



# Using MOOCs for Inter-Institutional Collaboration

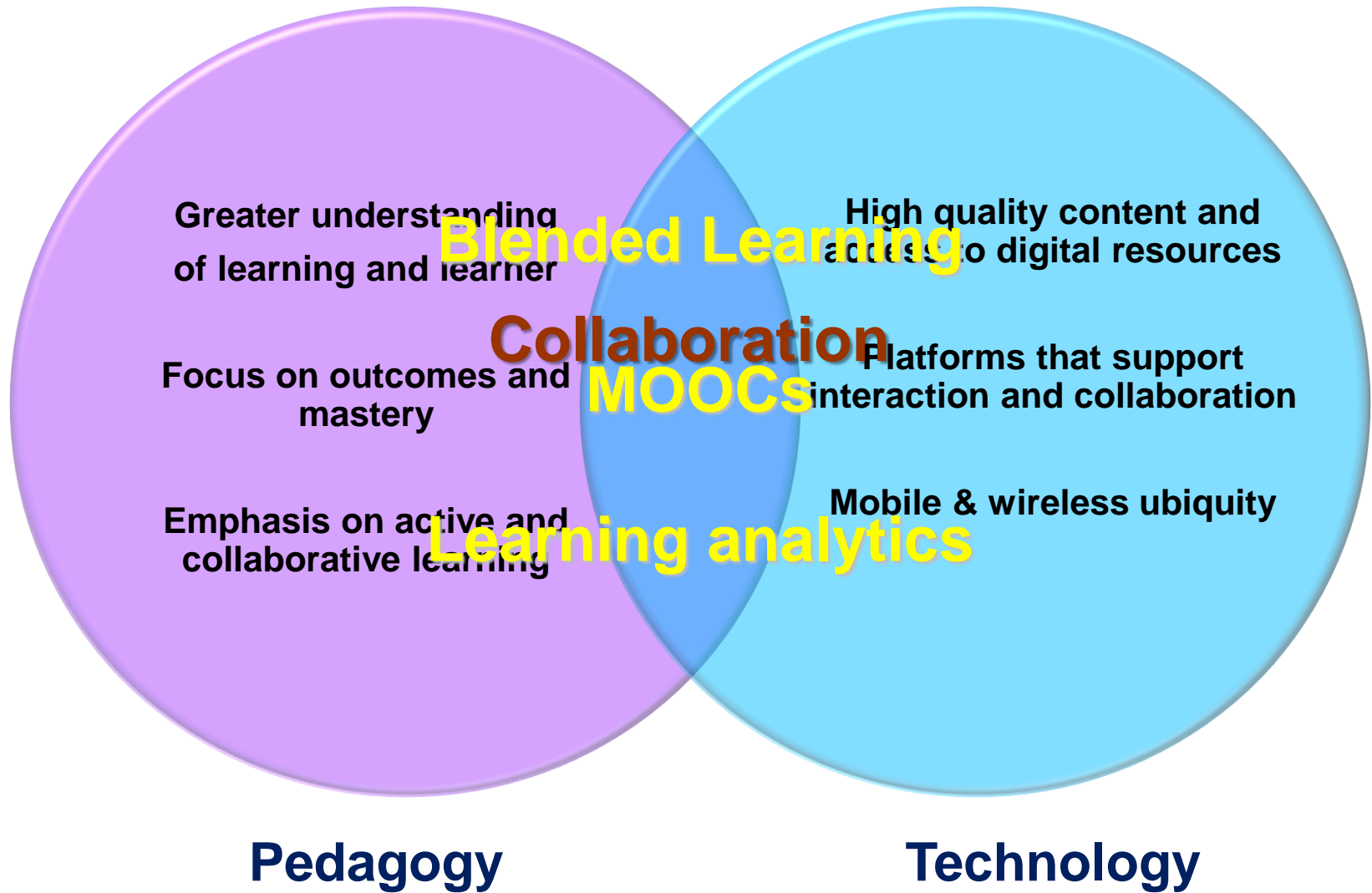
**T.C. Pong**

**Senior Advisor to the Executive Vice-President & Provost  
Director of Center for Engineering Education Innovation  
Professor of Computer Science & Engineering  
Hong Kong University of Science & Technology**

**7 January 2016**



# Trends and Convergence



A massive open online course (MOOC) is a type of online course aimed at large-scale participation and open access via the Internet.

- In addition to online video lectures, learners are involved actively in the learning process
- MOOCs go beyond just offering courses and content. Learning analytics allow us to understand how students learn and how teachers can improve their teaching.

# HKUST's MOOC Experience

25 INNOVATING TODAY  
IMAGINING TOMORROW  
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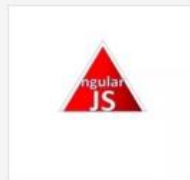
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## The Hong Kong University of Science and Technology

HKUST - A dynamic, international research university, in relentless pursuit of excellence, leading the advance of science and technology, and educating the new generation of front-runners for Asia and the world.



Front-End JavaScript Frameworks: AngularJS



Front-End Web UI Frameworks and Tools



Chinese Politics Part 1 - China and Political Science



Chinese Politics Part 2 - China and the World



Science, Technology, and Society in China I: Basic Concepts



The Science of Gastronomy



Understanding China, 1700-2000: A Data Analytic Approach, Part 1



Science, Technology, and Society in China III: The Present & Policy Implications

# HKUST's MOOC Experience



HOW IT WORKS

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SCHOOLS

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VERIFIED



HKUSTx  
ELEC1200.2x

A System View of  
Communications: From Signals to  
Packets (Part 2)

Starting Soon  
Starts: October 27, 2015



VERIFIED



HKUSTx  
ELEC1200.3x

A System View of  
Communications: From Signals to  
Packets (Part 3)

Upcoming  
Starts: January 15, 2016



VERIFIED



HKUSTx  
COMP102.1x

Introduction to Java Programming  
- Part 1

Current  
Starts: Anytime

Over 450,000 learners have registered for 12 MOOCs offered by HKUST



VERIFIED



HKUSTx  
ELEC1200.1x

A System View of  
Communications: From Signals to  
Packets (Part 1)

Current  
Starts: August 25, 2015



HKUSTx  
COMP107x

Introduction to Mobile Application  
Development using Android

Archived  
Starts: July 28, 2015



HKUSTx  
EBA102x

English for Doing Business in  
Asia- Writing

Archived  
Starts: June 2, 2015



# Hong Kong in the MOOC Arena



Courses ▾ How It Works ▾ Schools & Partners About ▾

I want to learn about...



Sign In

Register



## HKUx

[Back to schools and partners](#)

Free online courses from University of Hong Kong

Established in 1911, the University of Hong Kong (HKU) is the territory's oldest institute of higher learning. For more than a century, the University has committed itself to creating knowledge, providing education, and serving society. It has grown with Hong Kong and generations of our graduates have helped shape the city from which the university takes its name. Today, HKU is internationally renowned as a research-led comprehensive university, with frontier research endeavours and scholarly achievements that have won it worldwide acclaim.

[See more](#)

### University of Hong Kong MOOCs

Browse free online courses in a variety of subjects. University of Hong Kong 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.



HKUx  
HKU04x  
Making Sense of News

Upcoming  
Starts: February 16, 2016



HKUx  
HKU01x  
Epidemics

Archived  
Starts: September 15, 2015



HKUx  
HKU03x  
Humanity and Nature in Chinese Thought

Archived  
Starts: June 23, 2015

# Massive Open Online Program (MOOP)

**coursera**

Courses Specializations **New!** Institutions About | Sign In Sign Up

## Specializations

Master a skill with a targeted sequence of courses



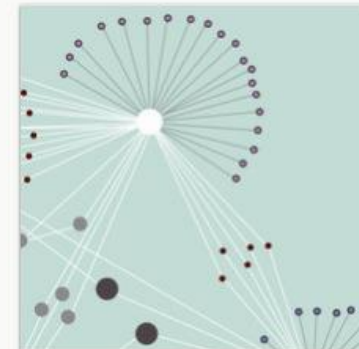
Data Science  
Johns Hopkins University



Entrepreneurship:  
Launching an Innovative  
Business  
University of Maryland, College  
Park



Digital Marketing  
University of Illinois at Urbana-  
Champaign



Data Mining  
University of Illinois at Urbana-  
Champaign

INNOVATING TODAY IMAGINING TOMORROW

# Coursera Specifications

## Request for Proposals

Coursera issued Request for Proposals (RFPs) in topics of high demand among learners:

- Software Development with Google
- Full Stack Web Development → **HKUST**
- Professional Sales
- Product Management
- Social Media Marketing
- People Management
- Business Strategy
- Data for Managers
- Introduction to Analytics (Business Analytics)
- Data Analysis Fundamentals
- Video Game Design
- iOS Application Development and Design



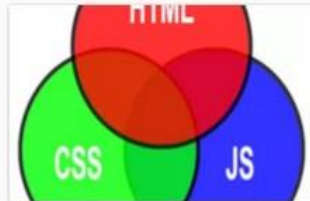
# HKUST's MOOC Experience

25 INNOVATING TODAY  
IMAGINING TOMORROW  
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HTML, CSS and JavaScript  
On-Demand



Server-side Development with NodeJS  
On-Demand



Multiplatform Mobile App Development  
with Web Technologies  
On-Demand



Front-End Web UI Frameworks and  
Tools  
On-Demand



Front-End JavaScript Frameworks:  
AngularJS  
On-Demand



Full Stack Web Development  
Specialization Capstone Project  
On-Demand

# Massive Open Online Degree (MOOD)

HOME NEWS LEARN COURSES PROGRAM INFO

Georgia Tech College of Computing

## ONLINE MASTER OF SCIENCE IN COMPUTER SCIENCE

*Offered in collaboration with Udacity and AT&T*

### The Story

The Georgia Institute of Technology, Udacity and AT&T have teamed up to offer the first accredited Master of Science in Computer Science that students can earn exclusively through the Massive Open Online Course (MOOC) delivery format and for a fraction of the cost of

### The Buzz

- ▶ [Presidential Double-Down: Obama Praises OMS CS for 2nd Time](#) - Georgia Tech College of Computing
- ▶ [Ga. Tech's MOOC Master's Degree Program Off to Solid Start](#) - WABE Atlanta

# The first MBA on Coursera from the University of Illinois

**Coursera**

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S Pong ▾



## University of Illinois iMBA Program

Learn the strategic approach to management with a flexible, online MBA curriculum. A high-quality and affordable program from the University of Illinois, built on Coursera Specializations.



### About the Course

**START WITH A SPECIALIZATION, BUILD TOWARD A REAL DEGREE**

Master corporate finance, strategy, marketing, social responsibility, and more— learn everything you need to excel in today's global business environment.

#### About the iMBA

The University of Illinois is partnering with Coursera to launch the first online MBA delivered in part through the Coursera platform. This program is ideal if you're interested in an MBA, or if you're simply interested in the individual Specializations in the program.

### Sessions

Future Sessions ▾

Add to Watchlist

### Course at a Glance

🌐 English

### Instructors



The MIT logo, consisting of the letters 'MIT' in a stylized, blocky font, is centered above the dome of the building.

MIT's #1 ranked Supply Chain Management program, now delivered in additional new ways...

MIT proudly announces two new programs that offer learners around the world new ways to learn with MIT. Supply Chain professionals who seek a residential program can still apply to MIT's 1-year masters degree in SCM. In addition, the same program and the SCM degree are now available through a new additional path: half online , half on campus.

Major MOOC platforms:

- Coursera and edX in the US
- FutureLearn in the UK
- France Université Numérique (France Digital University) in France
- Iversity in Germany
- Open2Study in Australia
- XuetangX & CNMOOC in China
- JMOOC in Japan
- KMOOC in Korea
- .....

# A Joint E-learning/MOOC Platform for Hong Kong's Tertiary Education Sector

<http://hkmooc.hk/>



REGISTER NOW

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Welcome to Open edX @ HKMOOC!

*This is the homepage of HKMOOC,  
the MOOC platform for Hong Kong's Tertiary Education Sector.*

COMP1022P Introduction to Computing with Java →

HKUSTx

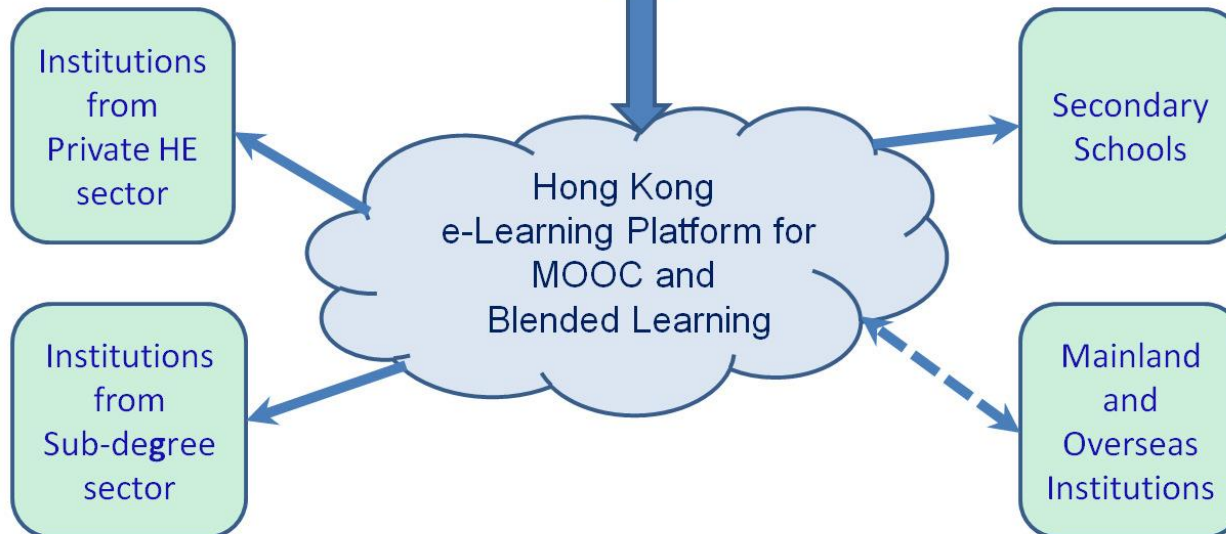
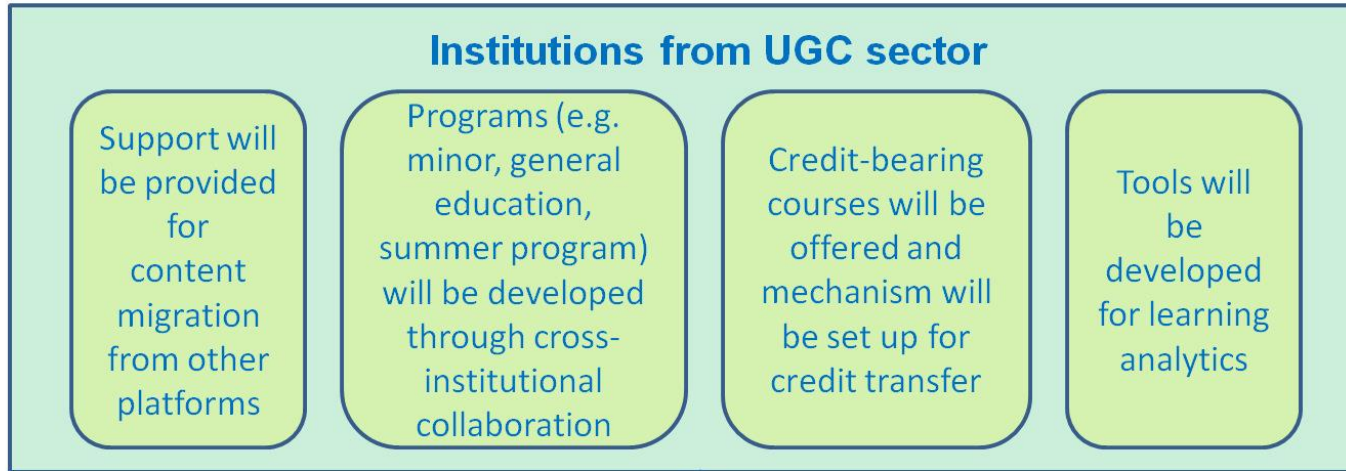


# A Joint E-learning/MOOC Platform for Hong Kong's Tertiary Education Sector

## Project Objectives:

- To establish a joint e-learning platform for the sharing of online courses among UGC institutions.
- To use the platform for piloting innovative pedagogies such as active learning, flipped classroom and peer instruction.
- To foster collaboration among institutions by packaging related courses offered by different institutions into curriculum programs.
- To provide a platform for collecting data on students' learning patterns and perform learning analytics for enhancing the learning experience of students.
- To provide a platform for outreaching to post-secondary and secondary school sectors.

# A Joint E-learning/MOOC Platform for Hong Kong's Tertiary Education Sector



Note: Access from outside UGC sector would not be subsidized by UGC fund.

# Blended Learning and MOOC: Introduction to Computing with Java

- Offered as a flipped course in Spring 2014 and 2015
  - The course was offered with enrollments of up to 65 students.
  - Students watch online lecture videos and participate in online quizzes before class.
  - Classes start with Q&A and then redo some of the online quizzes.
  - Students then participate in group discussions and activities.



# Classroom for Active Learning



# Student Performance vs Video Views

Total number of videos = 44

Average video hit counts per student per video

Student groups	No. of students	Total views	Average views
Midterm score $\geq 90$	25	1465	1.33
Midterm score $\geq 80$	54	2975	1.25
Midterm score $\geq 50$	92	4846	1.20
Midterm score $< 50$	15	607	0.92

# Blended Learning and MOOC: Introduction to Computing with Java

- Offered as a flipped course in Spring 2014
  - The course is divided into two sections of 45 and 65 students.
  - Students watch online lecture videos and participate in online quizzes before class.
  - Classes start with Q&A and then redo some of the online quizzes.
  - Students then participate in group discussions and activities.
- Offered as a MOOC on edX started in June 2014



# MOOC on edX: Introduction to Computing with Java



HOW IT WORKS COURSES SCHOOLS & PARTNERS REGISTER NOW

log in



## Introduction to Computing with Java

Designed to equip students with the fundamental elements of programming and data abstraction using Java.

### About this Course

Do you wish to become a better problem solver?

This course aims to provide you with a good understanding of basic Java programming elements and data abstraction using problem representation and object-oriented framework. As the saying goes, "A picture is worth a



School:	HKUSTx
Course Code:	COMP102x
Classes Start:	June 2014
Course Length:	10 weeks
Estimated effort:	3 - 5 hours/week

Register for **COMP102x**



# Introduction to Computing with Java: Demographic Distribution

## Geography Metrics

185

Total Countries  
Represented

United States

Top Country by  
Enrollment

23% of students

India

Second Country by  
Enrollment

23% of students

United Kin...

Third Country by  
Enrollment

3% of students

## Geographic Breakdown

Download CSV

Country	Percent	Total Enrollment
United States	22.8%	8,119
India	22.7%	8,073
United Kingdom	3.0%	1,070
Spain	2.9%	1,021
Canada	2.3%	817
Brazil	2.2%	770
China	2.0%	726
Mexico	1.8%	641
Pakistan	1.7%	596
Germany	1.6%	574

Show 10 entries

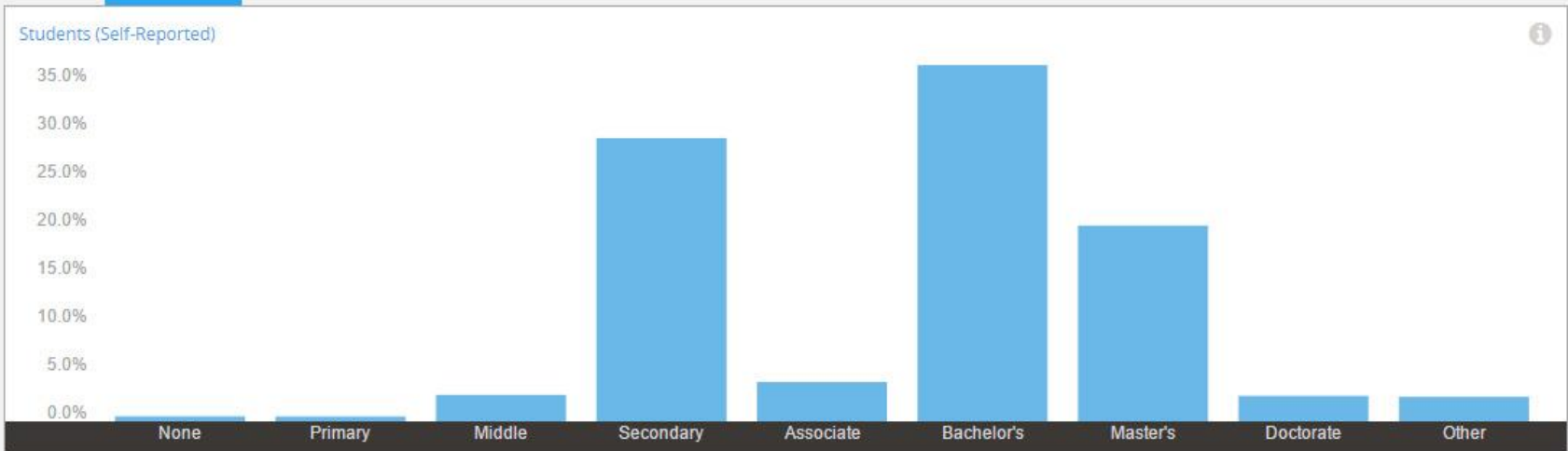
< Previous 1 2 3 4 5 ... 19 Next >

# Introduction to Computing with Java: Demographic Distribution

ENROLLMENT Activity Demographics Geography

Age Education Gender

What level of education do my students have?



## Education Metrics

32.7%  
High School Diploma or Less

41.2%  
College Degree

23.0%  
Advanced Degree



## Top Students with almost perfect scores

#	grade	gender	level_of_education	Location
1	100.00%	m	Master Degree	Beograd, Republic of Serbia
2	100.00%	NONE	NONE	Brisbane, Australia
3	100.00%	m	Junior High School	New Delhi, India
4	100.00%	m	Bachelor Degree	Caracas, Venezuela
5	100.00%	NONE	NONE	Brzezce, Poland
6	100.00%	m	High School	New Delhi, India
7	99.50%	f	Master Degree	United Kingdom
8	99.33%	m	Bachelor Degree	Hong Kong
9	99.20%	m	Junior High School	Polska, Poland
10	99.20%	m	Bachelor Degree	Tombolo, Italy
11	99.20%	None	None	Sao Paulo, Brazil
12	99.10%	m	High School	Hyderabad, India

## VisMOOC: A visual analytics tool for MOOC developed by Prof. Huamin Qu's research group

VisMOOC : Visual Analytics for Massive Open Online Courses

HKUST About Us Help

Course Name

A New History for a New China, 1700

Select a Course

A New History for a New China, 1700-2000: New Data and New Methods

The Science of Gastronomy

Introduction to Computing with Java

1.2: Who Gets What and Why? (3:34)

1.3: Social Mobility and the Examination System in Late Imperial China (20:25)


1.4: Cultural Reproduction and Education in Late Imperial and Contemporary China (14:10)

Week 2

2.1: Comparing Inequality in Education and Income Between China and the West (11:3)

666

600



Stacked Stream Expanded

play pause seeked ratechange stalled error

Course

Course Info

Popularity Info

Demographic Info

Video

Temporal Info

Forum

Sentiment Analysis



# Learning Analysis on clickstream patterns

## Course Name

Introduction to Computing with Ja

### Week 1

Course Team

Learning Objectives

What is a Well-defined Problem?

Finding the best way to travel from Hong Kong to London

Learning Objectives (Cont.)

Hardware

Software

Application Software and Operating System

Programming Languages

Problem Solving

The Game of Tic-tac-toe

Square Apple Problem

Importance of Problem Representation

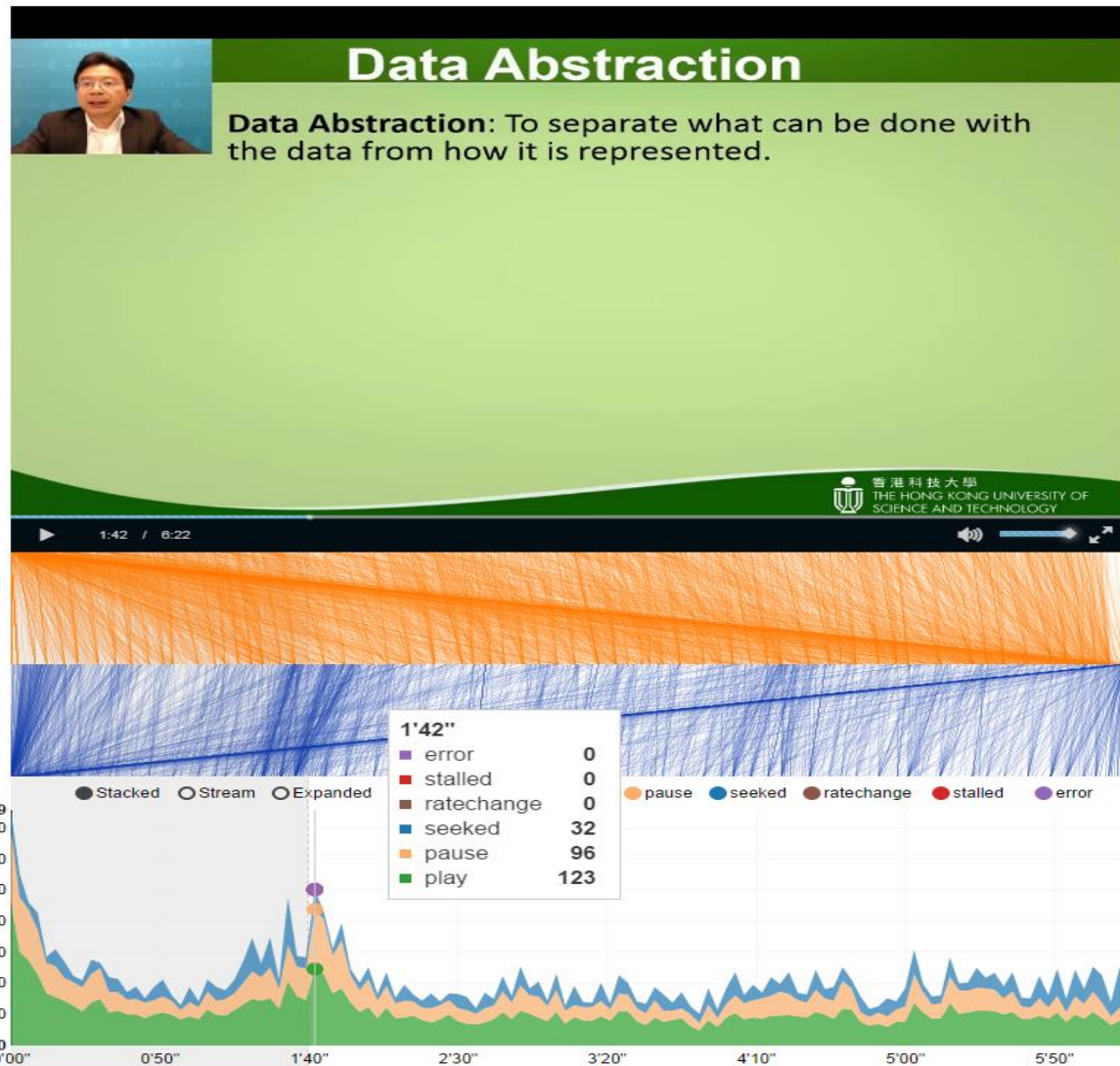
HelloWorld

### Week 2

Message from the Instructor

Introduction

CourseGrade Example



## Course

Course Info

Popularity Info

Demographic Info

## Video

Temporal Info

## Forum



# Using MOOCs for Asynchronous Flipped Courses

A model for offering course credits by combining MOOCs and face-to-face instructions

- Students from HKUST and partner institutions:
  - Complete the MOOC during Fall/Spring semester
  - Take an assessment to confirm participation
  - Enroll in a face-to-face Winter/Summer session and earn academic credits for the course
- A model to use MOOCs for expanding the international student exchange program and outreach to secondary school students

# Data Science and E-learning Research Cluster

A Data Science and E-learning Research Cluster was established under the HKUST–MIT Research Alliance Consortium:

- A tripartite collaboration between universities and industries with 1:9 matching funding support from the government.
- Aims at conducting pre-competitive research with industry partners to develop innovative teaching and learning technologies in the following areas:
  - Design and development of e-learning platform
  - E-learning content development
  - Learning analytics tools
  - Crowdsourcing and social network for education purpose
  - Knowledge mining from e-learning content
  - Bridging big data analytics and behavioral sciences
- Proposals have been prepared through collaborations among Hong Kong universities and MIT.

# MOOCs as a Platform for Inter-institutional Collaboration

Using MOOCs for inter-institutional collaborations in education and research:

- *Using MOOCs as bases for developing blended / flipped courses*
- *Using the data collected to perform learning analytics for improving the learning experience of students.*
- *Outreaching to students, including secondary school and sub-degree students, around the world*
- *Extending MOOCs in Summer/Winter terms for student exchange programs*
- *Packaging MOOCs into curriculum programs – Massive Open Online Program/Degree (MOOP/MOOD)*
- *Conducting research on issues related to MOOCs*



**Thank you!**

