

Reaching the world – Ten years MOOC Econometrics: Methods and Applications

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Summary

Ten years after its launch, the MOOC ‘Econometrics: Methods and Applications’ has reached 200,000 learners. This note briefly describes what the MOOC is, why it was made, who made it, when and where it has been studied, and who are its learners.

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MOOC – What?

A MOOC is a Massive Open Online Course, which means it is openly available to everyone and it is fully offered online. The MOOC ‘Econometrics: Methods and Applications’ (henceforth abbreviated as EMA) is the first MOOC developed by Erasmus University Rotterdam and was launched in November 2015.

EMA is meant for (advanced undergraduate) students in economics, finance, business, engineering, and data analysis, as well as for those who work in these fields. It requires some basics of matrices, probability, and statistics, which are reviewed in a ‘Building Block’ module. Covered topics include simple and multiple regression, model specification and diagnostics, endogeneity, binary choice data, and time series data. Each module has five lectures: Motivation (by a real-world example), Representation (by an econometric model), Estimation (by econometric methods), Evaluation (by econometric and statistical methods), and Application (to a practical example). The EMA learning objectives are that learners

- can translate data into models to make forecasts and to support decision making in a wide variety of fields, ranging from macroeconomics to finance and marketing;
- understand the methods of simple and multiple regression and can apply them in practical application;
- understand and can apply econometric methods for model specification and for dealing with endogenous variables;
- understand and can apply econometric methods for binary choice data and for time series data.

EMA learners study in cohorts that start every four weeks. Apart from viewing videos, they develop hands-on skills by answering in-video quizzes and by making an extensive set of training exercises with video answers. To earn the Coursera Certificate, learners must complete all modules by passing six test exercises and a case project that integrates all modules. Grading is done in a peer-review system, where each submitted work is graded independently by three randomly selected peers and the middle score is the final grade.

Further information on EMA and all its lecture videos and exercises can be found on Coursera¹.

¹ <https://www.coursera.org/learn/erasmus-econometrics>; the data used in this note were downloaded from Coursera on 15 March 2026, the day where the number of learners (200,012) crossed the 200,000 margin.

MOOC – Why?

The EMA MOOC is based on the textbook ‘Econometric Methods with Applications in Business and Economics’ (Oxford University Press, 2004)². This book had grown out of half a century of experience in teaching undergraduate econometrics at the Econometric Institute in Rotterdam that was founded in 1956 by Henri Theil with the support of Jan Tinbergen. It presents the ‘Rotterdam way’ of doing econometrics, where rigorous theory is always motivated by and aimed at solving practical questions. Because it gives a firm understanding of both where econometric methods come from and how they are used in practice, it was quite successful and was adopted by over 200 academic programs all over the world.

Notwithstanding this success, members of the Econometric Institute wanted to solve two shortcomings. First, because the book is rigorous and extensive (nearly 800 pages), it was adopted only by (mostly graduate) university programs and by large research institutes. Second, because the book is often too expensive for students in poorer countries, it mainly reached students in Europe, North and South America, South East Asia, and Australia.

The wish to reach both students and lecturers in poorer and more remote countries was the main motivation to make the EMA MOOC. It is much shorter than the book, treats a smaller range of topics in a simpler way, and is freely available to anyone who has access to the internet. Table 1 shows that the MOOC is better spread over the world, with a much larger share for Africa. It reaches nearly all countries, as will be described later in more detail.

Table 1: Spread over continents

Continent	Book adopters		MOOC learners		Coursera
	#	%	#	%	%
Africa	2	1.0	13,844	7.0	8.7
America-North	38	18.7	41,915	21.3	26.9
America-South	28	13.8	13,098	6.6	10.5
Asia	45	22.2	71,501	36.3	37.2
Europe	85	41.9	53,384	27.1	15.5
Oceania	5	2.5	3,414	1.7	1.3
Unknown	--	--	2,856	--	?
Total	203	100.0	200,012	100.0	100.0

Notes

- 'Book #' is number of academic programs per continent that adopted the book, and 'MOOC #' is number of enrolled learners.
- 'Book %' is percentage of all (203) book adopting programs that are from the continent.
- 'MOOC %' and 'Coursera %' is percentage of all learners that are from the continent.
- 'Unknown' is for learners with unknown IP address (this number is not available for Coursera).

² <https://doi.org/10.1093/oso/9780199268016.001.0001>

MOOC – Who?

The idea for the MOOC came from Philip Hans Franses, and Christiaan Heij coordinated its production. Figure 2 shows who made the MOOC, all of whom present parts of the MOOC:

- Module 1 – Simple Regression Philip Hans Franses
- Module 2 – Multiple Regression Christiaan Heij
- Module 3 – Model Specification Michel van der Wel
- Module 4 – Endogeneity Dennis Fok
- Module 5 – Binary Choice Richard Paap
- Module 6 – Time Series Dick van Dijk
- Building Blocks Erik Kole
- Solutions of Exercises Francine Gresnigt & Myrthe van Dieijen

As mentioned before, the material for the MOOC is based on the book ‘Econometric Methods with Applications in Business and Economics’ written by Christiaan Heij, Paul de Boer (†), Teun Kloek, Philip Hans Franses, and Herman van Dijk (†). Further, the guidance of learners was in the hands of Christiaan Heij until 2022, after which Wendun Wang took over.



Figure 2: From left to right: Richard Paap, Myrthe van Dieijen, Dick van Dijk, Philip Hans Franses, Michel van der Wel, Erik Kole, Francine Gresnigt, Dennis Fok, and Christiaan Heij.

MOOC – When?

Before EMA became available, a successful MOOC on Econometrics did not exist yet. When EMA was launched in November 2015, it immediately attracted many learners who apparently had been waiting for a MOOC in this area.

Figure 4 shows cumulative and quarterly numbers of enrolled learners and course completers. After its first year, EMA had already 44,000 learners. Later, the number of new learners per quarter was approximately 4,000, until the outbreak of Covid-19 in 2020 that caused large disruptions in the working and personal life of many around the globe. With jobs at risk and online life at home, many felt the need to reconsider their professional life and had time to prepare for a career switch. Of the many MOOCs of Coursera, the ones on business and data science became most popular. As EMA offers knowledge and skills at the intersection of these two areas, it got a boost in 2020 and the number of learners more than doubled compared to 2019. After Covid-19, learner numbers returned to pre-covid levels and declined somewhat since 2025 due to stricter payment policies of Coursera for learners who aspire to get the certificate and need access to the test exercises and peer review.

The number of course completers is rather stable with an average of around 100 completers per quarter, except during Covid-19 where it more than doubled. On average, slightly more than 2% of the learners complete the course, which is common for MOOCs.

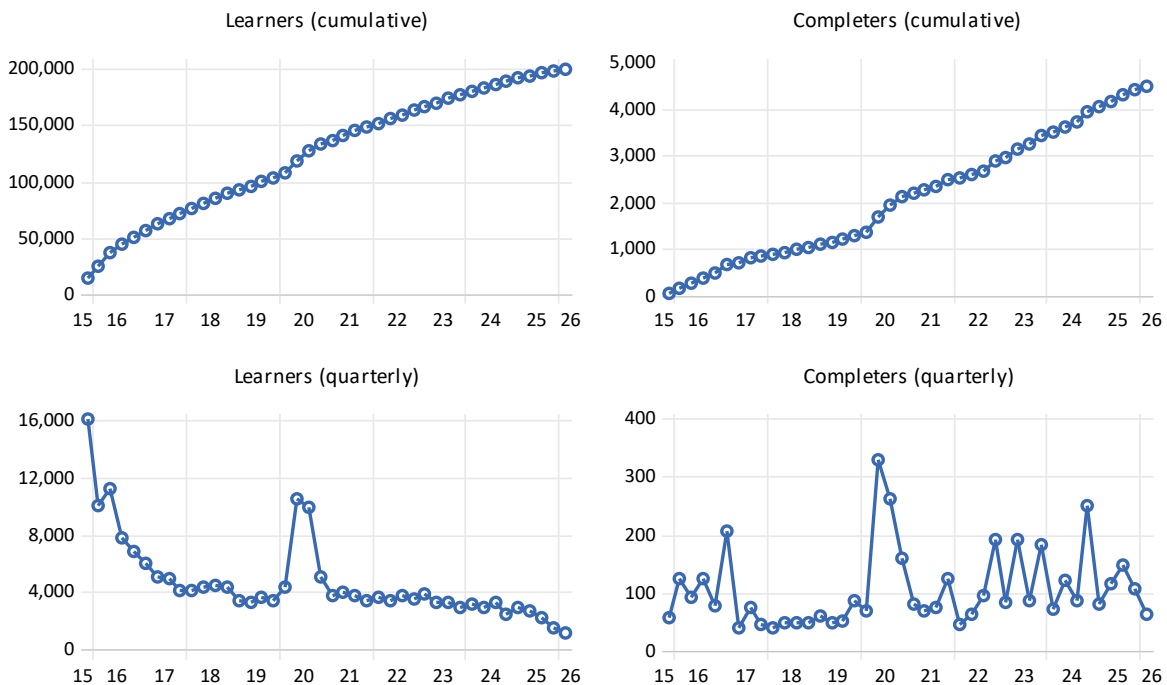


Figure 3: Learners and course completers, cumulative (top) and quarterly (bottom), from 2015Q4 until 2026Q1.

MOOC – Where?

The world has 193 states that are member of the United Nations. The total number of ‘countries’ is 250, including 2 non-UN states (Palestinian Territory and Vatican City), 4 other areas (Antarctica, Kosovo, Taiwan, and Western Sahara) and 51 ‘dependencies’ that are not independent states (for example, Falkland Islands, Greenland, Hong Kong, Svalbard).

Table 4 shows that EMA reaches nearly all UN states (the exceptions are North Korea, Nauru, Palau, San Marino, and Tuvalu). In terms of population, countries not reached by the MOOC contain only 0.3% of the world population (nearly all of whom live in North Korea). The map in Figure 5 shows the reach of the MOOC across the globe. It has clearly fulfilled the motivation of its makers to allow learners all over the world to study their MOOC.

In the Appendix, Table A1 shows the complete list of reached countries and Table A2 has information on the top-25 non-African and top-15 African countries. Not surprisingly, India and the USA have most learners, and in Africa the largest learner groups are from Nigeria, Egypt, and Morocco.

Table A2 shows various differences of interest across these top-countries in terms of learners, course completers, and learners with payment. Female participation (average 28.7%) varies from below 15% (Ethiopia, Somalia) to 40% or more (Russian Federation, China, Viet Nam). The reach per head of population (average 2.6 per 100,000) is highest in Singapore (51.6) and lowest in China, Ethiopia, and Uganda (0.4-0.5). Course completion (average 2.2%) is surprisingly high in Ethiopia (27.8%) and also high in Morocco, Russian Federation, and Uganda (4.8-6.3%), and lowest in Ivory Coast, Cameroon, and Egypt (0.0-0.6%). Payment (average 5.9%) is highest in Somalia, Uganda, and Ethiopia (10.0-30.2%), and lowest in Peru, Brazil, and Columbia (2.8-3.1%), and financial aid (average 60.8%) ranges from above 95% in Algeria, Ethiopia, and Somalia to below 30% in the Russian and the Netherlands.

Table 4: Country reach of MOOC

Type of country	Number	Population (M)	MOOC	% Countries	% Population
United Nations	193	7,791	188	97.4	99.7
Other	57	32	33	57.9	96.9
Total	250	7,823	221	88.4	99.7
African countries	58	1,347	56	96.6	99.9

Notes

- Population is in millions (Wikipedia 2022).
- Other types of countries are other states (2), other areas (4), and dependencies (51).
- Not reached: North Korea (25.7M, 0.3% of world) and 28 very small countries (0.8M, 0.01% of world).

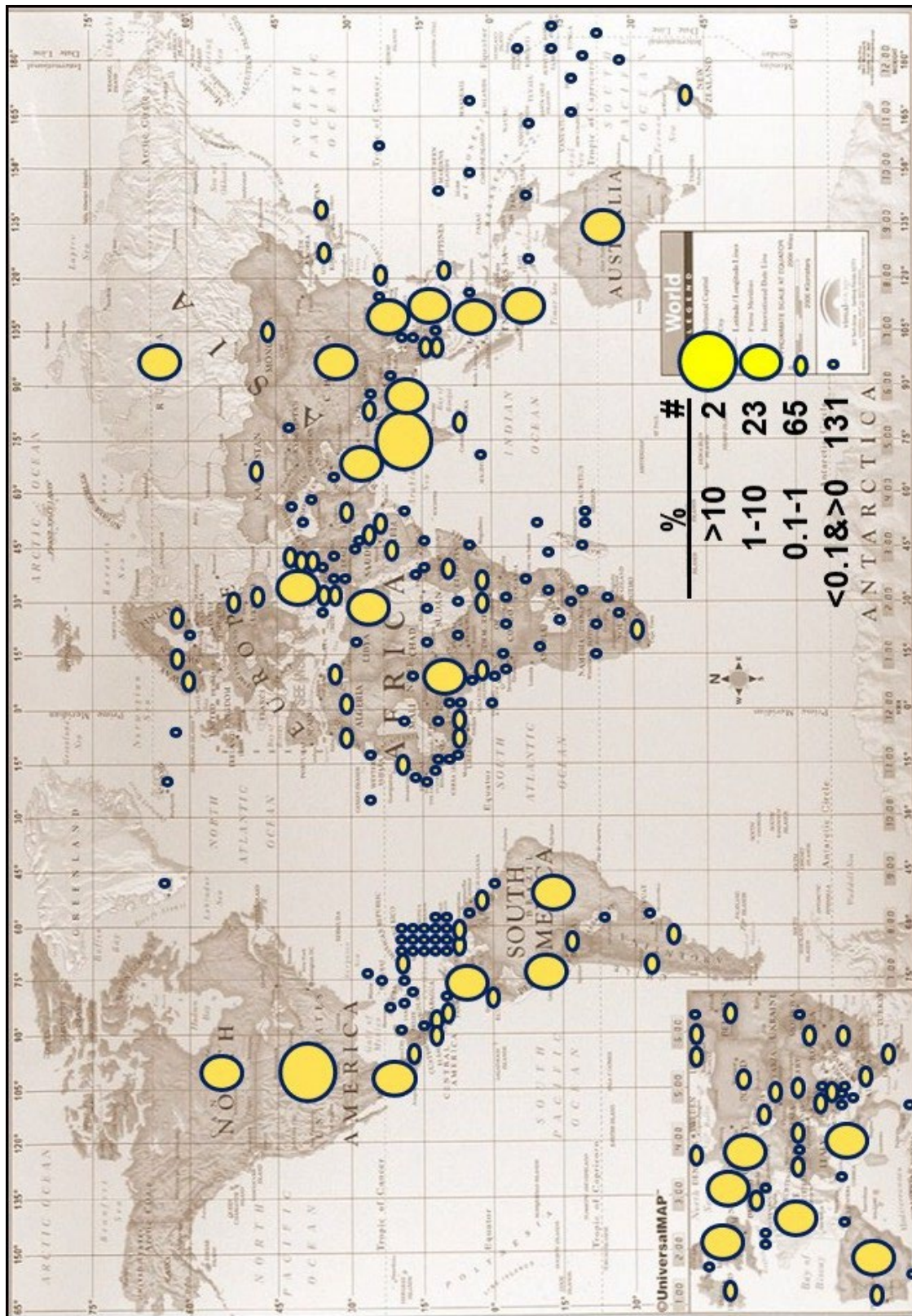


Figure 5: Spread of MOOC over the world (Europe excl. Scandinavia is shown separately at bottom); ‘%’ is percentage of all EMA learners who are in this country; ‘#’ is number of countries with this %.

MOOC – Who?

The Coursera platform has detailed information on the location of enrolled learners, which is derived from their IP address. This information was missing for 2,856 learners (1.4%, some perhaps from North Korea). Information on age, gender, education level, and employment status is available of all learners only on an aggregate level, whereas this is known on individual level for learners who answer a questionnaire.

Table 6 summarizes the personal background of learners. Of the 200,012 enrolled EMA learners, 4,485 (2.2%) completed the course and 11,487 (5.7%) are learners with payment of whom 7,183 (62,5%) get financial aid. The fraction of learners with payment who get financial aid is relatively larger for lower education levels and for unemployed persons, whereas gender has no notable effect.

Table 6: Personal background of learners

	Coursera	MOOC				
		All learners	Completers	Learners with payment		
				Total	Own	Aid
Sample size	200,708,892	200,012	4,485	11,487	4,620	7,183
Age						
34-	45.9	45.5				
35-54	46.9	49.6				
55+	7.2	4.9				
Gender						
Female	39.7	28.7	28.3	27.1	28.4	26.3
Male	60.3	71.3	71.7	72.9	71.6	73.7
Education (highest)						
Doctorate degree	3.1	10.1	11.0	7.7	10.9	5.9
Master degree	21.4	41.1	36.3	38.4	46.1	34.0
Bachelor degree	37.5	32.4	34.2	37.7	29.4	42.0
Other	38.0	16.4	18.6	16.2	13.6	18.0
Employment						
Full time	47.8	50.3	45.9	38.0	63.4	27.8
Part-time	5.9	6.7	6.0	6.4	4.1	7.2
Self-employed	7.4	6.8	4.6	6.2	9.8	4.8
Unemployed looking for work	22.1	21.3	21.7	30.8	10.8	38.7
Other	16.8	14.9	21.8	18.6	12.0	21.5

Notes

- Table numbers are percentages per group of learners, i.e., per column section.
- For Coursera and MOOC 'All learners' the available data are aggregates, whereas for course completers (learners with payment) the sample sizes are 2,288 (6,527) for gender, 1,776 (5,409) for education, and 737 (2,345) for employment.
- Payment sample sizes for 'Own' and 'Aid' add up to more than 'Total' as some learners have double payment status.
- Age data are not available for course completers and for learners with payment.
- 'Other' employment status is unemployed not looking for work (incl. students), unable to work, homemakers, and retired.

The information in Table A2 on learners, course completers, and payments shows that learners from African countries differ in the following respects from non-African learners:

- lower reach relative to population size (1.0 vs 2.9 per 100,000);
- higher course completion rate (3.0% vs 2.2%);
- higher percentage of learners with payment (7.9% vs 5.8%);
- higher percentage of financial aid (86.3% vs 58.2%).

The lower reach shows opportunities for further improvement in reaching African learners. The higher course completion and payment rates indicate higher learner motivation, and the more frequent financial aid is in line with the intended targeting of support programs.

Conclusion

The Econometric Institute of Erasmus School of Economics at Erasmus University Rotterdam is the only institution in the world having seventy years of experience in offering undergraduate education in econometrics. This experience resulted in a textbook on econometrics in 2004, which in turn provided the basis for the EMA MOOC in 2015.

In the ten years since its launch, EMA has reached 200,000 enrolled learners (and over 750,000 visitors) spread all over the world. Compared to the book, this MOOC is much more successful in reaching learners in poorer and more isolated countries. And it contributes to the strategic goals of Erasmus University Rotterdam, with the following first three priorities³:

- *Academic education and research that makes an impact:* ‘Strong focus on creating positive societal impact.’
 - MOOC teaches econometric methods and data analysis applications for students and practitioners in business and economics.
- *An inspiring and innovative education portfolio:* ‘Reach individuals who may not naturally find their way to university.’
 - MOOC reaches poor learners in remote areas.
- *Lifelong learning:* ‘meet needs practitioners and develop flexible learning pathways.’
 - MOOC can be studied anytime by anyone wanting to acquire, deepen, or refresh knowledge needed in current job or future professional career.

³ <https://www.eur.nl/en/about-university/vision-strategy-2030/strategic-goals-and-priorities>

Appendix

Table A1: Countries reached by the MOOC

UN States		UN States		UN States		UN States		Dependencies	
Afghanistan	●	Egypt	●	Madagascar	●	Seychelles	●	Aland Islands (FI)	●
Albania	●	El Salvador	●	Malawi	●	Sierra Leone	●	Am. Samoa (US)	●
Algeria	●	Equatorial Guinea	●	Malaysia	●	Singapore	●	Anguilla (GB)	
Andorra	●	Eritrea	●	Maldives	●	Slovakia	●	Aruba (NL)	●
Angola	●	Estonia	●	Mali	●	Slovenia	●	Bermuda (GB)	●
Antigua and Barbuda	●	Eswatini (Swaziland)	●	Malta	●	Solomon Islands	●	Bonaire, St E. and Saba (NL)	●
Argentina	●	Ethiopia	●	Marshall Islands	●	Somalia	●	Bouvet Island (NO)	
Armenia	●	Fiji	●	Mauritania	●	South Africa	●	Br. Indian Ocean T. (GB)	
Australia	●	Finland	●	Mauritius	●	South Sudan	●	Cayman Islands (GB)	●
Austria	●	France	●	Mexico	●	Spain	●	Christmas Island (AU)	
Azerbaijan	●	Gabon	●	Micronesia (F.S.o.)	●	Sri Lanka	●	Cocos Islands (AU)	
Bahamas	●	Gambia	●	Moldova (R.o.)	●	Sudan	●	Cook Islands (NZ)	
Bahrain	●	Georgia	●	Monaco	●	Suriname	●	Curacao (NL)	●
Bangladesh	●	Germany	●	Mongolia	●	Sweden	●	Falkland Islands (GB)	
Barbados	●	Ghana	●	Montenegro	●	Switzerland	●	Faroe Islands (DK)	●
Belarus	●	Greece	●	Morocco	●	Syria (A.R.)	●	French Guiana (FR)	●
Belgium	●	Grenada	●	Mozambique	●	Tajikistan	●	French Polynesia (FR)	●
Belize	●	Guatemala	●	Myanmar	●	Tanzania (U.R.o.)	●	French South Lands (FR)	
Benin	●	Guinea	●	Namibia	●	Thailand	●	Gibraltar (GB)	●
Bhutan	●	Guinea-Bissau	●	Nauru		Timor-Leste	●	Greenland (DK)	●
Bolivia	●	Guyana	●	Nepal	●	Togo	●	Guadeloupe (FR)	●
Bosnia and Herzeg.	●	Haiti	●	Netherlands	●	Tonga	●	Guam (US)	●
Botswana	●	Honduras	●	New Zealand	●	Trinidad and Tobago	●	Guernsey (GB)	●
Brazil	●	Hungary	●	Nicaragua	●	Tunisia	●	Heard and McDonald I. (AU)	
Brunei Darussalam	●	Iceland	●	Niger	●	Turkey	●	Hong Kong (CN)	●
Bulgaria	●	India	●	Nigeria	●	Turkmenistan	●	Isle of Man (GB)	●
Burkina Faso	●	Indonesia	●	North Macedonia	●	Tuvalu		Jersey (GB)	●
Burundi	●	Iran	●	Norway	●	Uganda	●	Macao (CN)	●
Cabo Verde	●	Iraq	●	Oman	●	Ukraine	●	Martinique (FR)	●
Cambodia	●	Ireland	●	Pakistan	●	United Arab Emirates	●	Mayotte (FR)	●
Cameroon	●	Israel	●	Palau		United Kingdom	●	Montserrat (GB)	●
Canada	●	Italy	●	Panama	●	United States (of A.)	●	New Caledonia (FR)	●
Central African R.	●	Jamaica	●	Papua New Guinea	●	Uruguay	●	Niue (NZ)	
Chad	●	Japan	●	Paraguay	●	Uzbekistan	●	Norfolk Island (AU)	
Chile	●	Jordan	●	Peru	●	Vanuatu	●	Northern Mariana I. (US)	●
China	●	Kazakhstan	●	Philippines	●	Venezuela	●	Pitcairn Island (GB)	
Colombia	●	Kenya	●	Poland	●	Viet Nam	●	Puerto Rico (US)	●
Comoros	●	Kiribati	●	Portugal	●	Yemen	●	Reunion (FR)	●
Congo	●	Korea (D.P.R.o.)		Qatar	●	Zambia	●	Saint Barthelemy (FR)	
Congo (D.R.o.)	●	Korea (R.o.)	●	Romania	●	Zimbabwe	●	Saint Helena (GB)	
Costa Rica	●	Kuwait	●	Russian Federation	●			Saint Martin (FR)	
Côte d'Ivoire	●	Kyrgyzstan	●	Rwanda	●			Saint-Pierre and Miq. (FR)	
Croatia	●	Lao (P.D.R.)	●	Saint Kitts & Nevis	●	Non-UN States		Sint Maarten (NL)	●
Cuba	●	Latvia	●	Saint Lucia	●	Vatican City		South Georgia (GB)	
Cyprus	●	Lebanon	●	Saint Vincent & G.	●	Palestinian Territory	●	Svalbard & Jan Mayen (NO)	
Czech Republic	●	Lesotho	●	Samoa	●			Tokelau (NZ)	
Denmark	●	Liberia	●	San Marino		Other Areas		Turks and Caicos I. (GB)	●
Djibouti	●	Libya	●	Sao Tome & Princ.	●	Antarctica		U.S. Minor Pacific I. (US)	
Dominica	●	Liechtenstein	●	Saudi Arabia	●	Kosovo	●	Virgin Islands (GB)	●
Dominican Republic	●	Lithuania	●	Senegal	●	Taiwan	●	Virgin Islands (US)	●
Ecuador	●	Luxembourg	●	Serbia	●	Western Sahara		Wallis and Futuna (FR)	

Table A2: Top-25 non-African countries and top-15 African countries reached by the MOOC

Country	Learners	% Fem	% Pop	Pass	% Pass	Pay	% Pay	% Aid
Non-African (all 165)	183,312	31.8	2.9	4,046	2.2	10,579	5.8	58.2
India	32,323	34.0	2.3	561	1.7	2,469	7.6	73.2
United States of America	30,346	30.9	9.1	562	1.9	1,665	5.5	45.6
United Kingdom	9,397	32.9	14.0	181	1.9	542	5.8	37.1
Netherlands	6,420	30.6	36.3	201	3.1	430	6.7	29.3
China	5,937	41.0	0.4	184	3.1	338	5.7	52.7
Germany	5,892	34.1	7.1	151	2.6	369	6.3	62.6
Canada	4,905	31.2	12.7	92	1.9	282	5.7	59.2
Mexico	4,692	28.4	3.7	44	0.9	396	8.4	75.5
Brazil	4,647	21.2	2.2	56	1.2	143	3.1	42.0
France	4,262	31.9	6.3	110	2.6	268	6.3	53.4
Pakistan	3,080	20.5	1.4	65	2.1	273	8.9	92.7
Australia	2,930	31.0	11.3	37	1.3	146	5.0	40.4
Italy	2,885	29.7	4.9	75	2.6	154	5.3	40.3
Spain	2,821	28.1	6.0	66	2.3	123	4.4	35.0
Singapore	2,816	31.5	51.6	64	2.3	145	5.1	53.8
Turkey	2,787	31.2	3.3	28	1.0	126	4.5	78.6
Hong Kong	2,715	31.0	36.7	70	2.6	156	5.7	54.5
Colombia	2,642	28.0	5.2	37	1.4	83	3.1	72.3
Russian Federation	2,512	46.6	1.7	141	5.6	169	6.7	25.4
Viet Nam	2,284	42.7	2.3	71	3.1	154	6.7	84.4
Bangladesh	2,259	22.2	1.3	31	1.4	131	5.8	93.9
Indonesia	2,193	34.3	0.8	39	1.8	125	5.7	72.0
Peru	2,077	26.2	6.3	30	1.4	59	2.8	44.1
Korea (R.o.)	1,830	35.3	3.5	18	1.0	60	3.3	38.3
Japan	1,735	28.8	1.4	37	2.1	71	4.1	42.3
African (all 56)	13,844	27.1	1.0	416	3.0	1,099	7.9	86.3
Nigeria	2,142	25.6	1.0	66	3.1	211	9.9	91.0
Egypt	2,026	33.4	2.0	12	0.6	170	8.4	94.1
Morocco	1,365	29.7	3.7	28	6.3	93	6.8	88.2
South Africa	1,242	30.6	2.1	21	1.5	53	4.3	56.6
Ghana	932	19.4	3.0	14	1.5	64	6.9	90.6
Kenya	734	30.3	1.5	8	1.3	30	4.1	63.3
Tunisia	698	40.0	5.9	10	0.8	39	5.6	94.9
Ethiopia	633	13.1	0.5	194	27.8	63	10.0	96.8
Algeria	477	32.9	1.1	9	1.2	27	5.7	100.0
Somalia	441	14.9	2.7	7	1.5	133	30.2	95.5
Zambia	254	18.3	1.4	2	0.8	25	9.8	76.0
Cameroon	218	21.5	0.9	1	0.5	16	7.3	75.0
Uganda	215	30.7	0.5	9	4.8	23	10.7	87.0
Ivory Coast	206	16.7	0.8	0	0.0	17	8.3	70.6
Rwanda	187	24.8	1.4	5	2.3	18	9.6	50.0

Notes

- '% Pop' is ($\times 1,000$), so the number of learners per 100,000 inhabitants.
- '% Fem', '% Pass' and '% Pay' denote the percentage of learners who are female, who completed the course, and who paid.
- '% Aid' is the percentage of paying learners with financial aid