Chapter 6: MOOCs

Pierre Dillenbourg and Patrick Jermann
Luis Prieto, Beat Schwendimann, Łukasz Kidziński, Nan Li, Ksitij Sharma, Himanshu Verma
Massive Open Online Courses (2008)
Virtual Campus (2000)
Virtual University (1999)
Open Learning (1995)
e-Learning (1993)
Online Education (1993)
Computer-Mediated Learning (1990)
Educational telematics (1988)
Computer-Assisted Learning (1985)
Computer-Based Learning (1980)
Computer-Assisted Instruction (1960)
Why?

Context
- Financial crisis of US universities
- Huge debts of US students
- Ubiquitous internet
- Videos as a substance

Novelty
- Timing
- Crowdsourcing
- ...

• •
Evaluation ?
Correlation between peer’s grades and TA’s grades

$$R = .51$$

$$R = .55$$

EPFL Center for Digital Education
1 Who?
Plus haut niveau de formation des participants

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No HS</td>
<td></td>
</tr>
<tr>
<td>Some HS</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td></td>
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<tr>
<td>Some Univ</td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>45</td>
</tr>
<tr>
<td>PhD</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>
we loose control
• My students

• My colleague’s students

• All students (50kBel)

• Your employees

• Florence Colomb
students are no more prisonners
2 Why?
What motivates students to enroll?

Median and range across 5 post-course surveys

Yvonne Belanger, head Assessment & Planning, Duke University
In a MOOC, how much time do students take to watch the video material that correspond to a 2 hours lecture?

- 1.5 h ✓
- 3 h ✓
- 5 h ✓
« A MOOC »
3 Where?
Participants in EPFL MOOCs
(2012-2014, N=402,499, N=28 sessions)

<table>
<thead>
<tr>
<th>Region</th>
<th>Participants (people who connected to the course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>![Switzerland](10000, 10000)</td>
</tr>
<tr>
<td>Europe</td>
<td>![Europe](100000, 100000)</td>
</tr>
<tr>
<td>Americas</td>
<td>![Americas](100000, 100000)</td>
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<td>Asia</td>
<td>![Asia](100000, 100000)</td>
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<tr>
<td>Africa</td>
<td>![Africa](10000, 10000)</td>
</tr>
<tr>
<td>Oceania</td>
<td>![Oceania](1000, 1000)</td>
</tr>
</tbody>
</table>

- **Green**: french
- **Blue**: english
Exams?

Department of Computer Science

The Department of Computer Science is responsible for teaching and research in computer science at the University of Helsinki.

Functional Programming Principles in Scala, Martin Odersky's MOOC available for our students

Prof. Martin Odersky from EPFL (Lausanne, Switzerland) hosts a MOOC in Scala programming (Coursera) starting on September 18:

https://www.coursera.org/course/proglun

Pietu Pohjalainen, teacher at our department, follows the course and organizes a local evaluation (=exam) after the course. Successful completion is equivalent to our course Programming in Scala. Number of credits (ECTS) will be decided during the course; it will be equivalent to the workload according to our university's principles.

The pre-announced effort estimate results the amount of credits to equal to 2 ECTS.

To attend, first sign up to the course at Coursera web site. You'll receive the credit units after attending to the department's exam and you've shown the Coursera certificate to the instructor. (The deadline for the Coursera exercises is after the exam date). The exam time is at 16.11.2012 from 4 PM to 8 PM in classroom A111.

Note! This is the only scheduled exam for the course!
academic

landslides
4 What?
Activity levels (out of 100% registered, N=400'000)

- Come Once: 73%
- Watch Video: 61%
- Do Video Quizzes: 41%
- Turn in Assessment: 25%
- Do quizz exercises: 23%
- Get certificate: 8%
Emerging Student Patterns in Coursera-style MOOCs
Course (MOOCs)

Specialisation

Curriculum

Capstone Project

Concept (Khan Academy, Wandida)

Fragment (‘Open Educational Resources’)
5 BOOKs!
Mécanique

Jean-Philippe Ansermet

Deuxième édition largement remaniée

Compatible MOOC EPFL
100 pages de problèmes résolus

Presses polytechniques et universitaires romandes
Publisher of the EPFL Press

MOOCs save BOOKs
MOOC-BOOK Player

By Nan Li (EPFL)
On campus?
« Flipped Class »

- Re-explain
- Complex problems
- Exercises

- Experiments

- MOOC as textbook

Standard Lecture
Watching MOOCs in teams
we are social animals
7 Our Students?
Fears First

Loss of contact

Privacy
Answers from 84 EPFL students, M. Odersly & H. Miller
our MOOCs are not ‘cool’
«In the future, I would prefer to take this course.»
MOOOC
Good MOOCs are (in general) better than bad MOOCs
8 Teachers
Now they know !
MOOCs turned teaching into a high-stake activity
HIGH learning gain

LOW learning Gain

Kshitij Sharma, Himanshu Verma, Daniella Caballero, Patrick Jermann, Pierre Dillenbourg

EPFL Center for Digital Education
Is this hand useful?

Kshitij Sharma, Patrick Jermann, Pierre Dillenbourg
EPFL Center for Digital Education
Eye tracking experiment on MOOC Video

Following teacher’s references

Gaze of students’ watching Scala course by Prof. Martin Odersky (EPFL, Switzerland)

K. Sharma, P. Jermann, P. Dillenbourg
@ CHILI – http://chili.epfl.ch
Supported by the Swiss National Science Foundation (Grants CR1211_132996 and PZ00P2_126611)
« withmeness »

Time [msec] to visit the referred sites, first time

First Fixation Duration [msec] the referred site

Kshitij Sharma, Patrick Jermann, Pierre Dillenbourg
EPFL Center for Digital Education
Recurrence

Withmeness → Recurrence
9 Corporate
Please upload 3 pictures of soil erosion
20’000 \times 3 / 0.5 = 30’000 \text{ pictures}
Is it geological erosion or accelerated erosion?

Which one illustrates the best erosion?

30’000 pictures
Geological erosion

10,000

Accelerated erosion

12,000

8,000
Select top 5% pictures

500
Geological erosion

600
Accelerated erosion
Moocs questions the structure of corporate training: human resources, management, customer relationship, ... 

Training becomes a product
Will small universities disappear?
Will there still be MOOCs in 5 years?
MOOCs are just one visible sign of a deeper change
Better be an actor than a spectator

Pierre Dillenbourg, Center for Digital Education, EPFL