Impact of open education to improve student outcomes around campus community

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Katsusuke Shigeta

- Ph.D. at Osaka University (Human Sciences)
- A researcher conducting open education and educational technology
- Open MOOC in Japan 2014
  - “Open education and future of learning”
  - 7000+ enrollments, 1400 certificates
  - Introduce flipped classroom (50 participants)
- Publications (Japanese)
  - Open Education
  - Introduction of MOOC

Overview

1. “Open Education” Movement

   Activities to open learning materials and opportunity

2. The feature of MOOC

   MOOC as a “evolution” of open education

3. MOOC and Higher Education

   Future possibility of MOOC, HE, and Society

4. Open Education at universities in Hokkaido

   Share liberal arts education by SPOC and MOOC

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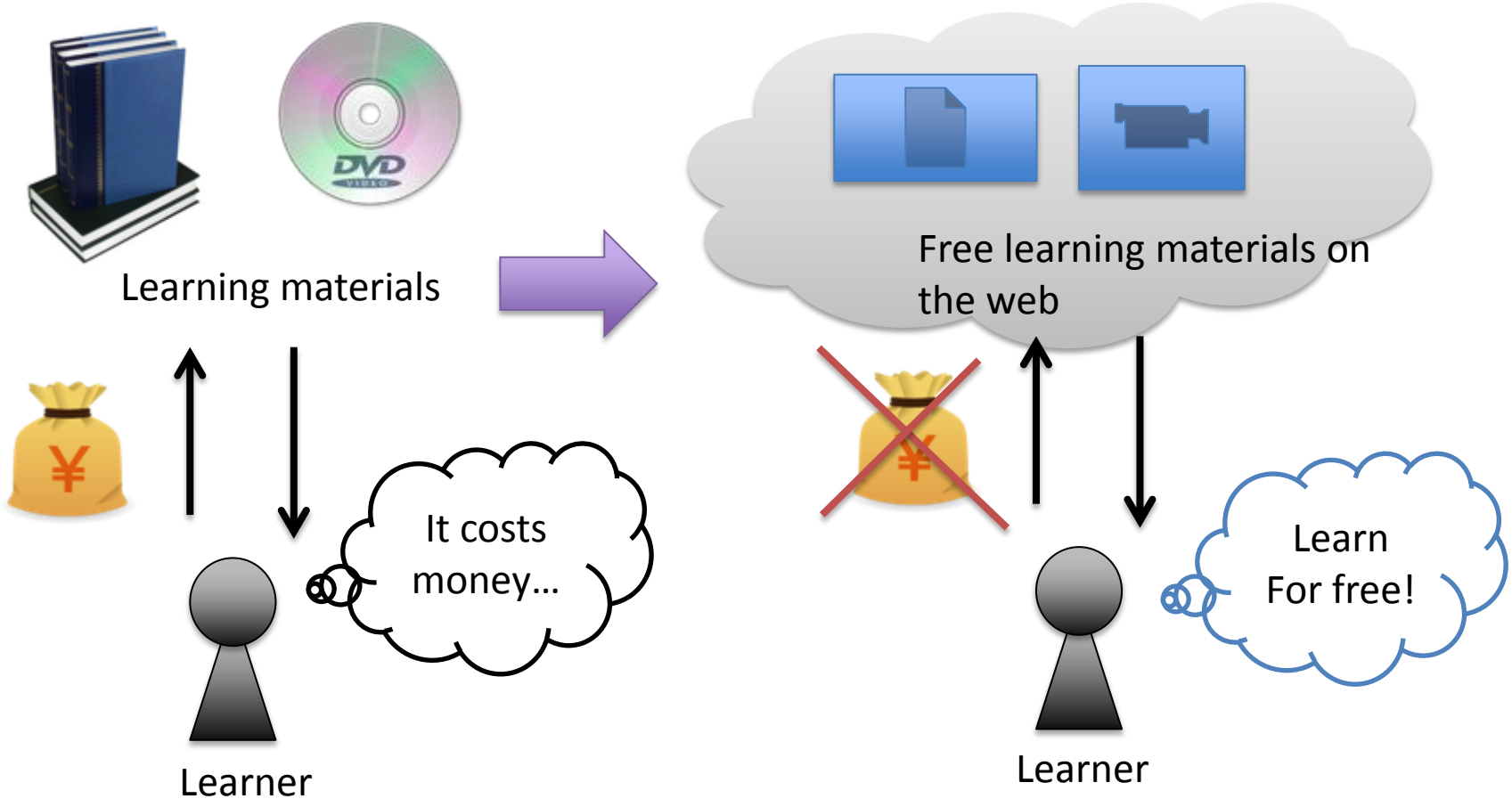
About Open Education

- What is “open education”?
  - “Open up” education to increase opportunity to learn
  - Everyone participates teaching and learning
  - Supported by society (government and foundation)
- Beginning of open education
  - 1990s : dissemination of e-learning
    - Failure of paid learning materials by universities
  - 2001 : OpenCourseWare founded by MIT
    - Open learning materials for free by universities
    - Spread of Open Educational Resources (OER)

Feature of open education (1)
Freely available learning materials

- Open free textbooks and videos online

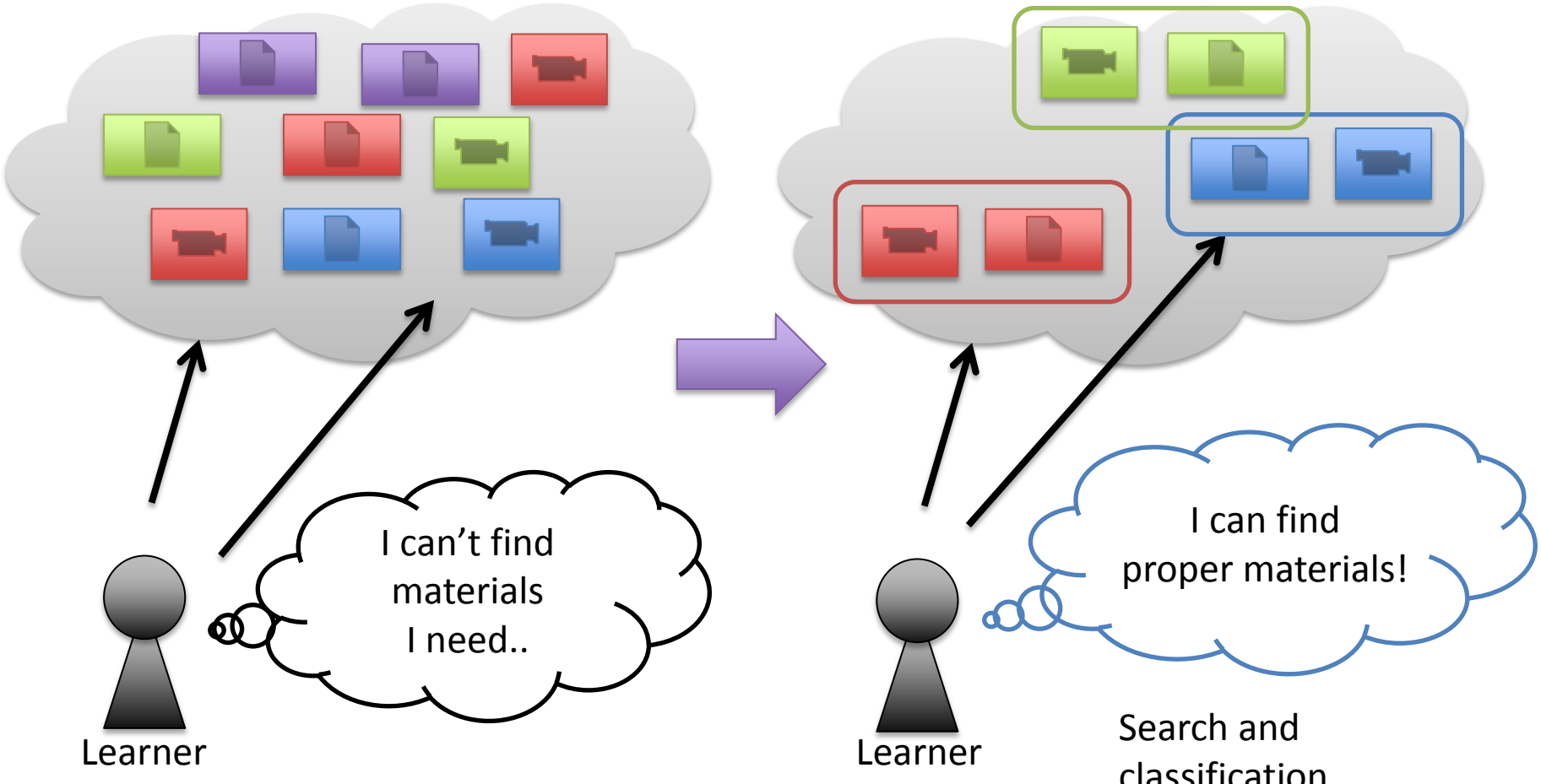


OER（Open Educational Resources)

- Learning materials freely available on the web
  - Textbook, lecture movies, etc.
- Reuse to enlarge quantity and diversity
  - Application of Creative commons license
- Dissemination by international movement
  - UNESCO 2012 declaration for “OER congress”
- Open Textbook
  - Replace existing publisher textbooks
  - Reduce costs for students

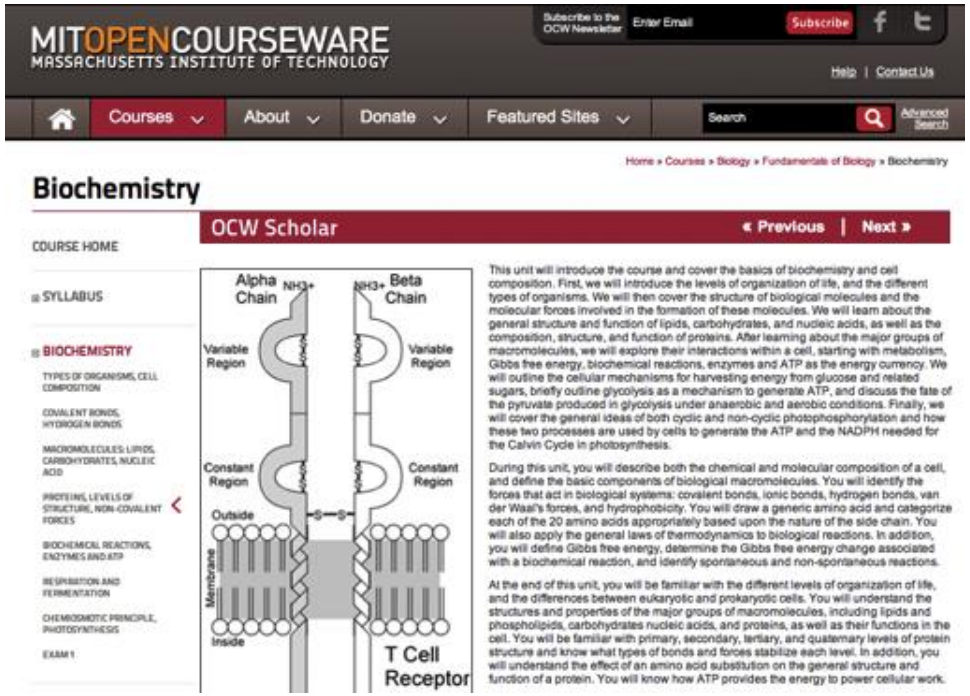
Feature of open education (2)
Establish websites for learning materials

- Find appropriate materials for purpose



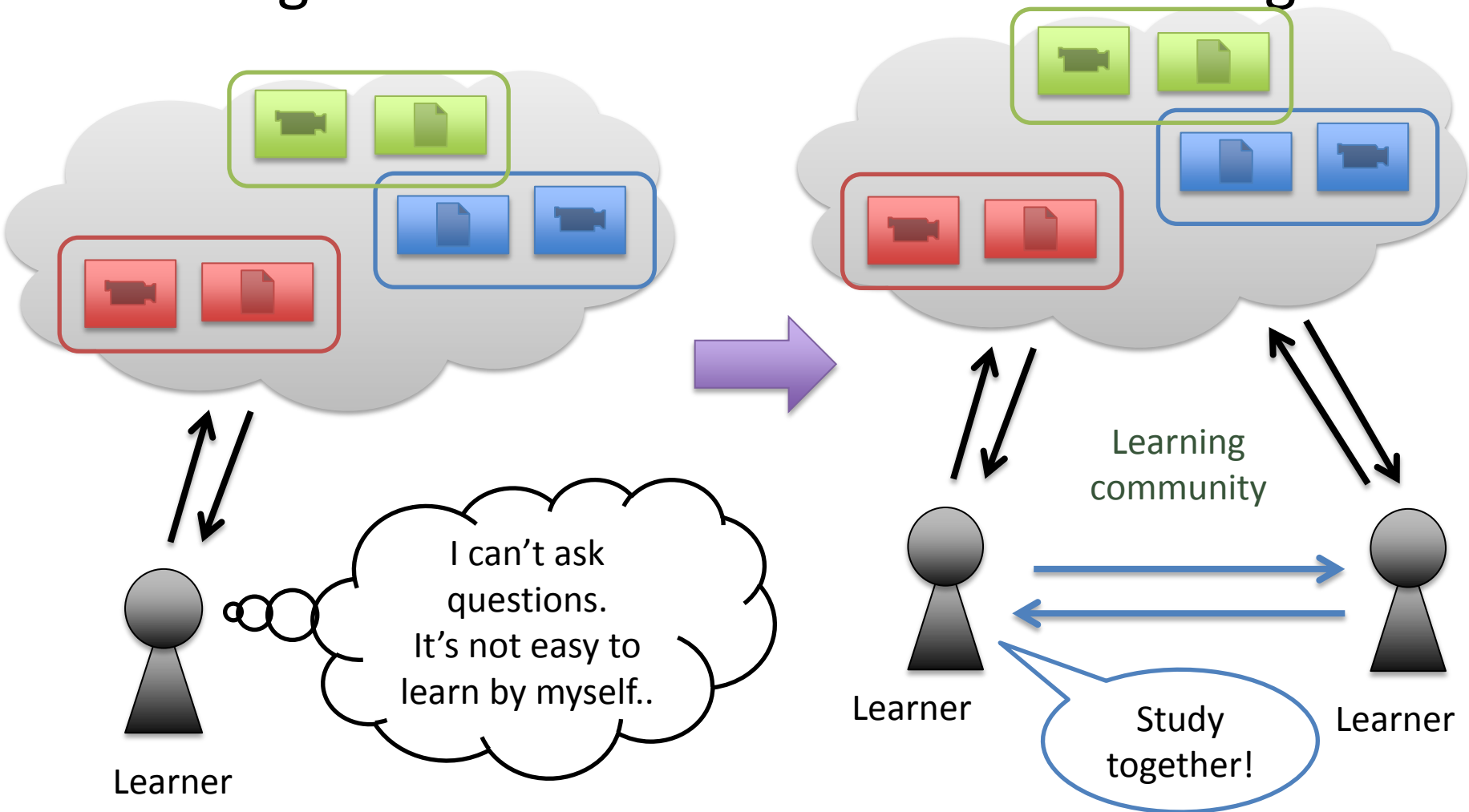
OpenCourseWare (OCW)

- Freely available lecture materials by universities
- Worldwide efforts
  - Regional and worldwide consortiums
- Translation of materials to local language



Feature of open education (3)
Establish learning community

- Encourage motivation and effects of learning



OpenStydy

- Online learning community
- Use OCW to learn together

Mozilla Open Badge

- Issue “digital badge” for accomplishment of learning
- Signaling for knowledge skills

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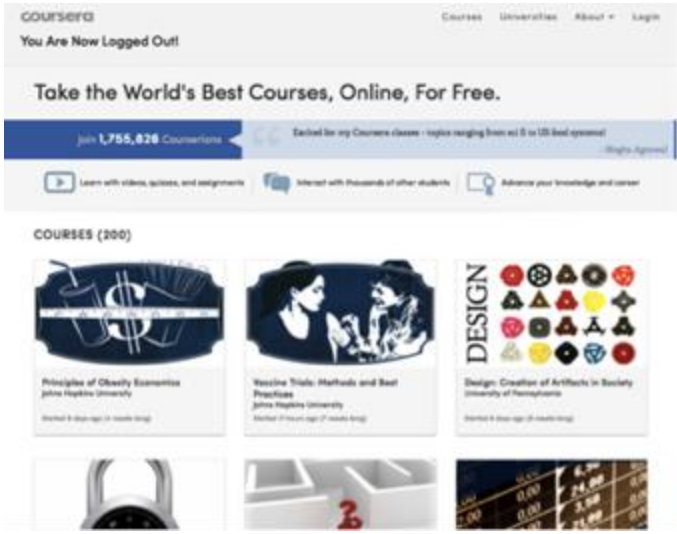
What is MOOC?

- Massive(ly) Open Online Course
- Provide opportunity to take courses in public
  - Duration: Several weeks to months
  - Not only open materials, but also provide learning environment
- Massively participation for free
  - Learning community around the world
- Emerge MOOC providers and consortiums
  - Around the US and Europe from 2012

Coursera

- Education company that partners with top universities and organizations to offer courses
  - Established 2012 by faculty at Stanford University
- Over 500 courses by over 100 universities
  - Humanities, medicine, biology
  - Social Science, mathematics
- Over 13 million enrollment
- Offered by multiple language
- Funded by over $60 million

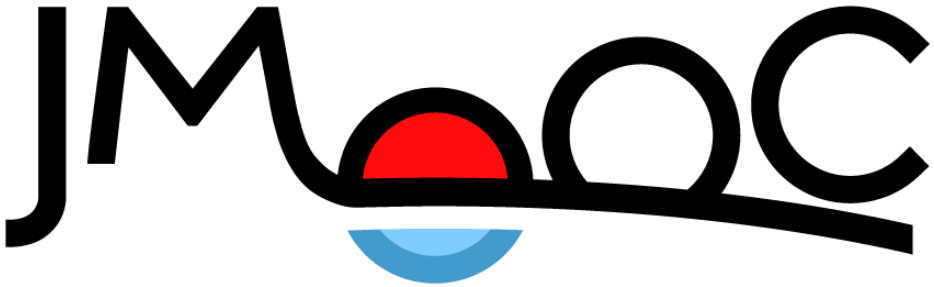


edX

- University consortium offer MOOC
  - Established 2012 by MIT and Harvard
  - Each contributed $30 million
- 43 universities offer university-level courses
- Over 5 million enrollment
- Open-source platform (Open edX)

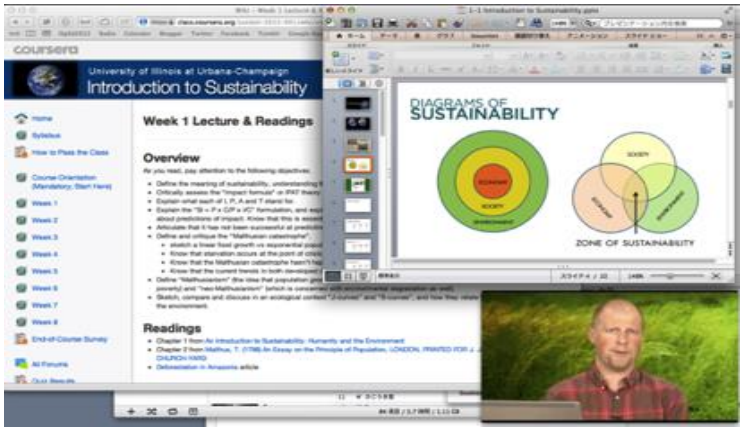
JMOOC

- Japan Massive Open Online Course
  - Collaboration with industries and universities
- Multiple MOOC providers
- Started April 2014, over 30 courses
- Over 150 thousands enrollments



Courses on MOOC

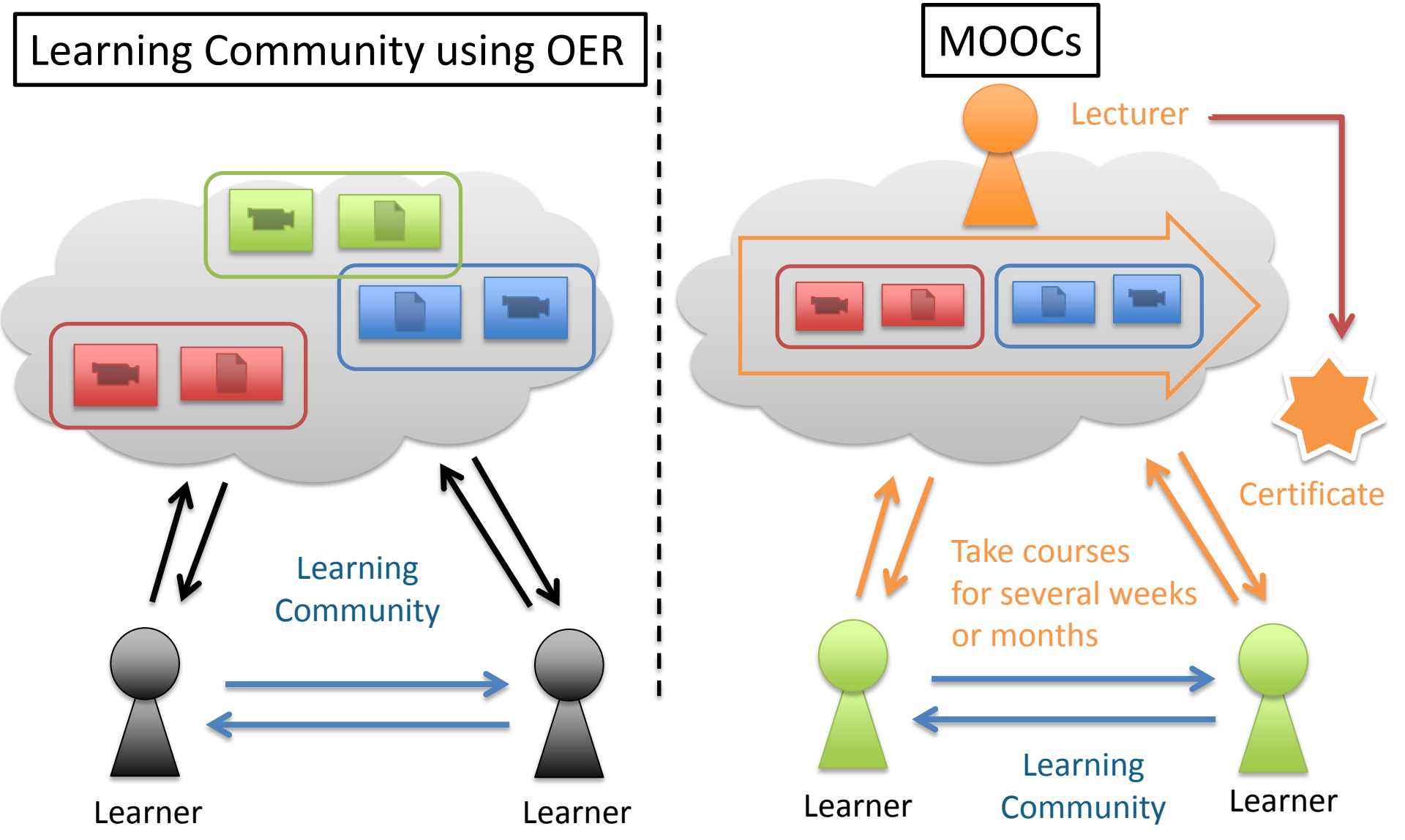
- Subject
  - Introduction courses for undergraduates
  - Distinctive courses (Development of Robot car etc.)
- Structure
  - E-learning courses with community
  - Sequential materials with video, text and quizzes
  - Peer-review of essay
  - Discussion Forum
- Issue certificate, not credit



Feature of MOOC compared to e-learning

- Differences between existing “e-learning”
  - Free to enroll, voluntary participation
  - No charge (No fee and no tuition)
  - No credits
  - Completion of course is not required (10%)
- Worldwide learning community
  - Millions of participants
  - “Meetup” events
    - meet neighboring participants organized worldwide

MOOC as a “learning service” by open online courses



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Backgrounds of open education activities by universities

- Ideal Aspects
  - Increase educational opportunities in global terms
  - International relief efforts to equal opportunity of education (translation of OER)
- Pragmatic Aspects
  - Provide return to universities
  - Increase publicity to open OCW and MOOC
    - MIT: 27% beginning students aware of OCW before deciding to attend MIT were influenced by it
  - Reduce costs (introduce Open Textbooks)

Using MOOC on campus

- Introduction of MOOC as “digital textbooks”
  - Flipped classroom or blended learning
  - Improvement of retention rate
    - From 50% to 90%
  - SPOC(Small Private Online Courses)
    - Use MOOC privately inside campus
- Online graduate school using MOOC
  - Georgia Tech Univ. Master of computer science
  - Collaborate with MOOC provider (Udacity)
    - $7000 for master degree

Verified certificate to credit

- “Signature Track” by Coursera (around 20 USD)
  - Identification procedure by Photo ID using webcam
  - Prevent plagiarism by key typing recognition
- Get credit by verified certificate
  - ACE Credit （Credit recommendation service）
  - Transferred to ACE Credit to be used for academic credit
  - Used as complement of credit on existing university

Criticisms and concern

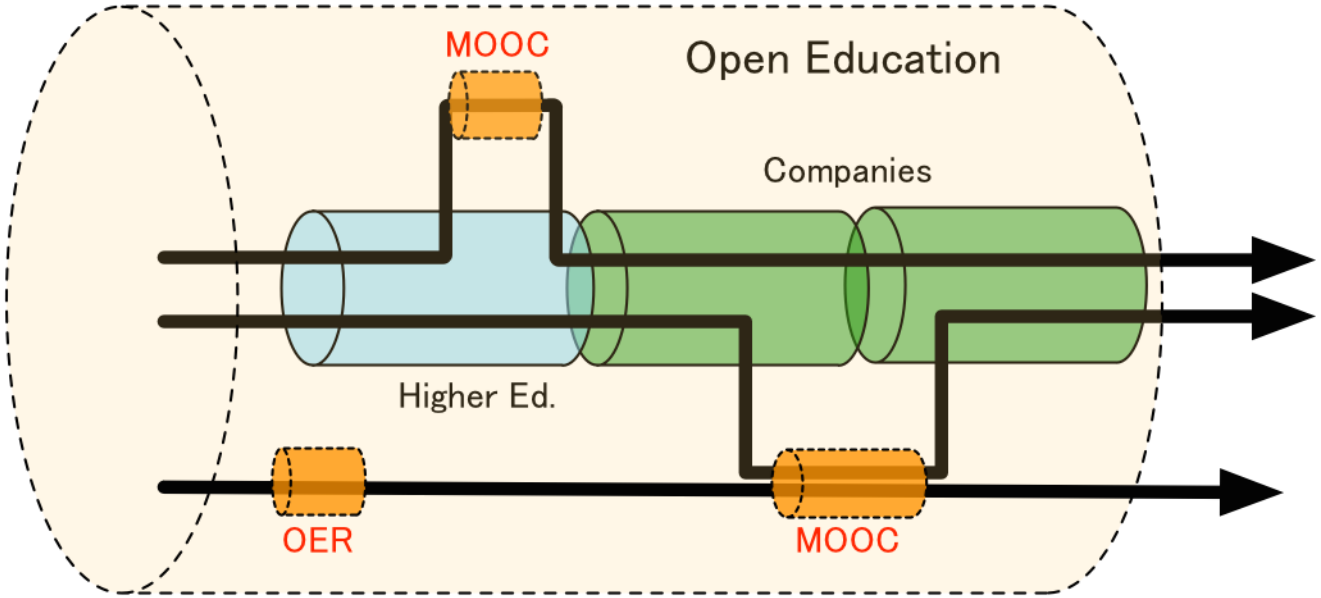
- Criticism
  - Integration of MOOC in traditional university setting exist
  - Rapid introduction of MOOC on campus restrict academic freedom of faculty and university
- Concern over sustainability
  - Remains unsure (funding depends on VC)
  - Developing a sustainable business model is essential
  - Crucial for universities to measure the efficacy

MOOC and higher education

- Improve online learning by MOOC
  - Using “big data” from “massively” participants
  - Improve online courses by learner’s behavior
- Potential of MOOC by private sector
  - For workplace learning (Yahoo! and Coursera)
  - Open Education Alliance
    - Udacity and IT(Google, AT&T) companies jointly established
    - Reduce skill gaps through online education to develop human resources on IT industry
- Government support (US) for teacher education

MOOC as a social infrastructure of learning

- Offer learning opportunities in diverse ways
  - Support workers and learners to expand social safety net to increase employment opportunities
  - Add existing education system to opportunity to learn



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Center for Open Education

北海道大学
オープンエデュケーション
センター
CENTER FOR OPEN EDUCATION
HOKKAIDO UNIVERSITY

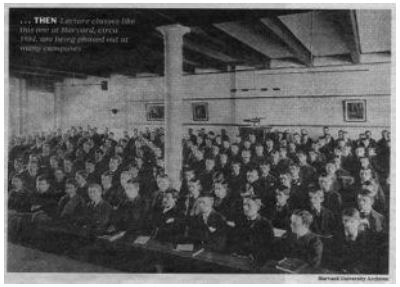
- University-wide organization
  - Under the Institute for the Advancement of Higher Education
- Objectives
  - Supporting teaching and learning using OER
  - OER research and development
- Unification of initiatives on campus
  - Hokkaido University OCW office
  - E-learning efforts on several departments

Backgrounds: Challenges in Hokkaido area

- Potential to realize diverse liberal arts education for cooperation of universities in Hokkaido
  - Specializing single-department universities (agriculture, engineering)
- Difficulty to support variety of liberal arts education on each universities
  - Limited faculty for second language courses
- Opportunities for students to learn diverse courses
  - Utilize distinctive features of universities

Cooperation of universities in Hokkaido

- Utilize distance learning
  - Videoconferencing system
  - Special classroom for active learning
- Improve student outcomes
  - Overcoming challenges to increase effectiveness of distance learning



18th century

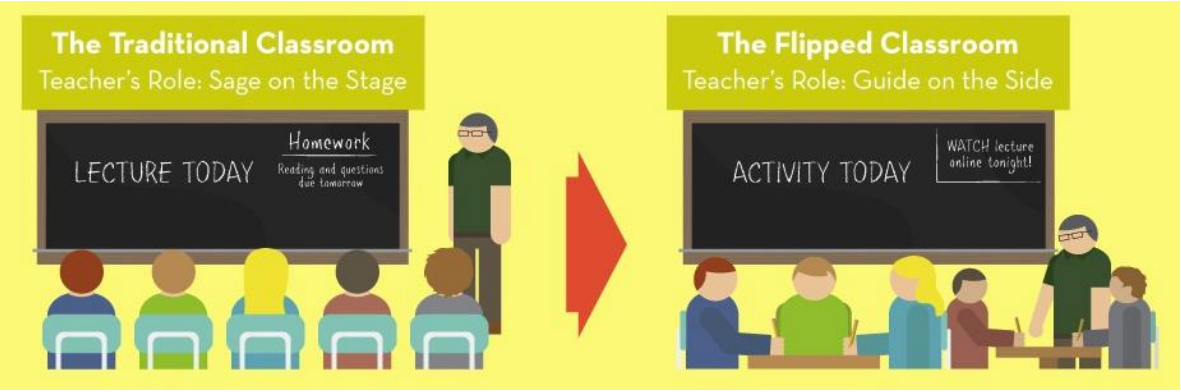
20th century

Active learning

21st century

Improve learning outcomes using OER

- Flipped classroom
  - Using learning materials for preparation
  - Activity to “use” knowledge in classroom
  - Improving student outcomes and reduce the drop-out rate

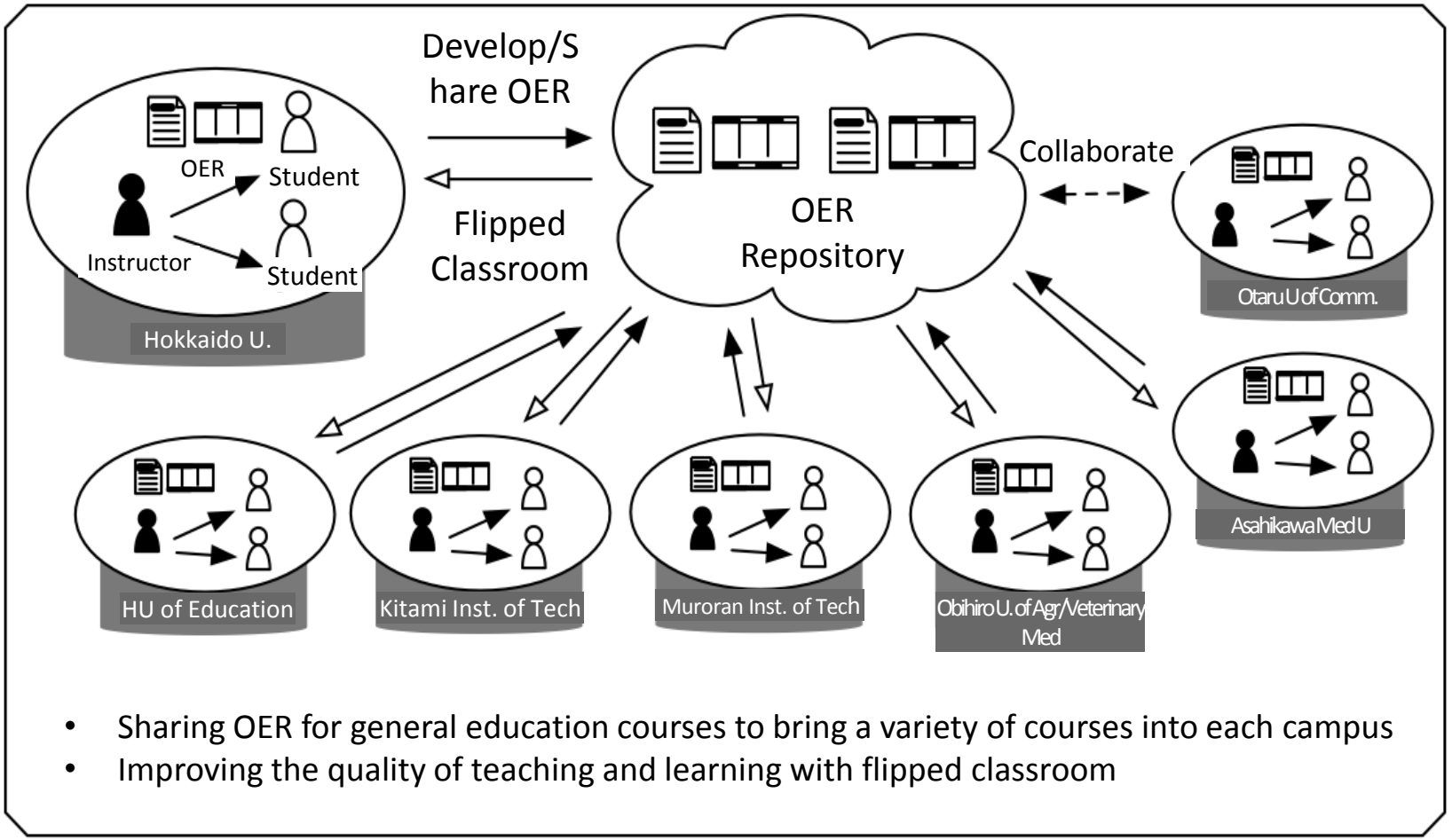


The Flipped Classroom: Turning the Traditional Classroom on its Head - http://www.knewton.com/flipped-classroom/

Activities (1)

- Create “OER Repository” to share learning materials
  - Videos, texts, e-textbooks, quizzes…etc.
  - On Open edX platform (localization)
  - Create model courses
    (4 courses / year)

Activities (1)



- Sharing OER for general education courses to bring a variety of courses into each campus
- Improving the quality of teaching and learning with flipped classroom

Activities (2)

- Develop OER
  - Applied ethics, Earth and space science, Digital Literacy, Environmental radioactivity
- Some OER are based on existing OER
  - Open Learning Initiative (Carnegie Mellon U.)
- Pilot courses from 2nd semester in 2014
  - Flipped classroom and active learning
- Credit bearing courses starting since 2015
  - Applied ethics/Digital Literacy

Designing OER

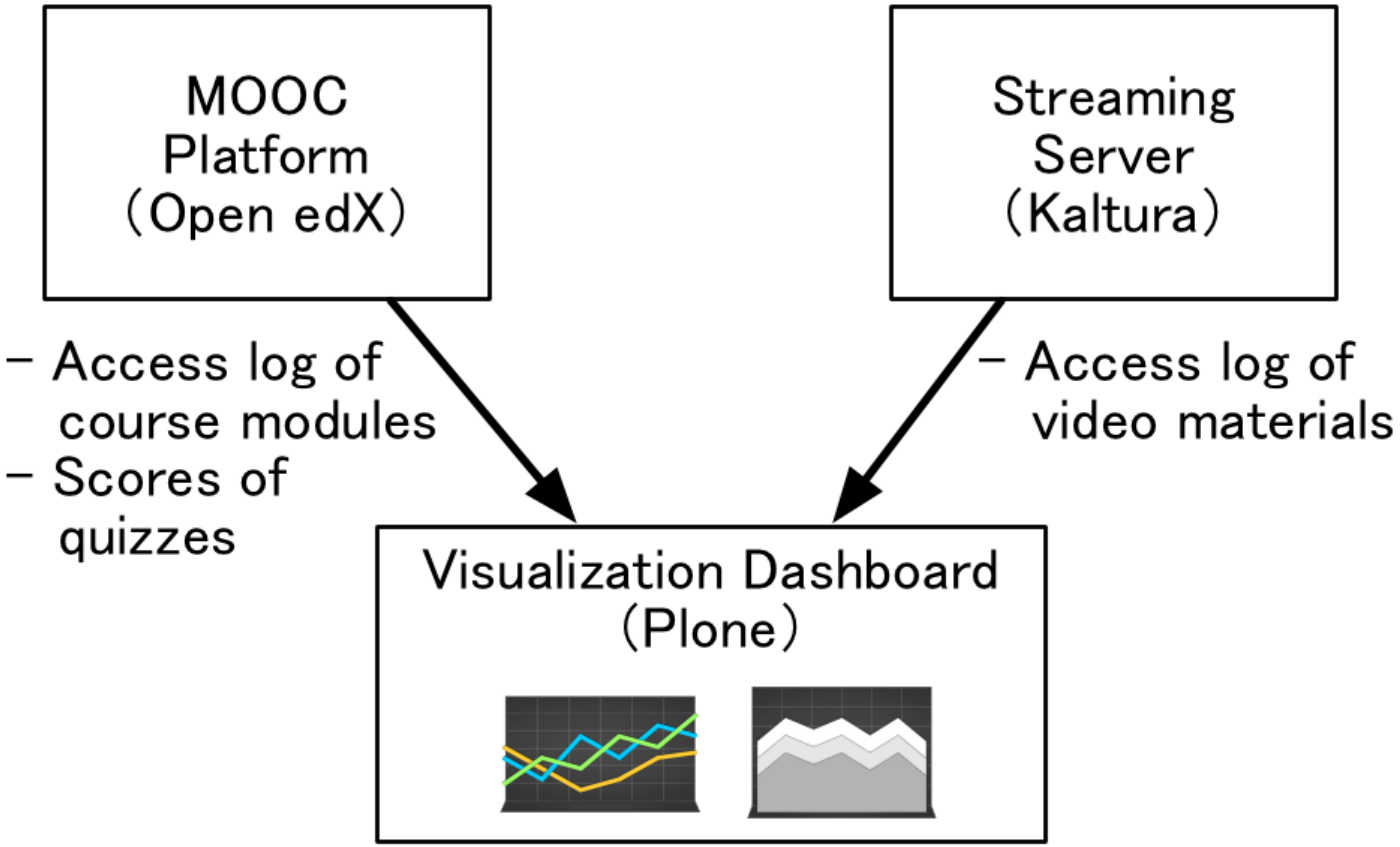
- “MOOC-type” learning materials
  - Short videos + quizzes
  - Structured materials developed based on instructional design
- Experts
  - Instructional designers
  - Video producers
  - Copyright clearance
    - Open license (CC-BY-NC)

OER Repository

- Academic Commons For Education (ACE)
  - Open since April 2014
- Based on Open edX platform

http://ace.iic.hokudai.ac.jp/ (Sign-in required)

Learning Analytics Tool using Plone

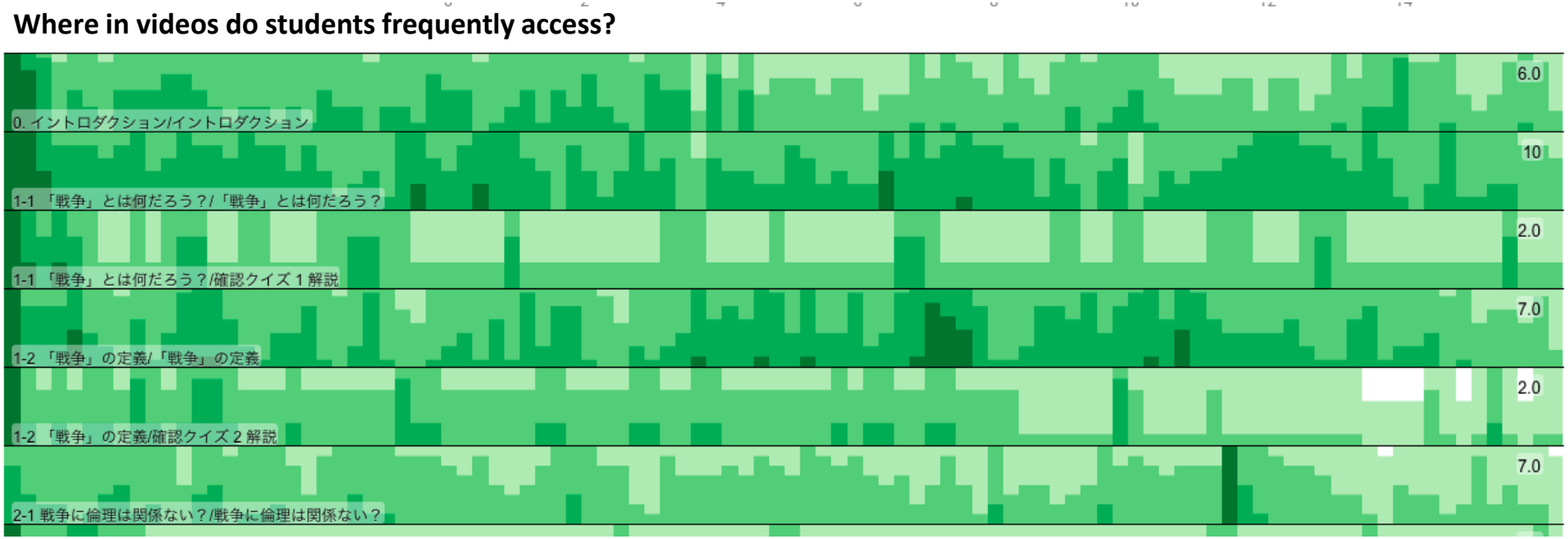


- Grasping how students study at home

Visualization Dashboard(1)
Scores of quizzes and status of login

How many times do students submit their answers for quizzes?

Visualization Dashboard(2)
Grasp access to video materials

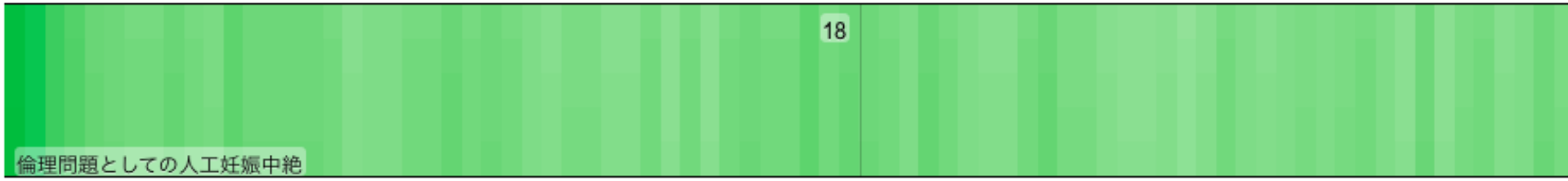


- Overall trend and individual trend
- Show the frequency of access by shade of color

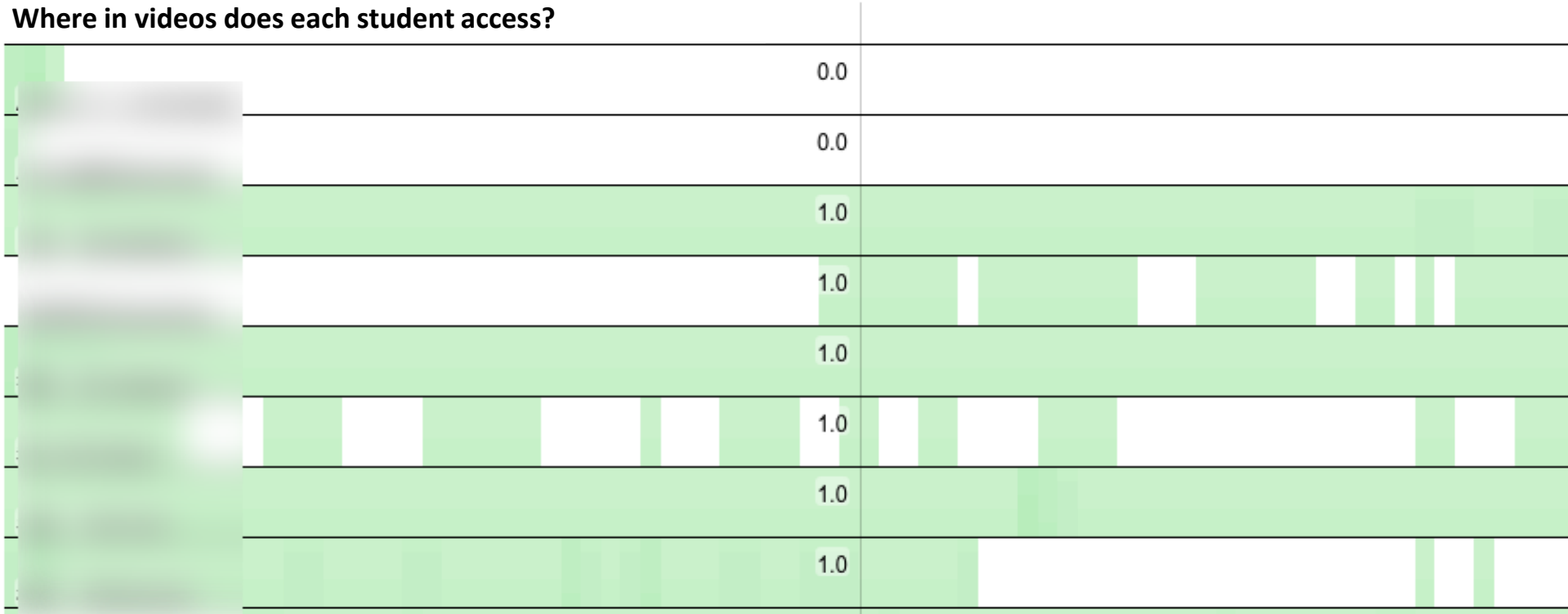
Visualization Dashboard(2)
Grasp access to video materials

Video: Induced Abortion

Where in videos do students frequently access?



Where in videos does each student access?



In class…

- Activities
  - Discussions, presentations, writing papers, and developing students' OER

In class…

- Connected with another university
- Staffs as TAs

Some examples of students' OER

What is the "my number"?

1. To begin with…

「マイナンバー制度」って
結局どんな制度なの？

こう思っていませんか？

2015年1月実施の内閣府世論調査よ
いる」と答えた人は、わずか28.3%で
生活に関わる重要な制度であり、適切

Election campaign using the Internet

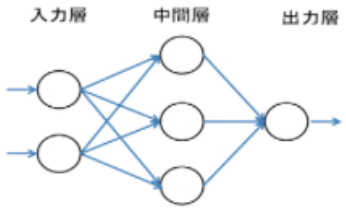
そもそもタイトルにもある「ネット選挙
るのでしょうか？
ここでは、簡潔にいうとインターネットを
す。この言葉はインターネット上で投票自
が、ここでは区別することにします。ちな
いされる方がいますが、インターネットを
ん。確かに、ネットを使って投票ができれ
く、こちらはもう少し先になりそうなので
動は２０１３年４月に公職選挙法が改正されたことによって解禁となりました。改正前は選挙の公正、候補者間の平等を確保するため、選挙運動期間中に行われる文書図画の頒布、掲示その他の選挙運動について一定の規制をしてきました。インターネット等による情報の伝達も文書図画の頒布にあたるものとして規制されていました。しかし改正により、具体的にはウェブサイトおよび電子メールを利用した方法が解禁されたのです。

【選挙運動とは】
判例・実例によれば、選挙運動とは、「特定の選挙について、特定の候補者の当選を目的として、投票を得る又は得させるために

Deep learning

ディープラーニングとは中間層がたくさんあるニューラルネットワークを

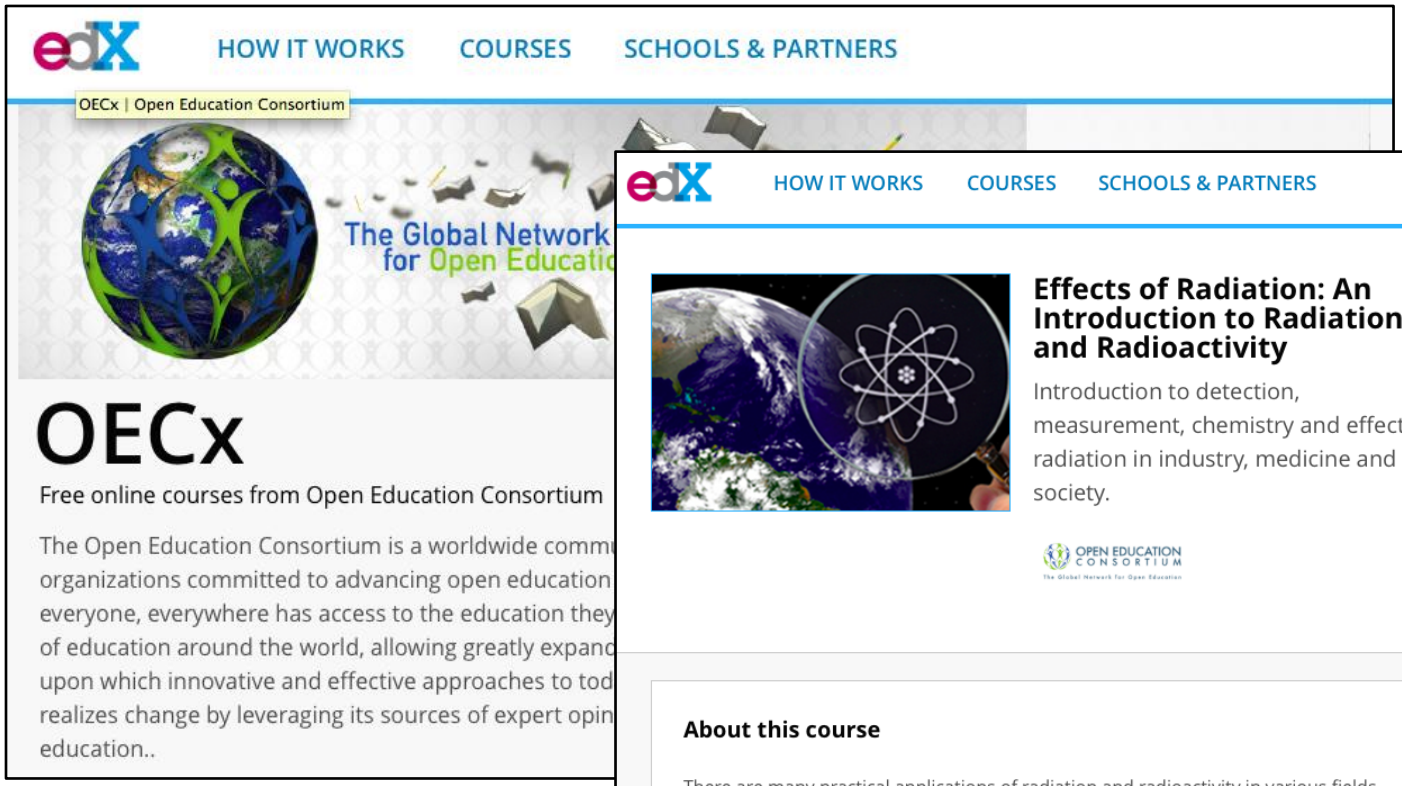
ニューラルネットワーク：人間の脳にあるニューロンを真似して作られた
力層、中間層、出力層の3層から成り立つ。

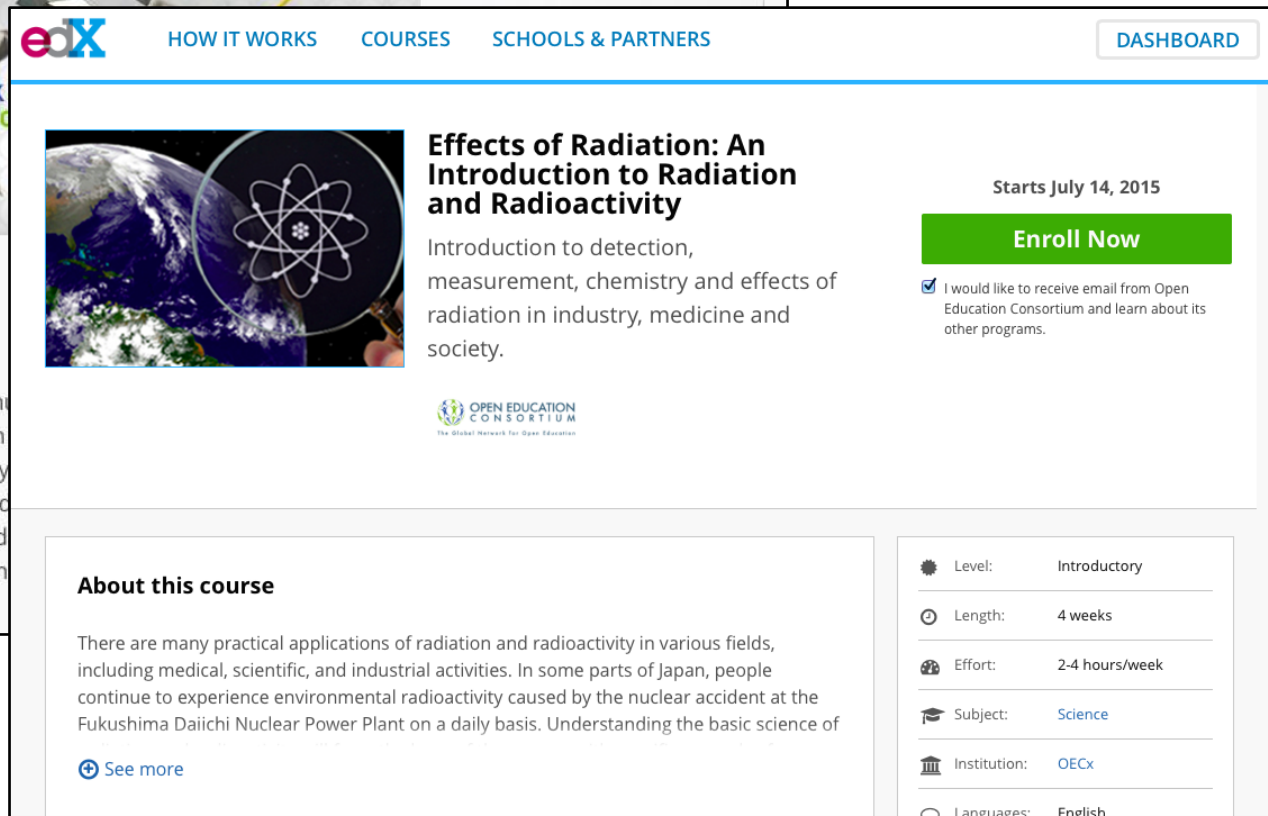


(図2)ニューラルネットワークの図

MOOC using our OER

- Jul. 14 – Aug. 24





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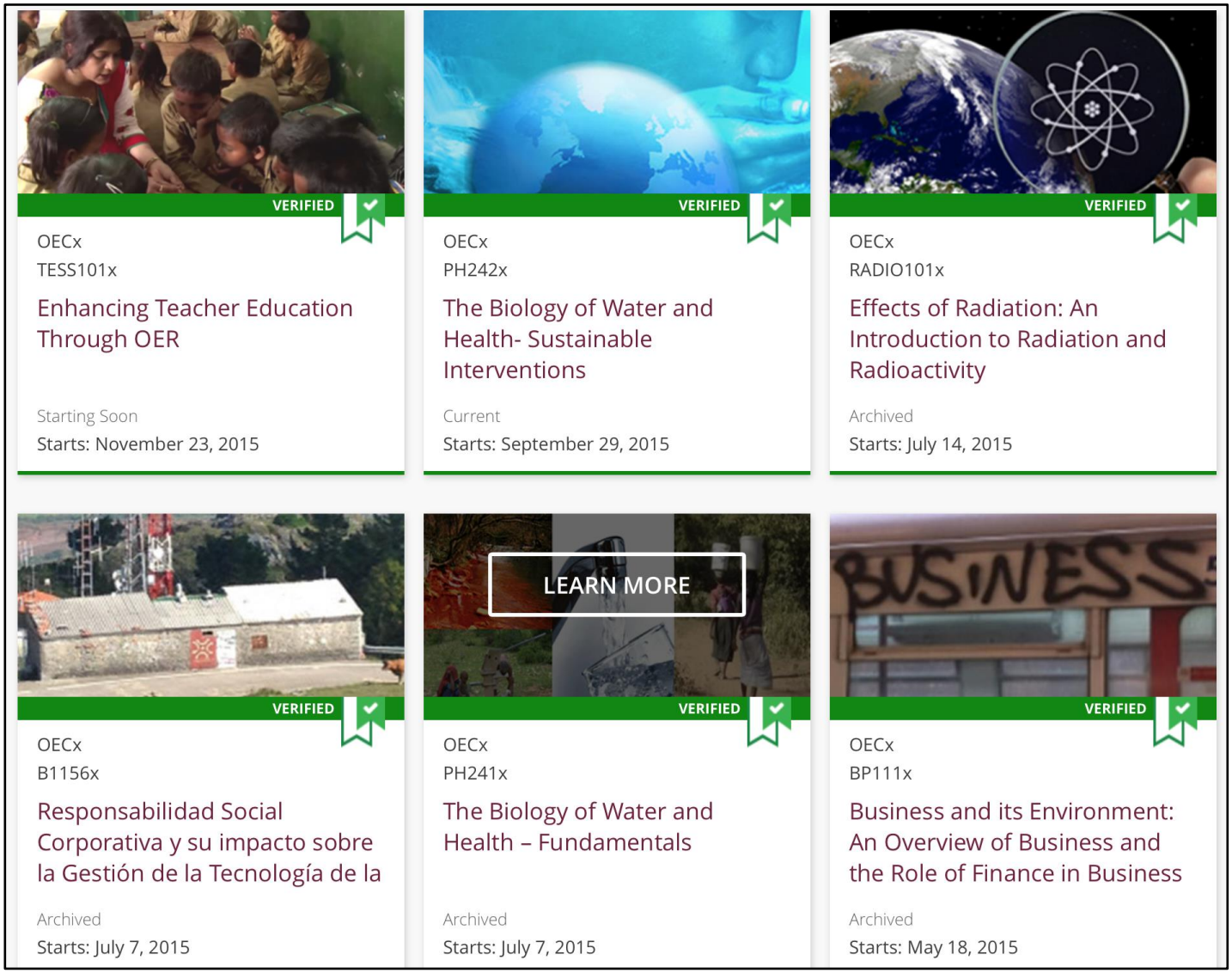


RADIO101x: Effects of Radiation

Title : Effects of Radiation: An Introduction to Radiation and Radioactivity

Length : July 14, 2015 – August 24, 2015

Assignments : Weekly quizzes (50%), Mid-term exam (40%), Final exam (10%)

Prerequisites : None (High-school physics/chemistry is preferred)

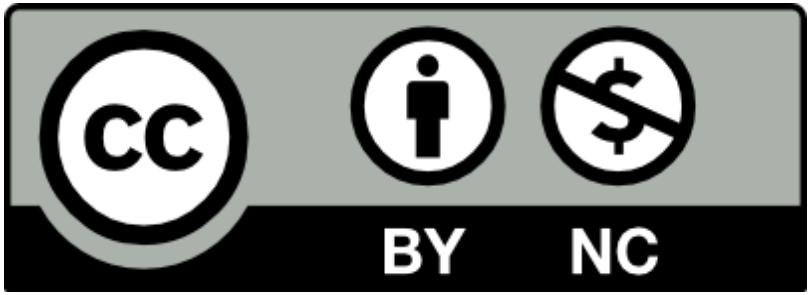
Instructors : Eight instructors from engineering/veterinary medicine department







Making the MOOC “open”



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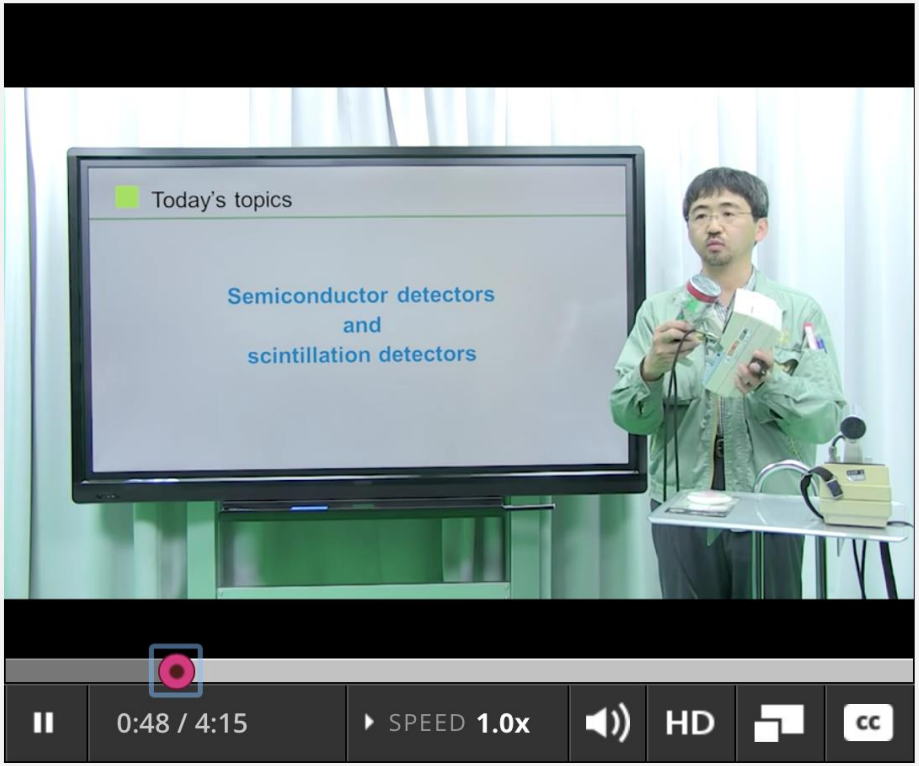
“This means that the course allows learners not only to openly register and freely learn online, but also to reuse, revise, and remix almost all of the materials used in the course as long as you use them for non-commercial purposes.”.

Making the MOOC “open”

VIEW UNIT IN STUDIO

INTRODUCTION



detectors and scintillation detectors.

In the previous lecture, Professor Kozaki talked about gaseous ionization detectors.

I brought a gaseous ionization detector with me today.

It's called a “G-M counter”, or “Geiger-Müller counter”.

This detector is generally the best type for measuring beta rays and is often used for finding out surface contamination.

It's a bit loud. You bring it outside like this and operate it at the location that you want to measure.

Today, I also brought a gas mantle that you can find at hardware stores.

It contains the element thorium, which is radioactive.

By bringing it near the detector, you can

Download video | Download transcript | .srt | Download Handout

The completion rate

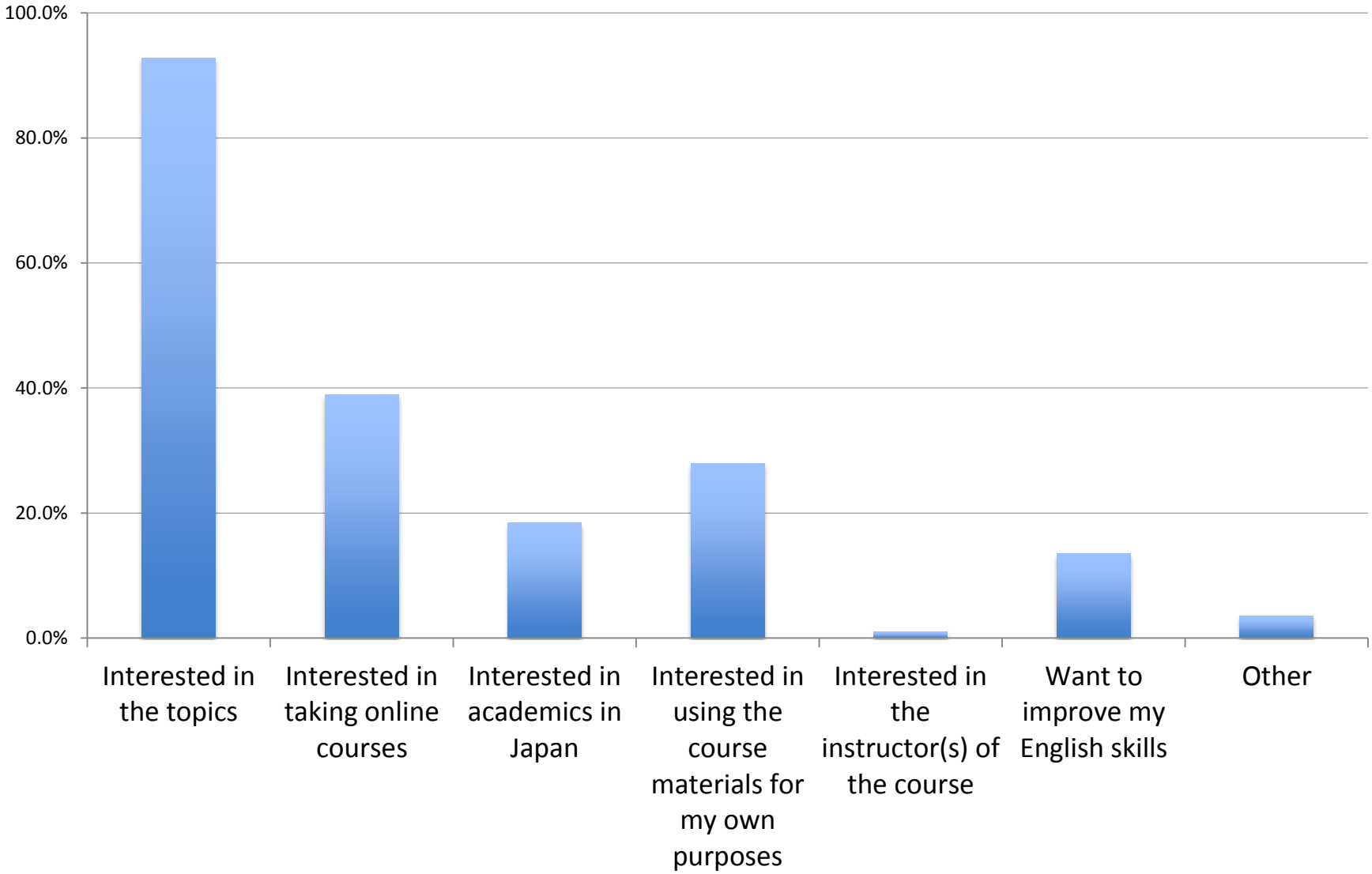
Number of registrants：4342
Those who completed：380
Those who visited　　：1385

※As of Sep. 14, 2015

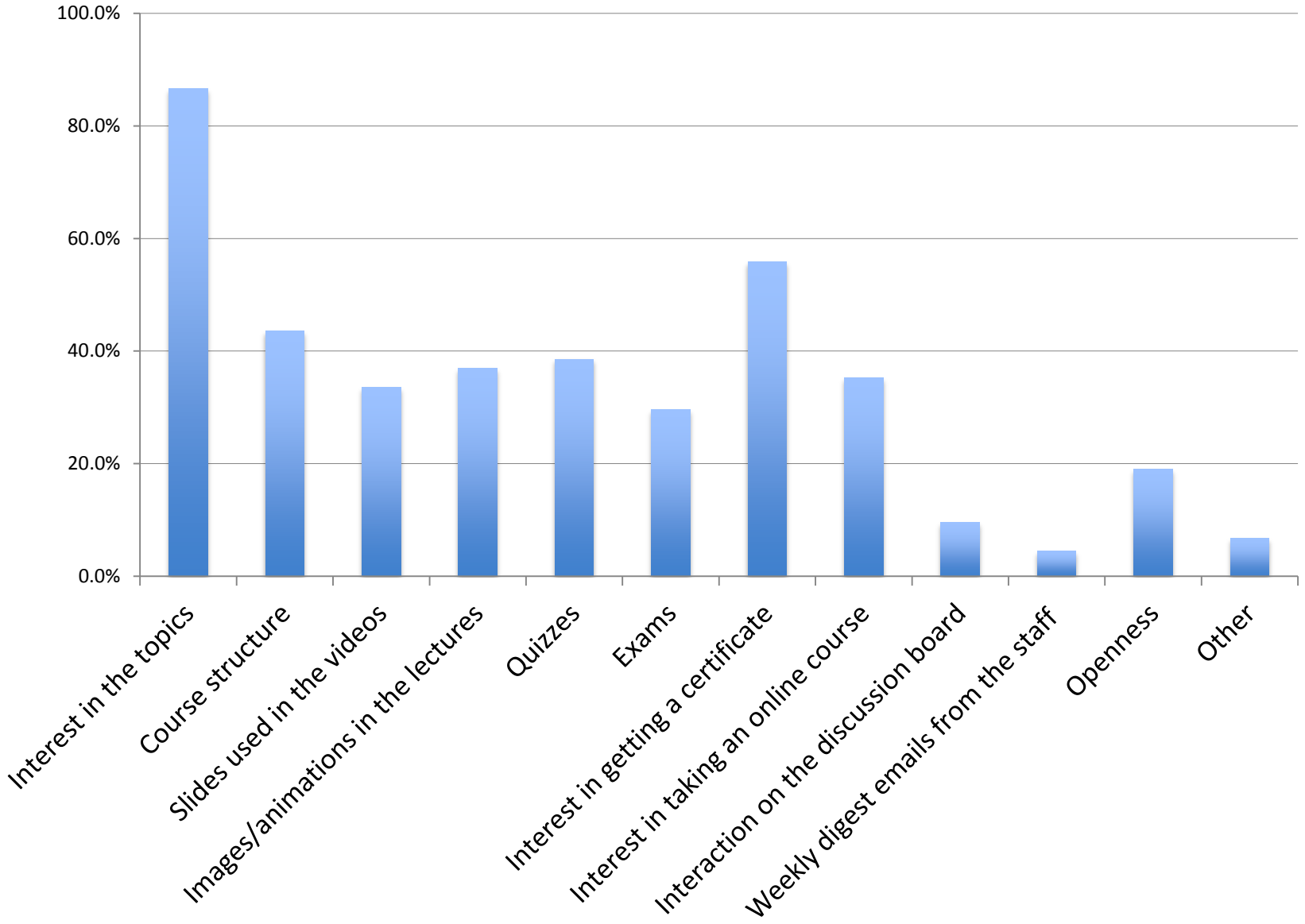
(Completed)/(Total registrants) = 8.7%

(Completed)/(Visited) = 27.4%

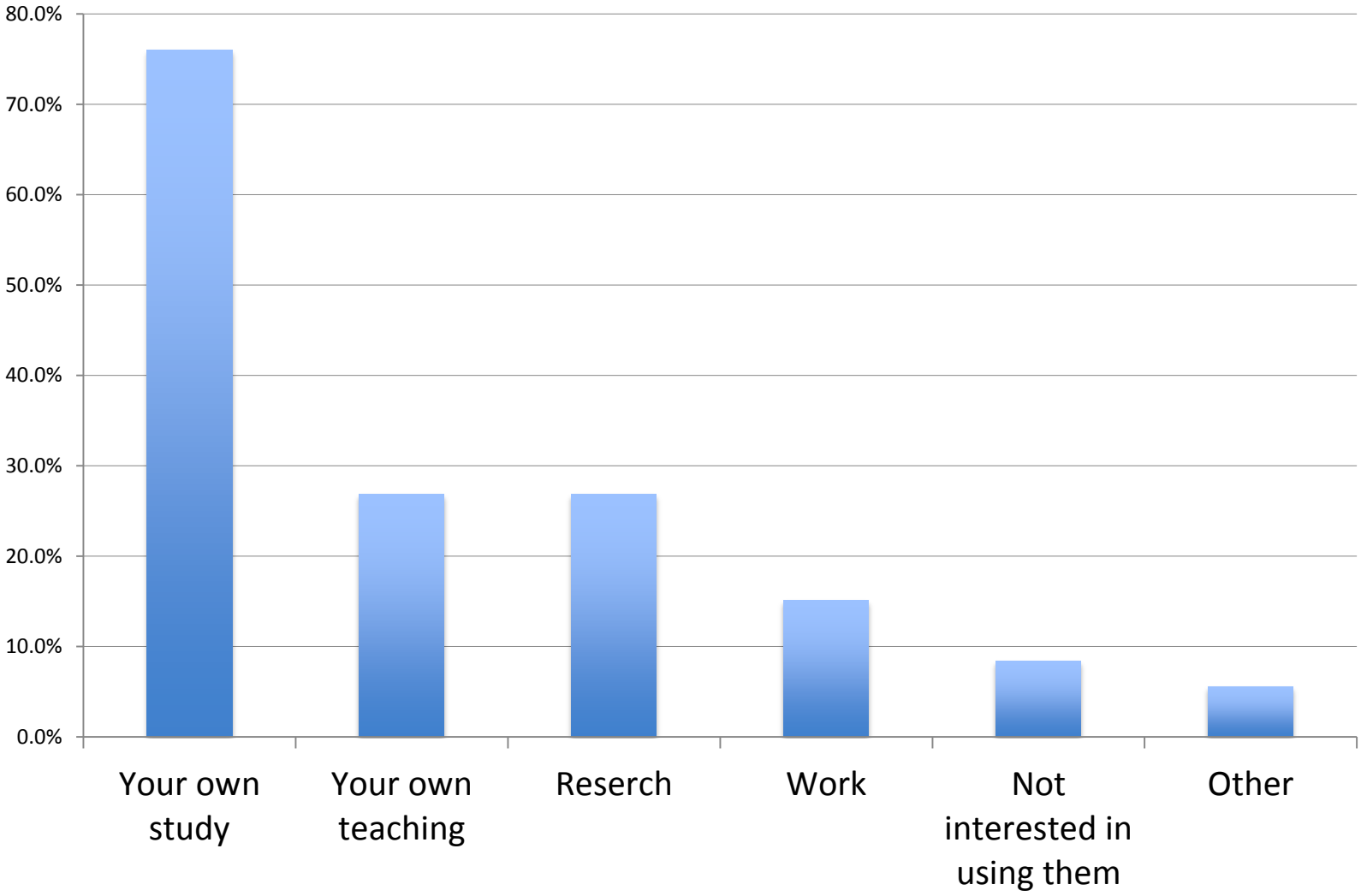
Motives for taking the course



What made them reach to the end?



How would they use the course materials?



Prospective Outcomes

- Realize diversity of liberal arts education
  - Improve effectiveness of distance learning among universities
  - Dissemination of open educational resources
- Increase learning opportunities by MOOC
  - Promotion and internationalization
  - Open MOOC on global consortium (edX)
- Practice to apply SPOC and MOOC among campuses
  - Improve student outcomes with distance learning