



Massive Open Online Courses

How might they be relevant to the actuarial profession?

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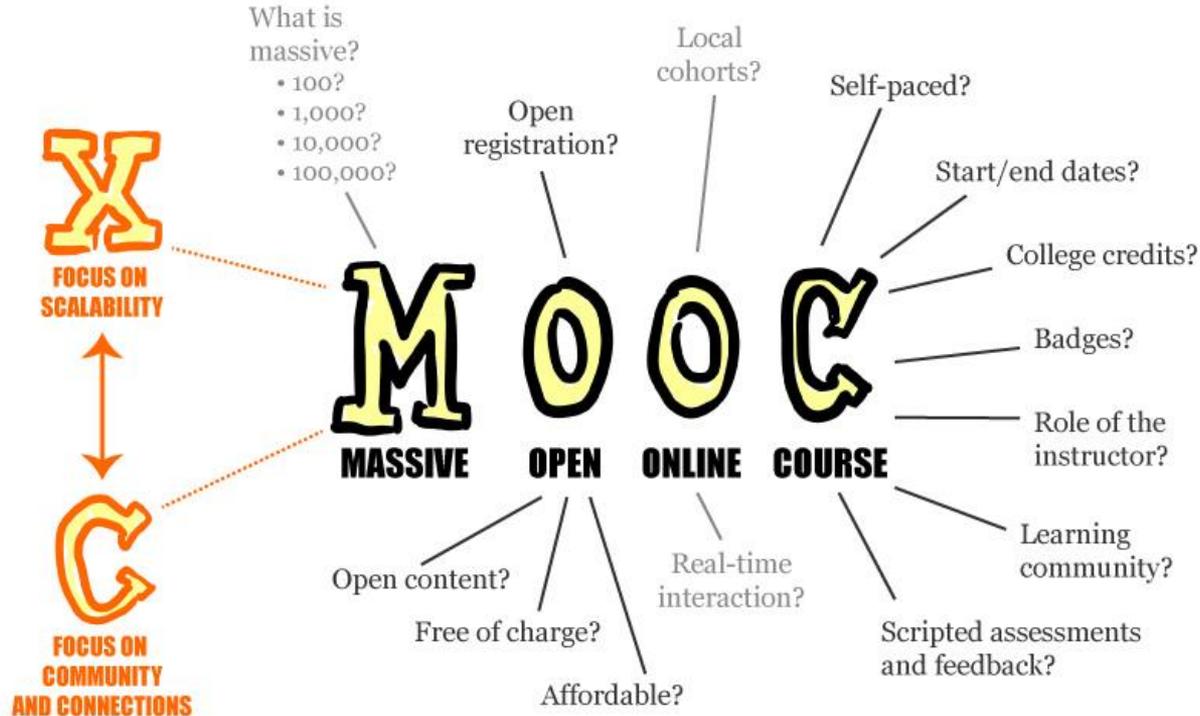
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*This presentation has been prepared for the Actuaries Institute 2017 Actuaries Summit.
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Agenda

- Background to MOOCs
- “Introduction to Actuarial Science”
- Impact on higher education
- Impact on the actuarial profession

What is a MOOC?





Main players

- Coursera
- edX
- FutureLearn
- Canvas Network
- Udacity



- Founded by Harvard and MIT in 2012
- Other partners are ANU, Berkley, Cornell, ETH Zurich, Princeton, Toronto, etc.
- Around 1,500 courses ranging from humanities, math to computer science
- Over 5 million users

Introduction to Actuarial Science

- Synchronous version 17 October – 14 December 2015
- Self-paced version 22 December 2015 onwards

Background to “Introduction to Actuarial Science”

My “sales pitch” to the university requesting permission and support for the course:

The actuarial profession is one of the smallest and least known professions in the world, although it is growing rapidly worldwide, particularly in Asia. Despite the profession’s size, actuaries have a significant influence in financial markets, with their combination of mathematical, statistical, economic and business knowledge being vital in understanding, quantifying and managing financial risks. This course will provide students with an introduction to the actuarial profession and the fields that actuaries work in, along with basic examples of actuarial work in practice. We see the course as being of interest to students considering an actuarial career as well as those who are interested in the work of actuaries. As the first MOOC that we are aware of in actuarial science worldwide, the course will promote both the profession and the ANU actuarial program.

Writing the course

- Driven by target market – those looking to make university/career choices
- Aim was to give students an experience of the profession in as short a time frame as possible
- Centre course around a specific example of actuarial practice – life insurance



Writing the course

- I first wrote “course notes”
- 7 Lessons + Final Exam:
 - 1) Valuing Cash Flows
 - 2) Applications of Valuing Cash Flows
 - 3) Analysis of State Transitions
 - 4) The Life Table
 - 5) Valuing Uncertain Cash Flows
 - 6) Modelling a Life Insurance Company 1
 - 7) Modelling a Life Insurance Company 2

Turning a written course into an online course

- A series of 3-8 minute videos
- Guest lecturers (practitioners)
- Interspersed with questions that apply what has been learned in the videos
- Discussion forums



An example video





An example question

[SUBMISSION HISTORY](#)[STAFF DEBUG INFO](#)

Assessment Question 6.8

(1 point possible)

The whole of life policy described in this Lesson is updated to have a fixed term of 30 years, where the \$400,000 claim is paid upon the end of the year of death, or if death does not occur in the next 30 years, then the \$400,000 is paid in 30 years. This is known as an [endowment policy](#).

Update the [demonstration file for the simulations](#) to take into account the revised policy design, keeping all other values (interest rates, mortality rates, number of policies sold, etc.) the same. Calculate the premium (to the nearest whole dollar) to be charged to give a 90% probability of being sufficient to cover the claims cash flows.

?

[CHECK](#)[SAVE](#)[SHOW ANSWER](#)

You have used 0 of 3 submissions

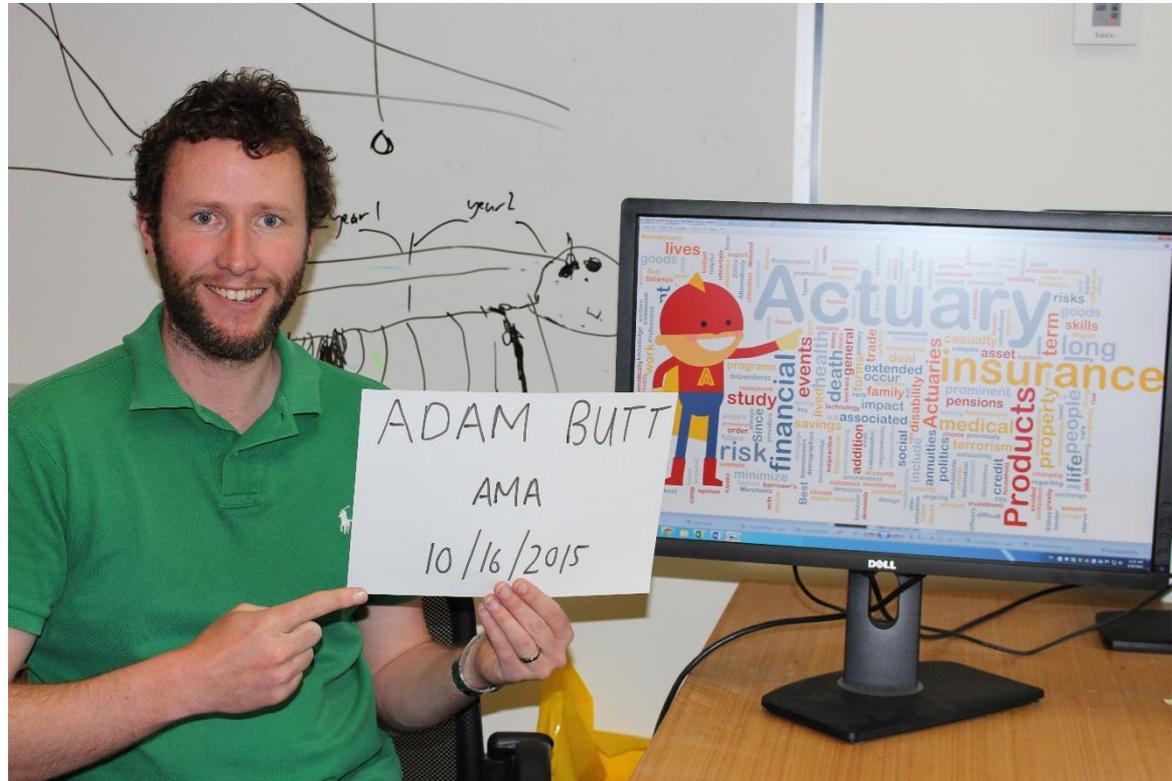


About video



Marketing

- [Reddit AMA](#)



Marketing

- Media
- Interview for our department website
- Articles for various actuarial associations
- Creating my own blog

Funding

- A total of \$90,000 to design course from university and department
- Have spend only around \$25,000 of this...on hardware/software, animation, captioning, guest lecturer travel, teaching assistants and marketing

Student numbers (as at 30 March 2017)

Course version	Synchronous	Self-paced
Total enrollments	11,490	21,196
Paid (Verified) enrollments	178	277
Attempted Assessment Question 1.1	1,793	3,929
Attempted Assessment Question 2.1	1,059	1,701
Attempted Final Exam Question 16	236	249
Passed the course	472	433

Student location



Student prior education

Answer		Response	%
Less than High School		26	2%
High School / GED		133	9%
Some College/University		180	12%
College/University Degree		596	41%
Masters Degree		419	29%
Doctoral Degree		66	5%
Professional Degree (JD, MD)		41	3%
Total		1,461	100%



Student motivation

Answer		Response	%
I am considering actuarial science as a university/college undergraduate degree		128	8%
I am considering actuarial science as a university/college postgraduate degree		149	9%
I am currently studying in a related area and considering taking some actuarial examinations through an actuarial professional body		204	13%
I am currently working and considering a career change into actuarial science		397	24%
I am currently studying actuarial science (exams and/or university/college degree) and would like to know more		102	6%
I am generally interested in actuarial science but have no plans to pursue it as a career		613	38%
I am already an actuary		31	2%
Total		1,624	100%

Feedback

- [Course reviews](#) 4.5 out of 5 stars (15 reviews)

“Well taught and in an excellent format of short interviews with an area specialist followed by a lecture from the specialist and then spreadsheet oriented exercises. For anyone thinking of the US exams, I think this is a better first step toward becoming an actuary than focusing on statistics & probability for the first exam since this gives a better impression of what the professional environment and processes might be like.”



Future intentions after course

#	Answer	Response	%
1	None - I expect this to be the only study I do in actuarial science	51	35%
2	None - I have done some previous study in actuarial science already (exams and/or university/college degree) and have no intention to do any more	3	2%
3	None - I am currently studying actuarial science (exams and/or university/college degree) and intend to cease this study	1	1%
4	I am not currently studying actuarial science but intend to do so (exams and/or university/college degree) in future	61	41%
5	I am currently studying actuarial science (exams and/or university/college degree) and intend to continue doing so	22	15%
6	I am already an actuary	3	2%
7	I am not currently studying actuarial science but intend to do so at ANU in future	6	4%
	Total	147	100%



Impact of course

#	Answer		Response	%
1	These were already my intentions prior to the course - the course has had a significant impact in affirming this		71	50%
2	These were already my intentions prior to the course - the course has had no or a small impact in affirming this		45	32%
3	These were not my intentions prior to the course - the course has had no or a small impact on my change in intentions		5	4%
4	These were not my intentions prior to the course - the course has had a significant impact on my change in intentions		20	14%
	Total		141	100%

Comments from those who said the course had a significant impact

- *I had a brief idea about what is included in the field of Actuarial Science, but the interviews with the industry experts gave me a more clear picture as what a career in actuarial science has in store for me.*
- *It confirmed my enjoyment of dealing with mathematics in the context in business problems.*

Comments from those who said the course had a significant impact

- *Before this course, I almost knew nothing about actuarial science; what I knew is being an actuary is a good job. After taking the course, I know what actuarial science about and maybe it's not impossible to be an actuary for me if I work hard, and I'm really interested in actuary science and data analysis.*
- *I have studied Operations Research and Biostatistics. I did not know much about Actuarial Science before the course, but found it fascinating.*

Comments from those who said the course had a significant impact

- *I never thought I would be interested in finance, and Introduction to Actuarial Science has shown me the beautiful world of problem solving using numbers. Every day actuaries are confronted with different problems to solve, and it was through this course that I got a taste of how it was like to be an actuary.*
- *It has demystified / explained the subject*

How will MOOCs affect higher education?

- Inevitable that “online” degrees will become even more prevalent
- More learning material will be made freely available online
- Rationalisation of on-campus providers
- Providers will work to differentiate online and on campus offerings

How will MOOCs affect professional qualification?

- Lots of questions from students on whether my MOOC would prepare students for actuarial exams
- Associations will maintain the qualification key
- Will learning become free and paying for completing exams become the funding model?
- Will the FIAA still have value?

How will MOOCs affect professional development?

- Reduced market for training companies
- Professions to create / sponsor MOOCs as formal CPD activities
- Greater opportunities for non employer-sponsored professional development

