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## **Massive Open Online Courses (MOOCs) as a Window into the Veterinary Profession**

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### **Abstract**

MOOCs are freely available on-line courses open to anyone who registers and typically are associated with thousands or hundreds of thousands of participants. Using an established online platform, we created and delivered a 5-week MOOC aimed primarily at prospective veterinary students, but open to anyone with an interest in finding out more about the veterinary profession in general. 11,911 people signed up for the course and of these, 8137 interacted in some way with the course and 1716 received a certificate of completion. The majority of participants (84%) were female and there was a wide age range (under 18 to over 65). Most participants were from North America or the UK. 65% of those completing the entry survey were hoping or intending to work in the vet profession in the future, while 33% were not.

Qualitative data indicated that the course was helpful in aiding those undecided as to whether they wanted to be a veterinarian or not to decide one way or another whether they want to pursue veterinary medicine as a career. Furthermore, the course was seen as being a useful introduction to the veterinary profession even for those who had no intention of working in the field.

(200 words)

### **Introduction**

Massive Open Online Course (or MOOCs) have become a popular phenomenon in recent years. MOOCs are freely available on-line courses open to anyone who registers and typically are associated with thousands or hundreds of thousands of participants. Whilst the notion of online delivered courses is not new, it is the extent and potential global reach of such courses that makes them an exciting phenomenon (Jona and Naidu, 2014) (Baggaley, 2013, Aguaded-Gomez, 2013).

The University of Edinburgh established a partnership with the company Coursera in 2013. Six MOOCs from a range of disciplines were successfully delivered in the pilot year, attracting over 300,000 participants and the number of MOOCs offered continues to grow. In 2014, faculty at the veterinary school developed the first UK-based veterinary MOOC aimed primarily at prospective veterinary students, but open to anyone with an interest in finding out more about the veterinary profession in general. There are relatively few MOOCs reported on a veterinary theme, including one on canine theriogenology (Kustritz, 2014) and two others run by the veterinary school in Edinburgh on Equine Nutrition and Animal Behavior and Welfare (MacKay et al., 2016). The 'EDIVET: Do you have what it takes to be a veterinarian?' (EDIVET) MOOC<sup>a</sup> ran for the first time in May 2014. As this MOOC aimed to broadly touch upon many key areas over a 5 week period, a relatively large team of faculty were involved in the design of the content.

This paper describes the format of the MOOC and reports on the numbers and demographics of people undertaking it, as well as providing insight into the participants' experiences of the MOOC and its effect on their knowledge of, and intention to work in, the veterinary profession. There was also a unique opportunity to follow up in more detail with MOOC participants about their experience as some then joined the veterinary degree programme.

Usage data, plus pre- and post-course evaluations were used to explore the hypothesis that engagement with this type of course can be beneficial in providing a 'window' into the veterinary profession more generally for a range of participants in addition to more specifically assisting potential veterinary students decide whether to aim for entry into veterinary school.

## **Materials and Methods**

### ***Course Design***

The MOOC was designed to run over a five-week period using the Coursera platform. As the aim of the MOOC was to provide a typical 'taster' of first year veterinary courses, each week focused on a discrete topic rather than building on the content of the previous week, which would be the more typical MOOC design.

The five weeks' topics were:

- Basic Animal Care
- An Introduction to Body Systems
- Veterinary Professional Skills
- An Introduction to Clinical Skills
- The Past, Present and Future of Veterinary Medicine

The MOOC was led by a different member of staff (or team of staff) each week, with additional staff members invited to give short additions according to their specialism. The subjects covered were chosen carefully to minimize any risk of participants causing harm to animals or themselves during their learning. This was highlighted on the home page where a short video described the School's commitment to animal welfare in its teaching. Additionally the Course Participation Statement explained that MOOC participants would be learning about clinical observational skills only (rather than practical skills), and included a disclaimer accepting no responsibility or liability for any harm caused to animals or humans by MOOC participants.

The materials and assessments for each of the five topic weeks were released on Mondays at 9 am BST. Participants were encouraged to work through the materials during the specific topic week, but were able to work at their own pace. The content of each week was delivered via a series of short videos (most of 5 - 10 min duration) with about 1 hours' worth of video content provided in total per week. Additional resources and materials were provided as appropriate either as handouts, revision quizzes or as links to external websites. One additional week was provided at the end of the course to allow the students to complete the assessments if they wished.

The students were encouraged to engage in peer discussion via the Discussion Forum which had a thread dedicated to each week. The Discussion Forum was monitored by a team of teaching assistants and tutors whose role was not to answer individual questions but rather to pick up trends and any emerging issues and respond appropriately, referring to week leaders for input as appropriate. A team of 4 tutors with a mixture of veterinary experience and experience of previous MOOC tutoring were employed. At the end of each week, a summary response was posted by the week leaders either in video or text format. An approved standard statement, listed below, was posted in response to any threads or comments asking for advice about the care or treatment of a particular animal e.g. someone's pet:

"For more information on a particular species or disease of interest or for information on the health of your animals we recommend you seek veterinary advice at your local practice."

Assessed multiple choice questions were released at the end of each week, each of which was worth 20% of the final overall assessment (three attempts were permitted per weekly assessment with the highest mark being accepted as the final score). For some weeks formative revision quizzes were also provided. To pass and obtain a certificate of completion of the MOOC students had to obtain an aggregate score of 60% over all five weekly assessments by the stated completion date (six weeks after the course opened).

### ***Evaluation***

#### **Learner Analytics**

Information on the numbers of participants who registered for the MOOC and the numbers engaging with different aspects of the course were accessed from the Coursera platform's analytics tools.

#### **Entry and exit course surveys**

All participants were asked to complete an entry survey delivered through Coursera on first logging on to the site, and an end of course evaluation once the course had ended. The surveys included a range of question types from binary yes/no questions, Likert-like 5 point scale questions, multi-answer

questions and open-response questions. In the entry survey, demographic information and information on the participants' previous MOOC experience and expectations were included, as well as their motivation for taking the course. The end of course evaluation survey again asked demographic data about participants as well as their feelings on the content level and pacing of the course. A final open-response question also asked 'Any other comments on the course'.

### **Focus groups**

It was recognized that the school was in a unique position in that some of the incoming cohort of veterinary students could have completed the EDIVET MOOC. Students starting at the school in 2014 were asked informally whether or not they had taken the MOOC course. Of those who said they had, a request was made for volunteers to attend a focus groups to discuss their impressions of the course. Two focus groups, each lasting up to an hour and facilitated by one researcher were then run, with a total of 6 participants. Focus groups were audio-recorded and transcribed for later thematic analysis. Students were asked about their motivation for signing up to the MOOC, as well as their experience of it, and how they felt the course could be useful for those who wanted to know about the veterinary profession. Data from the interviews was thematically analysed to capture the major themes from the students' experiences of the MOOC. This analysis was led by one researcher with discussion of emerging themes involving two other researchers.

## **Results**

### ***Engagement with the MOOC***

11,911 participants signed up for the MOOC, 6835 (68%) of whom watched a lecture (Table 1). 1716 MOOC participants received certificates of completion of the course representing 14% of all those who enrolled.

### ***Entry and exit survey response rates***

2190 participants responded to the entry survey (27% of those who visited the site and accessed material) and 690 to the exit survey (8.5%). 449 of these filled in both surveys (5.5%).

### ***Entry survey results***

#### **Participant demographics**

85% of participants were female and 15% male. The age range of participants is shown in Figure 1 Nationality is shown in Table 2 with the UK and North America dominating. The highest level of academic achievement of participants who filled in the entry survey is shown in Table 3, the majority having trained at undergraduate or postgraduate level. There was a proportion (over 10%) who had school level education (including primary school level) only, suggesting a number of secondary school-age individuals may have participated.

*[Insert Figure 1 here]*

#### **Participant motivation**

MOOC participants who completed the entry survey were asked as part of the standard Coursera suite of questions 'What do you hope to get out of the course?' and given a number of options to choose from, with the option to select multiple answers (Table 4).

Two additional questions were also asked to identify more specific aspirations towards working in the veterinary profession amongst participants. 64% had plans to work in the veterinary profession in future and 67% were hoping the MOOC would help them decide whether a career in veterinary medicine was something worth considering.

Participants were also asked whether their previous academic study was related to the course. The majority (60%) of respondents' previous study was not related to the content of the course while 36% said they had studied a related subject. The remainder preferred not to say.

### ***End of course Exit survey results***

### **Overall experiences of the course**

Respondents were asked to rate their overall experience of the course (Figure 2) and whether their expectations had been met. 35% reported that the course had exceeded their expectations, 58% that it had met their expectations and 7% that it fell below expectations.

*[Insert Figure 2 here]*

Respondents to the Exit survey were also asked similar questions as in the Entry survey regarding their aspirations towards the veterinary profession. The wording in the exit survey was changed slightly to assess whether the MOOC had influenced their plans (Have you plans to work in the Vet Profession in the future?" in the Entry survey compared with "Are you now considering working in the Vet Profession in the future?" in the Exit survey). Analysis of the data revealed that although the majority of respondents maintained their answer as either yes or no, over 10% of respondents changed from either a 'Yes' before to a 'No' after and vice versa (Table 5).

### ***Qualitative themes from Course evaluation survey and group interviews with MOOC participants now studying Veterinary Medicine at The University of Edinburgh.***

A number of common themes were identified from the qualitative data collected in both the Exit survey "Any other comments" question and the two group interviews. Whilst all of the group interviewees were students who are now studying to be veterinary surgeons, the comments from MOOC participants revealed a range of motivations and aspirations towards working in the veterinary profession.

A number of participants commented that the MOOC had helped them decide about wanting to be a vet:

"Really did help me make that final decision as to what I should be studying and which direction I want my career to take." Exit survey comment

"This course has definitely convinced me that becoming a vet is the right career path for me!" Exit survey comment

"I'm only 14 and still figuring what I'm wanting to do, and I think this has consolidated my dream job (being an equine vet or surgeon)..". Exit survey comment

One comment came from a veterinarian who said they were using the course to help inform colleagues and also young people who wanted to be vets:

"(I am a veterinarian, 30+ years in practice and still working). I took the course to review material to recommend to my staff members, and young people interested in veterinary medicine. I found the course excellent for that purpose!" Exit survey comment

Other participants, including those in the group interviews, talked about the course being a useful introduction to the veterinary profession even for those who have no intention of working in the field.

"I think it's quite good for that, for people who maybe even aren't necessarily considering it but just want to learn more about the field, it did seem like a nice kind of introduction." Student 1 from interviews

"This course is an amazing way to learn and comprehend more about what veterinarians do as a profession" Exit survey comment

"Wish I had done something like this 30 years ago I might have then become a vet!" Exit survey comment

"I didn't take the course with the aim of deciding whether to become a veterinarian. I'm past the age of it being a viable option. .... It's great for laypeople to be able to get an opportunity to sample the profession." Exit survey comment

Some commented on how useful the course was as an animal owner or someone who works with animals to learn how more about veterinary practice.

“I work with companion animals daily and this course was educational and helps in me in handling the animals.” Exit survey comment

“The reason of my enrollment in this course was just to learn new things, as I am a pet owner and dog lover. It certainly met my expectatives.” Exit survey comment

## Discussion

This study has explored the potential for MOOCs to be used as a window into the veterinary profession both from the point of view of general education of the public but also to further inform potential applicants to veterinary medicine degrees about the nature of veterinary studies. The survey questions revealed that 65% of the 2,190 who completed the entry survey were hoping or intending to work in the vet profession in the future. Indeed, the demographic information collected from MOOC surveys suggested that whilst there were a number of younger participants of the age who may be considering applying to veterinary school, many of the MOOC participants were over the age of 25. These older participants may have been considering a change of career or simply participating in the course for other reasons, such as gaining information or personal satisfaction. Comments from the course evaluation survey concur with this, as some participants said they had signed up to find out more about how to care for their animals or to better understand the workings of veterinary practice.

Of those who signed up for the MOOC, 1716 (14%) completed all of the assessments and received a completion certificate, a figure which demonstrates a relatively high retention rate in the context of MOOCs more generally (KOLLER et al., 2013). A total of 4388 (37%) participants completed at least some of the assessed tasks, compared with 6835 (57%) who accessed the videos. As Koller et al. state (KOLLER et al., 2013), this may have been the learner's goal from the outset, with such individuals termed “passive lecture watchers”, or “lurkers” who still gain value from the MOOC without taking part in the assessed activities. We may hypothesise that such individuals could have included participants who commented that they simply wanted to know about animal care or the profession, and thus may not have felt it necessary to take the assessments.

It was interesting to note that the percentage of respondents who wanted to be a vet or were hoping the MOOC would help them decide stayed roughly the same before and after the course. However, some changes in individual responses were identified - some participants who had originally wanted to work in the veterinary profession continued to do so after participating in the MOOC, but some also had changed their mind and no longer wished to do so. Similarly, some participants who had not wanted to work in the profession before participating in the MOOC had also changed their mind subsequently. Some older participants also commented that if they had had access to a course like EDIVET when they were younger they would have considered a career in veterinary practice. In addition, some younger participants commented that participation in the MOOC had helped them to decide that they wanted to be a vet. These results suggest that the MOOC course was helpful in informing participants' aspirations towards the profession in both directions.

The aim for the EDIVET MOOC was to inform potential applicants and introduce the general public to some of the concepts and topics involved in studying veterinary medicine. Results of this study indicate the participants felt that the design of the MOOC matched these course aims. Results from focus groups with new veterinary students also indicate that the MOOC succeeded in connecting students to the School. Many of the elements used in the MOOC connected with current use of resources and technologies in teaching at the School, including the use of 3D design and models. In this, every effort was made by the teaching team to ensure that the experience of the MOOC echoed as closely as possible what the student would experience if studying at our School, while also balancing the appropriateness of materials shared with a wider audience. This may have impacted on the experience for the small number of participants who felt that the course fell below expectations. Some participants expected greater depth in some areas, and this may have been the result of seeking this balance.

Comments from participants who then went on to become students at the School alluded to the course allowing them a window not only into the veterinary profession, but also the learning

environment at Edinburgh. They felt the MOOC helped them feel welcomed as they recognized some of the staff, teaching methods and content when they arrived. This shows the potential for MOOCs to not only help those who are deciding whether or not to apply to veterinary school, but also to induct and prepare incoming students and ease their transition into a new university environment.

Given the combined aims of public engagement and provision of information for potential applicants, this study has demonstrated the utility of open course architecture and design to showcase the veterinary degree and introduce participants to the profession through the lens of the veterinary school. With the release of the Vet Futures report<sup>b</sup> the use of MOOCs could be a useful tool to emphasize and promote the wider role for veterinary professionals in society, and to widen awareness in a new generation of young people and inspire them to become the veterinary surgeons of the future.

#### Footnotes

A <https://www.coursera.org/learn/becoming-a-veterinarian>

B [<http://vetfutures.org.uk/download/reports/Vet%20Futures%20report.pdf>]

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**Table 1. Level of engagement**

<b>Level of engagement</b>	<b>Number of participants (% of total)</b>
Signed up for the MOOC	11,911 (total)
Visited the course site/accessed materials	8137 (68% of those signed up)
Watched a lecture	6835 (57%)
Submitted a quiz or exercise	4388 (37%)
Browsed discussion forum	2913 (24%)
Posted on discussion forum	686 (6%)
Commented on posts on forums	318 (3%)
Received certificate of completion	1716 (14%)

**Table 2. Nationality of Entry survey respondents**

<b>Country</b>	<b>Number of respondents (% of 2190)</b>
United States	779 (35)
United Kingdom	373 (17)
Canada	153 (7)
Australia	77 (4)
China	72 (3)
Spain	53 (2)
Brazil	34 (2)
Singapore	33 (2)
Others	<2%

**Table 3. Highest level of academic achievement of Entry survey respondents.**

<b>Highest level of education</b>	<b>Number of participants (% of 2190)</b>
Postgraduate degree	356 (16)
Undergraduate degree	541 (25)
College	375 (17)
Secondary School	413 (19)

**Table 4. Participant motivation for studying the course based on responses in the Entry survey**

<b>What do you hope to get out of the course?</b>	<b>% of respondents (of 2190)</b>
To get a certificate	39%
Learn new things	92%
Improve my career options	47%
Meet new people	78%
Try online education	29%
See what MOOCs are	16%
Browse Edinburgh's offering	13%
Unsure	2%

**Table 5. Change in individual participants' responses to the question "Have you plans to work in the Vet Profession in the future?" in the Entry survey versus "Are you now considering working in the Vet Profession in the future?" in the Exit survey.**

<b>Response</b>	<b>% of 449 who completed both surveys</b>
Unchanged Yes	51
Unchanged No	24
Changed No to Yes	12
Changed Yes to No	11



Figure 1

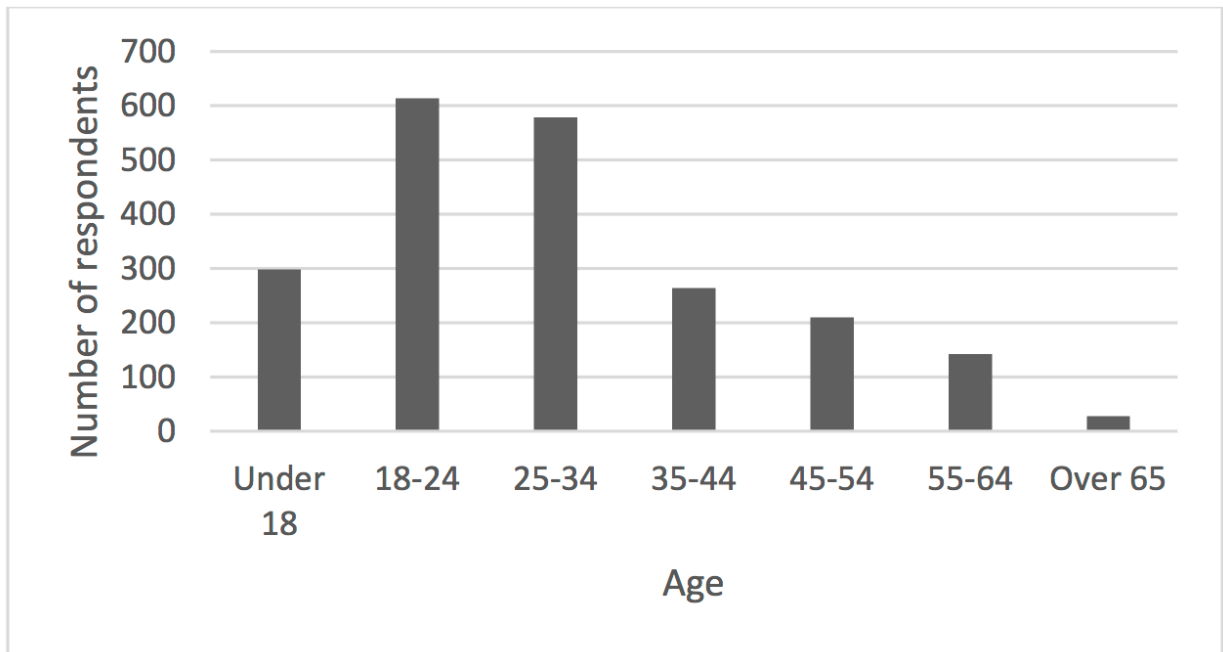


Figure 2

