Technology and Educational Transformation New Connections between Content, Curriculum and Community.

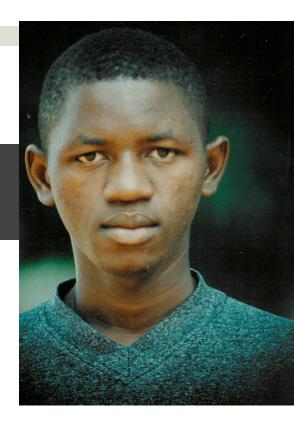
M.S. Vijay Kumar

(...with a little help from my friends)

Chais Conference, OUI, Israel 2010

Making A Difference

"Last semester, I had a course in metallurgical engineering. I didn't have notes, so I went to OCW. I



downloaded a course outline on this, and also some review questions, and these helped me gain a deeper understanding of the material."

> — Kunle Adejumo, Engineering student at Ahmadu Bello University, Zaria, Nigeria

Making A Difference



"I was delighted by the way the material is so coherently presented.

It is truly inspiring to see this level of excellence."

— Prof. Richard Hall, LaTrobe University, Melbourne, Australia Teaching Information Systems, Beginning Microprocessors, and Advanced Computer-Aided Software Engineering

Flashback - Flashforward

"... even though I relied heavily on materia from [Differential Equations], I had no idea how it was being taught—or what was being taught.

... I'd like to bring more of the technology into the classroom, so that while I was giving a lecture, I could give them a flashback to something they had seen in a previous course... This will create better linkages, and to fully integrate the learning experience."

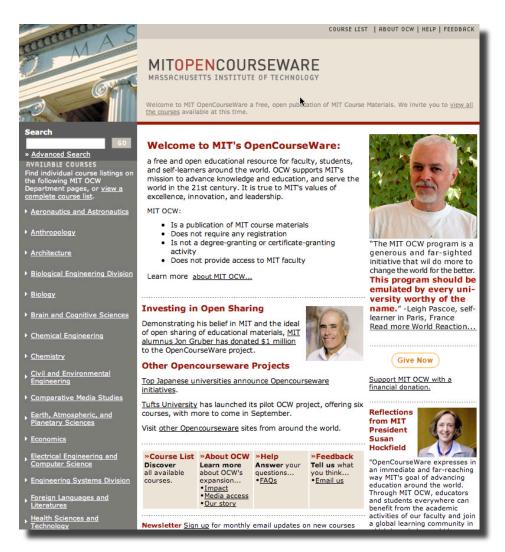
— Prof. Karen Willcox, Aeronautics & Astronautics Teaches required aero/astro course to MIT juniors

MIT OpenCourseware 1900 courses

Site Highlights

Syllabus

- Course Calendar
- Lecture Notes
- Exams
- Problem/Solution Sets
- Labs and Projects
- Video Lectures



Accelerating Global Movement





OPENCOURSEWARE



NPTEL

200+ OCWC Institutions Over 8,000 OCW Courses Online ~2,000,000 visitors/month

IGNOU





OpenUniversiteitNederland









Accelerating Global Movement

MITOPENCOURSEWARE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Learn



IGNOU

Yale University











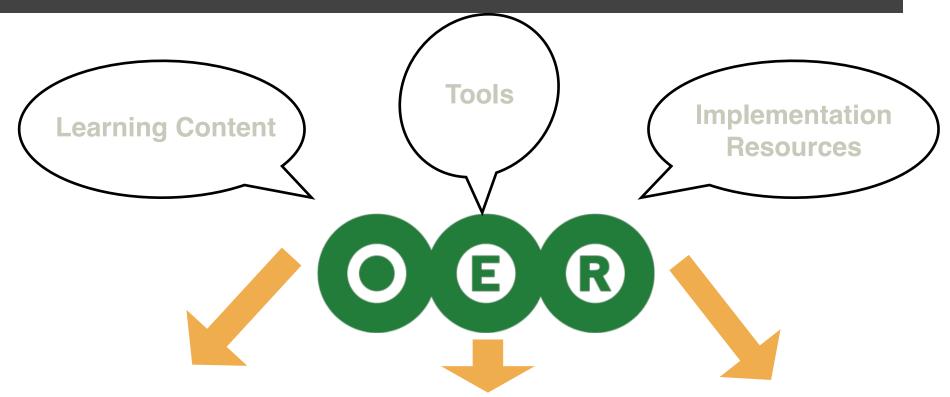


OPENCOURSEWARE CONSORTIUM

170+ OCWC Institutions Over 6,000 OCW Courses Online ~2,000,000 visitors/month

NPTFI

Open Education Resources

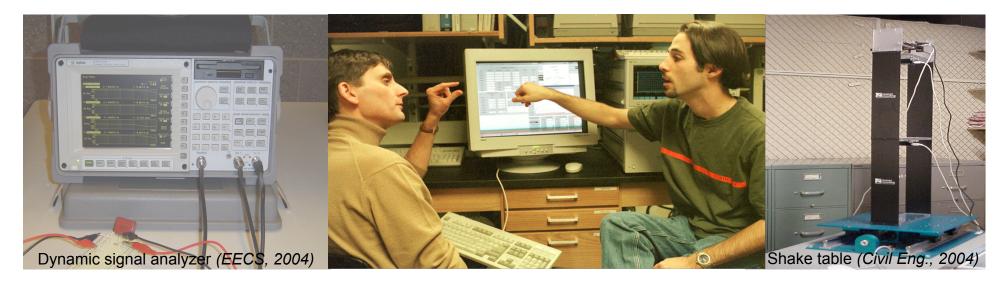


Full courses, course materials, content modules, learning objects, collections, journals

Software to support the creation, delivery, use and improvement of open learning content including searching and organization of content, content and learning management systems, content development tools, and on-line learning communities.

Intellectual property licenses to promote open publishing of materials, design-principles, and localization of content.

iLabs: *"If you can't come to the lab... the lab will come to you!"*



U.S., Australia, China, India, Africa: iLabs Consortium

Order of magnitude more lab experiences More lab time to users/researchers More sophisticated labs available Communities of scholars created around iLabs Sharing educational & research content

CET Strategy



Innovative Learning Environments

Move away from large passive lectures

Intellectual Commons

Demonstrate intellectual and educational leadership by making materials freely available to the world

- Inter-Institutional Collaboration Explore new ways to collaborate with other universities and private industry
- Extended University Community Use technology to enhance on-campus education and engage members of the community, both alumni and the public

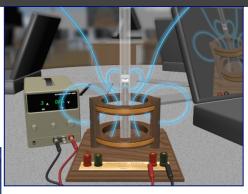
Electricity & Magnetism with Studio Physics

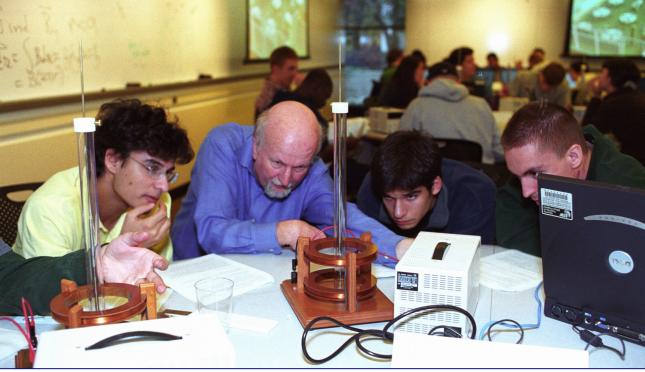
- Studio format
- Visualization/simulation
- Desktop lab experiments
- Student teams

Innovative

Learning

Environments





Now with ⁴ Virtual Worlds!

Robot World

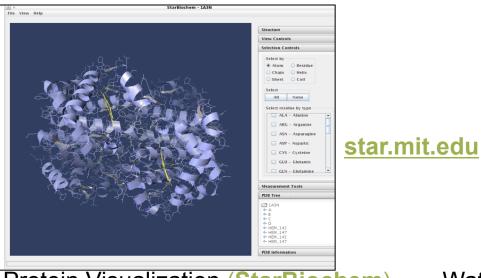
Project-Based Collaborative Engineering Design



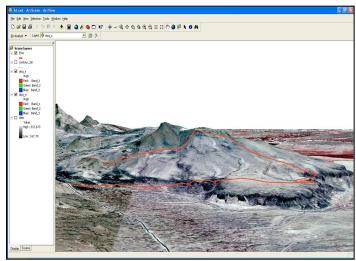


- Curriculum for design fundamentals
- Simulation tools
- On-line collaboration environments
- Peer-review assessment tools

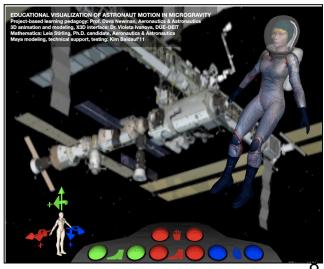
Biology Hydrology



Protein Visualization (StarBiochem)

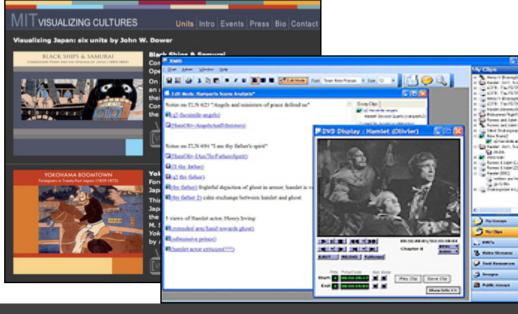


Watershed Mapping (StarHydro)



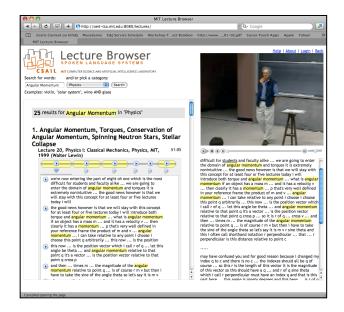
16.00AJ - Fundamentals of Engineering Design: Explore Space, Sea & Earth

Linking Content to the Curriculum



Multimedia and Image Tools

- Bringing close reading to media (xmas)
- Visual narratives (Visualizing Cultures)
- Searching across media repositories



Spoken Lecture Browser

- Leveraging Content across Courses
- Media Notebooks
- Deeper Learning

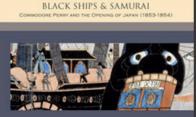


MIT Visualizing Cultures

IVII I VISUALIZING CULTURES

Units Intro Events risss bi

Visualizing Japan



Black Ships & Samurai Commodore Perry and the Opening of Japan (1853–1854)

On July 8, 1853, residents of feudal Japan beheld an astonishing sight; foreign warships entering their harbor under a cloud of black smoke. Commodore Matthew Perry had arrived to force the long-secluded country to open its doors. Essay by John W. Dower

VC Curriculum /C|TV]

YOKOHAMA BOOMTOWN reigners in Treaty-Port Japan (1859-1872)

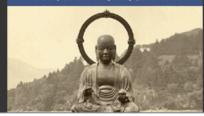


Yokohama Boomtown Foreigners in Treaty-Port Japan (1859–1872)

This window on the imagined life of foreigners in Japan at the dawn of the modern era is based on the catalogue of the 1990 exhibition at the Arthur M. Sackler Gallery, Smithsonian Institution, Yokohama: Prints from Nineteenth-Century Japan, by Ann Yonemura. Essay by John W. Dower.

VC|**TV]** [VC|Curriculum]

Felice Beato's Japan: Places An Album by the Planeer Foreign Photographer in Takahana

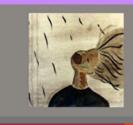


Felice Beato's Japan: Places An Album by the Pioneer Foreign Photographer in Yokohama

This 50-image album features scenes along the routes that foreign sightseers travelled in the opening years of the Meiji period. Album courtesy of the Hood Museum of Art, Dartmouth College. Essay by Allen Hockley



Ground Zero 1945



Ground Zero 1945



Yellow Promise/Yellow Peril Foreign Postcards of the Russo-Japanese War (1904–05)

The first war to be depicted internationally in postcards is captured here in these dramatic images. Produced in association with the Museum of Fine Arts, Boston. Essay by John W. Dower.



Ground Zero 1945 Pictures by Atomic Bomb Survivors

These drawings and paintings by Japanese survivors of the atomic bomb were created more than a quarter century after the bombs fell on Hiroshima and Nagasaki in August 1945. They are provided by the Hiroshima Peace Memorial Museum. Essay by John W. Dower.

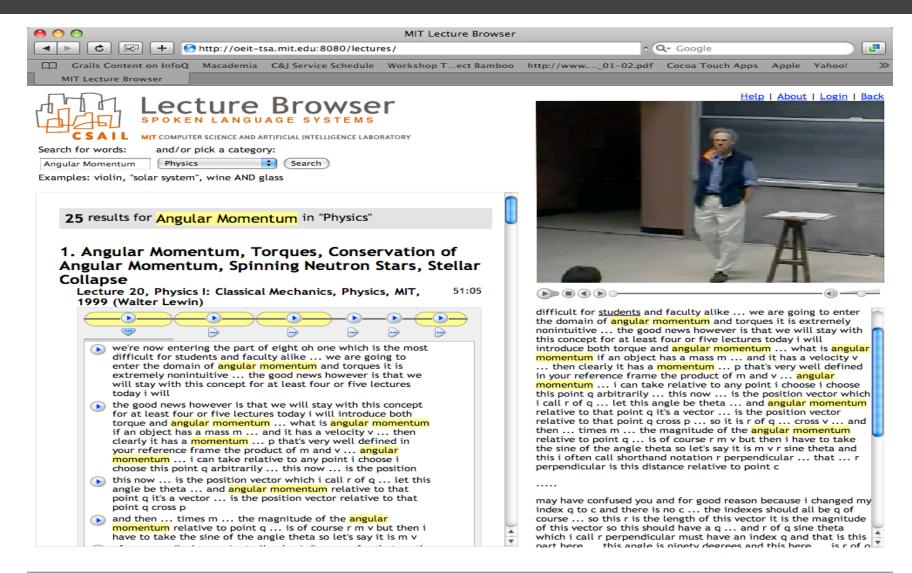


Ground Zero 1945 A Schoolboy's Story

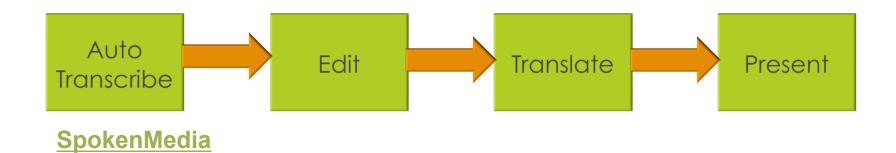
This unit presents the illustrated testimony of Akihiro Takahashi, who survived the atomic bombing of Hiroshima on August 6, 1945. Illustrations by Goro Shikoku, with English translation by Yuki Tanaka. Courtesy of Hiroshima Peace Institute.



Deeper Learning and Leveraged Resources



What did we do ifor IIHS in India?



How do we do it? Lecture Transcription

James Glass <u>SLS</u> glass@mit.edu

SPOKEN LANGUAGE SYSTEMS MIT Computer Science and Artificial Intelligence Laboratory

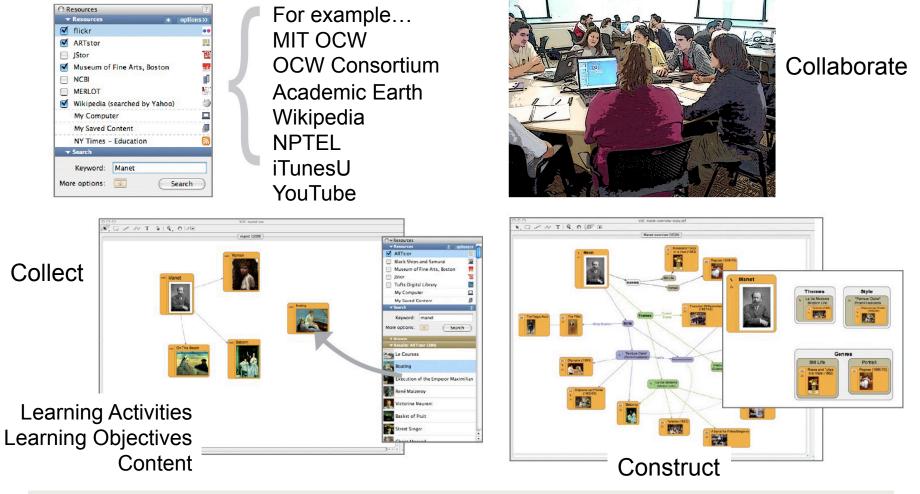
- **Spoken Lecture: research project**
- Speech recognition & automated transcription of lectures
- Why lectures?
 - Conversational, spontaneous, starts/stops
 - Different from broadcast news, other types of speech recognition
 - Specialized vocabularies

http://spokenmedia.mit.edu/demo/iihs/

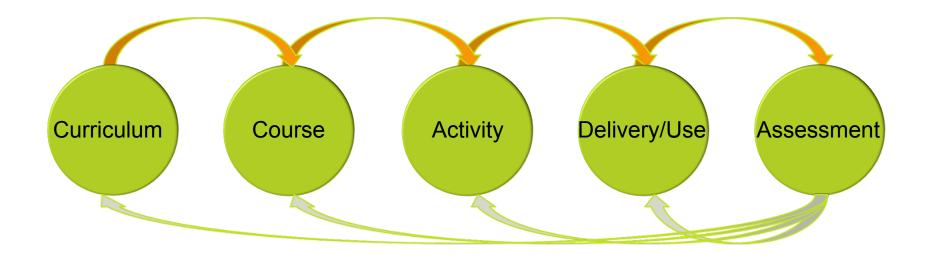
Process and Platform for Collaborative Course & Curriculum

: Finding \rightarrow Getting \rightarrow Building

Discover



Lifecycle



Concept Map of a Course Using Visual Understanding Editor (VUE)

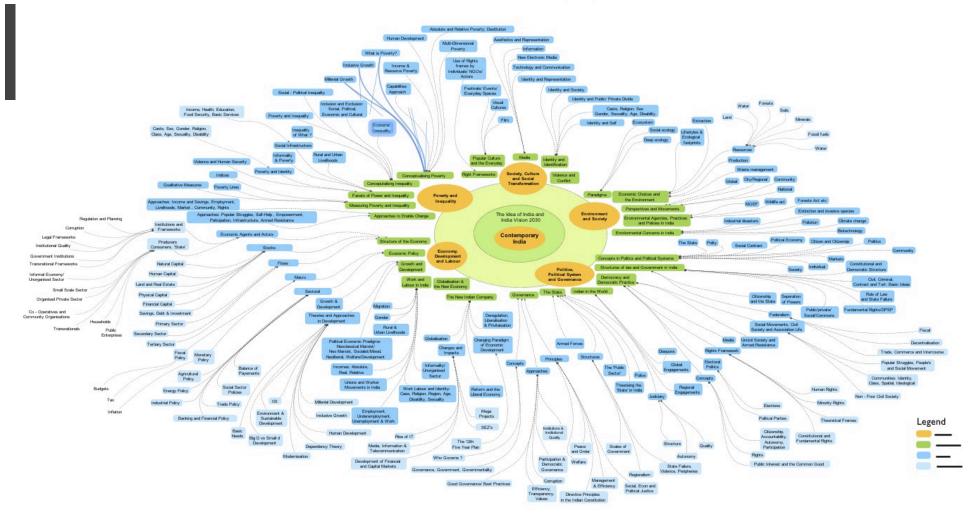
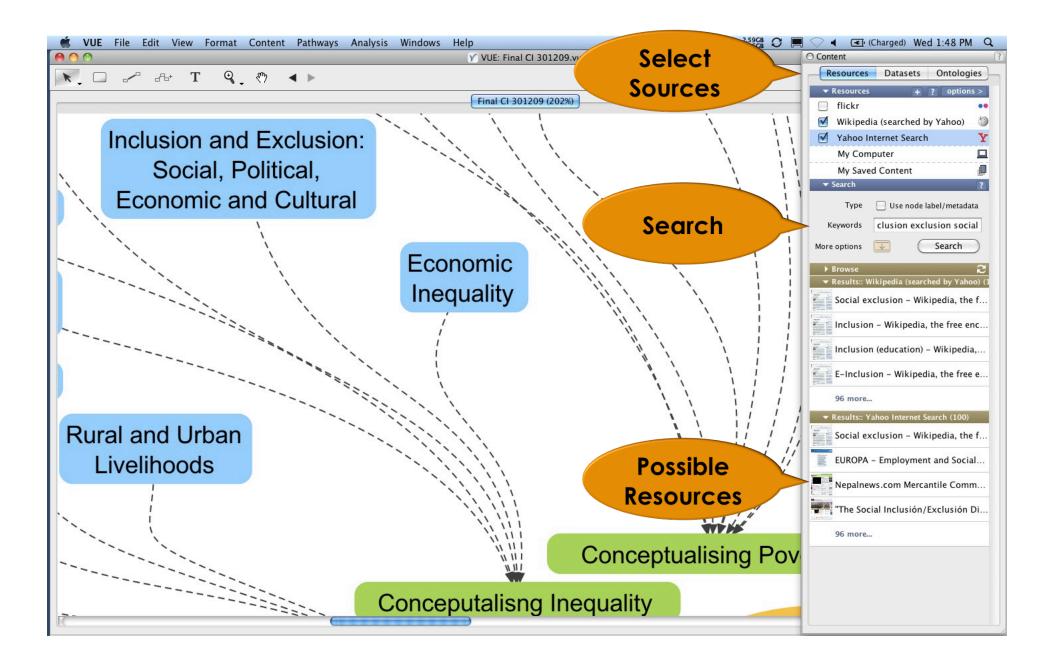
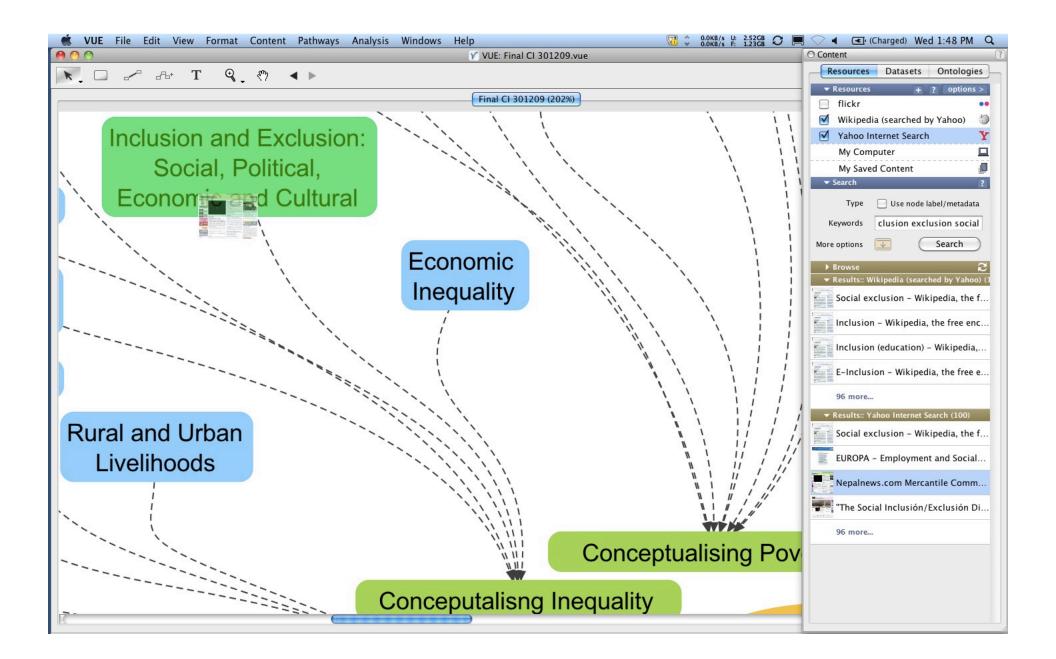


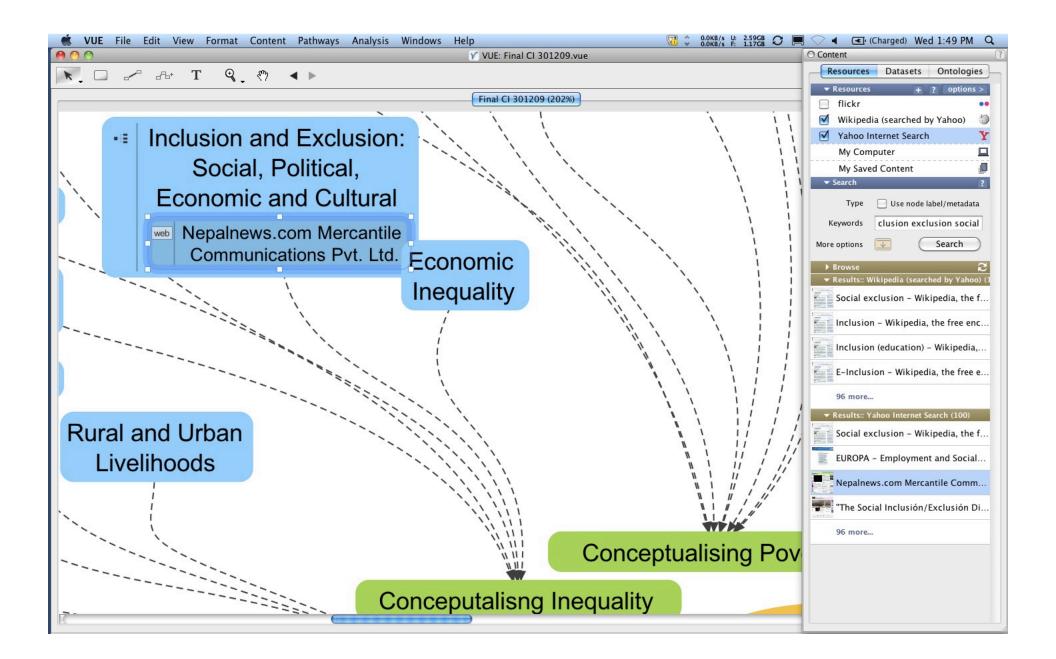
Figure 7: Commons Course - Contemporary India

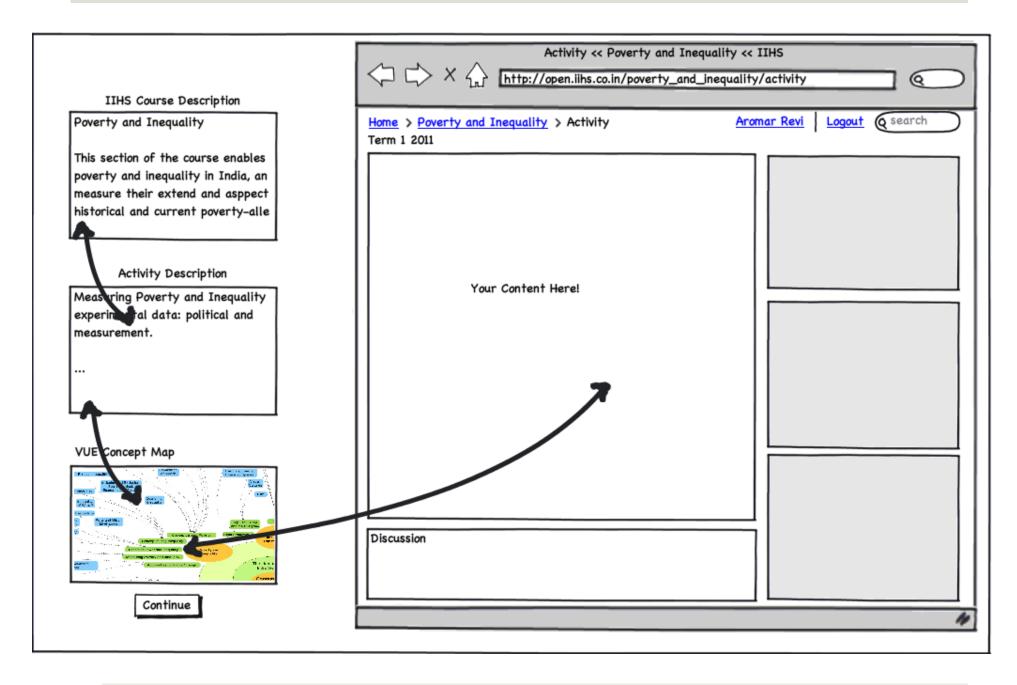


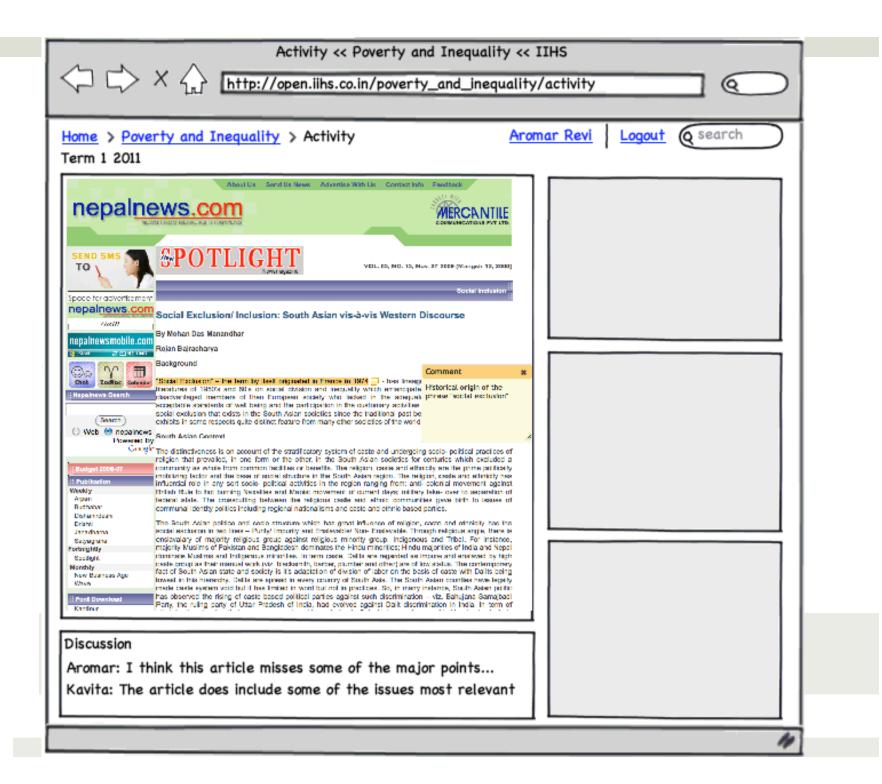


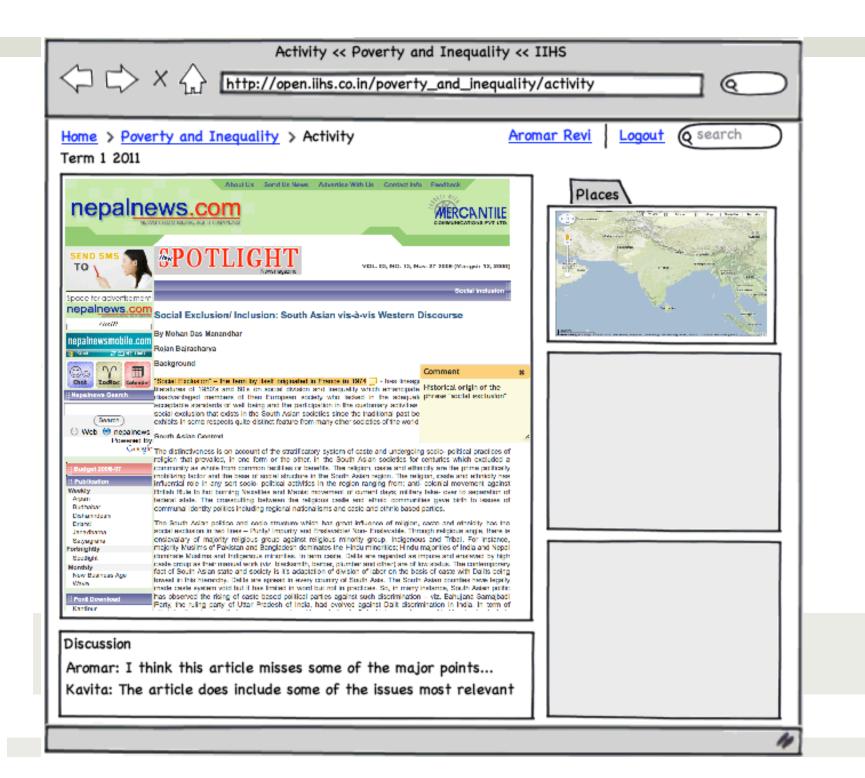


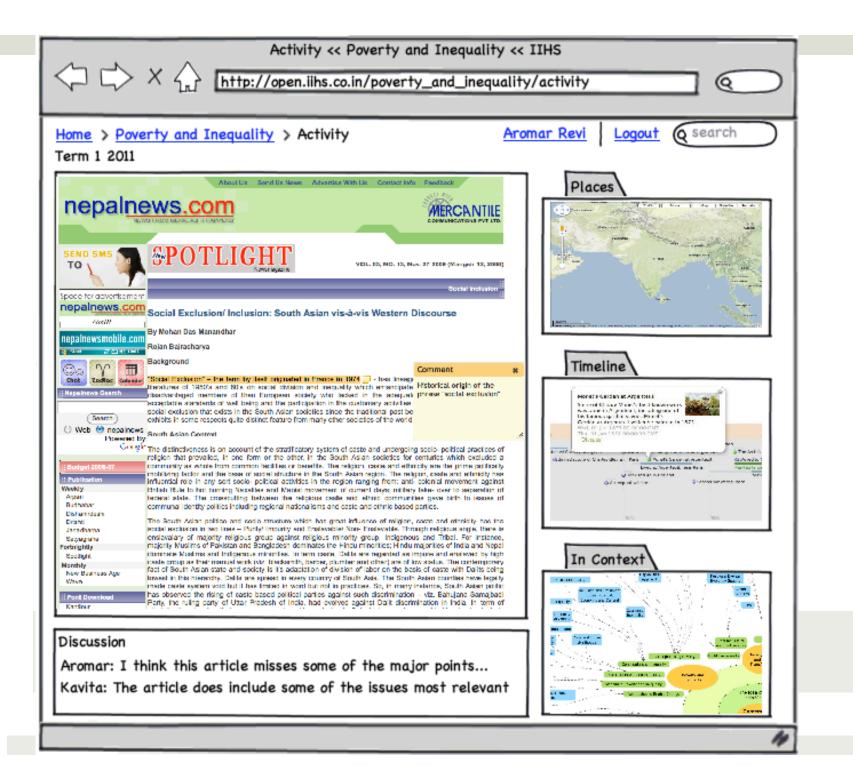














Content Readiness: Technical Development and Implementation

Content harvesting

 Automate the creation of metadata and other descriptive information, identify and tag conceptual information within content

Collective intelligence

Social tagging and social networking tools to help find useful materials more quickly and to share best practice

Content federation and re-aggregation

Transformative Potential: A Pedagogy of Abundance

Access: Scaling Excellence; Alternate Pathways; Localization; Participative

Blended Learning Boundary-less Education

C Continuous improvement C Continuous Education

Where are we going?

Visible

Situated

Receiving/ Knowing

Limited Term

Enrolled Student

Dropouts

DE Second Class

University



Usable

Anywhere;Virtual, Blended

Affecting

Varying/Lifelong

Registered Lifelong Member

100% of students Finish

Net Enabled Open Education Central Modality for delivery

Metaversity



We are seeing the early emergence of a meta-university—a transcendent, accessible, empowering, dynamic, communally constructed framework of open materials and scdent platforms on which much of higher education worldwide can be constructed or enhanced." --Charles M. Vest, President Emeritus, MIT, (p. 30). (Vest, C. (2006). Enabling Meta University, EDUCAUSE Review, May/June, (41:3), 18-30, <u>http://www.educause.edu/apps/er/erm06/erm0630.asp</u>)

If We Don't See You in the Future.....



.....We Will See You in the Pasture

Thank You

vkumar@mit.edu

- "How can we advance teaching and learning by taking full advantage of open education?"
- A hardcover book + free online distribution with Creative Commons
- 30 chapters by 38 prominent leaders and visionaries (Foreword by John Seely Brown)
- Lessons learned and visions of the future from: OKI, IMS, CNI, Sakai, Moodle, ETUDES, iCampus, VUE, Mellon Foundation, OCW, Connexions, OLI, MERLOT, OpenLearn, SOFIA, Creative Commons, LAMS, Hewlett Foundation, CASTL, VKP, ISSOTL, Open University, Carnegie Foundation, and more

OPENING UP Education

The Collective Advancement of Education through Open Technology, Open Content, and Open Knowledge



Toru Iiyoshi and M.S.Vijay Kumar

The Carnegie Foundation's Book on Open Education (Winter 2008, MIT Press)

Open... a preferred future for learning

"Recasting the role of the university education in light of an open world presents a value proposition far more profound than the free dissemination of educational tools and resources – it allows us to proactively construct new preferred learning."

Challenge: Recasting Resources, Relationships and Roles

Institutional Inertial Frames and Invariants

Scarcity vs. Abundance

Recasting roles and values

- Sense Making
- Ordering the digital disorder
- Pedagogical Shifts
 - □ Individual learning -> collaborative, social learning
 - **Co-development of knowledge with learners**

Credentialing

- **Distributed over time and place**
- P2P and Self-Learning

Recommendations

Investigate the Transformative Potential and ecological transitions

Systemic Consideration of Programs. Practices and Priorities

- **Re-contextualize Invariants**
- Build receptivity and support for the use of open educational resources at many levels.
- Make Practice and Knowledge Visible and Shareable.
- Make Open Education Solutions Sustainable.
 - Programmatic and technical integration
 - Synthesis and synergy
 - Governance

Thank You

Dr. M.S. Vijay Kumar

vkumar@mit.edu

Content is King, but Context Rules

"Water, Water, Everywhere, Nor any drop to drink."

— Coleridge, The Rime of the Ancient Mariner

Platform for Collaborative Course & Curriculum

Assembly of courses from content from separate physical repositories:

- MIT OCW Repository
- Other Sources
- Support the collaborative development of courses among faculty peers.
 - Wiki based authoring; Concept Mapping tools
- Options for Delivery of these courses.

Resource Sites

- web.sls.csail.mit.edu
- spokenmedia.mit.edu
- ocwfinder.org
- www.ocwconsortium.org/use/use-dynamic.html
- www.folksemantic.com
- oeit.mit.edu
- vue.tufts.edu
- nptel.iitm.ac.in
- <u>http://web.mit.edu/ocwhq/intel/contentreview/index.html</u>)
- <u>http://cnx.org/aboutus/technology/cnxml</u>)

Enabling Infrastructure: Functional Characteristics

- Flexibility
- Interactivity
- Proximity
- Adaptability

Spoken Lecture Project

James Glass glass@mit.edu



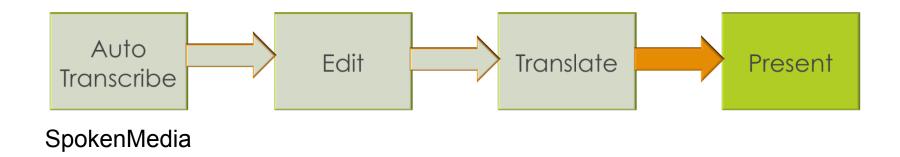
Processor, browser, workflow

Prototyped with lecture & seminar video

- MIT OCW (~300 hours, lectures)
- MIT World (~80 hours, seminar speakers)

Supported with iCampus MIT/Microsoft Alliance funding

How did we do it?





INDIAN INSTITUTE FOR HUMAN SE

Search transcript

Challenges of Planning, Critical Challenges facing Cities of Global South, IIHS, and Challenges within the IIHS Curriculum Framework

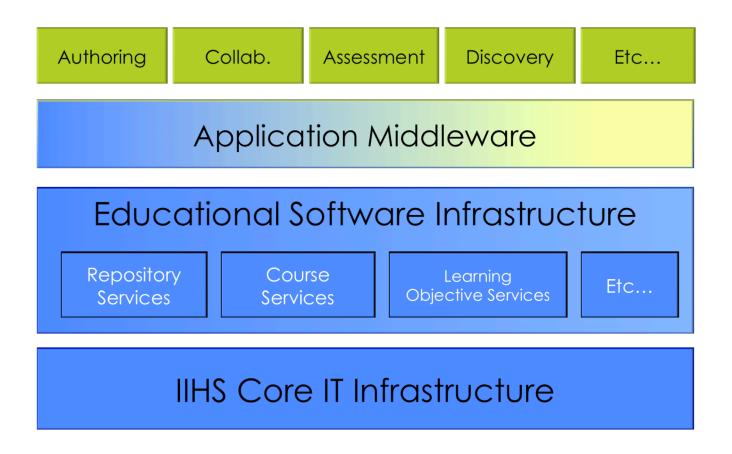


Prof. Bish Sanyal

I think one central challenge of planning is legitimacy of government as a key institution that should be involved in bringing the change The legitimacy of the government is under attack in many different parts of the world so that it has to be reestablished as a major planning institution I think the second challenge for planning at least in the US or the west is that the market is

Audio English (US) 🗘 Transcript English (US) 🗘

Open Framework for Flexible Education



...a possible vision

- Engaged with Peer-to-Peer University developing a platform to test the collaboration
 - Beta platform January 15
 - Course use February 1, 3.003 at MIT and P2PU courses

Starting a consortium, the Campus Project

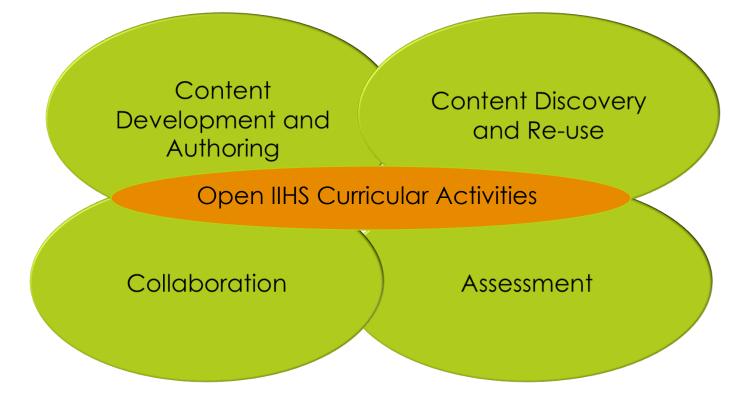
- Universidad Oberta de Catlunya
- Universite de Lyon

...a possible vision

- Open high quality digitized educational content, tools and communities
- Available anytime, anywhere for free; Localizable and re-mixable
- Greatly expanded and accepted pathways to learning : Alternate ways to learn: Accelerated/deeper learning
- Virtual "meta" universities created which offers access to cross-linked educational resources.
- Students keep the record of their own learning that has been validated in a variety of ways by a variety of educators.
- □ 100% of students finish college who enter college.

п

Open IIHS Interactive Education



Open IIHS is a realization of the WHOLE educational infrastructure

2 Demos from January 2010

SpokenMedia

- Video/audio transcription, enabling translation
- Process and tools
- "Access to high-quality learning must be open to all"

Open IIHS Experience

- Course/activity design; student interaction
- "Make curriculum openly available"



INDIAN INSTITUTE FOR HUMAN SE

Search transcript

Challenges of Planning, Critical Challenges facing Cities of Global South, IIHS, and Challenges within the IIHS Curriculum Framework



Prof. Bish Sanyal

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Audio English (US) 🗘 Transcript English (US) 🗘

Open Content MITOPENCOURSEWARE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

http://ocw.mit.edu/

"OpenCourseWare looks counter-intuitive in a market-driven world. It goes against the grain of current material values. But it really is consistent with what I believe is the best about MIT. It is innovative. It expresses our belief in the way education can be advanced – by constantly widening access to information and by inspiring others to participate."

> Charles M. Vest, President of MIT Sept. 2001



The Collectivity Culture

Meet Garret, Kristen, Aaron and Nick



.....from Gen Y



Our friends think that we are rocket scientists and astronauts

Because we work here



But truthfully, we tend to work just as much here.







Last week, we interacted with people from here ...



... friends, family, classmates, colleagues, even strangers.



They all wanted to know more about what we do at NASA.

So we got to thinking...



Why aren't they connected to NASA?

Why isn't a whole generation connecting to NASA?





First, better understand the audience

Then focus on getting us interested again



So the challenge is to take this and create new ideas.

Because the NASA we want to work for and connect to is like us:





Thank You vkumar@mit.edu

OPENING UP EDUCATION

The Collective Advancement of Education through Open Technology, Open Content, and Open Knowledge



Toru Iiyoshi and M.S.Vijay Kumar