

# MocViz: A Large Scale, Open Access, Collaborative, Data Analytics Platform for MOOCs

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## Abstract

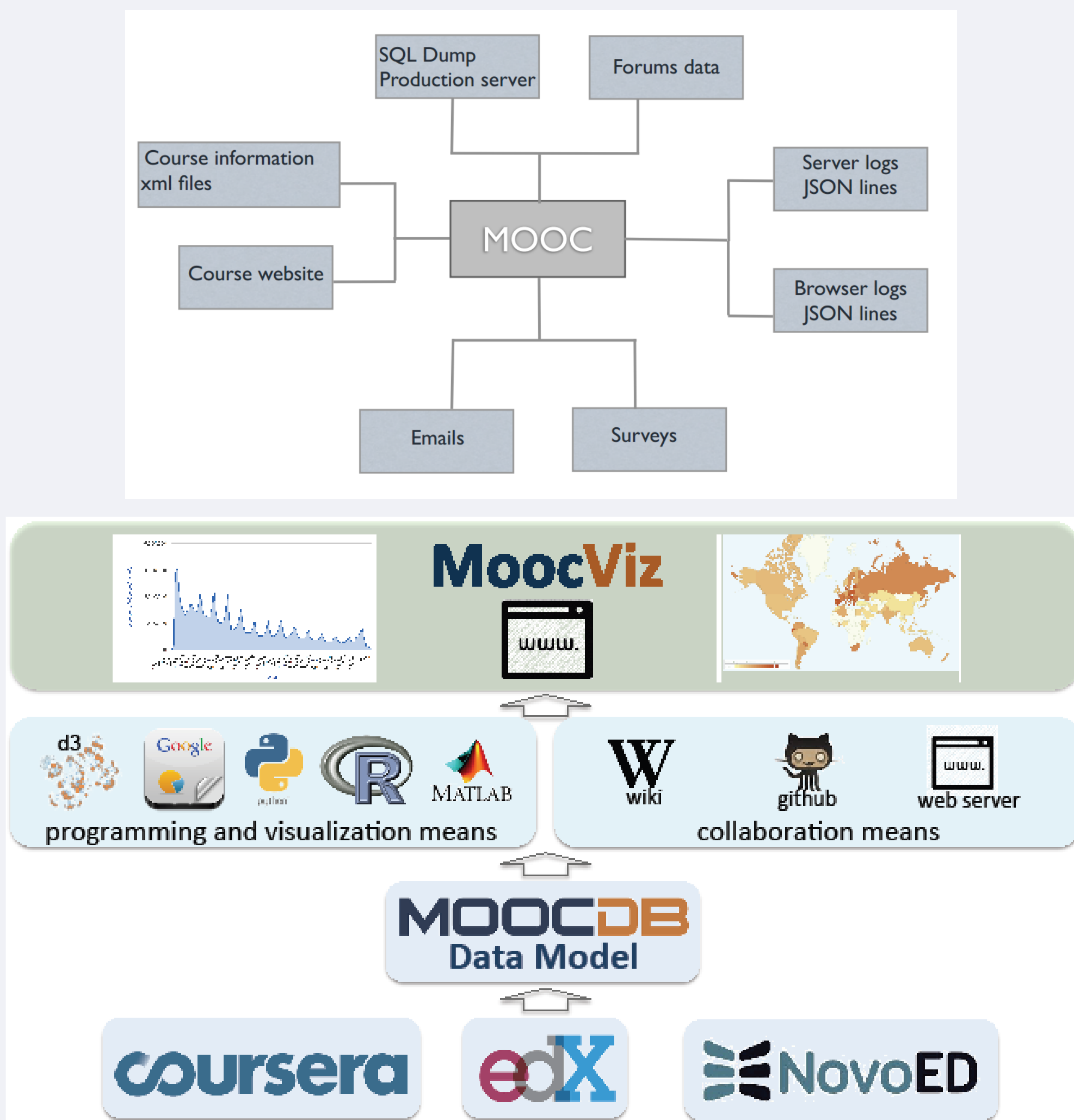
We present an **open access large scale analytics platform** that helps researchers analyze MOOC data from multiple platforms without the need to share the data.

The platform allows researchers to **share their scripts and effort**, compare results and attempts to engage the community to achieve shared educational science goals.

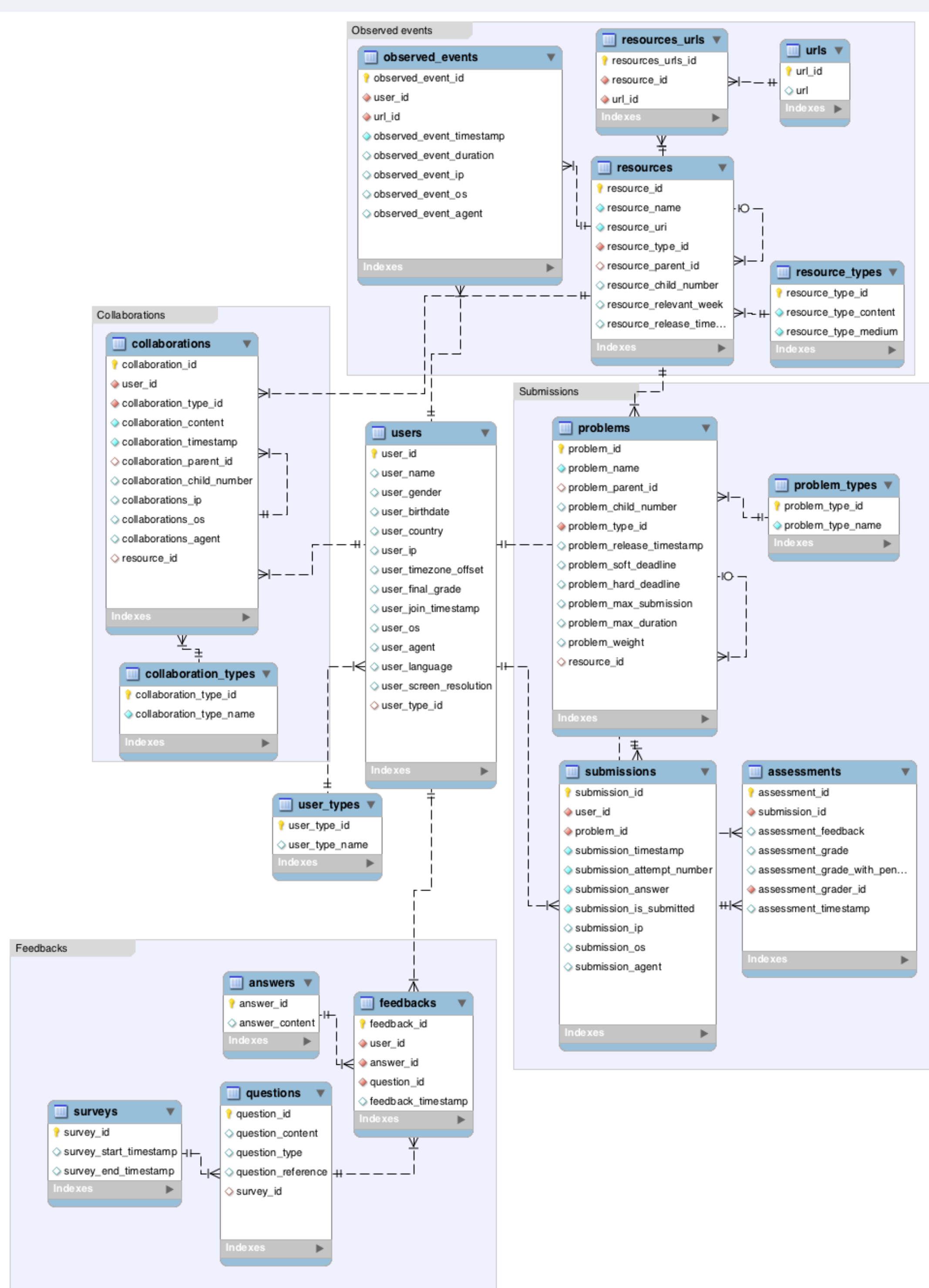
We demonstrate the platform's capability by **analyzing data from two MOOCs**, one from Coursera (offered by Stanford University) and one from edX (offered by MITx).

## 1. Introduction / Motivation

Conducting MOOC research with one or multiple platforms' behavioral data, or interacting with the data in even simple ways is an overwhelming challenge.

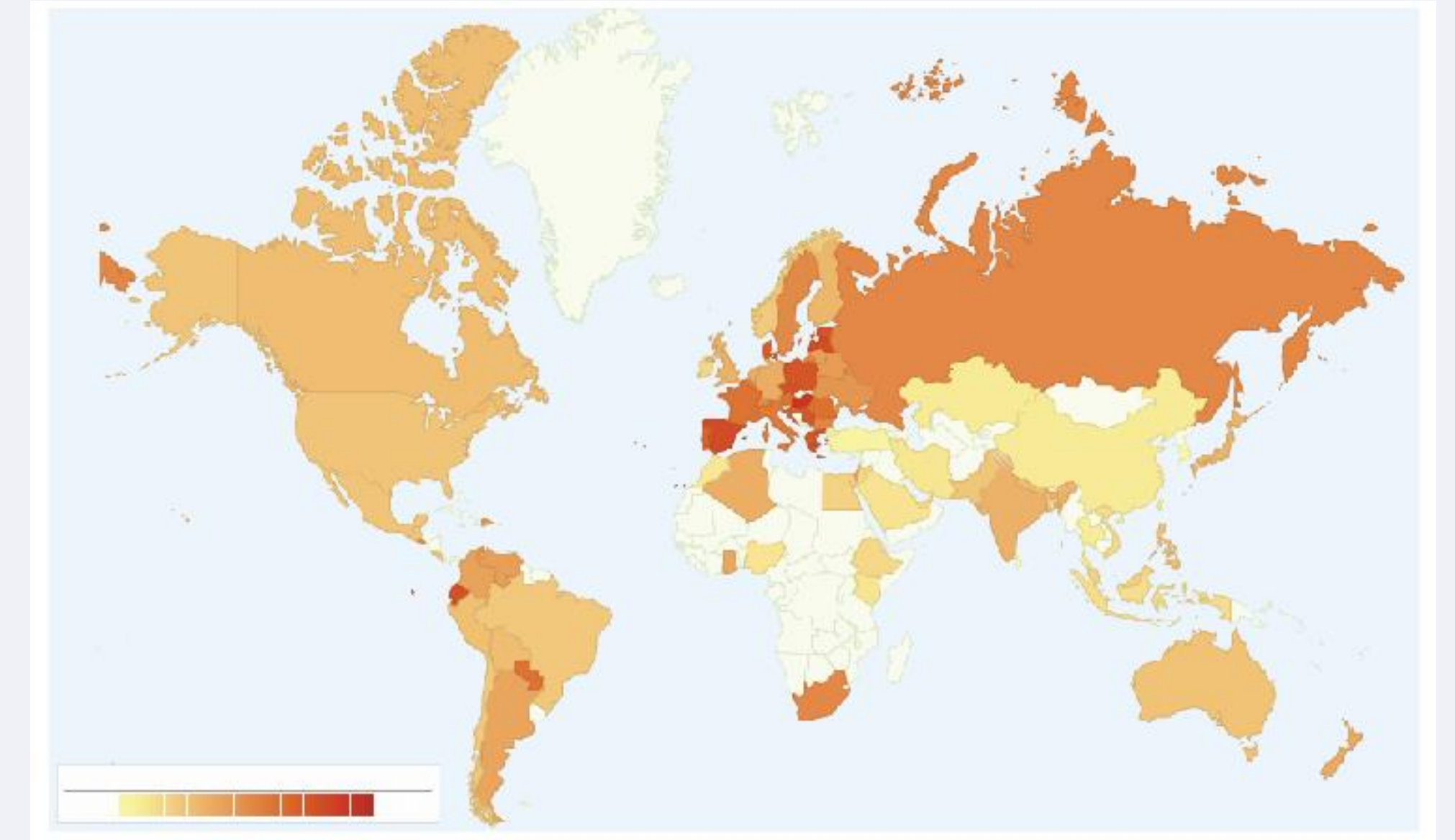
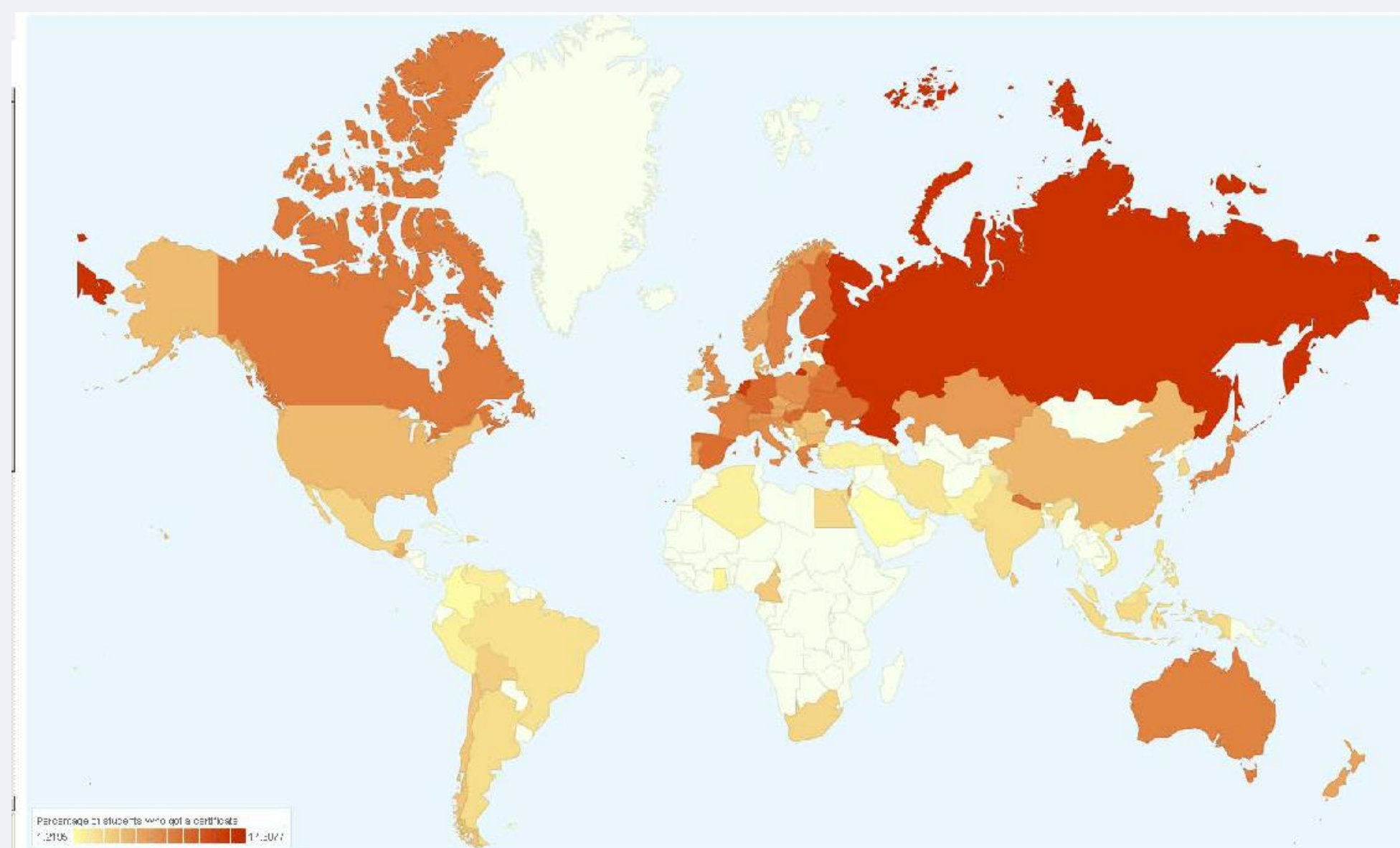


## 2. MOOCdb schema

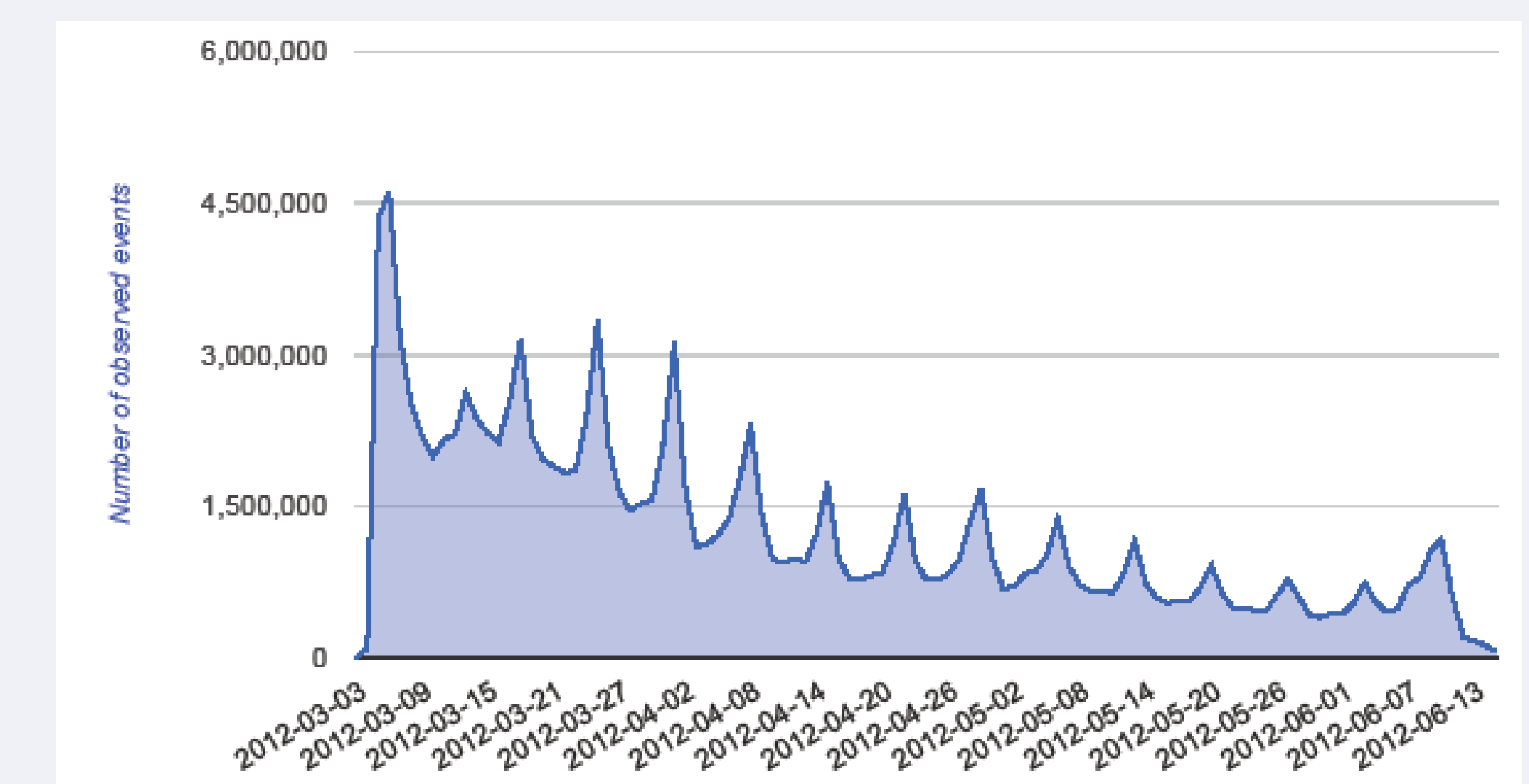
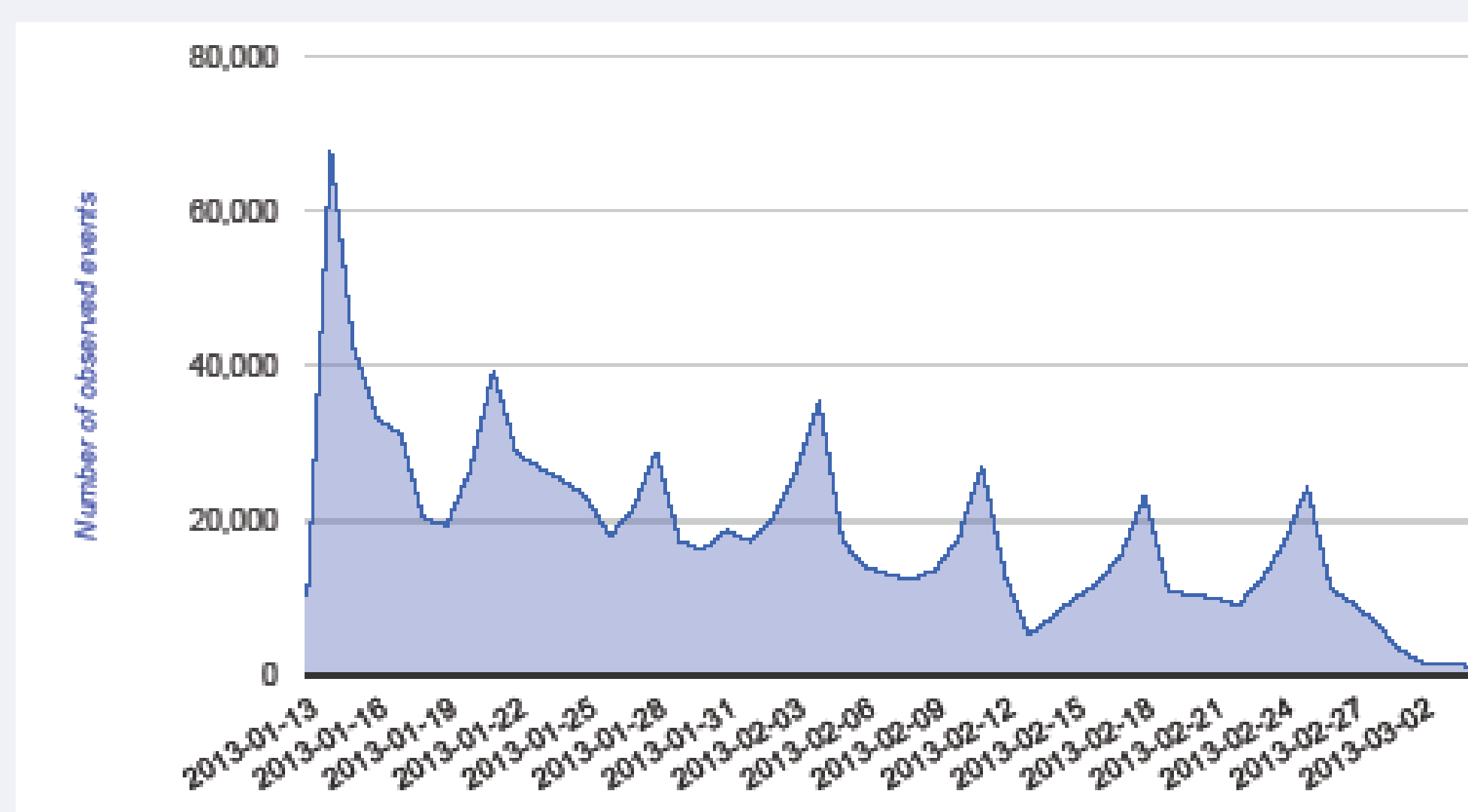


## 3. Results

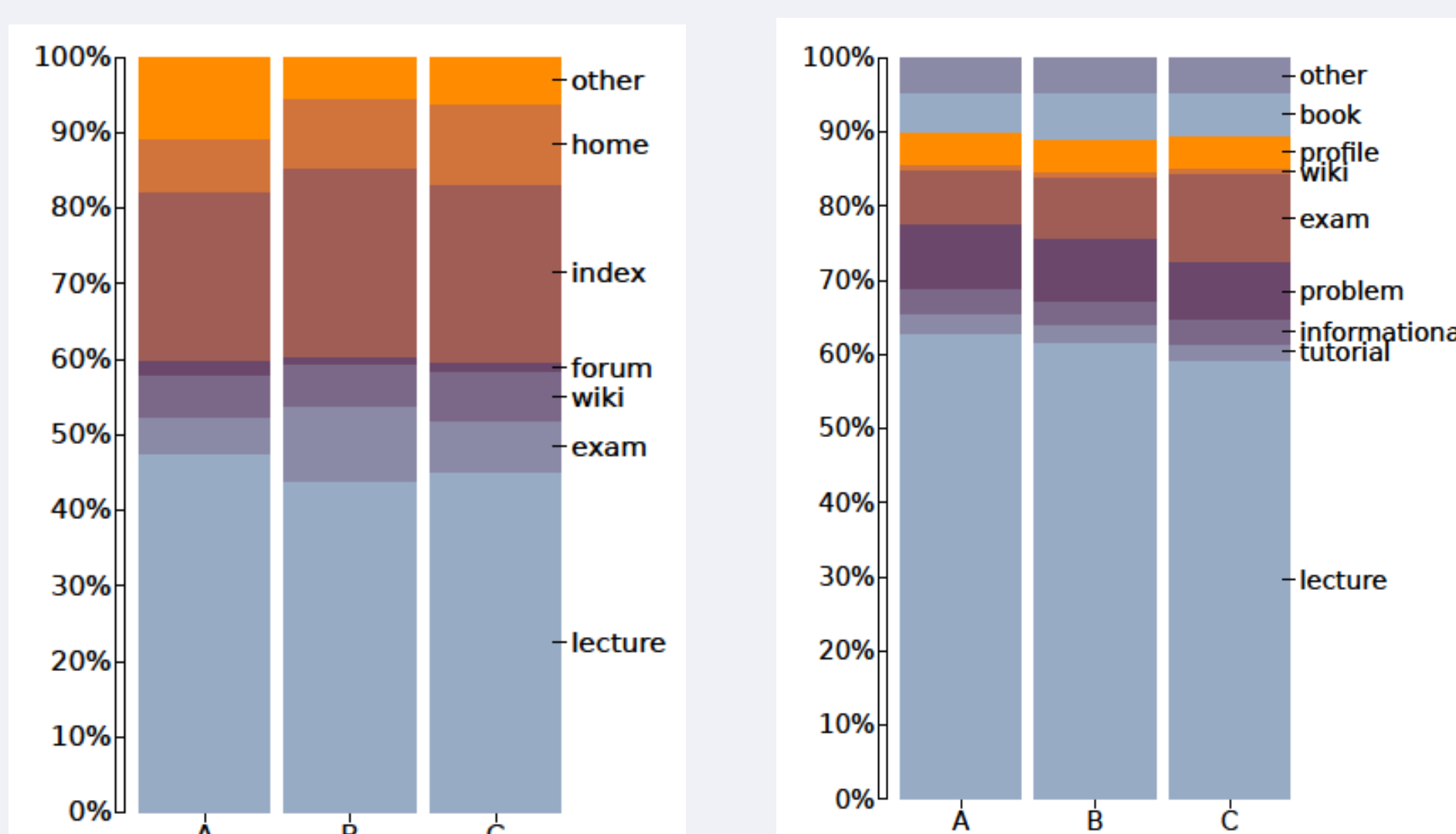
|             | Coursera course     | edX Course                                  |
|-------------|---------------------|---|
| Title       | Cryptography I      | Circuits and Electronics (6.002x)           |
| Instructors | Dan Boneh           | Anant Agarwal, Gerald Sussman, Piotr Mitros |
| University  | Stanford University | MIT   |
| Length      | 6 weeks             | 14 weeks                                    |
| Platform    | Coursera            | edX   |
| Start date  | Jan 13th, 2013      | March 5, 2012                               |
| Registrants | 21,744              | 154,763                                     |



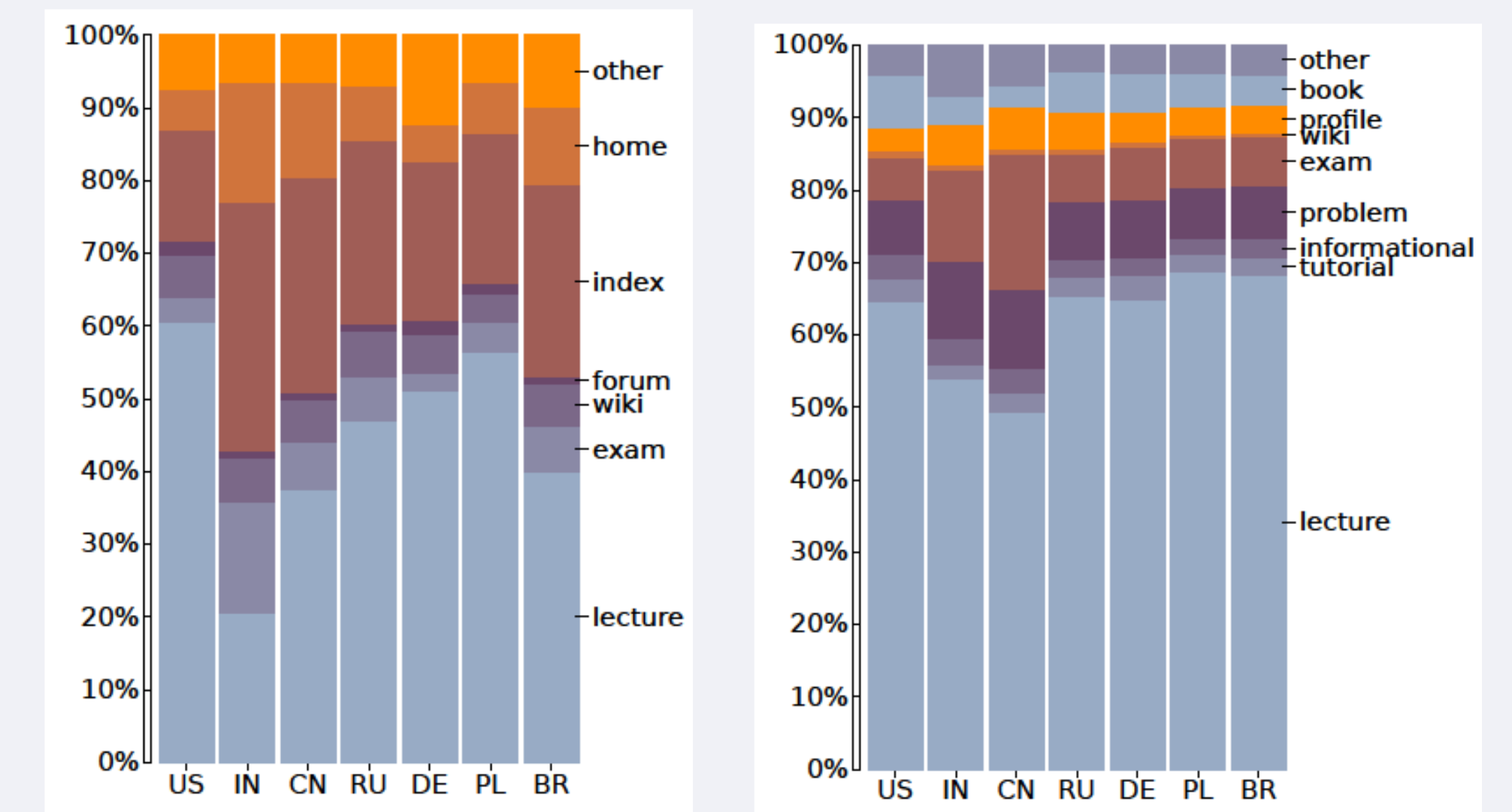
Left plot shows the colored plot for the ratio of certificate winners to the number of registrants on a per country basis for the course offered via Coursera. Right plot shows the colored plot for the ratio of certificate winners to the number of registrants on a per country basis for 6.002x offered via edX platform.



Example of interactive visual analytics for data from a MITx course offered on the edX platform and a Stanford course offered via Coursera platforms. Left plot shows the number of observing events by day for the Stanford course. Right plot shows the number of observing events by day for the MITx course.



Differences in relative use of resources by students that got different grades (left: Coursera ; right: edX)



Differences in relative use of resources by students from different countries. (left: Coursera ; right: edX)

|          | Lecture |         | Exam    |        |
|----------|---------|---------|---------|--------|
|          | l       | u       | l       | u      |
| BR vs.DE | -28253  | -1117.2 | -1024.1 | 592.15 |
| BR vs.IN | -461.58 | 21961   | -1335.2 | 0.2361 |
| BR vs.RU | -20329  | 3236.1  | -758.69 | 644.88 |
| BR vs.US | -24271  | -2475.1 | -685.78 | 612.37 |
| DE vs.IN | 15939   | 34930   | -1017.1 | 114    |
| DE vs.RU | -4025.8 | 16302   | -446.33 | 764.43 |
| DE vs.US | -7811.2 | 10435   | -364.14 | 722.64 |
| IN vs.RU | -25998  | -12595  | 211.44  | 1009.8 |
| IN vs.US | -29106  | -19138  | 333.96  | 927.65 |
| RU vs.US | -10989  | 1337    | -346.88 | 387.29 |

|         | Lecture |         | Exam    |         |
|---------|---------|---------|---------|---------|
|         | l       | u       | l       | u       |
| A vs. B | 20131   | 25304   | 577.26  | 877.79  |
| A vs. C | 11348   | 21823   | -264.72 | 343.8   |
| B vs. C | -11341  | -924.13 | -990.56 | -385.41 |

Analysis of the duration spent on resource type by country and grade based student cohorts for the Coursera course

|          | Lecture |         | Exam    |         | Problems |         | Book    |         |
|----------|---------|---------|---------|---------|----------|---------|---------|---------|
|          | l       | u       | l       | u       | l        | u       | l       | u       |
| BR vs.DE | -35405  | 138970  | -2563.1 | 9993.1  | -7198.3  | 12247   | -37926  | 13293   |
| BR vs.IN | 165720  | 287580  | -1668.5 | 7106.2  | 2319.2   | 15908   | -8910.5 | 26882   |
| BR vs.RU | -60298  | 94243   | -1072.3 | 10056   | -5549.5  | 11684   | -29058  | 16336   |
| BR vs.US | -113120 | 4533    | -5271.2 | 3201    | -16114   | -2993.5 | -53044  | -18485  |
| DE vs.IN | 102530  | 24721   | -6205   | 4212.7  | -1477.3  | 14656   | 55,123  | 42550   |
| DE vs.RU | -121360 | 51742   | -5455   | 7009.4  | -9108.7  | 10195   | -19468  | 31378   |
| DE vs.US | -176650 | -35499  | -9832.1 | 332.03  | -19948   | -4207.7 | -44179  | -2717.7 |
| IN vs.RU | -269690 | -149660 | -2548.6 | 6094.8  | -12739   | 646.57  | -32976  | 2281.4  |
| IN vs.US | -313990 | -247900 | -6133.3 | -1374.5 | -22352   | -14982  | -54456  | -35045  |
| RU vs.US | -129150 | -13383  | -9695.1 | -1358.9 | -19076   | -6166.2 | -46405  | -12401  |

|         | Lecture |        | Exam   |        | Problems |        | Book    |         |
|---------|---------|--------|--------|--------|----------|--------|---------|---------|
|         | l       | u      | l      | u      | l        | u      | l       | u       |
| A vs. B | -16144  | 22245  | -1346  | 1117.5 | -3689.6  | 315.26 | -13797  | -3978.9 |
| A vs. C | 64383   | 119560 | 3935.6 | 7476.6 | 8216     | 13972  | -2728.8 | 11383   |
| B vs. C | 59184   | 118660 | 3912   | 7728.6 | 9679     | 15884  | 5609.6  | 20820   |

Analysis of the duration spent on resource type by country and grade based student cohorts for the edX course