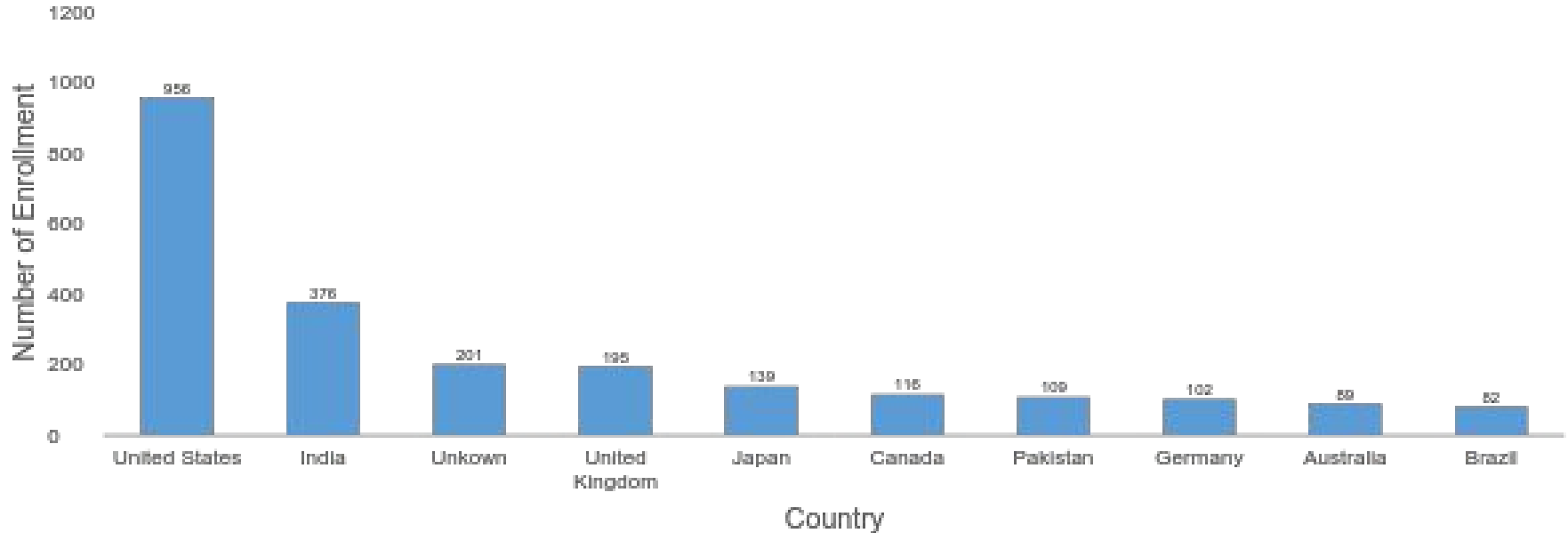
	Week 1	Week 4
No. started	1118	268



23.9 % of students
completed 4 weeks course.

Course Learners Enrollment By Country

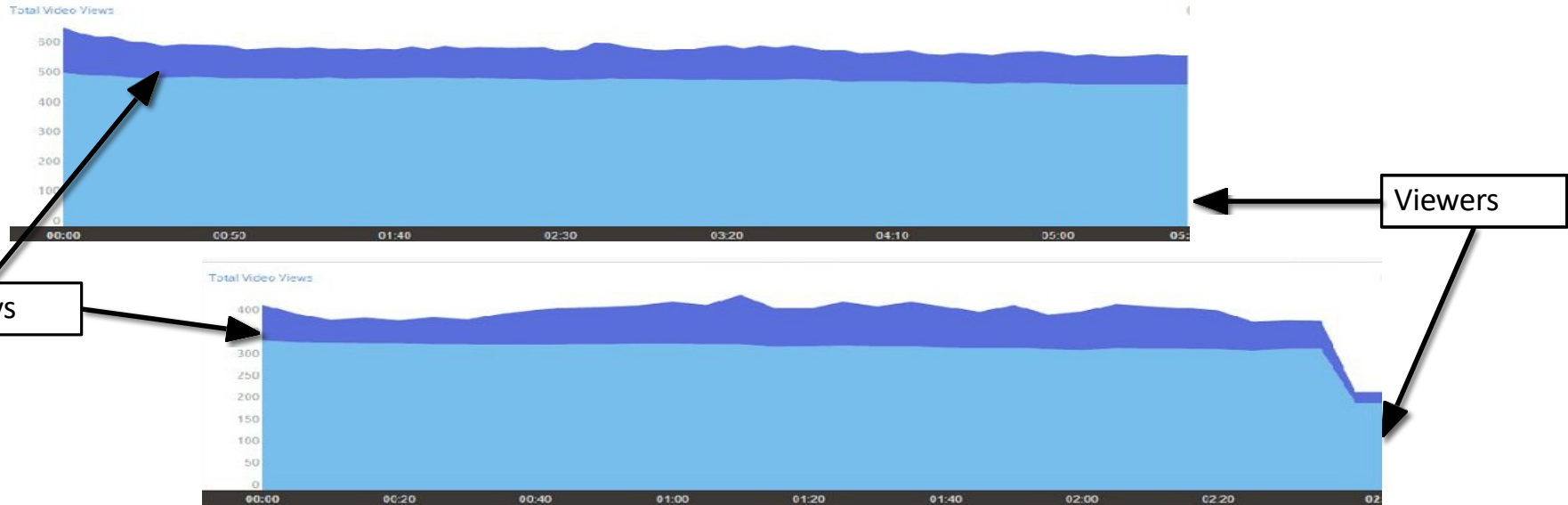
Geography:



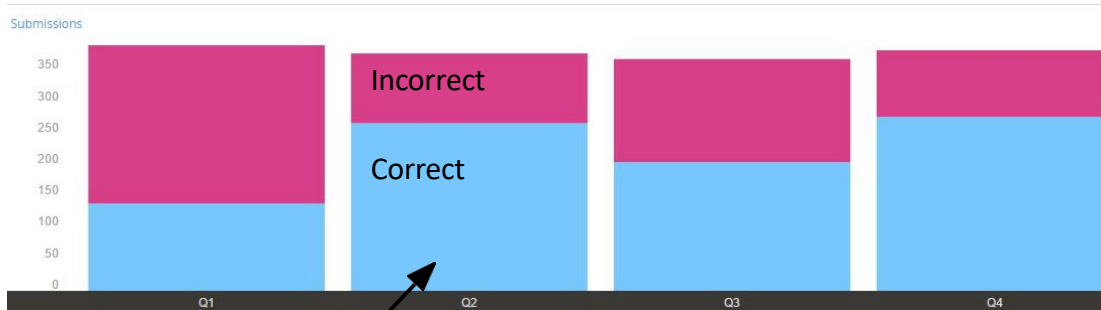
<https://openedx.atlassian.net/wiki/spaces/COMM/pages/90538191/Open+edX+2016+Presentations>

MOOC video analysis views and replays

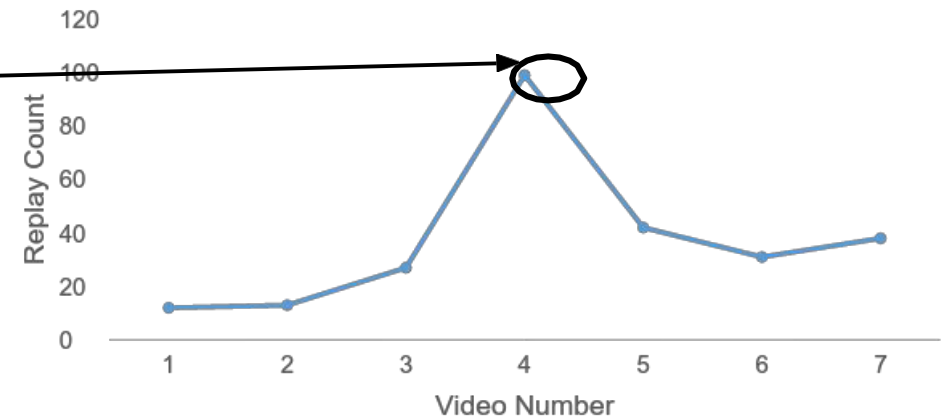
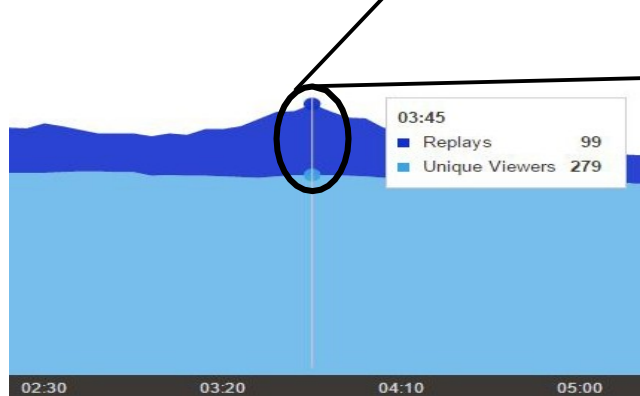
- Course consists of videos, text, quiz, homework
- Weeks 2 & 4 video comparisons (replays vs. view)



Example of Analyzing Video replay & quiz



The most replayed video is usually the one containing the answers to the quizzes questions.



Week 1 video making

Electrical Engineering Online Course lecture videos in Japanese and Dubbed into English

[Video dubbed in English using AI](#)



Dubbed video in English using Google API
https://youtu.be/_cLVisxGtuQ

[Japanese lecture video](#)



<https://youtu.be/S2nc9InNQ9Y>

Question # 3 for discussion

What differences do you notice between Japanese and English lecture voices (timing)?

Is a Human voice better to listen to than the AI generated voice?



Cross lab *AI in Education* Research Group

The students in the AI in Education group at the Cross lab work on a variety of topics:



Chevuth

Self-Efficacy of Cambodian Undergraduate Students



John

AI-based Writing Assistants' Impact on English Language Learners' Writing Fluency



Luc

University Students and Elementary School Teachers Lifelong Learning Through Play



Dorj

A Chatbot for a TSE Professor's Laboratory Using Combined Architecture



May

Personalized Online Adaptive Learning System

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AI in Education Group
at the Cross Lab

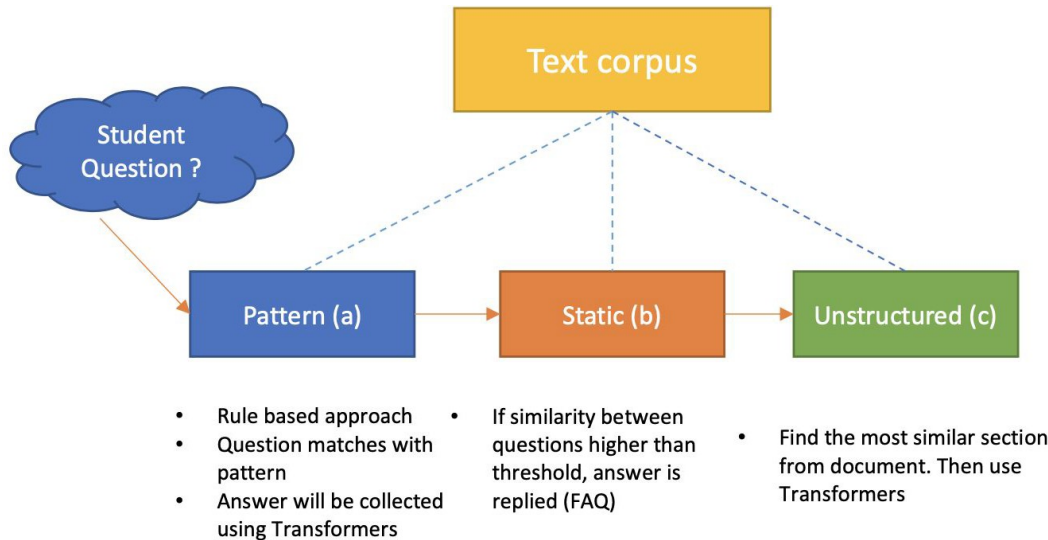


A Chatbot for a TSE Professor's Laboratory Using Combined Architecture

Chatbots provide information by using Artificial Intelligence (AI) after training on text (web, report).

chatbot similar to one-on-one instruction.

Dorj - took the Cross lab student guide 15 pages and made a chatbot from it which answers new lab student questions with text and audio.





Copy of Extractive QA with Elasticsearch ☆

File Edit View Insert Runtime Tools Help [Last edited on September 30](#)



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▶ 0:00 / 0:01



Question 18: What does Prof Cross expect from the fulltime student

▶ 0:00 / 0:03



Answer from chatbot : Prof. Cross expects you will be doing your research, attending courses and studying 50 hours per week.

▶ 0:00 / 0:07



Cross-lab operating guidelines & best practices October 2020

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These guidelines are prepared to inform new B4, M1, D1 students and remind existing lab students about operational policies for the Cross lab, dept. policies, facilities and graduation degree issues. In addition, Prof. Cross wrote this guide to pass on my research know-how and Tokyo Tech (Japan) procedural knowledge to help students understand lab operations and procedural matters in order achieve your academic goals and obtain your degrees. Education is a powerful means to change lives and careers in order to impact society. Please read it carefully and be prepared to confirm you have read in the first semester when you join the lab. This guideline will be updated periodically. Please let me

15 page lab
guide

John Maurice Gayed (JOHN)



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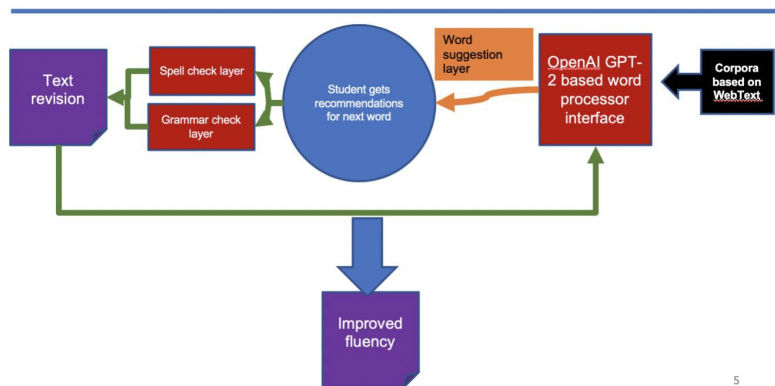
AI-based Writing Assistants' Impact on English Language Learners' Writing Fluency

Input words in a sentence (essay),
output is next word prediction (%)



Allen Institute for AI. Language Modeling Demo.

<https://demo.allennlp.org/next-token-lm?text=This%20research%20will%20>



AI system based on Open AI's GPT-2 language model.

Expect AI-based writing assistants can improve students' writing fluency.

AI-based Writing Assistants' Impact on English Language Learners' Writing Fluency



AI in Education Group
at the Cross Lab

Cross Lab AI-Writer

Type text
here in
English
In web app

Choose 2nd
language, AI
based
translation

Enter your text here:

This essay will discuss the relationship between religion and

User input here. All non-English characters removed.

Choose a language:

Japanese

このエッセイは宗教との関係を議論します

Google Translate API - Translate to over 100+ languages

Export as txt Export as pdf Export as docx

Next likely word:

Most likely word prediction. GPT-2 345M Model. Based on AllenNLP

the	8%
politics	7%
science	5%
political	4%
social	2%

AI based
predicted
next word

Question # 4 for discussion

Which do you prefer when seeking information, ask a person (me) a question or a chatbot about today's lecture in English?

If you could ask the question in written Japanese or spoken Japanese versus speaking the question in English, would that impact your above response?

A person's culture impacts one's impression about Robots interaction

Why Westerners Fear Robots and the Japanese Do Not

The hierarchies of Judeo-Christian religions mean that those cultures tend to fear their overlords. Beliefs like Shinto and Buddhism are more conducive to have faith in peaceful coexistence.



<https://www.wired.com/story/ideas-joi-ito-robot-overlords/>

Use of AI is not always faster than humans

- In dubbing EE lectures videos into English using Google Text to Speech (TTS) API which generates an audio track, it required 7 hours of caption editing, TTS conversion and mp4 video file preparation for 1 hr of lecture video.
- Closed captions had to be edited manually by a TA into complete sentences with timestamps (took 5 hours for 1 hour of video).
- It would have been faster (take less time) to read aloud closed caption lecture while recording then re-edit the videos with English audio track then using TTS Google API which needs transcript with timestamps for each sentence.
- Using AI based processes is not always faster than doing process manually with people with video editing skills for a process that involves several steps.

Summary / Conclusion

- Due to COVID-19 online education has greatly expanded worldwide (merits and demerits).
- Online courses allow learner interactions with the course to be analyzed
- Online learning has created jobs in the field of educational technology
- AI can be used to enhance personalized learning experience and provide learner support
- Does AI actually improve learning or speed up learning efficiency? To be determined (tbd).

Acknowledgements

Tokyo Tech Online Education Development Office, Staff and Teaching Assistants

Tokyo Tech Center for Innovative Teaching and Learning

Tokyo Tech Cross lab AI in Education research group students, in particular May Carlon who prepared some of the slides.

edX and open edX LMS

THANK YOU

For CREDIT students only: REPORT questions

1. Please list the types of online courses and programs edX offers ? Which are free?
2. What do online courses with videos/reading passages/assessments allow the instructor to do that a traditional lecture based course taught in a classroom with a Professor using a chalk board and graded paper exam/quizzes does not?
3. What is a learning management system and how is it used in online courses?